



## XMOS sees its first chips

**B**ristol-based startup XMOS Semiconductor has received its first chips back from the foundry and released more details of its multi-core architecture aimed at consumer applications.

Central to the XMOS technology is a compact, event-driven, multi-threaded processor called XCore. With up to 500MIPs to share across up to 8 threads, the XCore engine readily implements a range of complex hardware functions. Access to its computational and control capabilities is through a familiar embedded software design flow. By using C-based behavioural languages, designers can quickly map white-board functional specifications into silicon.

“We estimate that the world’s universities are producing 20-30 software designers for every hardware engineer. This shouldn’t be a surprise, since the responsibility of product differentiation increasingly lies in the software domain,” said David May, CTO and founder of XMOS. “By introducing an accessible and familiar processor architecture, tightly coupled with an event-driven system and multi-threading

philosophy we are offering today’s silicon designers with the tools they really need.”

The XCore processor is tightly coupled to the outside world through a set of event driven input-output ports, and inter-thread communication is provided by XLink, a channel mechanism that allows threads and XCores to interact at the hardware level. These bridges between the physical world and the processor engine provide a stable and simple interface for the software designer and the hardware engineer.

Design tools and engineering samples of first-generation XMOS SDS chips will be available in the first half of 2008 and production volumes will follow 1-2 quarters later. These devices will be in the \$1-\$10 cost range to support cost-sensitive, high volume applications. ■

[www.xmos.com](http://www.xmos.com)

*“We estimate that the world’s universities are producing 20-30 software designers for every hardware engineer.”*

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## World’s first rollable displays ship from Southampton

**P**olymer Vision, a spin out of Royal Philips Electronics, has started production of its rollable displays from its recently acquired manufacturing facility, Polymer Vision (UK) Ltd, in Southampton.

Since taking over Innos in October, clean room facilities have been completed, the first complete manufacturing tool set has

been installed and the process has been successfully transferred from Eindhoven to the Southampton facility. The first batch of rollable displays produced has immediately delivered functional displays and volumes will ramp up this month to meet customer orders before the end of the year.

The company has produced its own

device, the pocket Rradius, which combines a 5in rollable display with 3G high speed connectivity, and the company claims to be leading the market for rollable/flexible displays by at least a year

“Our strategy to use standard semiconductor infrastructure has helped us to successfully and quickly start up production in Southampton“, says Guido Aelbers, COO of Polymer Vision. “The result is an unprecedented pioneering step for the flexible display industry as a whole and marks the beginning of a new era of commercialization of rollable display enabled devices”. ■

[www.polymervision.com](http://www.polymervision.com)

*“Our strategy to use standard semiconductor infrastructure has helped us to successfully and quickly start up production in Southampton.”*

## Farewell to 2007

As we approach the end of 2007, we can look back on a great year for the electronics industry in the South West. New ventures such as Panasonic/Elixent, XMOS and 3DLabs have demonstrated their first products, while Air Semiconductor is close behind and Atempo (now called Xintronix) is looking to keep the pipeline of innovation bubbling along. More established companies such as picoChip, Icera, Phytworks and Nanotech Semiconductor have all seen global success in their chosen markets, with world beating financial backing for world beating technology. And the core companies in the regions have also been growing and innovating in the region, from STMicroelectronics and Toshiba to HP.

With the Wireless2.0 conference bringing together the whole chain of mobile technology from chips to content, the region continues to be a global powerhouse for electronics technology, and 2008 promises yet more, so seasons greetings to you all

**Nick Flaherty  
& Simon Bond**

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### On the web:

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](http://www.flaherty.co.uk)

# Panasonic Deploys Reconfigurable Logic in Professional AV Products...


**P**anasonic has started using the reconfigurable logic technology from its Bristol-based design team in professional audio video equipment.

The technology, acquired from startup Elixent, is being used for an add-on codec board or both the AJ-HPX2100 camcorder and the AJ-HPM100 mobile recorder that adds support for real-time MPEG4-AVC (H.264) Intra-coded compression of 1080i/720p images, allowing electronic

news gathering (ENG) crews as well as cinema and TV program production DP (Director of Photography) to capture and store compressed HD video in real time. The AVC-Intra board uses a 130nm System on a Chip (SoC) manufactured by parent Matsushita that contains multiple D-Fabrix Reconfigurable Algorithm Processor (RAP) arrays connected to ASIC blocks and to a standard 32-bit RISC core. This is the first of a series of devices for consumer products, says the company. 

## ...as it looks to next generation reconfigurable array in 45nm

**I**n October, Panasonic announced the world's 45nm system-on-chip (SoC) for consumer electronics with a UniPhier chip for Blu-ray disc recorders. The Panasonic Strategic Semiconductor Development Centre Europe (PSDCE) centre in Bristol helps drive this culture of innovation, holding many patents relating to the development of the D-Fabrix V2 and V3 RAPs, and has already begun architecture exploration for D-Fabrix V4.


“Seeing the D-Fabrix V2 going into volume production has given our team in Bristol a real boost as we work on the implementation of our new V3 architecture in 45nm silicon,” said Andy Elms, Director of PSDCE. “The project has been great team effort between Matsushita’s design teams in the UK and Japan. We’re now actively growing our Bristol team to support the rapid adoption of D-Fabrix into new consumer product ranges.”   
[www.panasonic.net](http://www.panasonic.net)

## IPWireless expands in Czech Republic

**T**-Mobile in the Czech Republic is expanding its ‘Internet 4G’ wireless broadband service to cover over 60% of the population using equipment from Chippenham-based IPWireless.

IPWireless, now a subsidiary of NextWave Wireless of San Diego, has shipped more than 600 UMTS TD-CDMA wireless broadband base stations with more than 2,000 sectors of network capacity to T-Mobile and is now expanding to cover the republic’s largest cities. The TD-CDMA network now delivers over 10 terabytes of data each day which translates into each subscriber downloading several gigabytes of data per month - an amount several orders of magnitude greater than subscribers of conventional 3G data networks.

provides the performance and reliability that enables T-Mobile to stand out from the competition,” said Roland Mahler, managing director, T-Mobile CZ. “Both we and our customers have been extremely pleased with the performance of the network and we look forward to continued subscriber growth as we increase the network’s coverage.”

“We are delighted to see T-Mobile continue to expand its IPWireless network in the Czech Republic to meet the growing demand for broadband services,” said Dr. Bill Jones, chief executive officer of IPWireless. “Our experience powering one of the world’s largest true mobile broadband networks further deepens our unique expertise in next-generation mobile broadband and multimedia technologies.   
[www.ipwireless.com](http://www.ipwireless.com)  
[www.nextwave.com](http://www.nextwave.com)


“IPWireless technology from NextWave

# picoChip launches first single-chip femtocell design for WiMAX Wave 2...

**P**icoChip has announced the PC6532 Wave 2 femtocell, the next version of its industry-standard WiMAX basestation reference design and the industry's only single-chip (PHY + MAC) reference design to support WiMAX Wave 2 and full IO-MIMO in both downlink and uplink. The picoArray-based platform offers seamless migration path for existing WiMAX Wave 1 designs.

"Once more, picoChip demonstrates the power of its software-defined architecture, and we are delighted to be working as partners," said Paul Senior, CTO of picoChip customer Airspan. "The efficiency of the single-chip solution is attractive, furthermore the ability to seamlessly upgrade our current Wave 1 designs to Wave 2 and full MIMO in both uplink and downlink, gives us a significant advance in performance and

capability over alternative solutions."

The picoChip WiMAX architecture is scaleable from femtocell access points to sophisticated multi-sector carrier macrocells with full support for IO-MIMO and beamforming. Both reference designs run on a single processor: the PC205 integrates an ARM processor for MAC functionality, and picoArray multi-core DSP for software defined PHY. 

## ...powers new McWiLL wide area basestations for 2008 Olympics...

**X**inwei in Beijing has chosen picoChip's PC203 processor array for its next-generation McWiLL basestation. This is a Chinese-developed mobile broadband wireless access standard, Multi-carrier Wireless Information Local Loop, optimised for extremely wide area coverage, being deployed for the 2008 Beijing Olympics. In this design two PC203

processors replaced 9 TI C6xxx DSPs and two large FPGAs.

McWiLL combines SCDMA's traditional use in narrowband voice and adds nomadic broadband functionality. It is based on CS-OFDMA (combining the advantages of both OFDMA and CDMA), adaptive modulation and uses dynamic channel allocation, smart antennas, beam-

forming and interference cancellation to improve reach and throughput.

A McWiLL base station delivers 15Mbps per sector over 1-3 kilometers in an urban environment, using 5MHz of spectrum at 1800MHz; while at 400MHz, the range extends from 20 to 60 kilometers. Client devices using a 1MHz subcarrier deliver throughput (download and upload) speeds of 3Mbps while traveling at 120 kilometers per hour.

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We are also able to offer a fast turnaround and cost-effective design-assembly service using a small network of highly reliable suppliers saving valuable engineering resources.

**For more information please contact:**

**Jim Hurford on 01453 732820**

**or email [jim\\_hurford@dayford.co.uk](mailto:jim_hurford@dayford.co.uk)**

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[www.dayford.co.uk](http://www.dayford.co.uk)**



"Xinwei is a truly significant player and this is a good example of the advantages of our architecture over traditional DSP, and of our capability to power any standard," said Doug Pulley, co-founder and CTO of picoChip. "This agreement furthers picoChip's support for Chinese wireless development, and it is a testimony to the maturity of our architecture and tools that Xinwei has been able to develop such a sophisticated product so quickly." 

## ... and makes the RED HERRING Global Final

**P**icoChip is a 2007 finalist of the "Red Herring 100 Global" Award. From a pool of 1800 candidates, only 100 are chosen for this award, and only 10 in semiconductors. "You have made the final group because of your outstanding achievements and Red Herring Magazine is honoured to announce picoChip as one of the most promising technology firms in the world" said the largely Web-based publication.   
[www.picochip.com](http://www.picochip.com)

# Ocean Blue develops “Deep Hibernation” software to tackle rising standby power consumption...

**B**ristol-based digital TV specialist Ocean Blue Software has developed an intelligent, “deep hibernation” system for digital TVs and set-top boxes to reduce standby power consumption. The new software monitors device usage and will help tackle the increasing problem of standby power consumption, which currently costs UK householders over £500 million a year, producing some 3.1 million tones of CO<sub>2</sub>.

The Eco-TV module monitors device usage and reduces consumption by switching off functions that are not required. Freeview boxes, for example, consume almost 12 watts, on average, when in standby mode. Sunrise Eco-TV would quickly push the box into deep

hibernation, slashing consumption by an estimated 70%.

“The proliferation of electronic devices in the home is pushing up power consumption but few householders realise quite how much,” said Ken Helps, Managing Director of Ocean Blue Software. “Pushing a button on the remote to switch the TV or Freeview box ‘off’ is very convenient but very wasteful. Consumers want the convenience and it is up to the

manufacturers to find ways to make their devices more efficient. This software is a major step in that direction.”

Ocean Blue Software is working with several electronics manufacturers to implement Sunrise Eco-TV into future generation of chipsets and CE products. In some cases, the software can make instant savings, in others new electronics will be required to achieve greatest savings, which will take some months to develop. ☒

*“The proliferation of electronic devices in the home is pushing up power consumption but few householders realise quite how much.”*

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## .. sets up Hong Kong lab...

**O**cean Blue is setting up a lab in Hong Kong to complement its testing service here in the UK. The new lab will handle sales, support and development and grow from 10 to 20

people over the next two years, said Ken Helps, MD of Ocean Blue. “All the really clever development will be done in the UK as I believe all the best software engineers are here,” he said. ☒

*“All the really clever development will be done in the UK as I believe all the best software engineers are here.”*

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## ... and launches software for China

**W**ith China poised to roll out its new standard for terrestrial DTV, Ocean Blue has released a version of DMB-T/H for the market, based on its Sunrise DVB-T software. The mandatory standard will cover both fixed and mobile terminals and will eventually serve more than half of China’s TV viewers.

Though its name is not official yet, the standard is being called Digital Multimedia Broadcast-Terrestrial/Handheld. DMB-T/H signals the beginning of the end for previous Chinese trials of Europe’s DVB-T standard, and it adds another rival to the mix for mobile-TV services in China—the world’s largest market for TVs and mobile phones. An official announcement of the new standard is imminent, sources in China said, “Its release will end a fierce rivalry between two universities with very different approaches to the terrestrial standard.”

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## ... teams up with Sharp and NXP...

**O**cean Blue has teamed up with Sharp to integrate its Voyager MHEG5 software into the next generation of TVs. The new IDTV hardware platform runs on Trident digital decoders and video processor

chips, which is the HiDTV Pro LX and SVP WX products deployed in Sharp LCD TVs. It has also teamed up with NXP to supply the software on the latest Nexperia chips for set top boxes and personal video recorders. ☒

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## ... adds mobile TV...

**O**cean Blue has taken the DVB-H mobile digital TV stack from DIBcom in France and is integrating it into its Voyager DVB-

T middle to provide both terrestrial and mobile services across different countries in Europe. The demo will be ready for the 3GSM show in February. ☒

Ocean Blue’s Sunrise DVB-T software supports the Chinese DMB-T/H standard, and current OBS customers looking to develop their presence in China, will be able to capitalise on this new feature of the Sunrise software product. ☒ [www.oceanbluesoftware.co.uk](http://www.oceanbluesoftware.co.uk)

# Innovision opens up NFC market with IP licensing

Cirencester-based Innovision Research & Technology is making its Gem Near Field Communication (NFC) semiconductor intellectual property (IP) available under an evaluation licensing programme. This will enable semiconductor companies to develop NFC capability, either for stand-alone solutions or as part of System-on-Chip (SoC) integrated NFC solutions.

The move to license NFC silicon IP in this way – the first of its kind in the NFC market – will clear the way for semiconductor companies to move to the next stage of integration in chipsets and devices. The IP is fully compliant with NFC standards and includes support for advanced features such as ‘battery off’.

For the first time, developers will be able to create high-performance SoC designs that fully integrate NFC into other complementary technologies, including WiFi and other wireless or power chipsets. The benefits of this include a reduction in the silicon area, complexity and production

cost of NFC-enabled devices.

Innovision’s Gem IP will be offered to interested parties under an evaluation licence, with forthcoming test silicon. This will not only enable detailed evaluation of the NFC IP, but also enable the creation of demonstration systems to show to end-customers.

A key benefit of the Gem IP is its relative ease of transfer from one silicon foundry process or geometry to another, due primarily to the Digital Signal Processing (DSP) approach to much of the analogue design. Furthermore, the ability to customize its features, interface, performance, power requirements and,

ultimately, die area, enables a market-leading NFC chip to be developed in months rather than years.

“As NFC enters the next phase of volume deployment, manufacturers of handsets and other devices will require a competitive supply base to maintain innovation and reduce the cost of NFC technology,” said Marc Borrett, Innovision’s business development director. “Making our advanced Gem IP available for evaluation now is a key step in realizing this vision. It will help many device and chipset designers to meet the growing demand for high-performance, lower-cost NFC-enabled devices and applications.” [www.innovision-group.com](http://www.innovision-group.com)

*“As NFC enters the next phase of volume deployment, manufacturers of handsets and other devices will require a competitive supply base to maintain innovation and reduce the cost of NFC technology.”*

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## Ubiquisys and Motive team to manage millions of femtocells

Slindon-based femtocell developer Ubiquisys has teamed up with a leading provider of service management software that helps broadband and mobile network operators deliver and manage a new generation of voice, video and data services to consumers.

The Ubiquisys Femtocell Management Agent has been verified for Baseline TR-069 Interoperability with the Home Device Manager from Motive in the US, ensuring that the two companies can successfully deliver a complete device management system for large-scale femtocell deployments. Motive supplies over half the world’s telecoms companies,

including AT&T, Bell Canada, BT, Deutsche Telekom, Telecom Italia, Softbank BB and Verizon.

Ubiquisys has long argued that DSL-type management systems based on the TR-069 standard are the best method to manage millions of residential femtocells, and the combination of the Femtocell Management Agent and Motive’s Home Device Manager means that operators can centrally manage their femtocell population.

“Whilst femtocells are complex pieces of mobile telecoms equipment, they are also first and foremost consumer devices and as such they have to be simple

enough to be installed and managed by the average user,” said Will Franks, CTO and Co-Founder, Ubiquisys. “We spent a lot of time and money building the ZoneGate with no buttons so that all the user is required to do is plug it in. Our work with Motive is a key component of this and bringing to bear their considerable experience from the management of broadband devices has proven invaluable.”

“We have a great deal of experience working with broadband and mobile service providers to enable zero-touch provisioning and central management of large networks of consumer devices,” said Neil Dholakia, CTO of Motive. “Femtocells represent a significant new application for our technology and we are delighted to be working with Ubiquisys who are acknowledged as a leader in this exciting space.” [www.ubiquisys.com](http://www.ubiquisys.com)  
[www.motive.com](http://www.motive.com)

*“We spent a lot of time and money building the ZoneGate with no buttons so that all the user is required to do is plug it in.”*

# Digital TV Labs launches test suite for top 50 TV trouble spots

Digital TV manufacturers can now guarantee front-end receiver performance in Europe's most challenging DVB-T digital TV locations, with the launch of the first lab-based Radio Frequency (RF) test suite for benchmarking receivers against the top 50 DVB-T trouble spots across Europe.

Digital TV Labs' RF Test Suite consists of benchmarked RF captures that will enable chip and receiver manufacturers to validate front-end performance for Europe's most difficult field conditions in reproducible and repeatable lab conditions, in any worldwide location. As a result, manufacturers can for the first time address a major cause of product return rates and minimise the need for lengthy and costly field testing in locations across Europe.

Conventional lab test equipment can never replicate the complex real network reception conditions across Europe, so manufacturers need to field test receivers to validate RF performance. However, with ever-changing network conditions and switchover programs in full swing across 20 European countries, finding and visiting the RF trouble-spots to

field test every receiver variant is a huge undertaking. The test suite allows manufacturers to "Virtual Field Test" their receivers, accurately reproducing field conditions in a lab environment and ensuring products work effectively in Europe's biggest DVB-T trouble-spots.

Fresco Microchip, a Canadian fabless designer of RF, mixed-signal, and digital signal processing integrated circuits (ICs), has used the Bristol-based Digital TV Labs' RF Test Suite to test its ultra-small FM2080, the industry's first single-chip hybrid receiver for DVB-T markets.

"As the evolution from analogue to digital broadcasting gathers pace, digital TV manufacturers are demanding leading edge chips that will guarantee a high level of performance across Europe," said Mike Gittings, vice president of Marketing, Sales and Applications of Fresco Microchip. "Digital TV Labs' field test services and Virtual Test Suite enabled Fresco Microchip to accurately reproduce a variety of difficult European reception conditions to optimise our FM2080 single-chip Hybrid demodulator for every DVB-T region."

"Using DTV Labs Virtual Test Suite, Fresco's FM2080, exceeded a number of known challenging performance benchmarks, each important to high quality digital television broadcast," said Keith Potter, CEO of Digital TV Labs.

"As digital TV manufacturers expand into new European markets, brand perception is key to gaining an advantage in this highly competitive sector. DVB-T trouble-spots can significantly hamper the performance of front-end receivers, leading to high product return rates and customer churn, and lasting damage to a brand's reputation. By taking advantage of our lab-based RF testing, manufacturers can ensure products work in even the most challenging DVB-T locations in Europe, while reducing costs and speeding up time-to-market in all European regions," added Potter.

Digital TV Labs customers include some of the biggest names in the consumer electronics industry, including Microsoft, LG, Toshiba and STMicroelectronics. [www.digitaltv-labs.com](http://www.digitaltv-labs.com)  
[www.frescomicrochip.com](http://www.frescomicrochip.com)

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## ST moves to 45nm for RF...

STMicroelectronics has successfully manufactured the first functional devices to be built using the CMOS 45nm Radio Frequency (RF) technology. This leading-edge technology will be essential for next-generation WLAN (Wireless Local Area Network) applications developed at the site in Bristol.

Manufactured on 300mm silicon wafers at Crolles, France, the prototype System-on-Chip (SoC) devices integrate a complete functional chain from the initial detection of the RF signal to the output of digital data ready for subsequent processing. These prototypes deliver state-of-the-art performance and density (only 0.45 square mm for the low noise amplifier, mixer, analog-digital converter and filtering working at 1.1V).

"The results from the first devices fully confirm the ability of our 45nm RF derivative technology to bring next-generation WLAN connectivity solutions to the market," said Mike Thompson, Group Vice-President of Front-End Technology and Manufacturing, Advanced R&D – High Performance Logic &

Derivatives, STMicroelectronics. "The 45nm RF process exemplifies ST's ability to add value to the core CMOS platform by incorporating proprietary process steps that enable the final device to provide applications such as integrated RF/analog functions or various types of embedded memory functions." [ST](#)

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## ...as it buys Genesis for digital TV

STMicroelectronics is buying Canadian communications chip supplier Genesis Microchip for \$336m in a move that will give it key intellectual property for integrating into system on chip designs for digital TV and displays. ST Bristol is a key site

for the architecture development and specification of these chips.

The deal is expected to be completed in the first quarter of 2008. [www.st.com](http://www.st.com)

# Venture deals boom for 2008

This year saw significant growth in venture funding, says [Stuart McKnight](#) of Ascendant

Ascendant's research team track all tech investment in the UK and Ireland. (excluding life sciences and MBOs) over £500K. During 2007, they have been particularly busy as the number of deals, the value of investments and the number of active investors, have all increased dramatically. Over the last 11 months (this note was drafted in early December) 275 institutional VCs (ie not angels or private investors) have invested over £875m in 227 companies. This compares to 2006 (12 months) in which 217 investors completed 175 deals and invested £710m. The chart below, which plots the deals completed each month, highlights the upward trend.

Company	Invested (£m)
Plastic logic	51.0
Picochip	35.0
Open Hydro	28.0
TWMA	27.6
Picsel Technologies	23.0
Connectivity	17.0
Viagogo	16.5
Frontiers Silicon	16.0
TMO Renewables	15.0
Videojug	15.0

In 2005, VCs who specialise in tech businesses were on average completing about 13 deals per month. During 2007, this figure has risen to over 20 transactions per month. Whilst this is still some way off the peak which occurred during November 2000 when 67 deals were done, it is still a welcome increase in investment activity. The investors who were pushing this pace the most were SPARK Ventures, Amadeus, Balderton, 3i, Intel and SEP.

The ten biggest deals took 28% of the total funds invested. As can be seen in the table to the right, semi/opto and "cleantech" companies were well represented in this group.

These deals were a contributing factor to the fact that the semi/opto and "cleantech" sectors attracted more money than other

tech subsectors collecting £171m and £170m respectively. Where they differed was that the average deal size in the semi/opto sector was close to £11m whereas in the cleantech sector it was approximately £5m. Funds invested in cleantech have grown by almost 300% during 2007. Semi/Opto investors have also committed more to their sector deploying more than 110% than they did in 2006.

The very positive trends for the market as a whole mask some modest performance and interesting declines in certain subsectors. For example, our statistics indicate a very slight drop in money invested in internet/wireless service businesses (We have seen 66 such companies raise £165m in 2007.) which is counter intuitive. Our team believe that the figures may be understated due to a few of the key deals not disclosing the funds invested and hence lowering the aggregate in the analysis. However, we do remain confident in our overall conclusions that growth in this area has slowed and is not matching that of the semi/opto and "cleantech" sectors. Investors also reduced their commitment to software companies. Between January and early December, 54 software developers shared £157m. Clearly this qualifies as the 4th largest subsector but it is the lowest amount invested in software businesses for 4 years. We have remarked on this decline before and expect it to continue in 2008.

The top 10 deals included 3 semi/opto companies comprising Plastic Logic (£51m), Picochip (£35m) and Frontier Silicon (£16m). However, Light Blue Optics (£13m), CamSemi (£13m), Gige (£10m), Intense Photonics (£10m), Xmos (£8m), and Mirics Semiconductor (£6m) also raised significant amounts. Investors also backed Silistix, Redmere, Point 35 Microstructures, Nanotech Semi, Quantum Filament Technologies and Axilica. Contrary to popular belief these

deals were NOT shared amongst a very few specialist investors. Intel, Pond 3i and SEP all invested in a number of semi/opto plays but the 49 other institutions who invested in the sector often committed funds to just one company. Therefore identifying the range of potential investors and the right investors to target for a particular business is not quite as easy as some would believe.

The South West had another good year with 10 companies sharing £68m. The lion's share went 4 companies – Picochip (£35m), U4EA Tech (£11m), Xmos (£8m) and Marine Current Turbines (£7.5m). Other companies from the region which attracted funds included Exabre, Revolymmer, Nanotech Semi, BeCheeky.com, Aupix and Tbiconnect.

Looking to the UK as a whole, funds continue to be invested throughout the country. Investors favoured London based companies most (£236m) then Cambridge (£133m) and Scotland (£103m). Ireland was the only region to show a reduction in both the volume and value of deals done.

We still have a few weeks to go in 2007 and given the usual lag in reporting/announcing of deals Ascendant expects VC investment in the whole sector to top £900m which would be a notable increase over 2006. The outlook is generally good for 2008 as impact of the sub-prime crisis is likely to be remote or minor on the performance of early/growth stage tech businesses in the UK and Ireland. At the time of writing, debt is harder to come by but not impossible to raise for the right proposition and given that most tech companies are more focussed on equity raising we believe that the effects of the "Credit Crunch" will be marginal. VCs have raised funds during 2007 and many have fresh or "lazy" money that needs to be invested. Against this backdrop perhaps we might get to the magic £1bn of investment by the end 2008 – let's hope so. ☐

*For further information on investment trends or advice on raising capital, contact Stuart McKnight at Ascendant on 020 7993 8700 or [smcknight@ascendant.co.uk](mailto:smcknight@ascendant.co.uk).*

*"The outlook is generally good for 2008 as impact of the sub-prime crisis is likely to be remote or minor on the performance of early/growth stage tech businesses."*

# *XMOS ramps up for production*

As Bristol start up XMOS Semiconductor starts shipping its multi-processor chips for consumer applications, **David Manners** finds out about the company's plans

**X**MOS Semiconductor, the Bristol consumer IC start-up co-founded by Transputer designer Professor David May FRS, has got its first chips back from the foundry, TSMC, and is shooting for an early Q2 2008 initial production run.

"We've got a hundred chips from a multi-project wafer batch. They're packaged and they're being put onto development boards," says Richard Terrill, the new vice president of marketing at XMOS. Three or four boards will go to customers, XMOS will use the rest.

The multi-processor chips, called Software Defined Silicon (SDS) by XMOS, will sell for between \$1 and \$10, and are aimed at consumer electronics producers wanting fast, cheap, C-programmable silicon.

Design tools and engineering samples of first-generation XMOS SDS chips will be available in the first half of 2008. Production volumes, designed to support cost-sensitive, high volume applications will follow one to two quarters later.

*"The first step is to get customers to put in one of our smallest devices and get comfortable with it and the use SDS to take over more and more of the functionality."*

Terrill said that between thirty and forty companies are working on SDS applications, with a total of 50 projects being addressed by design teams using SDS chips. XMOS has FAEs in Holland, Singapore and Silicon Valley.

Users of low end FPGAs are taking to SDS, because SDS is much faster to use. "SDS takes minutes to recompile. It can take hours on a Spartan where every change in HDL re-starts the synthesis", says Terrill, a former Xilinx executive who ran Spartan marketing for many years.

"The most valuable thing is time," says Terrill, "SDS gives engineers more time, a more efficient design flow, more of an ability to respond to changing conditions in the market place."

Programming in C/C++ is attractive to them. "It's quicker and easier to write a behavioural description," says Terrill.

Despite the promise of SDS as a low-end FPGA replacement, it is expected that this application is only expected to make up about ten per cent of XMOS' market, with the majority of revenues coming from ASIC/ASSP/SOC replacement.

"The first step is to get customers to put in one of our smallest devices and get comfortable with it and the use SDS to take over more and more of the functionality", says Terrill.

The SDS chips, based on an event-driven, multi-threaded, 32bit, processor called XCore, have up to 500MIPS to share across eight threads, allowing the implementation of complex hardware functions.

XMOS has completed the beta version of its design tool. Although SDS chips are programmed with a standard embedded software development flow starting with C/C++ source, compile, link, assemble and de-bug, using standard industry development tools, XMOS has added extensions to C.

That's because C doesn't understand the XMOS port structure, and doesn't understand multi-threading and parallelism. So the company developed a language called XC which is 99 per cent C, with a few extensions to allow a

programmer control over the threading behaviour and the I/O port control.

The beta design tool is for use just by XMOS plus "one key launch customer," says Terrill.

The tool allows you to design an entire product for a multi-core application. The tool will go to further iterations once the test data from the test chip has been evaluated. Early next year a third iteration on the tool is expected to be completed.

Having software tools which allow designers to input requirements at the functional level is in keeping with the spirit of the age because, according to May: "We estimate that the world's universities are producing 20-30 software designers for every hardware engineer. The responsibility of product differentiation increasingly lies in the software domain."

May's perception is that consumer electronics companies hire loads of software engineers but few chip designers. So give them a chip programmable in a way that software engineers like, and you've got the basis for a business.

"Consumer electronics customers want to look at tasks and functions like Ethernet and UARTs, and they have built up teams of software engineers who understand C, very few understand RTL. They're not semiconductor guys. They're engineering teams set up to write software in C," says May's co-founder at XMOS, Noel Hurley.

XMOS has licensed technology from Sidense, the Canadian developer of anti-fuse one-time-programmable logic technology, to implement its SDS chip family.

XMOS is backed by \$16m in VC funding from Foundation Capital, Amadeus Capital Partners and DFJ Esprit. 

[www.xmos.com](http://www.xmos.com)

# Moortech targets SoC designers for analogue IP

Devon-based design house Moortec has changed its business model to license its high performance analogue and mixed signal designs, particularly low jitter PLLs, to system-on-chip developers in the UK and Europe.

The 'route2IP' approach is a commercial arrangement where the IP will be shared between vendor and customer. Under the terms of the collaboration the customer is able to own high performance analogue blocks on an attractive cost


model compared with normal IP vendor arrangements.

"There is a high demand for challenging analogue and mixed-signal IP from semiconductor OEMs and startups, particularly from those engaged in complex, largely digital SoC developments on 65nm and 90nm technologies", said Moortec's Managing Director, Steve Crosher. "Our 'route2IP' initiative allows SoC developers to gain high performance analogue block functions, such as low jitter PLLs, whilst

retaining IP and internal reuse rights". Since starting in May 2005 with designers from GEC Plessey Semiconductors in Roborough, Plymouth, Moortec has provided mixed-signal IP blocks for consumer, medical and automotive applications. With 'route2IP' Moortec offers an alternative to the common IP delivery model used by IP vendors.

"We're very excited about 'route2IP', as it allows our world-class PLL design experts to work closely with those customers targeting designs at cutting edge geometries", said Crosher. "The scheme will run alongside our established design services model which has been offered since startup."

*"We're very excited about 'route2IP', as it allows our world-class PLL design experts to work closely with those customers targeting designs at cutting edge geometries."*

Last month Moortec won a contract to supply an accurate, high frequency, digitally trimmable crystal oscillator for a wireless Ultra Wideband (UWB) SoC design. Operating at 33MHz and targeting a 0.18um BiCMOS process, the oscillator will be factory trimmed to sub-ppm accuracy. 

[www.moortec.com](http://www.moortec.com)

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## Intohand appoint non-exec from Virgin Media

Bath-based independent software house Intohand has appointed Dr Keith Monserrat as a Non-executive director to the Board. The company specialises in publishing content to mobile devices, Java application coding and mobile client-server content handling applications.

Keith Monserrat spent the early part of his career in optoelectronics research and has served for two years as the Group Managing Director – Strategy, Communications and Policy for Virgin Media.

"I am delighted to be joining the Intohand Board, and very much look forward to working with the growing executive team to deliver content and information to small screens," said Monserrat. 

[www.intohand.com](http://www.intohand.com)

# 3DLabs aims at satnav and next generation OpenGL...


The Bristol design team for 3D Labs Semiconductor is developing technology for the next generation of 3D imaging for embedded devices based on the forthcoming OpenGL ES2 standard.

The software runs on the DS02 array processor launched last year which is now

in mass production and being designed into personal media players, video surveillance systems and medical PCs.

The company is also developing 3D display software for satellite navigation systems using the next generation of data which needs to build 3D images of buildings. The current demonstration

system runs at 9 frame/s displaying maps with the buildings in 3D, generating a peak of 1.2m vertices/s.

The ES2 standard allows textures to be generated through a few variables, rather than having to store large texture images. This is important in embedded designs such as smartphones where memory is limited. 

## ...and adds Linux 2.6


3DLABS has ported Linux 2.6.21 to its DMS-02 array processor, bringing open source innovations to developers and device makers using the processor to deliver unrivalled application and media processing performance in low power environments.

The SDK provides a suite of development tools and production ready applications, CODECs and libraries that take full advantage of the underlying features and performance of the DMS processor, including:

- + Audio, video and imaging decoders and encoders, including; H.264/MPEG-4 AVC, Microsoft(r) WMV, WMA and VC1, MPEG-2, MPEG-4, AAC, MP3, Dolby Digital(r) (AC-3), G.276, Ogg Vorbis, Xvid, DivX X, JPEG and MJPEG
- + Media player and framework
- + Photo browser
- + 2D/3D libraries including OpenGL ES 1.1, DirectFB and support for GTK+
- + Imaging and camera processing pipeline
- + Compute library
- + Powerful GUI toolkit for enhanced user experiences
- + Access to pre-ported applications e.g. Opera(tm) web browser, messenger client, video conferencing and games such as Sudoku and

+ GCC 4.x Compiler and wide file system support (iffs2, vaffs and ext2)

“Many of our global customers are looking for an open source solution and need it to be compact, feature rich and production ready so that they can get their products to market quickly and efficiently,” said Tim Lewis, director marketing at 3DLabs. “By implementing the public domain Linux 2.6.21 kernel ourselves we are able to offer customers a competitive end-to-end solution that leverages our intimate knowledge of the kernel and DMS-02 processor to help ensure that their requirements and deadlines are met.” The Linux SDK supports the DMS-02, a multi-core System-On-Chip that

combines two ARM 926 cores with 3DLABS’s proprietary SIMD array processor and an industry standard set of peripheral functions. The fully programmable array performs all the media intensive tasks such as 2D/3D graphics, video encode/decode and image processing, offloading the ARMs and leaving them free to run CPU friendly tasks. The DMS-02 hardware platform supports a wide range of peripheral modules and drivers including; analog and digital displays, LCD touch screens, flash and DDR memory, audio in/out, ethernet, camera sensors, USB 2.0 OTG, IDE, UART and GPIOs.   
[www.3dlabs.com](http://www.3dlabs.com)

## Analog Design ....

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For SoC and digital ASIC designs Moortec are the perfect partner to provide those tricky analog blocks.



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