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David Dyson, the only network CEO to outlast 2016



First-ever interview – page 15

Huawei special pullout: Consumer MD James Jie reveals UK strategy



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Examining how dealers are capitalising on the demand for flexible working

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Shattered trust

Investigating the factors holding back the device repair market



If it ain't broke, don't fix it

The mobile phone repair market is growing, but are manufacturers holding it back?

Chris Jenkins

A recent Motorola survey of six countries showed that someone breaks their smartphone screen every two seconds, and that 21% of smartphone owners are using their phone with a cracked screen. That's a lot of potential repair work, and this doesn't even touch on other common problems such as water damage. Yet a recent Envirofone survey showed that a third of users put up with a cracked screen rather than face the cost of having it repaired, and smaller repair businesses are claiming that manufacturers are holding back their business by keeping parts costs high, creating difficulties with warranties and influencing opinion against independent repairers. So who is really making money out of the mobile repair market? The four main groups involved are small independents, official repair channels such as Apple's own, the increasingly popular high-street franchise chains, and large service providers that undertake repairs on behalf of manufacturers or retailers.

Big and small

At the smaller end of the scale – if only in the size of its premises – is Lovefone, which is opening up the world's tiniest repair shops inside British red telephone booths. The first of its kind opened in August 2016 on Greenwich High Street, and there

are plans to open at 35 locations in London over the next 18 months. It also has a Central London walk-in store, and a pick-up and return courier service operating in Zone 1. In terms of volume, the largest repair services are the highly visible high-street operations such as Carphone Warehouse's Geek Squad, which handles 250,000 repairs a year, and third-party specialists who will take on work for a number of manufacturers or retailers, or even direct from the consumer via websites. Kevin Gunter, director of UK&I Services for Dixons Carphone, says that the real challenge for a repair operation is to maintain quality: 'There are 10 million handsets within the market, and there is a real gap in service quality,' he says. 'We want to be the ones to address this, providing an all-around better experience for customers.' The main requirement of customers, says Gunter, is that the repair is done quickly. 'With

increasing demand for same-day service, we've recently launched a new concept store in Swindon, Wiltshire, which includes a trial for a full repair service on-site, allowing customers to get their phones fixed within hours,' says Gunter. 'The store houses the same state-of-the-art equipment found at Carphone Warehouse's main 750,000sq ft repair hub, and offers the same level of service as that which can be found in any large-scale repair operation.' On the issue of quality, Gunter adds: 'We want to provide complete flexibility and peace of mind to customers by offering a same-day service, and with full accreditation we can fulfil this.' Less immediately visible to the consumer are the third-party repair services such as Premiere Eurocom (Premeuro), founded by Raj Patel in 1988. Premeuro provides both in and out of warranty repair, refurbishment and BER Recovery solutions for MVNOs, handling more than 25,000 units per month at its 10,000 square foot facility in

North London. Patel says: 'Many PAYG or SIM-only MVNOs still need to provide a repair solution for their customers when their phones stop working. We are able to provide both a walk-in repair solution for fast turnaround (30 minutes), or completely secure reverse logistics for MVNOs and their customers across the UK.' Premeuro can also provide out-of-warranty repairs for insurance providers, as well as servicing the Recommerce (or 'buy-back') industry, and providing BER (Beyond Economical Repair) recovery and asset recovery. Handling devices from Samsung, Apple, Microsoft, Nokia, Yota and CAT, Premeuro offers a three-month warranty on all repairs (for the same fault), and provides BER recovery services for distributors. The company claims 98% recovery, back to either Grade A or Grade B stock, allowing distributors to put these products safely back into stock at a substantial uplift in price.

Customer aversion

So how do these different repair industry channels attract business? Cost and speed of repair are the main competition points. A Motorola survey indicates that 50% of phone damage is caused by the device simply being dropped, but customers can react negatively when they realise that the cost of repair can be high and is not covered under warranty. Research commissioned by recycling specialist Envirofone



suggests that almost 26% of UK adults have cracked their mobile phone screen, and one in three never get it fixed, waiting for their contract to come to an end – 21% with 12 months or longer left on their contract.

Richard Mavers, director of group marketing and online strategy at Envirofone, says: 'The fact that so many of us choose to put up with a smashed phone screen for so long suggests that not enough people know the options out there for getting a new handset. To fix a cracked smartphone screen can cost around £150, but many people will be able to trade in their broken handset and get a replacement before their contract ends, often for much less than that.' Insurance (either on a household policy or through a manufacturer) may cover repairs, but this isn't cheap either. The AppleCare+ insurance package for the iPhone 6 and 7 costs £119, and covers repair or replacement for up to two incidents of accidental damage, each subject to an excess fee of £25 for screen damage, or £79 for any other damage. There's also a degree of coverage on batteries and accessories, as well as a software support service. The cost of this sort of cover may explain why many customers rely instead on third-party repairers.

Using this route will usually void any manufacturer warranties, so it's common for independent repairers to offer their own warranty scheme.

Difficult manufacturers

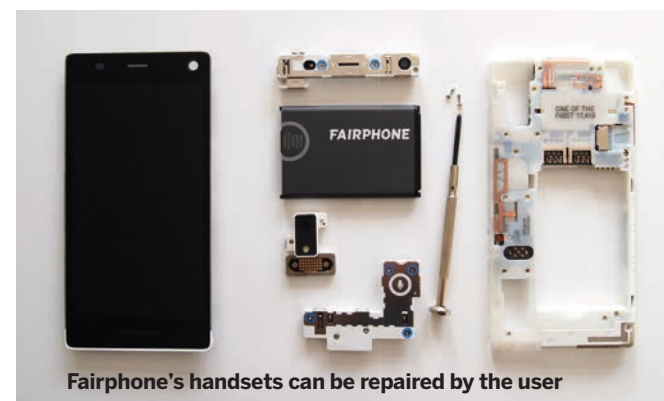
But the businesses at the smaller end of the scale are voicing concerns that third-party repairers are being held back by the attitudes of manufacturers. Lovefone CEO Rob Kerr says: 'Mobile device repair as a category has grown rapidly since the introduction of the iPhone, while traditional PC repair has declined. We see two big challenges facing the industry. The first is the growing tendency of manufacturers to create devices that are difficult or impossible to repair. An example is Samsung, and the use of adhesives to attach screen assemblies, which often require a repairer to break parts of the device (the back casing) to open the device. The use of adhesives also means that reusable components such as the LCD are broken during disassembly, which is very wasteful. The second challenge is the unwillingness of manufacturers to provide access to genuine spare parts for their devices along with information on repair guidance to the third-party

industry. There are accredited repairers for manufacturers that operate out of large depots for warranty and insurance repairs, however there is a huge third-party repair industry for older devices (second, third, fourth generation) that require repair and maintenance that is completely ignored (and in the case of Apple vilified) by manufacturers. Can you imagine having a Volkswagen Golf that could only be serviced by VW? There is a multi-billion dollar part industry in China that fills the gap here.' Kerr continues: 'Ironically, manufacturers such as Apple are responsible for creating a vibrant and healthy third-party repair industry with great product design, low model fragmentation and very repairable devices. It also goes out of its way to make it as difficult as possible for repair companies to service iPhones by not making official parts available on the open market, voiding the warranty on devices if they have been touched by any third party, and generally tarring the entire repair industry with the same brush.' But Kerr sees promise in companies such as iFixit and The Restart Project, 'who promote repair as a noble profession and publish tear-downs and repair guides for DIYers and the third-party repair industry'.

He also points out that the government is responsible for holding manufacturers to account for the environmental impact of their products. 'An iPhone requires 95kg of CO₂ to manufacture – that environmental cost is not accounted for, and we feel that the government should incentivise manufacturers to build devices that last longer and are easier to repair, upgrade and recycle.'

Rising cost

Some repair enterprises are disrupting the industry, offering not only an alternative to the manufacturers' own repair operations, but also a different approach to social concerns. Cracked It is a social enterprise specialising in screen repairs, which runs clinics in central London. Aiming to complete repairs in under an hour, Cracked It also runs regular pop-up clinics in workplaces, and is trialling an on-demand service where the tech travels to the customer's home, office or café. Cracked It serves a social purpose too, training 16-to-25-year-olds deemed at risk through gangs, crime or anti-social behaviour. Founder and CEO Josh Babarinde says: 'We harness the alluring elements of gang membership – gaining income, self-worth and belonging – and positively incorporate them into our enterprise curriculum. 'Our flagship programme is the Cracked It Bootcamp, an intensive five-day course where at-risk young people learn to repair three iPhone models, and how to market their talents. Our bootcamp culminates in a stall that the young people run in Spitalfields Market, where they're able to sell their repair services to the public and showcase their talents.' Babarinde agrees that price of parts and the attitude of manufacturers can be challenging. 'We want to keep prices as low and fair as possible, but this is very difficult when the price of hardware can often be very high – especially for the iPhone 6s and 7 models.'





Moreover, the price of hardware fluctuates regularly, so our margins change from month to month. Prices of hardware for older models (eg. the iPhone 5 series) tend to be more stable. 'The biggest impact that manufacturers had on our work was when there was public outcry over Apple's 'Error 53'. Many people were concerned that repairs conducted by third-party organisations like us would result in their iPhones becoming permanently locked due to Apple's accidental rolling out of this factory test. It was put right fairly quickly but made people cautious of third-party repair organisations for a while. We're doing everything we can to restore the trust lost throughout that fiasco.' At the higher end of the recycling scale, GreenTech Distribution describes itself as a hybrid distributor of mobile phones and other devices, combining recycling, logistics and fulfilment. It carries out Environment Agency accredited recycling of old/BER handsets, components and other WEEE materials; carries out global product remarketing through multiple channels to maximise return – including bulk distribution, e-commerce, and drop-ship – sources and supplies refurbished and graded handsets, and performs value add reverse logistics processes such as customer returns processing, IW

repair, refurbishment and remarketing. MD Clive Merrick says: 'We're not a handset distributor or recycler in the traditional sense. Whereas rivals solely focus on the trade-in element of recycling, we offer a broader range of services.' And even the largest repair and recycling businesses now face competition, with a move towards DIY repairs. Amsterdam-based social enterprise Fairphone, for instance, sells the Fairphone 2, a long-lasting, modular approach designed to be ethically manufactured, repairable, and customisable by its users. The phone is made to be easy to open, and the most commonly damaged component, the screen, can be replaced in under a minute without any tools. The life cycle assessment (LCA) of the Fairphone 2 shows that a repair scenario based on five years of use would reduce CO₂ emissions by about 30%, and that the phone's modular construction did not significantly increase its environmental impact over its full lifespan – certainly factors which may influence the product choice of the ethically aware customer.

Trust issues

But can customers rely on all third-party repairers for reliable and cost-effective work? Businesses such as iMend, a nationwide repair service specialising in Apple and Samsung devices, have fully-

trained and DBS cleared technicians, including specialists in areas such as micro-soldering, system diagnostics and water damage. The company also has an apprenticeship scheme in place to bring on new talent. But a recent ASA ruling against another repairer, claiming inaccurately to use only genuine parts, revealed a history of dozens of complaints – so how can customers find a reliable and cost-effective repair service? Aware of the difficulty of comparing various claims and prices, MendMyDevice has positioned itself as 'the Uber for mobile device repairs'. Mend My Device allows consumers to search for mobile device repairers locally, request quotes and choose a suitable repair shop. The platform has been in beta testing for several months and has now opened up for repair shop owners to register. Registration is free, with an optional package containing premium features and services. So far 77 repair shops have set themselves up on the service, which is now generating daily leads. Founder Dan Stevens, who also founded Case Hut, says he built MendMyDevice.com to make the selection process simple for the consumer. 'I see it on Facebook a lot; statuses asking where to get their phone repaired, what it will cost etc. Google struggles to cater for this process.' He goes on to say: 'We have seen

iPhone 6 cracked screen replacement charges

G@dgetClinic – £59.99
Lovefone – £79
QuickMobileFix – £99.99
Geek Squad – £119
Apple – £126.44

A hand holding a black iPhone 6 with a severely cracked and shattered screen. The cracks are extensive, covering most of the front face of the phone.

an uptake in people requesting repairs on a location-based aspect, but with the view of either an on-site repair or delivery service. There is also a real customer demand for a reputable service. Customers now carry a wealth of information on their devices, and are becoming ever-more security conscious. One repair company we have seen doing this very well is iFix (with five locations and growing). It has the concept right, the store presentation, and the questions answered transparently by most consumers. 'The challenge for the repair industry is price point. The consumer's knowledge on what a repair should cost and the parts they receive, or having a consumer contact us saying a friend or colleague was charged less, or asking why a service is so expensive, is challenging. 'Some repairers respond by using sub-par parts – but for example if an iPhone 6 has a Retina screen replaced with a sub-par screen, it is no longer Retina quality. The consumer may not pick up on this at first, but will eventually, but by then it's too late. 'But the opportunity is there to provide the customer with a service where they feel secure in handing over their device, and receiving a proper repair job. Combining this with a retail store front allows for accessory up-sells and a memorable service.'

Power 50 presents

A portrait of David Dyson, a man with short dark hair, wearing a yellow and white checkered shirt, smiling at the camera. He is standing in front of a large window with a view of a city skyline.

David Dyson
Chief Executive Officer, Three
2016 Power 50 rank: 4th

The only network CEO to keep their post throughout 2016, Three's leader isn't just trying to shape the company, but the entire market as well

Leadership

As CEO of Three, David Dyson has developed the company into a significant force in the UK mobile market, taking it from a price-led market disruptor to an established name with a loyal customer base, while maintaining its public perception as a consumer champion. In 2015 he was rated the world's third best boss, and best in the UK, in a survey by Glassdoor Recruitment, with one employee saying Dyson was the best CEO they had come across: 'Management communication is amazing, with regular monthly presentations from the CEO to all staff members, which is the best communication I have ever received from management.' The company also came seventh in the Best Places to Work 2015 Glassdoor Employees' Choice Awards. As a highly visible front man for Three's market proposition, Dyson has ensured that the company punches above its weight in terms of consumer awareness.

Innovation

Dyson helped to develop an Inspiring Leaders programme designed to 'reconnect the brand with its mission to make mobile better'. In explaining this strategic shift from a budget service to a market innovator, Dyson said: 'Three only exists because a lack of competitiveness and innovation within the mobile industry led the

UK Government to allow the introduction of a new operator back in 2003. To achieve growth, we had to price our services at a discount... 'When I was appointed CEO in 2011, my first priority was to reconnect the brand with its mission to make mobile better... But to reinvent the rules of mobile and live up to our brand promise, we had to develop leaders to be creative and bold. It wasn't enough to have great ideas, we also had to bring them to market first.'

Breakthrough

Dyson can claim significant improvements in Three's network infrastructure and customer satisfaction such as all-you-can-eat data, 4G at no extra cost, and an international data roaming service. But early failure to acquire network spectrum, and the EU's blocking of CK Hutchison's attempt to purchase O2 UK from Telefonica, means that Dyson now has to fight to expand Three's services. A National Audit Office review of the 2013 auction concluded that Three won what little spectrum it did at the lowest price possible under conditions designed to make its life easier, but was this a shrewd cost saving strategy or a sign of insufficient financial commitment?

Headline maker

Dyson certainly knows how to make headlines, challenging established policies and

principles with provocative statements and distinctive, unconventional marketing. He queried consumer appetite for 'quad-play' while many rivals scrambled to provide bundled services, and put Ofcom CEO Sharon White in the spotlight with the Make the Air Fair campaign. Urging Ofcom to limit BT's purchasing power in the next spectrum auction, Dyson said: 'The UK has the most unbalanced spectrum ownership of all the countries in Europe. We need competitive restraints to stop the imbalance getting worse.'

Financial muscle

After working with KPMG in Hong Kong and the UK, Dyson joined Hutchison in Hong Kong in 1998, worked at Three Sweden and Three Australia, before joining Three UK in 2006 as CFO. Becoming COO in 2009, with responsibility for balancing commercial and operational issues as well as a focus on improving customer experience, he was then appointed CEO of Three UK in July 2011. CK Hutchison, the Hong Kong conglomerate that owns Three, made UK losses for almost a decade as it built up business at a cost of about £11bn. It went into profit in 2012, although Dyson still states the market is difficult for smaller players. Three UK's financials for the first half of 2016 showed earnings before tax growing to £231m, with capital expenditure increasing year-on-year by 9% as Three ramped up network investment. Customer adds reached 191,000, but average margin per user decreased by 1%, falling to £12.81 per month.

Ones to watch

A small portrait of Sharon White, a woman with dark hair, wearing a dark top.

Sharon White
CEO, Ofcom
Portrayed as a consumer champion by Three's 'Make the Air Fair' campaign, and often described as one of the most influential business people in the UK.

A small portrait of Chris Pateman, a man with grey hair, wearing a suit and tie.

Chris Pateman
Chief Executive, FCS
The Federation of Communication Services has put its weight behind Three's Make the Air Fair campaign, supporting the argument that the mobile telephony market needs a fair balance of radio spectrum to encourage competition.

The future of work is mobile

Implementing flexible working patterns demands new approaches to mobile technology. How will unified comms dealers meet the challenge?

Chris Jenkins

Productivity matters

If the essential problem with UK business at the moment is one of productivity, flexible working may be part of the solution. Selling the flexible working concept to businesses presents opportunities for unified comms dealers. At more than three-quarters of UK companies, productivity is stagnant; hourly output in the three months to the end of September 2016 was only 0.4% higher than the previous year, and UK productivity is lagging well behind other G7 nations. Chancellor of the Exchequer Philip Hammond pledged in November 2016 to spend £23bn tackling the problem, but O2's January Business Barometer report found that 48% of British businesses want more government help to improve access to technology and connectivity. With 59% of all businesses saying better access to connectivity would benefit their organisation, Ben Dowd, sales director at O2, says: 'For us to continue to deliver a customer-centred digital transformation it has to be supported by further digital infrastructure investment.'

What are flexible working solutions?

Employees have expected a degree of flexibility in their working patterns since changes to the legal entitlement to flexible working in 2014. But with the near-universal adoption of mobiles, workers now feel that their digital devices should allow them to keep in contact, access apps and data in the Cloud, and exchange data from home, or when they are on the move. Flexible working has been shown to reduce absenteeism, improve morale, reduce commuting time, reduce staff turnover, improve recruitment, and extend hours of operation for departments such as customer service. While managers must learn to measure productivity by factors other than time spent at a desk, with

flexible working, improved employee satisfaction leads to improved productivity. The recent Power of Productivity report by the LSE, commissioned by Vodafone, suggests that there is no single key to productivity improvement; instead, what's required is a combination of change in management practices, enhanced technology, and flexible working arrangements. The LSE report states that while changes in management practices are essential, these have to be coupled with constant review of how the firm is integrating technology.

Keys to improvement

With news of tax relief for fibre installers and the separation of BT from Openreach comes the opportunity to sell broadband services at more competitive wholesale prices. For unified comms suppliers, the key is to integrate digital systems allowing flexible working with existing technology. A package of connectivity options could include unified messaging, which enables all message types to be collated in a universal inbox; audio or video conferencing; mobile internet connectivity, and cloud storage services. Only 2% of UK addresses are currently connected to a full fibre line, but upcoming superfast connections and increased data speeds could transform businesses by allowing them to access ever-more powerful cloud services such as VoIP and 'Platform-as-a-Service' solutions. Gemma Morris, head of business development and marketing at TWL Voice and Data, says: 'Ease of use and a balance between simplicity and accuracy need to be kept front of mind for all companies offering a service in our industry.' Stuart Carson, sales and marketing director of Rainbow Communications, says: 'Unified communications will come of age as more businesses transfer onto VoIP systems. This will have a positive effect on mobiles, as business

people will be able to do more with their phone and data connection.' Chris Earle, CEO of Verastar agrees, and adds: 'For small businesses in particular, the support of a service provider who can provide their core services effectively to allow them to focus on running their business is a trend we don't expect to change.' And Onecom CEO Darren Ridge says: 'The widespread adoption of full-fibre broadband is increasingly becoming a necessity rather than a luxury. The biggest challenge will be in ensuring that businesses understand the benefits of adopting full fibre as part of a tailored unified comms package – efficiently bringing all their comms needs together and putting them in the best position to compete.'

Opportunities to connect

Clearly, there are opportunities for unified comms providers to put mobile connectivity at the heart of their proposition; and with the client reliant on them for device management and guidance, there are also opportunities to increase ARPU and connections per user. A key emerging trend is that customers now favour getting their communications from a single provider, enabling one point of contact for support for mobiles, telephone systems, IT and internet connectivity. Unified Communications as a Service (UCaaS) is a delivery model in which a variety of communication and collaboration applications and services are outsourced to a third-party provider and delivered over an IP network, usually the public internet. With a single-tenancy approach, the customer receives a customised software platform that can be integrated with on-premises applications, while multi-tenancy customers share a single software platform. Hybrid solutions are also available, with a portion of unified communications on-premises and others in the cloud.



Many companies, primarily small businesses, use UCaaS to avoid the capital and operational expenses associated with deploying a unified communications solution on their own. As data speeds increase, cloud IT solutions will make businesses ever-more reliant on mobile devices. This will require provision of mobile coverage solutions such as distributed antenna systems (DAS) and managed small cells.

System integration

Unified comms specialist Mitel proposes moving business communications technology to the Cloud, so that systems can be built around the way a company works. Cloud communications can deliver the comms technology of a large corporation to any smaller enterprise; mobile-friendly communications, intelligent call routing, a broad selection of endpoints, automated callbacks, announced queue times, and so on. These advanced functions can be integrated with business critical applications, such as customer relationship management (CRM) solutions, to support key business processes that need to be communications-enabled, such as Salesforce.com, Microsoft Office 365 and Google Apps. The crucial aspect is the correct choice of communications deployment model. Mitel suggests that a small business could implement some integration into other key applications such as Salesforce.com, and a basic contact centre; mid-market (100 to 2,500 employees) would require sophisticated business process integrations and contact centres, with private networking; while a large enterprise of 2,500 to 10,000 employees would be looking to private cloud migration, hybrid cloud solutions and integration into larger IT frameworks. Mitel's solutions such as MiCloud Office, MiCloud Business and MiCloud Enterprise use geo-redundant datacentres to service voice calls securely traversing the public internet. Whether through a public, private or hybrid cloud solution, Mitel's systems are scalable to support a transition from an on-premises phone system to a more robust cloud-based

unified communications solution – and moving to a cloud communications provider enables businesses to reallocate IT staff to more value-added projects and business-critical responsibilities. Another unified comms provider, Polycom, aims to enable businesses to use video as their preferred method of collaborating. This approach is not dependent on any one network, carrier, protocol, application, or device, but nor, the company admits, can it be achieved by any one vendor, equipment manufacturer, service provider, or standards body. Polycom's President EMEA, Marco Landi, recently said: 'I think the big trend you will see in the market is a transformation from telephony on one side and videoconferencing on the other, to collaboration. That is driven from Microsoft and other big vendors. I think Microsoft has started to push it, but if you look at Google, and the likes of Cisco, everybody is looking to the collaboration space, whether it's with instant messaging, content sharing, voice conferencing or video conferencing. Rearranging the way people work and collaborate is a major driver. That is really pushing companies, and they are really looking at their infrastructure and all of the platforms they're using, and trying to consolidate it.'



Flexible working

Stats

60%

Employees saying they preferred flexible working to a 5% pay rise

£30,000

Estimated cost to a company of losing an employee

3m tonnes

Carbon emissions saved by 4m UK employees working from home

2 hours

Average time per day people spend on their smartphone

17%

Predicted number of UK organisations adopting flexible working by 2020

61%

Companies whose profits increased after adopting flexible working

75%

SME managers unaware of productivity enhancement technologies

£520m

Estimated saving by equipping Traffic Police with mobile broadband

Battery packs

Call them battery packs, or power banks, or portable rechargers, these handy accessories are the solution to the built-in battery dilemma. While most smartphone batteries will last a day, battery packs have an obvious appeal to heavy video consumers and games players, and the market will grow as 4G data consumption drives consumer demand for portable power

Hottest devices



Aukey PB-N15
From £24.99

The PB-N15 may be bulky at 15.2 x 1.8 x 8 cm and a weight of 445g, but it packs plenty of capacity, with 20000mAh allowing devices to be charged five to eight times. Output is 2.4A maximum for each USB port and 3.4A in total, so you can charge a cellphone and a tablet or two cellphones at the same time, though it doesn't offer a quick-charge function. It has 2A Lightning input and 2A Micro Input, so it can be recharged quickly with either an Android cable or iOS cable, and safety functions include automatic deactivation on full charge of the battery or device.

RAVPower Universal Power Bank Travel Charger
From £109.99

This is the one to choose if you want to charge both a smartphone and a laptop, as it features both an AC output for use with your laptop charger, and a USB socket for your phone. Its 65W AC output means it could also power GoPros, drones, printers, table lamps, vacuum cleaners, and small fans, and its 20,100mAh capacity means that it will charge your devices several times before needing to be recharged itself. Type-C and iSmart USB allows for the fast and simultaneous charging of two devices including a MacBook and an iPhone 7, and safety features include current surge protection and a dust cover.



Maxoak K2
From £115.99

With a massive capacity of 50000mAh/185Wh, the K2 is compatible with most popular laptops and notebooks, and can charge an iPhone 6 Plus or Samsung Galaxy S6 about 11 times, and an iPhone 6 about 17 times. It has six output ports, including one 20V/3A for laptops, one 12V/2.5A for digital cameras, and two 5V/2.1A and two 5V/1A for smartphones, tablets and other USB devices. Constructed with Lithium-ion polymer battery cells, it claims 1000+ recharge cycles, and has four Intelligent LED indicators showing remaining power capacity.



Source: **techradar**

From the field

Power hungry

'In the past year, power bank sales have increased 17%. Driving the trend are power-hungry devices and draining apps such as Pokemon GO. In fact, the week following the release of Pokémon GO in July last year was the best-performing week of power banks sales since Maplin started selling them, even out-performing Christmas. When shopping for a power bank, customers should look at the mAh capacity, as this determines the output power. The higher the output, the quicker the charge.'

Andy Fairweather, category buyer at Maplin

In the game

'Since the launch of Pokémon Go, we estimate that our overall charger sales have doubled on Amazon. For our larger capacity power banks such as our Ace 22000mAh, sales increases are even more significant, as consumers have recognised that they need a large-capacity charger to keep the Pokémon Go game running.'

Allen Fung, general manager for battery maker RAVPower

On demand

'The global lithium-ion battery market is expected to generate revenue of £36 billion by 2022, with a growth rate of 10.8% during the forecast period 2016-2022. Lithium-ion batteries are rechargeable batteries and are used as a source of power supply primarily in portable devices. Key factors that drive the growth of this market are the growing demand for smartphones, tablets, and other electronic devices; stringent government regulations aimed at reducing the increasing pollution levels; and enhanced efficiency of lithium-ion batteries.'

Allied Market Research, World Lithium-Ion Battery Market: Opportunities and Forecasts, 2015-2022

At capacity

'There is a vast variation in quality of battery (the main expense) in power banks and solar chargers. You very much get what you pay for. Lithium-ion Polymer batteries should not be "cheap" if they are going to be worth having. The best are Samsung, Sanyo, LG – reliable, safe and low loss on DC transfer, giving more charges per capacity.'

Mobile Solar Chargers, Somerset



10 ways to sell BDM

How unified comms packages can promote the benefits of business device management (BDM)

1.

Data security is financial security
Financial cost, reputational damage and, it's been proposed, even criminal liability could result from corporate data loss, and there's a trend towards data leaks originating from unsecured mobile devices. BDM allows remote control, so if a device is lost or stolen, vital data can be blocked or deleted, or the phone returned to its original state, removing sensitive settings such as Wi-Fi passwords, configuration settings, and sensitive or protected documents.
2.

Singing from the same hymn sheet
BDM reduces issues caused by incompatibility. With the growth of Bring Your Own Device (BYOD), it's even more important to control devices through software upgrades, app upgrades, installs, uninstalls, and remote updating of contact information. Smart device monitoring can eliminate unnecessary data transfer and administration costs associated with device verification – for instance enterprise customers with large-scale tablet enclosures operating in kiosk mode can rely on MDM to save the costs of manual updates.
3.

Automate red tape
Workforce monitoring via mobile devices can save time and paperwork by allocating jobs, recording
4.

Killing time
Controlling which apps can be installed and which websites can be accessed could have a positive effect on working practices. A survey by CareerBuilder says two out of three employees use their smartphones several times a day while working, and that for 20% of full-time workers, using apps such as social media sites means they work less than five hours a day.
5.

Remote control
BDM allows software issues to be dealt with remotely, without losing working time by taking devices out of service. All-too-common requests for lost passwords can be resolved using a remote unlock feature to reset the passcode, a particular timesaver when onboarding new employees.
6.

Performance enhancers
Data collected remotely from employee devices can be used to examine trends such as working
7.

Bring your own security
By adopting a BYOD policy, dealers can reduce low-margin device sales, and substitute high margin services. With reduction in airtime and device costs, expenditure can instead go into higher-margin MDM servicing. The risks of BYOD can be managed with security solutions such as Sophos' Mobile Control, which establishes and enforces mobile security policies, monitors device status and secures corporate data.
8.

Speed and agility
Businesses can enact changes quicker with BDM, ensuring all employees receive new systems and procedures at the same time, with the same message regardless of role and location. Business customers can now add corporate-owned iOS devices to O2's mobile device management systems, and benefit from the time efficiencies of Apple's Device Enrolment Programme (DEP).
9.

Save and protect
A study by the British Chambers of Commerce found that 93% of businesses that suffer data loss for more than 10 days file for bankruptcy within a year. MDM allows all device information to be backed up and maintained without any additional effort or cost to the client. The loss of a device or failure of a data storage system can have catastrophic results, particularly for small businesses.
10.

Build a backbone
BDM allows the implementation of systems such as VOIP, cloud, virtualisation, call redirecting and business process integration, without the company having to do the work itself. As the backbone of a complete UC package, it's the best way to make a unified comms proposition hassle-free for the customer.

patterns, travel routines, software use, inventory management and routes of communication within the business. All of this can become a guide to internal methods of boosting performance and detecting issues before they become critical.

Connected home ownership

Is the mobile industry doing enough to remain at the centre of the connected home universe?

Chris Jenkins

The mobile phone may be at the centre of the connected home, but is the industry ready to take advantage? The 'smart' or connected home has been the stuff of science fiction since the 1950s, and it has long been possible to automate many domestic functions such as lighting, heating, air conditioning, access, security, and communications. Until now, home connectivity required an expensive custom installation, with a mish-mash of different control systems. Specialist manufacturers such as Crestron, Lutron and AMX dominated a market that was out of reach for all but the well-heeled. Three years ago there were at least 50 different connected home platforms available, and it was clear that not all could survive, ultimately leaving early adopters with now 'dumb' gadgets, all connected to a useless proprietary system.

Control solutions

The advent of affordable, programmable touchscreen devices such as Apple's iPad



An O2 Home installer showcases the technology to an early adopting customer.

changed the game, offering built-in hardware and software compatibility with industry-standard devices. The smartphone is capable of all the same functions, and is an even more familiar, affordable and universal device, so perhaps it is the natural centre of the connected home. So why are mobile dealers not taking advantage of this opportunity?

Tech development

The prime sales driver for the

smart home may well be energy saving, which, it's often argued, can cover the cost of the hardware. If this is so, systems such as Nest and Hive have a market advantage and energy providers would be strong candidates for winning the race for system control. But despite the 'heat' surrounding the connected home and the Internet of Things (IoT), the stumbling block remains that connected devices will talk to your smartphone, but most won't

talk to each other. There is still a plethora of competing systems and manufacturers, including Apple's HomeKit, Google's Brillo, Lowe's Iris, and AllJoyn, using different wireless protocols such as Wi-Fi, Zigbee, and Z-Wave. A central hub, either a hardware router, mobile app or cloud software, could coordinate all smart products. This could be a voice-activated system such as Amazon's Alexa, or Apple's Siri. Google CEO Sundar Pichai, on the launch of its Pixel smartphone in



2016, said that Google believes the tech world is shifting from a 'mobile-first' to 'AI-first' focus. While manufacturers fight for dominance rather than cooperating, progress will be slow. Jon Carter, strategist at Deutsche Telekom, summarised feelings at the IoT World Forum, saying: 'Despite the hype, we're exasperated.' Samsung shows the way with its open SmartThings ecosystem, which now has 20,000 compatibles including Amazon's Echo and LG's Hub Robot. Other vendors' products are compatible with Google's Nest smart thermostat and Nest Cam.

Is retail ready?

David Plumb, digital director at Telefónica UK and Ireland, tells *Mobile* that now is the right time for the connected home; the technology is here, 'at a decent



David Plumb, digital director, Telefónica

standard, quality and price', and it addresses important issues in society, such as mobile working, elderly care, and energy conservation. Plumb points to O2's Home package, which includes a hub, Samsung internal camera, two open-and-close sensors, and a smart plug. Also available is a Tado thermostat. Crucially, the system can be paid for on a monthly contract, an approach that other operators haven't yet embraced. 'The connected home concept involves a lot of expensive gear on day one,' Plumb explains. 'With O2 Home we spread that cost over two years, including the cost of installation and a visit from an engineer, and we've built other vital elements including cloud backup and 4G backup into the package.' The O2 Home offering is built on the established AT&T Digital Life platform. 'But it's open and interoperable, and AT&T is working on its own AI system and compatibility with others, so it does not lock users into one standard,' says Plumb. Plumb seems relaxed about the fairly low-key start to the market, with O2 Home rolled out initially in only the South East, and sales running at around four per store per week. Dedicated areas in

Tottenham Court Road and Westfield were scaled back, as in Plumb's words: 'We found the locations weren't reaching the home-owning customer.' Seb James of Carphone Warehouse also sees a future in bundling services as part of the smart home proposition, and in line with wider buying trends. He tells *Mobile*: 'We think a combination of not just hardware, but finance, accessories, services, installations and support is what customers want in the future for a very predictable monthly fee – and what's more they'll want to have the newest technology, to be upgraded as soon as possible.'

Voices vs mobile

Brightstar's Joyce Mercer called the launch of its Smart Living proposition in 2015 just the start of a major push into the connected market: 'We know that growth will come from connected and SIM-enabled products, but until now very few retailers and operators have managed to find a way to successfully take them to market... while there is no shortage of interest in connected products, it's fair to say that most haven't yet capitalised on the opportunity or defined their strategy.' Rod Slater, head of Smart Tech and IoT at technology distributor

Connected Home on the High Street

O2

The O2 Home system is available to customers in the South East, and is on demo at branches in Balham, Epsom, Kingston Bantalls Centre, Uxbridge and Watford.

John Lewis

The flagship London Oxford Street store has four Smart Home interactive zones: Kitchen, Entertainment, Sleep and Home Monitoring, demonstrating everything from smart heating and lighting to audio, TV and appliances.

Fonehouse

The Fonehouse chain and its Techhouse accessory outlet have stores in Bluewater, Bromley, Lakeside, High Wycombe, Romford and Watford.

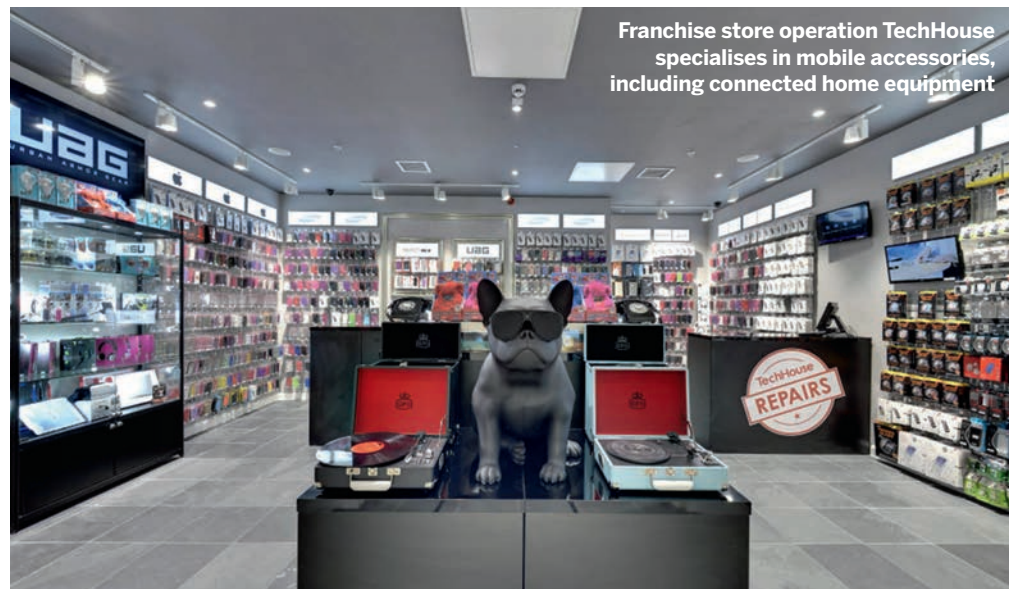
Maplin

Maplin Electronics has 218 stores throughout the UK and Ireland. Its Smart Home range includes the Nest thermostat, Panasonic products and LIFX lighting. It has a new connected range due later this year.

Homebase

Home improvement giant Homebase has more than 200 stores throughout the UK and Ireland, and features the Yale Smart Living lock, alarm and camera kits, and Warmup smart thermostat.





Franchise store operation TechHouse specialises in mobile accessories, including connected home equipment



A home security element of Samsung's SmartThings collection.

and service provider Exertis, says that security, energy, entertainment and convenience are the key categories driving interest in the area. 'Not surprisingly, home security has been one of the most influential drivers in this market and has been top of the list for many households. The ability to obtain instant monitoring with high-quality video direct to a mobile device from a small and convenient smart camera has clear benefits.' But Slater isn't wedded to mobile phone control. 'Mobile device control of smart home features is probably acceptable when you have one or two

Smart Tech brands. When each product has its own app, it starts to get complicated and time consuming.' Slater believes that mobile stores are currently providing neither the display space nor the training to sell smart home. 'Other channels such as hardware and DIY superstores have embraced the opportunity, but it would require a change to traditional mobile store display and their range of products.' The mobile channel is in the unique position where it could become the main protagonist of the smart home; millions of active

customers being regularly billed can reap huge rewards for the mobile channel. Many of the processes and systems to support this model already exist, it's just rethinking the role, strategy and execution methods.'

Consumer challenge

And Chloe Woodhead of John Lewis's Home and Tech division says that there are other challenges in selling the 'connected home' concept, one of which is consumer awareness. 'Smart home is still a category that has relatively low awareness

in the mass market. Retailers have to overcome two key barriers: perceived complexity of the technology, helping consumers understand the potential benefits, as well as the knowledge that Smart Home products actually exist,' she says.

Woodhead sees the strongest areas of connected home being heating, lightning, entertainment and home monitoring, and points to natural connections to utility services, for example smart thermostat and energy provider such as Hive and British Gas. But she points to another stumbling block in the way of the mobile market. 'In many cases smart home products require a smartphone or tablet in order to set up and control, and at this stage it is probable that it is the centre of connected home. However, I think it is also a barrier, as it's not a natural behaviour, and not always convenient to use.' It seems certain, then, that the connected home will find a market; but it's still unclear whether this will work to the benefit of telcos using a contract model, utility companies billing their household customers, or hardware manufacturers selling bundled solutions. Most likely, they will all need to work together.

Utility based connected home platforms can show a clear return on investment through reduced heating costs.



February around the world

Africa

Botswana – Orange heats up the summer

Traditionally, mobile service providers in Africa offer special deals to capture customers in the summer months of holidays and festivities. This summer, Orange Botswana is offering a range of bonus offers including free calls during key time periods, flash promotions for prepaid bundles, free unlimited calls for prepaid customers, and discounted devices such as the Orange Rise, a low-end Android smartphone with 3G. The offers are being promoted in local media and the new SmartStore in Airport Junction.

South Africa – Africa becoming a distracted continent

A Deloitte survey suggests that more than 33% of Africans check their phones every five minutes, and more than half of smartphone users regularly use their devices on public transport, at work and while shopping. The Game of Phones Survey suggests that this is an opportunity for businesses to provide a 'platform for life' that evolves its value through sophisticated data analytics. The survey finds that while mobile internet remains dominant, Wi-Fi and fibre is growing, particularly in South Africa and Nigeria.

Asia

Thailand – IoT network rolls out in April

Thailand is rolling out an IoT network in April this year serving central Phuket and Bangkok. One of the first commercial deployments of its kind in Southeast Asia, the network will be built by South Korea's SK Telecom and Thailand's CAT Telecom, a state-owned telecommunications service provider. Phuket has been earmarked as Thailand's first smart city, and will be launching a vehicle location tracking service, smart metering and smart street lighting services. Central Bangkok will get an IoT-based location tracking service, expected to prevent visitors getting lost near the Grand Palace.

India – Mobile phone production ramps up

Indian manufacturers are expected to produce 200 million devices in the financial year 2015-16, five times as many as two years ago, the IT Ministry has announced. In what is one of the world's fastest-growing markets, nearly 40 new factories have been built in the past two years, including Chinese names such as Huawei, Lenovo and Xiaomi, and homegrown brands Intex, Lava and Karbonn, as well as nearly three dozen supporting manufacturers. Local production enjoys around 12% incentive compared with imported products, and this has been a major incentive for companies to look inwards.

Oceania

Australia – Vodafone goes virtual

Ericsson and Cisco are to virtualise Vodafone Hutchison Australia's core and IP network. Ericsson will lead the transformation program, having responsibility for not only building the infrastructure but also for ensuring the delivery of an end-to-end operational system. Vodafone Hutchison Australia (VHA) aims to increase network agility, reduce opex and capex, deploy services faster, and improve customer experience. The project is the first major collaboration between Ericsson and Cisco on Telecom Cloud infrastructure.

Europe

Finland – Ericsson builds its 4G network

Ericsson and DNA are working together to boost mobile broadband coverage in sparsely populated areas of Finland using the 700 MHz frequency with the Ericsson Radio System. The Finnish population is the most active in the world in using mobile data, and using the new 700 MHz spectrum for mobile broadband, a spectrum previously used for digital television, enables build-up of 4G capacity. DNA's 4G network today covers 99% of the population in Finland.

Russia – Ufa gets radio boost

Ericsson and MTS are launching the Ericsson Radio System in the city of Ufa, to boost capacity towards 5G. Deployment of the Ericsson Radio System with new baseband and radio technology will enhance the network capacity and increase the efficiency of spectrum use, through implementation of LTE Carrier Aggregation, 4x4 MIMO and 256 QAM.

North America

US – Viber offers free calls

Viber, the call and messaging app for Windows devices, is enabling free calls to countries affected by the US President's immigration measures, including Iraq, Syria, Iran, Libya, Somalia, Sudan and Yemen. Hiroshi Mikitani, CEO of Viber's parent company Rakuten, tweeted: 'I am very sad to see what is happening now in the US. I came to America when I was seven and I really respect America's big heart.'

Canada – Voracious demand for wireless

Canada's big three telecoms providers sprinted to a strong finish in 2016 propelled by 'voracious demand for wireless services', according to financial reports. Despite competitive pressures that dampened results in the television and Internet markets, giants BCE Inc., Rogers Communications Inc and Telus Corp added more than 844,000 wireless subscribers last year, pulling in an extra 292,000 subscribers.

South America

Colombia – Tax reform could boost growth

A GSMA report suggests that reforming mobile sector taxation could promote investment and drive digital inclusion in Colombia. The report notes that sector-specific taxation represented 37% of mobile services' US\$1.36 billion total tax payments in Colombia during 2014; with the exception of the Dominican Republic, no other country in Latin America has a higher proportion of mobile-specific taxes, and 49% of non-users list affordability as a barrier to mobile adoption.



Flexible working, rigid security

A new way of working requires a new way of protecting businesses from online threats. Here's how the industry is responding.

Chris Jenkins

Last issue's look at flexible working and mobile solutions emphasised the advantages on offer to businesses, but there are of course also challenges attached, cybersecurity being one of the most significant. A recent survey by Cyren indicates that 71% of US small-medium businesses (SMBs) were hacked in the past year, with 71% suffering a malware-related security breach, 43% a successful phishing attack, 36% suffering a virus or worm infection and 23% falling victim to ransomware. 'These findings fully debunk the frequent misconception that "my organisation is too small to attract cybercriminals"', says Michael Osterman, principal analyst at Osterman Research. 'It's not surprising to see that SMBs increased their IT security spending 23% over the past year.' 'Cybercriminals are increasingly targeting mobile devices with threats such as malicious apps, phishing schemes and ransomware,' says Dan Maier, VP of Marketing at Cyren. 'In

response, we're seeing an explosion of new mobile threat defence solutions combining a lightweight, always-on approach with intelligent machine learning and cloud-enabled defences. These next-generation services give mobile operators a significant opportunity to provide additional value-added mobile security offerings for their B2C and B2B customers.'

BYOD threat

Scott Millis, CTO at mobile-enabled enterprise security and attack detection company Cyber adAPT, says: 'A major security implication of flexible working is the lack of mobile security in correlation to the rise of employees using personal devices for work. Mobile security tends to be an afterthought – and where it does exist, it is woefully behind the curve. Typically, just 24% of people are likely to have internet security on mobile devices, and only 5% bother to encrypt the data on their mobile.' As more workers use personal mobile devices when out of the office (the BYOD, or Bring Your Own Device policy) they will continue to be a

key point of entry for malicious activity. Scott Millis says: 'I predict that at least one, if not more, major enterprise breaches will be attributed to mobile devices in 2017. A Ponemon Institute report found that the economic risk of mobile data breaches can be as high as £21.17m for enterprises, and 67% of the organisations surveyed reported having had a data breach as a result of employees using their mobile devices to access the company's sensitive and confidential information.' Al Sargent, senior director of Product Marketing at OneLogin, says: 'The rise of the remote worker has been vital in helping organisational productivity. However, this growing percentage of the UK's workforce are also the weakest links when it comes to information security. 'Many remote employees have security software set up on their devices, yet most are bypassing the simplest of security procedures – password protection and sharing. 'While it's apparent that constant connection to

work can cause security concerns for business, the pros outweigh the cons when it comes to remote working. Those organisations looking to get access to control and ensure they aren't putting data at risk should implement an Identity Access Management (IAM) solution and single-sign-on technology to ensure they are the only ones who can access sensitive corporate data.'

Cloud solutions

Sargent's top tips for mobile enterprise cybersecurity include integrating your IDaaS (Identity-as-a-Service) system with HR. 'In the next year, HR will place a high importance upon IDaaS to ultimately simplify the on-boarding and off-boarding process, closing a door that was previously wide-open for cyber criminals and disgruntled ex-employees to exploit.' Stefan Widing, president and CEO of HID Global, forecasts a shift in the use of identity technology, leading to increased adoption of mobile devices. 'Particularly in industries focused on regulatory compliance, such as government, finance and healthcare markets,' says Wilding. 'This shift will precipitate the move from legacy systems to NFC, Bluetooth Low Energy and advanced smart card technology to meet the evolving needs of enterprises and governments worldwide.' 'New capabilities for managing and using trusted IDs will be driven by the increase of temporary offices, mobile knowledge workers and the evolution of the workplace.'

Locks and keys

But there's another aspect to digital security which may have wide implications for the mobile workforce, and that is physical access. Jaroslav Barton, product marketing director, Physical Access Control Solutions EMEA with HID Global, quotes an IFSEC Global report revealing that 80% of security managers fear that integrating mobile access solutions into

their physical access control architecture might increase system vulnerability. But in the light of increased interest in cloud-based solutions and mobile-enabled platforms, more security managers are considering a mobile physical access system. 'There are multiple aspects to consider for security managers, such as whether the digital credential is as safe as a physical badge, can it be copied easily, or could an employee manipulate the data on their private phone within a BYOD strategy? How secure is the wireless transmission of the keys? Can the communication path between a phone and reader be captured and used for fraudulent purposes? The overarching question is whether we are sacrificing security for convenience.' Barton's conclusions are that mobile access systems are often more secure than legacy building access cards, so concerns over whether mobile access is secure are unfounded. But, he argues, 'It is paramount that encryption methods have met stringent security criteria.' Mobile security solutions can be updated far more quickly than card-based systems, and Barton emphasises another advantage of mobile-based security solutions: 'An employee feels attached to their mobile devices, so if a phone is lost or stolen, it is reported right away and the mobile ID can be immediately revoked, thus preventing unauthorised access.' With the potential for biometric technology such as fingerprint, facial and voice recognition, mobile systems offer robust device security, so a stolen phone is useless for gaining unauthorised access. Barton concludes: 'Being able to offer multiple security layers, dynamically responding to security issues, inspiring employees to better protect physical architecture and being on the cusp of new security developments, mobile access is a secure choice for any business' building access control system.'



Key drivers

'We find customers are realising the threat to organisational data is very real as their employees log in to their CRM systems and email platforms daily, more likely than not from unsecure devices. Yet uptake can be slow for additional services such as VSDM and insurance, starting from just £1.25 per device, which is worth every penny when you comprehend how severe a mobile security threat could be. 'Connect Telecom offers Vodafone's full security solution – Vodafone Secure Device Manager (VSDM) ranging from Secure Device Management, to email, application and content management. Add-ons such as anti-malware and antivirus as well as advanced support is available.'

Scott Ritchie, director, Connect Telecom

Threat response

'Migration to the cloud is driving digital transformation, and is the number-one priority for many businesses all over the world, and mobile working is a significant factor that solves a lot of problems. But security is often a second priority, despite the combination of threats from the inside and outside, such as identity theft and malware. Efficiently managing a dozen apps, all rendering data to the cloud, calls for better ID management than just passwording – after all, most of us can't remember more than a couple of passwords. 'With app-based authorisation providing a second layer of security, if a device is lost or stolen the user can be suspended in the Cloud, so the load of password confirmation, onboarding and offboarding is taken off the administrator.'

Thomas Pedersen, CEO, OneLogin

Stop the leaks

'Security solutions are primarily a mobile requirement, though there are others – but at the moment the demand is very much driven by business transition to the Cloud. It's not a hard sell – our partners are certainly aware of security threats, and a mobile device management platform such as our MaaS360 gives you a powerful suite of tools to handle the management and security of all your mobile devices, all from a single screen. It prevents the bad things from getting in, and the good things from leaking out of corporate network. This will become a more significant part of unified comms as the move to the cloud continues.'

Sarah Delap, marketing manager, Activ Telecom

5G – ready, set, go?

Is the UK ready for the rollout of 5G?

Chris Jenkins

Like each generation of wireless communications standards before it, 5G is designed to offer users faster service and more features.

But with 2020, the date of the Olympic Games in Japan, set as the headline date for 5G deployment, there are doubts whether it can – or even should – be rolled out in time. There is also pressure to make 5G available for the 2018 Winter Olympics in Korea, or the 2019 Rugby World Cup in Japan.

In technical terms, 4GLTE has a typical download speed of 14Mbps, and a theoretical maximum of 150Mbps; while 5G could offer 10Gbps – around 1,000 times faster. EE claims it will trial 5G speeds of 1Gbps in 2017, while Ofcom sees 5G as achieving real-world speeds of between 10 and 50Gbps. The IHS Technology report *The 5G Economy* suggests that 5G could have a global value of £2.7tn by 2035, but that for technical and commercial reasons 5G is likely to be rolled out as an incremental series of new technologies, each offering its own applications and satisfying particular customer demands, while 4G LTE continues

to evolve through Gigabit LTE, LTE IoT, and NarrowBand-IoT deployments. If so, when could actual 5G be a commercial reality?

Short term

The first of these SMARTER (Services and Markets Technology Enablers) technologies will be Enhanced Mobile Broadband (EMBB), offering improved indoor and outdoor wireless broadband coverage, and fixed wireless broadband deployment. EMBB will extend cellular coverage into problematical areas such as office buildings, industrial parks, shopping malls and large venues, and will improve capacity to handle large numbers of high-volume data devices. The net result will be an improved and more consistent experience of mobile broadband in applications including enterprise teamwork, education, augmented and virtual reality, and extended mobile computing – largely enhancements to existing services catered for by 4G, and not truly transformative. O2 expects the European Telecommunications Standards Institute to set global standards from this year until around 2020, with 5G available between 2020 and 2024. A

spokesman says: 'Things are a long way off yet – in the meantime we continue to contribute to developments and engage with the industry and trials.'

O2 CEO Mark Evans says that government industrial strategy is essential. 'As the demand for faster connectivity increases, it is vital we build the next generation of digital infrastructure,' he comments. 'Mobile operators such as O2 are willing to make the massive investment needed to keep Britain connected. However, we can't do it alone. We need an industrial strategy that puts mobile at the heart of post-Brexit Britain.'

David Lister, principal researcher of 5G technologies at Vodafone, says that telecoms providers need to find use cases for 5G that will justify the cost of development and rollout. 'Before we get too carried away with any [5G] technology, we have to say: "This can only be supported if it can be commercially justified".' A Vodafone spokesman elaborates: 'Vodafone expects 5G to be introduced commercially by 2020. However, it's a well-established industry norm that standards evolve into each other over time. It's an efficient way to invest in the future – and it also means that in practice we are already beginning to build networks that will bring some of the benefits of 5G sooner than 2020.'

Phil Sheppard, director of network strategy at Three UK, says: 'Planning for 4G and, of course, 5G is all about how you can do it cost-efficiently.'

Sheppard advances Three's familiar argument on spectrum allocation, saying: 'You need to look at the future – (for) 4G Advanced or 5G, surely it's equally important to ensure that there's a fairly even distribution of spectrum, so that all operators compete in that giant technology world?'

Three is exploring dark fibre, small cell networks and additional spectrum to improve its mobile network without necessarily focusing on 5G, and it's notable that the company made no submissions to Ofcom's consultation into allocation of the 6GHz spectrum.

An EE spokesman tells *Mobile*: 'With 5G, speeds as high as 10Gbps aren't unrealistic. But 4G is getting faster too, and it's 4G that's still going

to be connecting the vast majority of people in 2020. 5G will really be about businesses and industrial usage first, not consumers – today 5G is all about research, because the technology is far from defined.'

Mid-term

The next 5G phase would be Massive Internet of Things (MIoT) capability, perhaps starting on the launch of 3GPP Release 16 specifications in 2021.

Qualcomm aims to ship its first 5G modem chips for phones in the second half of 2017, with follow-on chips targeting the IoT. If fixed 5G to homes works well in trials, Verizon says it will pursue a commercial rollout city by city in 2018 and 2019.

With applications such as asset tracking, smart homes, agriculture and cities, utility monitoring and connected shopping, MIoT is indeed transformative, but mobile industry body the GSMA argues that there are only three commercially viable 5G applications not achievable with LTE, LTE-A, and other 4G improvements: augmented/virtual reality, tactile internet, and autonomous driving. Many of these use cases are already being addressed by existing IoT technologies, but MIoT requires improved low-power requirements, operability in licensed and unlicensed spectrum, and improved coverage. IHT expects this market to be mature by 2035.

Long term

IHT anticipates a third stage of 5G development by 2035. Mission Critical Services (MCS) such as autonomous vehicles, drones, industrial automation, remote patient monitoring and smart utility grids require extremely high reliability, ultra-low latency, widely available networks and strong security. The main driver for MCS is the automotive industry, which needs it for autonomous vehicles. The 5G Automotive Association was recently joined by Chinese giant ZTE, which claims 'breakthroughs in channel coding, massive [multiple-input/multiple-output], network virtualisation and slicing, and accurate positioning.'

'All these achievements will make a fresh user experience possible for the smart internet of vehicles,' says Bai Gang, ZTE's GM of 5G product. But James Atkinson, editor of *Wireless* magazine, says: 'Until there's a concrete business case and real consumer demand for products such as autonomous vehicles, there doesn't seem to be a great hurry to introduce full 5G.'

And Adrian Scrase, CTO of ETSI, says the real demand for 5G will be to connect things, not people. 'The telco industry must engage with



'Entrepreneur in residence' Adrian Braine, local councilor Clive Sanders and University of Surrey 5G Innovation Centre COO Keith Robson show off their 5G signal at Basingstoke's SETSquared Hub

industry sectors such as transport, healthcare, mining and exploration, utilities, agriculture, aviation (drones), entertainment, factory automation, etc. We cannot expect them to come to us, we must be prepared to go to them and to meet them on level terms.'

Control mechanisms

3GPP, which has just launched an official 5G logo, plans a Phase 1 release of specifications sufficient to enable early 5G launch in 2018, and a Phase 2 release containing a complete 5G system description to enable full 5G launch in 2020, but this timetable may be somewhat optimistic.

Atkinson notes: 'UK operators are pretty much wait-and-see. Some want to see an ROI on 4G before thinking of investing in 5G. If any UK operator might look to go early, it would be EE, because of its interest in the Emergency Services Network.'

Companies such as Nokia and Ericsson in Europe, and Huawei and ZTE in Asia, are competing to establish the all-important patents that will form the lucrative backbone to 5G, but are partly constrained by the development of the specification.

Meanwhile, with expertise provided by the 5G Innovation Centre at the University of Surrey and technology specialists such as GemaTech, the 5G emulator at the Basing View innovation hub in Basingstoke provides a chance for SMEs to work with 5G-like performance through digital hubs located in Basingstoke, Farnborough, Guildford and Woking.

Doubting voices

The real question is whether the speed of 5G is a consumer requirement, and whether anyone is willing to pay for it. One potential 5G customer blogged: 'What good is all this speed, if it only means I reach my monthly limit in two minutes instead of two weeks?' 4G occupies frequency bands of 800MHz, 1800MHz and 2600MHz, while 5G is likely to take up the 6GHz band, and these higher frequency signals do not travel so far, so thousands of expensive multiple input and output antennas (MIMOs) will be needed to boost 5G signals.

And William Webb, president of the Institution of Engineering and Technology, argues in *The 5G Myth - When Vision Decoupled From Reality*, that current visions of 5G are inherently flawed. 'The key underlying rationale for previous generations and for 5G has been to meet ever-growing user requirements for more data and faster connectivity. This trend is coming to an end. Current mobile data speeds are more than adequate for all foreseeable uses,' he says. One possible scenario in investment-starved Europe is that there will be no real 5G deployment – the industry may push 4G as far as it can, then call it 5G. It could become a label rather than a technology, possibly applied to the IoT market. This, Webb says, would be a terrible missed opportunity 'to spend money where it is really needed, in improving network reliability rather than speed.'



The 5G innovation centre at the University of Surrey

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HOLDING IT TOGETHER

Fitsco specialises in the often overlooked parts connecting many assemblies. **Chris Jenkins** gets an insight into inserts.

"You have to do something different to get business."

Philip Schofield
of Fitsco

The sleepy Shropshire market town of Bridgnorth is perhaps best known for the funicular railway connecting the high and low parts of the town, but there's another focus of engineering excellence on its outskirts.

Fitsco, started up by Philip Schofield in 1990, was originally a straightforward buying and selling operation, but distinctive in that it specialised in threaded inserts rather than in general fastenings.

It's one of only a handful of companies still manufacturing threaded inserts in the UK, so this strategy seems to have worked well for Fitsco, which survived the recession, and is now celebrating its 25th anniversary. Having moved from its original location in Stourport to Bridgnorth, Fitsco is now receiving orders at such levels that it is aiming to acquire more machines and relocate to larger premises.

So what's the secret of survival in competition with cheap imports? "It is a challenge, but we do it by specialising in non-standard products" says Philip. "When you see products coming from China at £1 a bucket, you have to do something different to get business. We

now make around 1/2m pieces per month, not particularly in low volumes, more typically from around 10,000 units up; we have our own ranges, and also manufacture specials to order from customer drawings. Often these are regular orders and will go off our shelves quickly, but we can also hold stock of popular parts."

So what are the applications of Fitsco's threaded inserts? As Marketing Administrator Kimmy Forshaw explains, they can be used in plastics, wood and sheet metal materials, and are the 'silent partner' in many assemblies, the often forgotten components holding everything together. "A mains power socket, for instance, has a screw through the face plate, holding it to the box via a threaded insert. A thread-forming or self-tapping screw would deform the fitting, so it couldn't be removed and refitted; for a single use it could be suitable, but if the component needs to be disassembled, a threaded insert is the solution."

"Threaded inserts work tirelessly behind the scenes in applications such as automotive, defence, aerospace, injection

moulding, and many more – there are Fitsco parts in fire alarms, POS displays, water filter, tablet computers, even artificial limbs, more applications than most of us would imagine."

The current Fitsco premises combine manufacturing, warehousing and sales in one building, with easy access for delivery. Picking and packing is done by hand from the storage area on the upper floor of the building. Typically this means that Fitsco can fulfil orders from drawing to delivery in 48 hours.

Fast and furious

Fitsco's shop floor is equipped with venerable Davenport B Multi-spindle screw cutting machines, manufactured in the 1990s. The Davenports are iconic for their reliability, accuracy and versatility. Moreover, they're fast; by performing several small operations simultaneously on multiple spindles, they can often outperform modern CNC machinery.

As most of the Davenports are uncovered by anything other than plastic sheets to suppress oil mist, they're undeniably noisy in operation, and operators have to

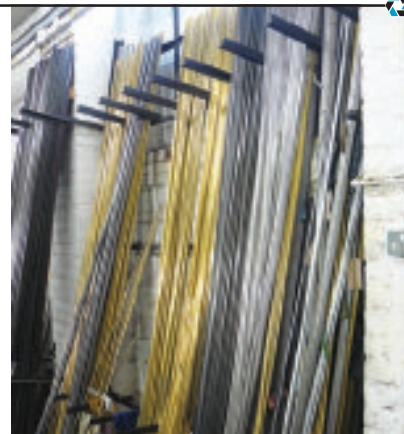
wear ear protection. This stands in contrast to more modern enclosed CNC machinery, which can run almost silently.

However, another advantage of the Davenports over CNC machines is that should they require servicing, they can be stripped, repaired and got back into action quickly by Fitsco's own operatives.

Of course, all this requires a skilled and experienced workforce. Fitsco is well aware that the skills required to set up and run the Davenport machines are in increasingly short supply, and is operating an apprenticeship scheme to make sure that the skills aren't lost.

Such is the reliability of the Davenport machines that Fitsco rarely has quality problems; the first five units off each bar are checked for conformity, and retesting is done after the parts are washed in paraffin to remove swarf. This commitment to quality has resulted in Fitsco receiving BS EN ISO 9001:2008 Quality Assurance approval.

Its manufacturing techniques may be traditional, but Fitsco is totally modern in its marketing methods; a good deal of



marketing is done via its website, social media, and the eBay outlet Fitsco Direct, used mainly for smaller orders for B2C customers. There's also a sister site Inserts-Direct.com, selling boxed components in popular thread sizes, often to customers such as radio control car enthusiasts.

The company also has its own internal digital communications channel, and production facilities for instructional videos. However, as Kimmy explains, the personal touch is still important to a number of Fitsco's customers who aren't on the digital 'radar', so Phil Schofield is often on the road seeing clients, following up on orders, and responding to survey data.

Fitsco is aware of its environmental responsibilities, recycling waste such as lubricant oil, bar ends and swarf, and runs a paperless office, with all documents such as catalogues, datasheets and

CAD drawings stored on the 'cloud'. The company has a relatively low carbon footprint as its workforce is largely local, and raw materials are sourced mainly from UK suppliers.

With the prospect of a move to larger premises, Phil Schofield reveals that Fitsco is contemplating expansion into new markets; possibly offering more complex parts which would require CNC machinery, possibly even the addition of a plastics moulding facility.

All this marks what Phil Schofield sees as a return of demand for quality UK manufacturing. "The 'high-volume' production that used to be done in the UK has generally moved offshore, but we're continuing to grow as a company, especially through exports." He concludes; "Business is coming back to the UK, and this is down to the quality we can offer."

www.fitscoindustries.com



// Threaded inserts work tirelessly behind the scenes in applications such as automotive, defence, aerospace, injection moulding, and many more. //

Self promotion

Manufactured in brass, steel, stainless, marine and other materials, Fitsco's own product ranges have self-descriptive names indicating their method of application. The Multifit, Heatfit, Pressfit, Screwfit and Mouldfit ranges were introduced in 2001, while the Rotofit range, aimed at the rotomoulding industry, came in from 2008. In 2009 came the introduction of the PlasFit thread-forming screws for thermoplastic mouldings, commonly known as PT screws; and in 2014 came the introduction of Marine Stainless 316 austenitic steel inserts, which are particularly resistant to saltwater corrosion.



DIY CINEMA: DETAILS MAKE THE DIFFERENCE

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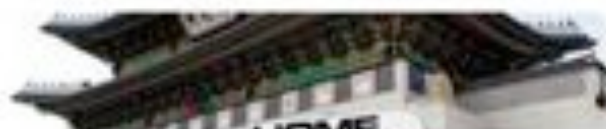
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Samsung – stars of the East

Chris Jenkins travels to South Korea to grill the minds behind the world's largest TV manufacturer

Wherever you go in Seoul, you can't avoid seeing the Samsung logo. The familiar blue design is plastered all over the South Korean capital and it's not just advertising TV products. As one of the largest of the family-owned, multinational conglomerates with fingers in numerous pies from construction to banking, Samsung is pretty much omnipresent. Its name (meaning 'Three Stars') appears on everything from trucks to apartment blocks.

So it should come as no surprise that Samsung's LCD panel factory in Tangeong, and R&D facilities in nearby Suwon, are jaw-droppingly

massive. The Tangeong facility alone employs over 9,000 people, and the scale of the buildings is James Bondian – at any moment you expect to see a helicopter flying out of a volcano.

HCC was there as part of a select group of European tech journalists, the only dedicated UK home cinema magazine represented. Our affable hosts from Samsung had lined up a tough four-day schedule of visits and presentations, not only to tell us about the company's new TV models, but also to impress upon us the scale and ambition of its future plans. Needless to say, these extend way beyond the new products announced at the 2011 CES.

Expeditionary force: Chris Jenkins (centre) with members of the European press in Seoul



Life and Seoul of the party

Braving bitter cold and the momentary possibility of a cross-border punchup with the less welcoming North Koreans, our party enjoyed unprecedented access to the Samsung engineers, designers and marketers who will be responsible for the shape of TV development for the foreseeable future.

Since 2005, when its new CEO decided to make a major investment in panel and processor production, Samsung has been keen to emphasise the 'vertically integrated' nature of its TV business.



In other words, rather than buying in technology or components, it develops and builds everything itself, from processing software to chipsets, panels and completed TVs.

Though there is still some TV assembly done in Korea at the Suwon site, for logistical and tax reasons much of it has been relocated to China and Eastern Europe. (Samsung also uses the brand name PAVIC for a range of products sold only locally.)

The 4.8 million-square-metre Digital City site in Tangeong is perhaps the ultimate in vertical integration; it incorporates its own water supply, power station, schools, hospital, leisure centre, parks and living areas. You could almost spend your whole life there in the service of Samsung – a prospect which the company certainly encourages, with a typical Far Eastern attitude to company loyalty.

The Tangeong LCD panel factory has grown from four lines in 1995 to its present eight; along the way it has gone through eight generations of LCD panel design, and will soon jump directly to 11th-generation designs. Plans exist, too, for a glass works and an OLED factory for mobile displays.

Suitably attired in protective clothing, I toured the LCD assembly line to see the whole module

production process, from the bare glass to the substrate and filter coating processes, attachment of the polarising layer, vacuum treatment to remove bubbles, PCB assembly, TAB (Tape Automated Bonding) attachment of ICs, fitting of backlight units, heat-based ageing process, and final inspection and manual testing. If there's one thing that seeing this process brings home to you, it's the immense investment in technology that companies such as Samsung have to shoulder.

Transforming viewing

"Samsung's vision is to create the future of the display industry", I was told. Ambitious, but no other company is in a better position to do so. The tactics seem to be three-pronged: to make 3D more accessible, to evolve the features of Smart TV, and to transform the viewing experience through design features such as narrower bezels.

I talked to Kevin So, in charge of European Product Planning for LCD, about Samsung's plans for TV technology for 2011.

"Television is changing to become the centre of an entertainment system through connectivity," he told me. "The keywords for the next several years are 3D and Smart TV."

Having taken 86 per cent of the 3D-LCD market in Europe, Samsung quickly established that the



Digital city: The site of the Tangeong plant is matched only by the scale of its investment in technology



Screen clean: The Tangeong LCD panel assembly lines operate with clinical efficiency

How we test

Home Cinema Choice's hardware reviews combine the subjective opinion of our seasoned reviewers with hard technical data.

Chris Jenkins explains how the HCC Tech Labs work

HCC hardware reviews combine the opinions of our experienced reviewers with objective technical data from our test lab. Here's how we do it...

HCC's gear reviews have a long tradition of combining the subjective opinions of experienced reviewers with hard scientific data from our test labs. That way you can be sure that there's no danger of favouritism or prejudice creeping into the reviews – when we combine the reviewer's opinions with the test data, we can be sure that the results we present to you, the readers, are honest, reliable and accurate.

For over 20 years, we have been developing testing methods for every AV technology from CRT TV and VCRs to the latest 3D flatscreens, multichannel amplifiers and media players. Our testers have been trained by the ISE, Tektronix, Home Acoustic Alliance and other industry bodies, and we use industry-standard testing equipment so we can be confident our results make sense in terms of manufacturers' claims.

Our Tech Labs set-up consists of two main facilities.

The Viewing Room

Used mainly for testing TVs, projectors and speakers, the Viewing Room is designed to reproduce the conditions found in a typical mid-range home cinema installation. Created by award-winning custom installers Pounds (www.poundst.co.uk), it's completely light-proofed for testing of TVs and projectors, is partially soundproofed using Acoustiblok (www.acoustiblok.com), and has been acoustically treated and tuned using custom absorbers and diffusers by the experts at RPO (www.rpo-europe.co.uk).

The room has a resident Crystal Acoustics TX-T2 7.2 speaker system and a Screen Research 100in projection

screen. TVs, projectors and amplifiers are moved in as needed for testing. We use a TV stand from Gecko (www.gecko-furniture.co.uk) for mounting flatscreens. The room is fully cabled with speaker, HDMI, and interconnects from Peerless. Multiple displays can be fed from the same source using a Gefen 2-in-4-out HDMI switcher/splitter, and the room is also equipped with network connections.

The testing equipment used for TVs and projectors is the Chroma5Pip meter and ChromaPure Pip software supplied by Kalibrate Ltd (www.kalibrate.co.uk).

This sophisticated tristimulus colorimeter and analysis software allows us to measure functions such as contrast ratio, colour temperature and luminance, all essentials in picture performance.

The Test Lab

Mainly used for performance analysis of amplifiers and players, the Test Lab is equipped with an Audio Precision APx565 multichannel analyser. This generates programmable test signals, and runs a huge range of tests of functions such as output power, frequency response and distortion. It also has digital audio test functions. A Tektronix VM700 is used for analysis of analogue video signals.

Cables for the test system are again from Peerless.

In addition to the main test units, we use a number of audio and video signal generators from Sencore and Snell & Wilcox, analogue test equipment such as a oscilloscope, mains power meters from Maplin, a library of test and measurement DVDs and Blu-rays (plus all the newest software releases), and standardised digital files for media players.

For testing of media software and portable testing

Tech Lab tests explained



White screen: This is a measurement of a display's power consumption in Watts when displaying a pure white (100%) signal with muted audio.

Test footage: How the power consumption is measured with a looped test sequence of test footage (complete with explosions!) and the audio volume up.



Picture: Contrast ratio claims by TV manufacturers are often extravagant, and don't follow an established standard. Our real-world measurements cut through the hype and show one brand's contrast to be compared with another in a consistent way.



Presets: Most TVs default to a picture setting, which is too bright and hot (blue), in order to make them look good in shops, but also have a choice of colour temperature presets. We tell you which of these gets closest to the industry standard setting of 6,500K (D65).



Idle: In full regulation, standby power consumption for most devices is low under full, so we don't usually measure this, but the consumption when power is on can be considerably higher, so we measure this for DVD and Blu-ray players, and some other devices.

Playing: When a disc is spinning, the device's power consumption usually rises, so we measure when playing a standard disc. In theory, media players should display no change in consumption when playing.



Sound: The analogue audio filter from a device such as a Blu-ray player is measured in percents. The lower the number, the better. Though analogue audio output is perhaps rarely used, it's often a good indicator of the general build and component quality of many devices.



Test bench: The Viewing Room (above) simulates a typical home cinema, while the MSI laptop runs test software for the AP9085 analyser (right) and ChromaPure system (above right)



applications, we use an MSI GT640 laptop PC with HDMI output and SRS sound.

Results

All this testing generates a huge amount of data, which is fed into the product reviews and stored on our database. From this we can establish performance averages which help us to keep our scoring realistic.

Of course, this mass of information is too unwieldy and detailed to publish in the magazine unedited, so our next job is to present it in a way which is meaningful and easy to understand. Our graphical presentations (see below) should make it all more digestible. So, while one key reviewer is normally by-lined for our tests, the whole team will have been involved in bringing you results you can rely on.

Video jitter: 13



Video jitter: The analogue video jitter of 4/0/0 or 80 pixels may be irrelevant when the digital output is eventually used, but it is a good indicator of general build and component quality. We also measure other video quality indicators such as chroma crosstalk and frequency response at 1,000 Hz.

Loading: Boot time



Loading & level: For any disc player can be annoyingly slow to load and play discs, thanks mainly to the DPM and Java content. We measure time from power on to disc spinning, and time to load menu of a standard DVD disc.

AVR power: 970



Power: Power consumption of an AVR is an important factor. It's a requirement of decent output levels. We measure consumption in two states, when idle, and when loaded with a multi-channel surround system.

Amp output power: 100



2-channel B.L.Z: Manufacturers claim for amplifier output power can be wildly exaggerated, and testing standards vary widely. Our tests deliver a figure for stereo performance with an 8Ω load, and quite a total harmonic distortion result.

Pure power: 100W



Fidelity forward: This is our way of measuring an amp's output power ability before it is tested by distortion. We measure at 300 Hz with an 8Ω load to get an indication both of output power and component quality.

Signal/noise: 80



S/N ratio: These amp measurements reveal the ratio of signal to noise at a specific frequency. Low and high readings are taken to determine the imaging and tone character of the amp.