Panasonic CF-52

Motion Computing tablet, supplied by Box Technologies

Tablets – flat out to beat notebooks at their own game

Are tablet computers ready for the challenges of field applications? Sharon Clancy reviews the latest advances on both sides, and finds tablets are surging forward on many fronts

For higher-end tasks, notebooks have up to now had the mobile computing market pretty much to themselves. A PDA or ruggedised handheld computer simply doesn't cut it when the user needs to display a lot of information or run multiple applications simultaneously.

Earlier generations had some drawbacks, not least because restrictions on their communication capabilities meant users often had to carry a second device; but that didn't stop people buying them.

Tablet computers have been threatening to take a bigger share of the mobile computing market since they first appeared in 2002, but there has been resistance from buyers, partly because of cost and pa ´ly because notebooks offered more functionality.

The original concept of the tablet PC was to provide an electronic alternative to pen and paper for note taking. The device tended to look a bit like a notebook in which the base and the display had been combined into a single, flat "tablet-like" format. Special software saved handwriting as graphics or converted it into text.

Voila – by replacing paper and pens with something similar in concept, tablets reduce waste, and there is no need to learn keyboard skills.

Early tablets had their own dedicated operating system, based on Microsoft Windows XP, called Windows Tablet (to handle the "digital ink" writing). They tended to have lower processing power than comparable business-class notebooks, and the essential touchscreen technology meant they were more expensive. None of this helped them much in the push to gain acceptability.

However, the latest generation of tablets pose more of a challenge to notebooks, and the makers see field service as a big growth area for them. That's certainly the view of Mark Dale-Lace, director at CMC Computing, which distributes the Swedish-built JLT 8404 tablets in the UK.

"The latest generation of tablets have a lot more functionality and incorporate GPS and navigation," he says, "so field workers no longer need a second device for tracking and scheduling applications." Having a single device in the field reduces support costs, he points out. "The majority of the latest-generation tablets operate with Windows XP and Vista, so as far as the IT department is concerned, it is another PC on the net."

One sign that tablet manufacturers are determined to broaden their appeal is that there are now a variety of models to suit different working environments. For instance, if your mobile workers are on construction sites or outdoors for much of their working lives, they need a device that can cope with that kind of requirement.

But for many service tasks, a less rugged device is suitable. Tablet users do not necessarily need a fully ruggedised computer, says Dale-Lace. "There is a difference between a rugged computer and a ruggedised one. The more rugged a computer is, the higher the cost, and unless your field staff are working outdoors in all weathers, a rugged computer rather than a ruggedised one will probably be able to cope."

In any case, he says, tablets are inherently better protected against water and dust ingress than a conventional notebook. "The keyboard on a notebook is a vulnerable area where dust and water can get in. There are moving parts and key covers can pop off. Slate tablets don't have a keyboard, so there is less risk of damage to the electronics."

Performance

Regardless of whether a tablet or notebook best suits the needs of your mobile workforce, the latest generation of devices have some impressive features, all designed to improve performance.

Wireless strength, radio choices, durability, performance, processing power, outdoor viewability and security are all key criteria when sourcing notebooks and laptops.

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>
> Mark Dale-Lace, CMC Computing

Security

Biometric fingerprinting sounds very James Bond, but is a widely available option on the latest generation of laptops and tablets, where it has been introduced to improve security and eliminate the need to remember passwords. And that's not all the manufacturers have thought of to protect corporate data from hackers by rejecting unauthorised access.

Getac's new P470 rugged notebook and Panasonic's new CF-74 are typical of this new breed. The TPM chip and biometric fingerprint reader in the CF-74 rugged notebook provides cryptographic data encoding and clear identification and authentication of the notebook in company networks. The Trusted Platform Module (TPM) chip makes possible secure data transfer and unique identification of the notebook in a corporate intranet. It monitors every step, from pre-boot to OS load, to guard against unauthorised tampering, whether resulting from physical theft or software attack.

The P470 boasts a biometric fingerprint reader for a secure and reliable authentication device for login or to access sensitive information.

As tablet manufacturers seek to widen the appeal of their computers for mobile working, security has moved up the agenda. "We understand that data security has become an integral issue in today's mobile computing environment," says Mark Holleran, president and chief operating officer of Xplore Technologies. "On the basis of input from our customers and the ➜

computers. Now it is available on bigger screens, and Terralogic expects the appeal of tablet computers for outdoor use to be enhanced. The transflective option is currently being phased in on the company's 13in, 15in and 17in platforms.

Motion Computing's LE1700 incorporates ViewAnywhere screen technology, which is said to improve screen contrast in bright conditions.

Faster processing

This year has seen the introduction of new notebooks that feature the latest generation of processors (CPUs). The Intel Core 2 Duo T7300 processor with the Mobile 965GM Express chipset seems popular in this application, and is used by General Dynamics in its Itronix GoBook VR-2 and by Pansonic in its CF-74.

Earlier tablets may have had less powerful processors, but as the role of tablets has expanded, so too has the need for the same level of computing power as offered by notebooks. Motion Computing's slate tablet PC, the LE1700, is said to be the first of its kind with Intel Core 2 Duo technology. It is said to deliver twice the CPU performance of models using the previous-generation Centrino chipsets, says distributor Box Technologies, which claims that it increases system responsiveness when running multiple applications and extends mobility with smart battery power management.

Panasonic: CF-19

Building in toughness

Magnesium alloy casings on the latest laptops have helped reduce weight and add toughness. The magnesium alloy casing on Getac's P470 has cut weight by a quarter compared with the previous model, so it now comes in at less than 3kg. The casing increases the strength by 50 per cent, too, so it is better able to cope with small drops and knocks. The disk drive and LCD TFT screen are shock-mounted for extra protection and to prevent connections coming loose.

The Panasonic CF-74 has a shockproof magnesium alloy casing to protect the electronics and has a splash-proof keyboard and touchpad. The 80GB hard drive is additionally mounted in shock- and vibration-resistant polymers, meaning it should withstand a drop from up to 38in.

Terralogic specialises in ultra-rugged computers. Its latest option is a waterproof rugged expansion unit for its Toughnote DI-7 and Toughnote DM-7 tablet PCs. The side panel can be made any length with internal spaces of 60mm and 30mm, and this allows any size of expansion card to be accommodated, the company says, as well as protecting expansion sockets.

Not all notebooks are produced on a modular platform, but the Toughnote series is, so users can virtually build their own. There are sealed Flexi and hard drive bays to prevent water/dust ingress into the machine core. The Flexi-bay can hold a secondary battery, DVD-RW drive or floppy disk drive. All of these are removable and swappable. The shock-mounted, waterproof 2.5in hard disk has also been made removable to simplify swapping data between machines and upgrading to a higher capacity drive.

Terralogic: DI-7

Weight

Tablets win hands-down on weight. Terralogic's DI-7 notebook, for example, weighs 1.8kg. Notebooks tend to come in around the 2.5kg to 3kg mark, although the Panasonic CF-19 Toughbook weighs only a remarkable 2.28kg, despite its ruggedised features. Weight can be critical in gaining user acceptability, especially if people are going to spend a lot of the working day holding a notebook or tablet.

"Tablets win hand down on weight ... which can be critical in gaining user acceptability"

There are two types of tablet PC. With a hybrid or convertible notebook, the user can swivel the screen round so that it sits on top of the keyboard. While this arguably gives the user ultimate flexibility, there is a cost penalty.

A "slate tablet" has no keyboard, and essentially acts as an electronic notebook. Users write on the screen with a plastic stylus or pen, and the writing is converted into digital format and displayed. You can also touch the screen to navigate between applications or through menus. Tablet PCs, like notebooks, also have a variety of features that enhance mobility, including Bluetooth, Gigabit Ethernet and Wi-Fi capabilities.

When it was launched at the end of 2006, Panasonic's CF-19 was the first ruggedised notebook to incorporate a swivelling screen to convert it to a laptop. The anti-reflective high-contrast screen has a low reflection rate and screen brightness of 460 candelas, keeping the screen clear and easy to read even in bright sunlight and at varying angles. Its LCD hinge is extremely tough and resistant to dust, and it is said to cope with falls from 90 cm (3ft) unscathed. The CF-19 has the shock-resistant magnesium housing, and there is extra protection for the hard disk in the shape of a foam jacket.

A year on, the CF-19 has some competition, not least from ruggedised slate tablets. Getac's V100, for instance, is an ultra-rugged hybrid notebook/tablet with a rotating 10.4in WXGA TFT LCD screen that also incorporates a waterproof 1.3-megapixel camera. The V100 complies with both MIL-STD 810F and IP54 standards. It is capable of withstanding heavy rain and spillages and is said to be immune to damage from airborne dust and debris. The removable hard disk is protected with anti-vibration rubber and has anti-shock housing.

Motion Computing's LE1700 comes as standard with a 12.1in high-resolution SXGA+ display. There are two input modes – a pen stylus and the optional WriteTouch display, which offers input by writing or touchscreen.

Xplore Technology's Renegade tablet range incorporates auto-sensing technology, which allows users to switch automatically between pen input and finger-based touch input. "This dual input feature gives our customers both the accuracy and digital inking capabilities of an active digitiser and the convenience of a true finger-touch resistive input panel without the need to toggle manually between them," says Mark Holleran.

He says many customers want the ability to use their finger when Xplore's rugged Tablet PC is docked in the vehicle to assist with navigation and despatch tasks, but then like to switch to using the active stylus or pen when they leave the vehicle and need to use a mobile computing application. This approach also means there is an alternative data entry method if the digitiser pen should get lost or damaged during a shift.

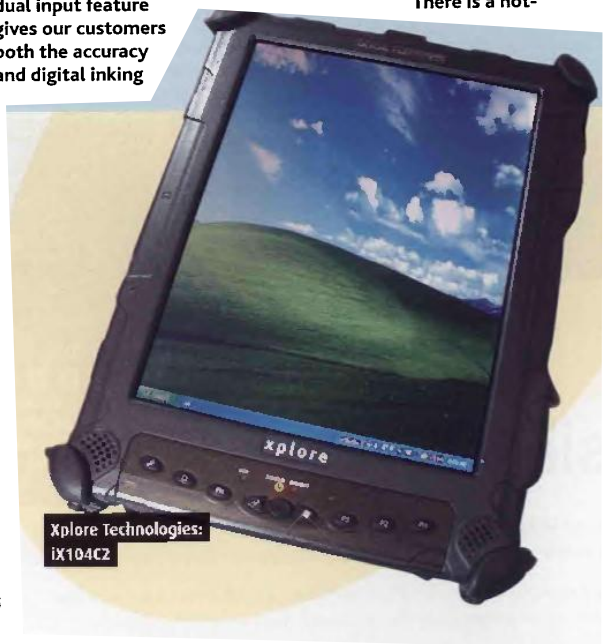
CMC's solution, the JLT8404, makes use of the experience gained with the company's earlier tablet PCs to define a new platform. There is a powerful processor and the unit has integrated Bluetooth, Wi-Fi, 3G/GPRS and high-sensitivity GPS, with antennas embedded in the housing to eliminate damage.

The JLT8404 is compact, with an 8.4in sunlight viewable touchscreen and function keys. There is a hot-swappable battery, allowing extended periods of operation, and a choice of rugged hard disk or flash disk to provide data storage capabilities to suit every requirement. The JLT 8404 has a high IP65 rating for dirt and dust ingress.

Some manufacturers have developed small form-factor tablets. General Dynamics' new GoBook MR-1 measures just .3in by 6in and weighs 1kg. The 5.6in wide SVGA screen has a DynaVue touchscreen and runs the full Windows XP Pro operating system (and Vista by the end of 2007).

Small doesn't mean less tough. The MR-1 is designed to meet or exceed MIL-STD 810F and is IP54 rated for dust and water ingress resistance. It has a shock-mounted display and impact-absorbing bumpers for key internal components.

The Fujitsu Siemens LifeBook P1510 weighs just 1kg and has an 8.9in touchscreen. The swivel screen allows you to use it as a conventional notebook or swivel into a slate tablet. The Lifebook overcomes another hurdle for tablets, too: at £1,500 it is one of the cheapest around.



Xplore Technologies: iX104C2

needs of target markets, we developed a product that addresses this issue."

The company claims its iX104C3 tablet PC features the first-ever use of biometrics on a rugged pen tablet computer. It certainly won't be the last. Indeed, Motion Computing's new LE 1700 tablet incorporates fingerprint reader technology that enables the biometric footprint reader to operate like a mouse.

Screen technology

The latest screens can also incorporate technology to improve screen visibility in sunlight conditions, although often this feature is available only as an optional extra. General Dynamics Itronix, however, is now incorporating its DynaVue technology as standard in its notebooks and tablets. DynaVue combines contrast ratio and polarisation techniques to optimise viewability in all lighting conditions. It uses light filtering technology to improve visibility to achieve improved contrast ratio, and a single cold cathode fluorescent lamp to provide brightness control, so there should be no sacrifice of battery performance or processor speed.

Xplore's AllVue technology is standard for its new iX104 tablet PCs. Allvue is an advanced LCD assembly process that reduces glare and increases screen readability in all light levels. Compared with standard tablet, laptop and notebook displays, says Xplore, Allvue delivers an 86 per cent reduction in reflective loss, a 300 per cent increase in screen effectiveness outdoors, a 16 per cent increase in screen effectiveness indoors, more efficient light pass-through, and a 200 per cent increase in impact and scratch resistance. Impressive stuff – and there is said to be no impact on battery life.

Rugged specialist Terralogic has introduced transflective LCDs for its Toughnote DI-7 notebook and DM-7 tablet computers. Transflective technology, says the company, addresses the multiple issues raised by direct sunlight readability, but has previously been restricted to small form-factor

"Data security has become an integral issue in today's mobile computing environment"

Mark Holleran, Xplore Technologies