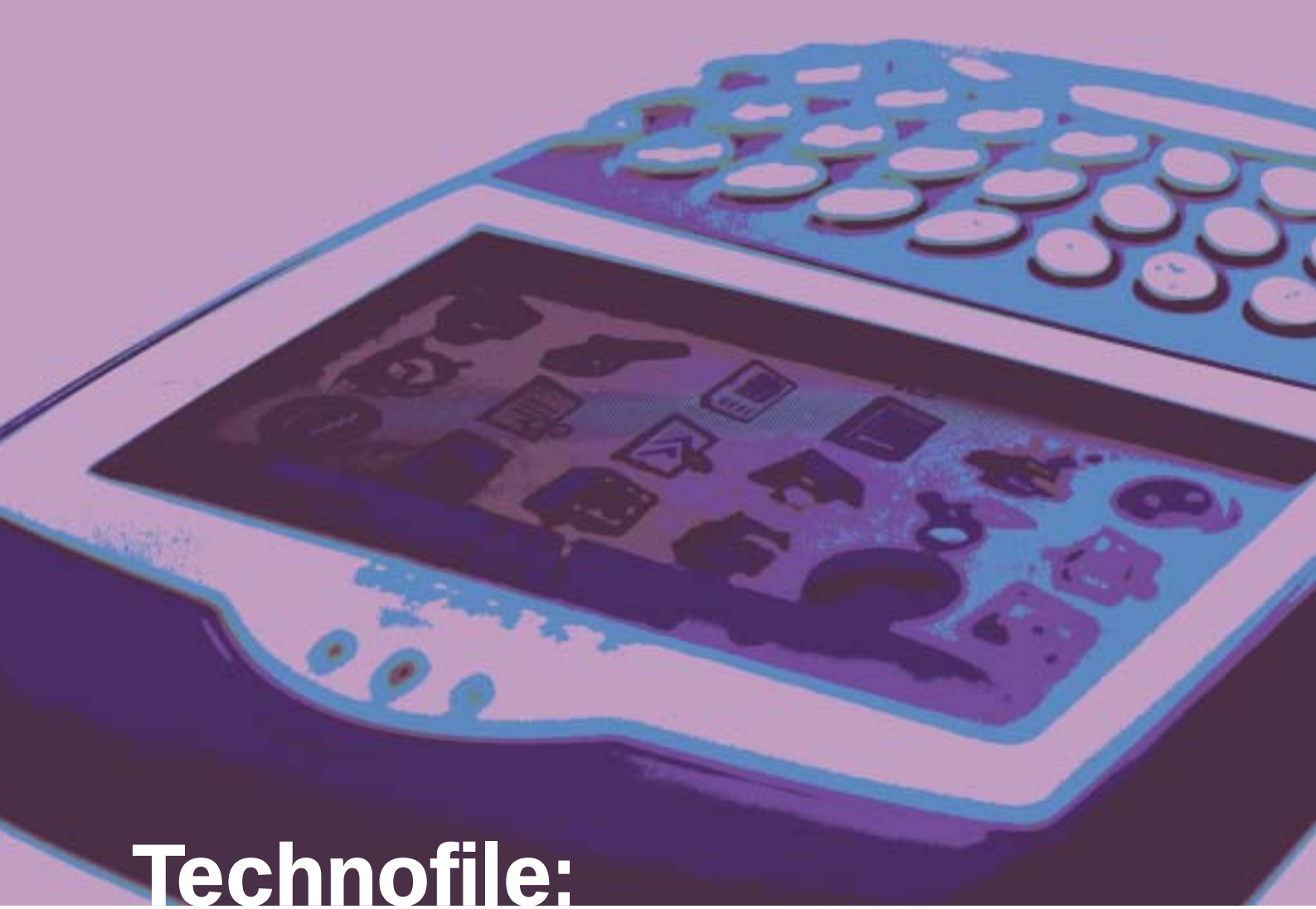


Technofile: smartphones

Fed up with carrying a PDA and mobile phone around with you? Or maybe you're after a portable device that's less cumbersome than a notebook but still gives you standard apps and multimedia facilities. Stan Everett measures up the latest breed of smartphones

Anyone that owns a PDA (personal digital assistant) will be familiar with this problem: you own a device that can organise your life, send and receive messages anywhere in the world, look at any web page and play high-quality movies. Trouble is, you never get around to using anything other than the address book and calendar.

There's a simple reason for this. Despite all the features your PDA has, there's a missing link – connectivity. Smartphones provide this missing link by combining all the functions of a standard PDA with those of a mobile phone.

Suddenly, the messaging functions become a lot more attractive – the ability to read and reply to emails is much more useful if you can send and receive replies instantly rather than waiting until you get back to your PC.

Smartphones are a relatively new breed of device. No manufacturer has managed to invent the perfect model yet, so buying one is all about compromise. Before you head to the shops you need to sit down and have a think about what you will use a smartphone for, and how you will want to use it.

There are plenty of issues to weigh up, so don't make a purchase without reading our indispensable guide.

Size matters

Your primary consideration should be the device's physical bulk. Smartphones come in all shapes and sizes. At the top end of the scale are models like O2's xda and Palm's Tungsten W, which are about the same size as normal PDAs. Smaller devices include models like Orange's SPV E100 and Nokia's 3650, which measure the same size as a three-year-old mobile phone.

Smartphones are designed to replace your existing mobile phone and PDA, so ideally you'll want something that is light enough to take with you wherever you go. The problem for manufacturers is that, if they shrink the size of the case, everything else has to shrink with it. Small phones equal small screens and even smaller keys. Not ideal for looking at web pages and emailing people on the move, but appropriate for phone calls.

PDA-sized models that have larger screens and keys are great for data applications, but are too large to use as normal phones. There's no getting away from it – you're going to have to compromise on something.

The key decision is whether you're going to use your new device more for

data applications, such as sending emails, or making voice calls. If it's the former you should plump for one of the larger devices. If it's the latter, turn to one of the phone-sized models.

Jungle juice

It goes without saying that battery life is a crucial consideration when buying a new smartphone. Unfortunately, the heavy demands of high-resolution colour screens, fast processors and always-on data connections mean that many smartphones are hampered by extremely short battery life.

All models come with rechargeable batteries as a matter of course. These will almost certainly be either lithium-ion or lithium-polymer cells, although the technical differences between the two types are of no consequence to the user. Thankfully, the days are gone when you had to wait for a battery to run down before charging it up again and both types of lithium battery can be recharged when you want without causing harm.

Generally speaking, the larger the battery the longer it lasts. This partly explains why bulkier models (such as the P800 and Palm's Tungsten) are placed near the top of the battery life league table. That said, the processor used in each device also has its part to play.

O2's xda, for example, employs a chip running at 206MHz, whereas the longer-lasting Palm Tungsten W gets by on a 33MHz model. The faster the chip the more juice it needs to keep ticking over, which has a knock-on effect for the battery life of the device.

As a guide, however, don't expect any of these models to last more than a day before you have to plug them into the mains.

Operating systems

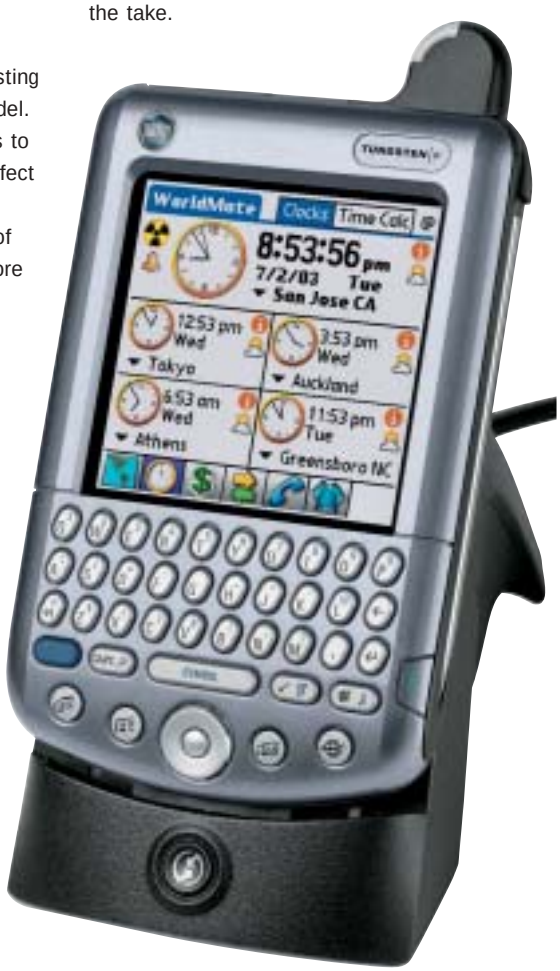
On a PC a fast processor almost certainly equates to speedy performance, but the same isn't true of smartphones. The key difference is that, whereas the Windows platform has become the de facto standard for the PC, all of the smartphones featured here run on different operating systems.

Some operating systems, like Microsoft's Pocket PC 2002 Phone Edition which runs on the xda, require more processing power to run effectively. Others, like Symbian 7.0 on the P800 and Palm OS 4.11 on the Tungsten W, are more efficient and can work happily with slower processors. Unfortunately for us this means that every smartphone has a totally different interface and, therefore, will take some getting used to.

Each OS has its own set of dedicated fans convinced that it is the best. In truth, however, they are all about as difficult as each other to master. The key contrast is between the operating systems that run on the three mobile phone-sized devices – the SPV E100, Nokia 3650 and the P800. Anyone can write and run an application for a Symbian phone (featured on the latter two handsets) which means that there's a healthy, vibrant development community creating some useful applications for distribution (often free of charge) over the web.

Microsoft's software on the SPV E100, however, has some restrictive security features. You can only install applications that have been tested and approved by the network that sells it (in this case, Orange).

The official line is that the restrictions are in place to ensure that no one runs an application that could damage Orange's mobile phone network. However, it also means that Orange can make sure that you pay for every single application you install on the device and that it gets a cut of the take.



Information hub

All smartphones can be synchronised with PCs in exactly the same way ordinary PDAs are – install the software on your computer, connect it to a cable or drop it into a cradle and you're done.

Thanks to the integrated mobile phone, however, you don't have to use cables to get information to and from your device. Those with POP3 email accounts (that's most people with an account at home) can send and receive messages from anywhere in the world. Simply type your account and server details into the setup screens and the smartphone can check for new messages every now and then, sending them to your device automatically.

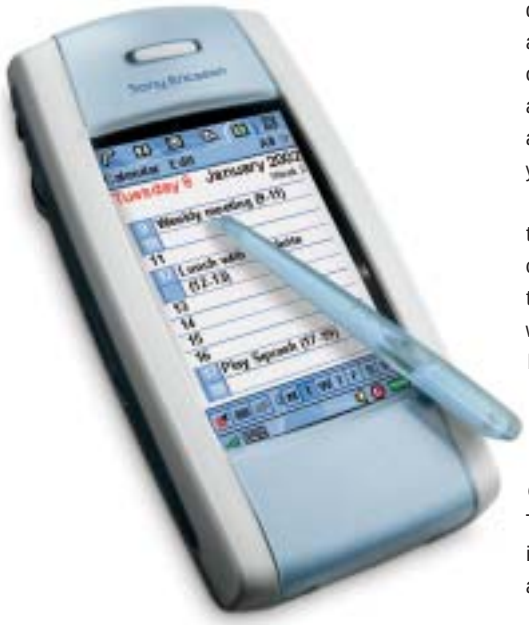
You can also look at WAP and web pages on the go. However as web pages were designed to be displayed on standard computer screens, they can be difficult to read on the relatively small screens used by smartphones. Luckily, this is where WAP suddenly becomes useful.

Most WAP sites consist purely of text and, while the pages don't fit too well on the low-resolution screens that ordinary mobile phones have, they're well suited to the higher resolution displays of smartphones. Plus, as there are few (if any) images to download, the pages load almost instantly over a fast GPRS connection and cost relatively little to view.

Let's see those fingers

There are three main methods of entering text into a smartphone: using a numeric keypad, a miniature keyboard or via a touchscreen. Which you choose will be determined by a mixture of personal taste and the amount of text you'll be typing.

Anyone that's sent a text message will be familiar with using a numeric keypad to write a message without the help of predictive text – tapping the number two once, for example, brings up the letter A, tapping it three times brings up the letter C. This gets tedious for anything more than a few lines of text, however, so if you'll be writing a mini-opus on a regular basis you're going to need something a bit more substantial.



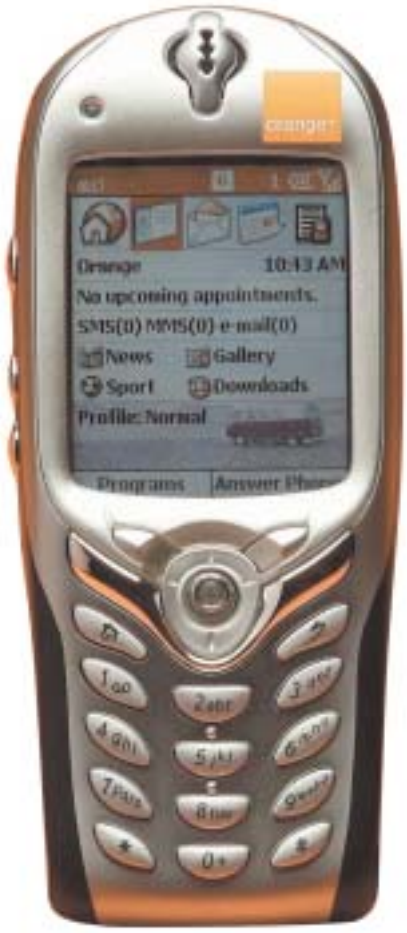
Some manufacturers think the perfect solution is the miniature keyboard. The idea is that you hold the smartphone in both hands and poke at the miniature keys with your thumbs. Although they don't look as though they're going to work particularly well, with a bit of practice miniature keyboards can be surprisingly effective.

The biggest problem is learning how to be accurate – the keys are so close together it's initially all too easy to hit the wrong ones by mistake. Those with fat fingers and shaky hands should probably steer clear.

Anyone that owns a standard PDA will be familiar with touchscreens, but using one is a little more awkward on a smartphone. If you're trying to find an address or an email while walking down the street, for example, it's not always terribly convenient to stop, pop out the stylus and start jabbing away at a screen. Nevertheless, this is a quick and accurate method of data entry once you've learnt its intricacies.

In terms of the products we've chosen to highlight, the P800 is the king of the castle when it comes to input options – there's both a keypad and a touchscreen – while the SPV E100's weeny keypad can be expanded with a plug-in keyboard.

Despite Palm's inclusion of a miniature keyboard on its Tungsten W, there's still the option to use the Graffiti system on the touchscreen should you wish. That leaves the xda with touchscreen-only input options and the Nokia 3650 with a solitary keypad.



Talk to me

So far we've just talked about the data capabilities of smartphones, but exactly how good are they at making voice calls? If you like using hands-free kits the answer is excellent. If not, the answer's not very good. All the products we feature here can be used as phones in the usual way, but that can pose a whole new set of problems.

Holding a PDA-sized slab of electronics to your ear and talking into it is hardly the most stylish of poses. And it's surprising how easily the touchscreen attracts ear grease – even if you give the smartphone

Getting connected

Most smartphones in this article will be sold with a contract which will tie you to a particular network for at least 12 months. They should work straight out of the box – you won't have to fiddle around with too many settings, as the operator will have configured them for you. The one exception is Palm's Tungsten W. You buy this without a contract and it's up to you to sort out a connection. In theory, you can hook it up to any network, but it's only guaranteed to work on Vodafone.

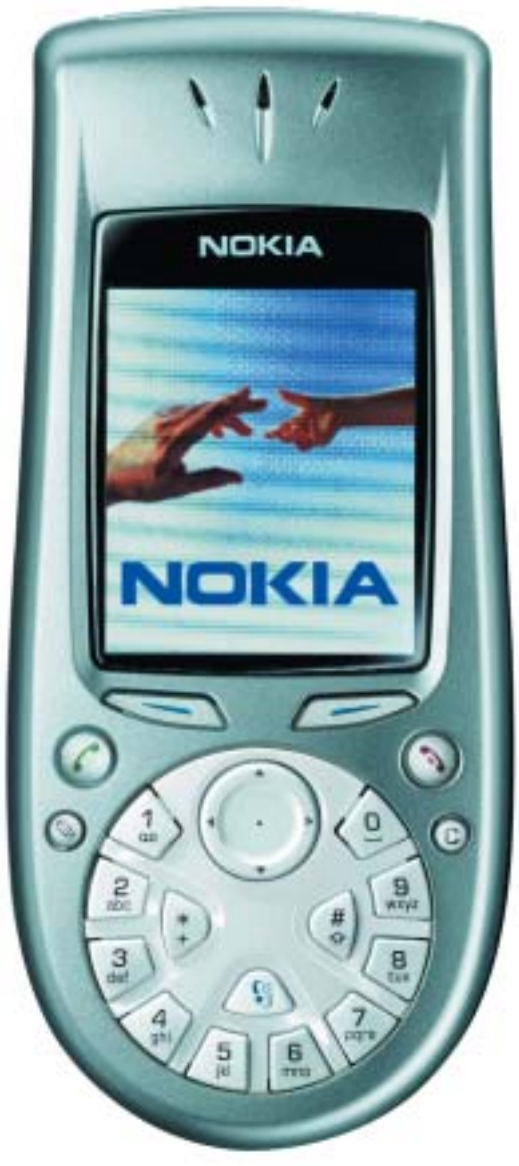
Regardless of the device you choose, you'll be given a GPRS contract that will require you to pay a monthly fee. GPRS data calls will are priced differently to voice calls. Instead of being charged by the second for the length of time you are online, you pay for each byte of downloaded data. That means that, even if you were connected for a day but didn't download anything, you wouldn't pay a penny.

Costs vary massively between the different tariffs on each network and it can be tricky to keep a track of your spending. Looking at a web page with plenty of pictures on it will be more expensive than downloading a short text-based email, for example, as you need to download much more information to your smartphone to look at the web page.

To help control your spending it's best to get a tariff that includes a set amount of data with your monthly fee – Orange offers 1MB worth of data each month for £3.

Smartphones: comparing the models

Model	Telephone	Website	Price (ex VAT)	Dimensions (wxdxh)	Weight	Network standards	Other wireless capabilities
O2 xda	0870 850 0202	www.o2.co.uk	£254 (with contract)	73x18x129mm	201g	dualband, GPRS	infrared
Orange SPV E100	0500 802 080	www.orange.co.uk	£200 (with contract)	48x21x116mm	120g	triband, GPRS, MMS	infrared
Sony Ericsson P800	0870 523 7237	www.sonyericsson.com/uk	£281 (with contract)	59x27x117mm	158g	triband, GPRS, MMS	Bluetooth, infrared
Nokia 3650	0870 055 5777	www.nokia.com	£128 (with contract)	57x26x130mm	130g	triband, GPRS, MMS	Bluetooth, infrared
Palm Tungsten W	0118 974 2700	www.palm.com/uk (no contract)	£425	78x17x138mm	183g	triband, GPRS	infrared



a quick wipe down with your sleeve afterwards, over time the screen will become increasingly obscured.

If you plump for a PDA-sized smartphone then you're going to have to use a hands-free kit – the good news is that all the manufacturers discussed here provide one in the box. The phone-sized models can be used for voice calls in the normal way without similar problems, although sometimes the extra bulk of the devices can make them uncomfortable to use.

Extra connectivity

Smartphones don't just have integrated mobile phones – some have wireless capabilities too. Bluetooth should be the most useful, but using it is frequently more trouble than it's worth.

In theory, you should be able to take a Bluetooth-enabled notebook and connect to the phone wirelessly, using it as an extra-fast data modem while on the move. Our experience of this is mixed, however. Depending on the Bluetooth-based product you use, sometimes it will work and sometimes it won't. If you stick to Bluetooth headsets, though, you should have more success.

From our experience, infrared is the most useful wireless connection and fortunately all of the smartphones we've looked at here have it. Although this requires your phone and notebook to have a line of sight, it should work much more reliably.

The one missing component is Wi-Fi. No manufacturer has worked out a way of squeezing this technology in with everything else yet. Remember, though, that when you start using infrared or Bluetooth, your battery comes in for even more of a hammering than usual. If you can, use a cable. It may not feel as technologically advanced, but your batteries will thank you for it.

Getting faster

All of the smartphones in our table above are GPRS-compatible. General packet radio service provides an always-on data connection that's much faster than the one you get with older phones. These are sometimes referred to as GSM (global system for mobile communication) phones.

A GPRS connection can be as fast as 42Kbps (kilobits per second), as opposed to 9.6Kbps on a GSM handset. That's about the same speed as the dialup connection you might have at home, but is much slower than broadband.

As with anything mobile, the speed you actually get depends on how strong the mobile phone signal is in your area and how many other people are using the service at the same time as you. See *Getting connected* on page 70 for more information on GPRS.

How much memory?

One of the elements that varies considerably between devices is the amount of internal memory each has –

Operating system	Screen res & no of colours	Internal memory	Slots	Input device	Battery life	Battery type	Software & extras
Pocket PC 2002 Phone Edition	240x320, 4,096 colours	64MB	Secure Digital	touchscreen	3.5-hour talktime 150-hour standby	lithium-polymer	Outlook 2000, ActiveSync
Windows Powered Smartphone	176x220, 64,000 colours	8MB	Secure Digital	keypad	3-hour talktime 100-hour standby	lithium-ion	Outlook 2000, ActiveSync, clip-on camera
Symbian 7.0	208x320, 4,096 colours	12MB	Memory Stick Duo	touchscreen, keypad	13-hour talktime 400-hour standby	lithium-polymer	Sony Ericsson PC Suite, built-in camera
Symbian 6.1	176x208, 4,096 colours	3.4MB	Multimedia Card	keypad	4-hour talktime 200-hour standby	lithium-ion	Nokia PC Suite, built-in camera
Palm OS 4.11	320x320, 65,536 colours	16MB	Secure Digital	touchscreen, keypad	10-hour talktime 200-hour standby	lithium-ion	Palm desktop software

anything from 3.4MB to 64MB. How much you need depends on the operating system that the device is running and what you plan to use the smartphone for.

Microsoft's operating systems, for example, generally require more memory to run properly and tend to create larger file sizes than Palm's. Equally, the 3.4MB in the Nokia 3650 may not sound like a great deal compared to the xda's 64MB but it's enough for hundreds of calendar entries and contacts.

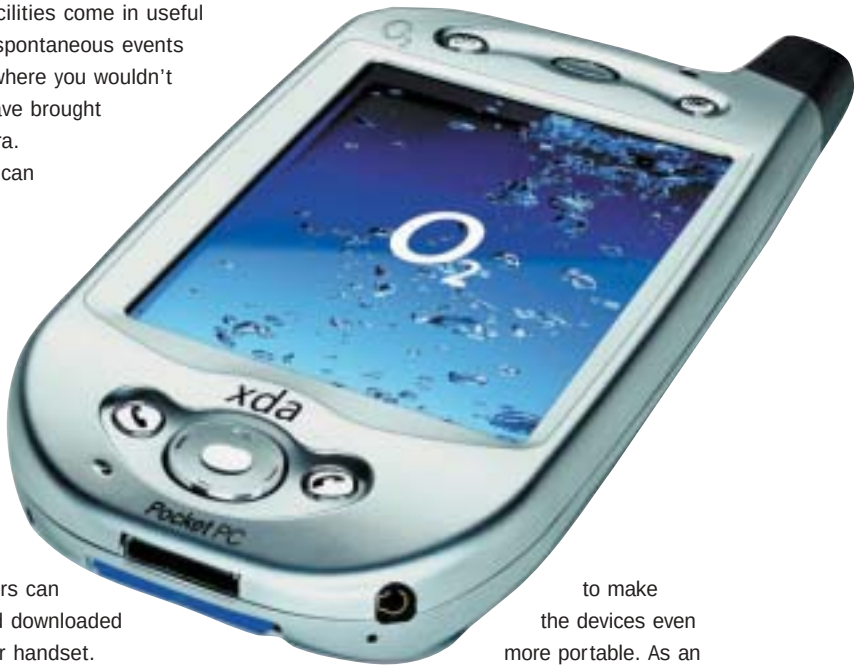
If you have any multimedia aspirations for your new smartphone, however, you'll need more memory regardless of your phone's operating system.

Pictures, videos and games can take up a large amount of space, but thankfully all of the smartphones here have expansion slots for memory cards. Our recommended card format for smartphones is Secure Digital as it has a greater maximum capacity and is available from a wide number of manufacturers. Multimedia Card and Memory Stick Duo formats are also competent performers.

Getting snappy

We've left the best bit until last – smartphones aren't all about serious data applications. For starters, most of them have cameras that are either integrated or clip on. The quality of the pictures won't be amazing and certainly not good enough to print, but they are perfect for emailing.

Capture facilities come in useful for recording spontaneous events in situations where you wouldn't necessarily have brought along a camera. Smartphones can also be used to play games – sometimes you can buy and download these from websites, installing them on the smartphone via a PC; others can be bought and downloaded directly to your handset.



Some smartphones are also capable of recording and downloading videos. At the moment downloadable clips are of a low quality and tend to be restricted to things like movie trailers, while footage you record yourself can only be a few seconds long. It can be a fun feature, nevertheless.

The future

At their best the current generation of smartphones are easy-to-use tools; at their worst they are frustrating bricks with too many features. Over the next couple of years manufacturers will work out what consumers like and dislike and find ways to make the devices even more portable. As an increasing number of operators build 3G networks, wireless data speeds will increase and many of the restrictions placed on today's smartphones will disappear.

But that's the future. What we've got today may not be perfect, but current smartphones are much more useful than ordinary PDAs. So if your PDA is unused, don't delay – sell it and buy one of the latest breed of connected devices. ■

Unsure of a technical term? Find out exactly what it means in our searchable Glossary which is on the cover disc