WORDS: NIK RAWLINSON **TESTING:** LEO WALDOCK
PHOTOGRAPHY: HUGH THRELFALL **ILLUSTRATION:** WENDY MORGAN

Print preview

A printer is an essential PC peripheral, but the choice is
now even more complex. We carried out a series of exhaustive
tests on nine inkjet printers, both for the home user and
the professional, to make your search simpler

After the PC itself, inkjets have long been the second most popular computing purchase. These printers are relatively cheap to buy and, although less cost effective than a laser device, fairly cheap to run, especially if you can make do with using photocopy paper rather than the more costly inkjet paper.

A few years ago printers were much of a muchness. You had two choices: piezo or thermal. But now, with new technologies emerging all the time, the choice is more complex. Over the past 12 months, manufacturers have worked hard to enhance photo performance, but with online image printing services maturing, many users are now just as interested in other areas, such as the quality of text output and business graphics.

Our standard suite of tests examines every area of a printer's functions. An A4 photo is sent to photo paper, PowerPoint graphics are printed to inkjet pages and text is output to office photocopy paper. Other tests scrutinise the remaining functions, for a comprehensive output workout.

This test is split into two categories – photo printers and budget, or home-user printers – and we'll be picking a winner from each. **>**

CONTENTS

Canon S450

PRICE £106.91 (£90.99 ex VAT) **CONTACT** Simply 020 8498 2100

PROS Parallel and USB connection; fast **CONS** Awkward paper tray; disappointing photo

OVERALL Speed alone does not make a good printer

TEXT QUALITY ■□□□□   **IMAGE QUALITY** ■■□□□

SPEED ■■■■■   **OVERALL** ■■■□□

A rather conventional looking printer, the S450 sports both parallel and USB connections for maximum compatibility. It's fast, too. The driver was fiddly to install, but worth the effort once we got there – it was among the most informative in this group test, keeping us updated on how the job was progressing, how much ink we had left and which page we were on.

A switch on the front toggles between paper and envelopes, and a rather awkward output tray protrudes from the front. This does not slide back into the body, so you'll need to clear some desk space.

Text pages appeared in a third of the time it took Epson's 895 to do the same job. There were 50 pages in the output tray after just nine minutes 42 seconds. Quality was excellent, with dense characters and barely any sign of feathering. This was more than good enough for business use.

Unfortunately, the photo was very disappointing. There was clear banding, and considerable graininess. This was probably due to the fact that Canon supplied only colour and black cartridges as standard – a photo cartridge is an optional extra. The overall result was also a little blurred. In its favour it arrived in just six minutes 27 seconds, but time, paper and ink were wasted. In fairness, however, this was Canon's budget entry, so it's not really a photo printer.

If you are less interested in photos than business graphics, though, this is a good choice. Our PowerPoint slides were well rendered. Colours were even and bright, and when sent to transparency there was solid, unbiased coverage across the whole surface. The transparency slide remained tacky for quite some time after printing, but not enough to smudge. Ten slides printed as three-to-a-page handouts were ready for distribution in 14 minutes 26 seconds. The A4 transparency took five minutes 36 seconds.

Epson Stylus C20UX

PRICE £51.69 (£44 ex VAT) **CONTACT** Dabs.com 0870 429 3120

PROS Small; great photo quality **CONS** PowerPoint a little less inspiring; a little slow

OVERALL The results are worth waiting for

TEXT QUALITY ■■■■□   **IMAGE QUALITY** ■■■■■

SPEED ■□□□□   **OVERALL** ■■■■□

Epson's budget entry, the Stylus C20UX, is a four-colour device that looks less substantial than some of the competition. Epson calls this design 'aesthetic'. Top resolution is a respectable 720dpi, but it's a USB-only device. There is an alternative parallel model. In-the-box drivers will happily talk to Windows 98, 2000 and Me.

Setup is dead simple, and for novice users a sheet of instructions will lead you through the necessary steps. This explains the charging process that is necessary for first-time Piezo operation, which will probably be a relief for the befuddled novice.

We were prepared to turn a blind eye to the budget printers' photo performance, but the C20UX did a sterling job. Colours, including skin tones, were realistic with smooth gradation across areas of tonal variance. Edges were clearly defined, and at no point was there any evidence of dark colours bleeding over into lighter areas. There was no banding and only very slight graininess, and the picture completed at the highest-quality setting in 20 minutes 50 seconds.

PowerPoint output was a little less encouraging, with some stripes running through our solid colours, especially when we blew up one of the slides to A4 and sent it to print on a transparency. This took four minutes 28 seconds, while printing 10 in handout format at the highest quality setting took just under 16 and a half minutes. Text output was good on photocopy paper, with sharp edges and dense characters. Fifty pages dropped into the output tray in 32 minutes 30 seconds, averaging one page every 39 seconds.

In all, the C20UX is a competent device that will produce the kind of output home users will be looking for. Its better than average photo performance makes it worth consideration, and it's not a slowcoach, either.

HP Deskjet 845C

PRICE £79 (£67.23 ex VAT) **CONTACT** Simply 020 8498 2100
PROS Attractive; excellent text quality **CONS** Rather rough with our pages
OVERALL HP knows what it does well, and sticks to it
TEXT QUALITY ■■■■■   **IMAGE QUALITY** ■■■□
SPEED ■■■□□   **OVERALL** ■■■■

The Deskjet 845C is a very smart printer – smart in the sense of fashion, not intelligence. Its charcoal-grey casing is immediately endearing, although it's no great departure from the HP norm, as it's from the same mould as the 720 series.

In the box you'll find the ubiquitous quick-start installation sheet and a comprehensive set of troubleshooting flowcharts at the back of the user guide. HP makes a big thing out of the fact that this printer won't wake a sleeping child. Unfortunately we didn't have one to test with. It's USB-only, but includes drivers for both PC and Mac users, and under the hood there's a helpful sticker reminding you which cartridges to buy when refill time comes around.

Our PowerPoint slides were a little grainy, but the colours were bold and bright, and the small fonts on the handout slides were clear and easy to read. The handout job completed in nine minutes 43 seconds, and the transparency in six minutes and 56 seconds. The colours were similarly impressive in our photo when output to photo paper, but blocks of solid colour were grainy. Skin tones were realistic, though, and there was no banding, so from normal viewing distances the results look good.

On photocopy paper and at normal quality the 845C's text output was the best in the group. There was no feathering, edges were crisp and characters were bold and dense. It came home in the middle of the pack, completing the 50 pages in 16 minutes 48 seconds, and the 50-page Adobe Acrobat file in 46 minutes 20 seconds.

Sadly, though, while the quality of the output was difficult to fault, the 845C had a tendency to tear the tops of our pages, which made them unsuitable for use in a business or educational environment. We are assuming this is a one-off problem with our test unit.

Lexmark Z33

PRICE £69.32 (£59 ex VAT) **CONTACT** Dabs.com 0870 429 3120
PROS Good at rendering Acrobat and business documents **CONS** A little slow
OVERALL A fair performance but nothing special
TEXT QUALITY ■■■□□   **IMAGE QUALITY** ■■■□□
SPEED ■■□□□   **OVERALL** ■■■□□

'Photo-quality perfection at 2,400 x 1,200dpi' screams the box, but inside you will find only black and colour cartridges – not a hint of a sniff of a set of photo inks. The Lexmark Z33 is a slim, attractive device that sits low on the desk and will be a smart addition to any home office. Connection is by means of USB cable.

Apart from the photo statement, the Z33's other claim is to produce 'laser-sharp black text'. In our tests the word 'black' in that statement was borne out, but if this was laser quality then the laser had a slight squint. Edges were fair, but on photocopy paper they were certainly not up to the razor-sharp standard of a laser printer. At an average reading distance you're not going to notice the feathering as it's very slight, but it's not quite up there with some of the competition.

The Z33 was fairly zippy, though. The 50 pages of text took a mere 16 minutes 30 seconds to print, averaging out at just under 20 seconds a page.

Our Acrobat document was well rendered, with good solid colours and smooth grey shading. Likewise, the grey bars in our mixed content Word document were an even slate-like grey. The 50-page pdf completed two seconds short of 47 minutes, while the mixed content document took 23 minutes and 21 seconds.

It didn't do too badly in the photo test, sending its output to Kodak photo paper. It wasn't quite up to the standard you'd be hanging on your wall, though, for while transitions between areas of tonal variation were smooth and controlled, and skin tones were well rendered, there was considerable graininess across the whole of the print, particularly in the lighter areas.

The Z33 has been around for a while and has been overtaken by faster budget models, but should not be discounted entirely.

Sharp AJ-1805

PRICE £81.06 (£68.99 ex VAT) **CONTACT** Simply 020 8498 2100

PROS Good paper tray arrangement **CONS** Grey shading appeared pink on output; slow

OVERALL Does not match the performance of the competition

TEXT QUALITY ▪▪▫▫▫▫   **IMAGE QUALITY** ▪▫▫▫▫▫

SPEED ▪▪▪▫▫▫   **OVERALL** ▪▪▫▫▫▫

Ugly is the first word you have to use when reviewing the AJ-1805. It's big and boxy and dominated by a large orange switch-set that would make even an iMac feel self-conscious. Paper handling is reminiscent of the HP models, with a front-mounted paper cartridge, the top of which doubles as the output tray.

A dial on the side lets you select paper or envelope printing, and a door at the back opens to allow for a straighter paper path. Sharp was unable to supply its own media, so we used the most appropriate alternatives from the competition.

Our considerable problems sourcing genuine Sharp paper supplies may be worth bearing in mind if you are considering a purchase. That said, in the week after our tests were completed, Sharp was due to launch its own paper range.

The AJ-1805 was one of the easiest printers to install, but its output was a little strange. Grey-shaded areas in a Word document and Acrobat file were rendered pastel pink. Nice, but out of place. It was slow, too. The 50 pages of text output appeared just 17 seconds shy of 50 minutes.

Characters were dark and looked a little smudged, almost as though every letter had been overprinted and slightly offset. This was not all that uncommon when cheaper printers used to make a composite black from the contents of their colour cartridges, but the AJ-1805 does not have this excuse – the head carries four individually replaceable chambers; one each for black and the three subtractive colours.

We were disappointed by the PowerPoint slide it printed to transparency. All devices interpreted the colours of our slides slightly differently, but the Sharp printed out bold green as a rather lacklustre algae-yellow/green.

Taken in isolation this is not a bad printer, but when you compare it to the others on test it fares poorly.

INKJET TECHNOLOGIES: THE OPTIONS

How or why your printer works is of very little importance. As long as it gets the job done quickly, cleanly and its output looks the way you want, how it does it is inconsequential.

To the manufacturers, though, it most certainly does matter how it happens, as each uses techniques and actions invisible to the user as justification for why you should buy its device over that of the competition.

Of the manufacturers reviewed here, HP, Canon, Lexmark and Sharp fall into the thermal inkjet camp. Ink flows into a chamber where it is rapidly heated. The ink expands, forcing the drops closest to the opening, or orifice as most engineers call it, to literally burst out. That sounds rather messy, but the manufacturers have worked hard on the specific orifice shapes and on controlling the rate at which the heating element heats the ink to keep things nice and clean.

The other camp has only one occupant – Epson. It uses Piezo-electric technology, in which a small Piezo cell vibrates and pushes ink through the orifice before pulling back again to suck the ink back and make sure no more than it wants gets onto the page.

Of course, each camp claims to be superior. Those who fly the flag of thermal technology claim that Piezo-electric technology is wasteful. A certain amount of 'flushing' must take place to fill the head with ink, as air bubbles in

Piezo-electric technology

Charge · Piezo disc (Piezo Electric) · Droplet · Cavity
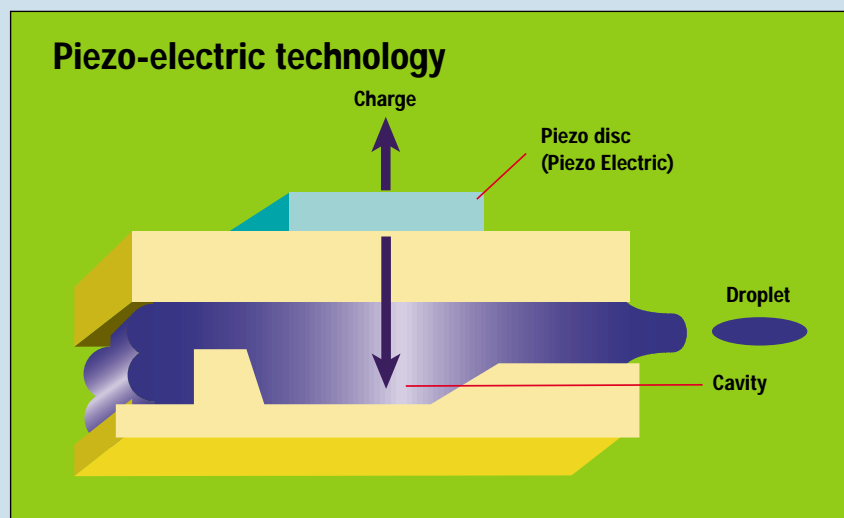
Piezo-electric print heads vibrate a disc of crystals to eject the ink onto the page

the chambers of channels that feed them will cause severe banding.

Piezo advocates, though, claim that because there is no need to engineer the ink to withstand rapid changes in temperature, its development can be geared more towards producing vibrant colours, dense blacks and its ability to withstand sunlight.

When choosing a printer, though, the best advice is always to try and get your hands on a sample print-out. Ask your local retailer if it will let you print out a couple of data files you have brought with you. Bear in mind, also, the kind of paper you want to print on, and what it and the ink will cost you – manufacturers make a lot more money out of consumables throughout the life of a printer than they do from the sale of the device itself.

Canon S800 Photo

PRICE £293.74 (£249.99 ex VAT) **CONTACT** Simply 020 8498 2100

PROS Good text quality; good at colours **CONS** Slightly soft photos

OVERALL A mixed bag in terms of performance. Consider how you'll use it before you buy

TEXT QUALITY ■□□□□   **IMAGE QUALITY** ■■■□□

SPEED ■■■■□   **OVERALL** ■■■□□

Sporting both USB and parallel ports, this has all the connection bases covered. It's quiet and simple to set up, so is particularly suited to home use. On the top there are just two buttons – one for power and one to advance the paper. The output tray is telescopic and, when pushed back into itself, tilts up to close the front of the case, saving desk space when not in use.

It's a six-colour device, with half-strength cyan and magenta inks backing up the more common CMYK. All are in individual tanks, so you can replace them one by one.

When we saw how long the S800 took to complete our 50 text pages we had to check that there really was a separate black cartridge; for while the cheaper S450 finished in a little under 10 minutes, the S800 took a full 24 minutes and 57 seconds. Surprised? No, we weren't. The higher ranking Canon took longer than its less expensive sibling in the last group test, too. Quality was good, but no better than any other in the group.

The speed at which our best-quality A4 photo appeared was nothing short of breakneck. Two minutes 28 seconds from hitting Print to picking up the output is truly impressive, although close inspection revealed a slightly soft result. Colours were good, tonal transitions were smooth and there was no evidence of banding or grain.

On inkjet paper, PowerPoint slides with solid background colours were flecked with white, which somewhat spoilt the result. On transparency, though, colours were deep and even, and there was no smearing or bleeding from dark into lighter areas. The 10 slides printed as handouts completed in three minutes, 15 seconds; the A4 transparency in four minutes 19 seconds.

If most of your printing involves text this is not for you, but if you want quick photos it's worth considering.

Epson Stylus Photo 895

PRICE £173.89 (£148 ex VAT) **CONTACT** Dabs.com 0870 727 2190

PROS Excellent image and text quality; speed **CONS** PC Card only handled CF cards

OVERALL Our top choice for photo printing

TEXT QUALITY ■■■■□   **IMAGE QUALITY** ■■■■■

SPEED ■■■■■   **OVERALL** ■■■■■

This is not the first standalone printer we have seen, but it is the best equipped. To the front there's a slot for media-holding PC Cards, but the bundled card will swallow only CF (Compact Flash) media, so if you're a SmartMedia or Memory Stick user, you'll have to buy an upgrade.

Behind the main body a holder will happily take 100mm x 8m rolls of photo paper, while on the top you'll find an LCD panel through which you can control almost every aspect of the device, and getting a thumbnail printout is a one-button job.

The clever aspect, as if this was not enough, is what goes on inside, where Epson has integrated PIM (Print Image Matching). Used with any compatible camera – and there are plenty to choose from – this will enhance photo output by reading supplementary information from the jpeg headers and using it to tweak its settings. We didn't believe it until we'd tried it, but it's true.

Setup was a breeze, and output was suitably striking. The photo impressed us all, with vibrant colours that really brought the page to life. Contrasts were sharp, and transitions between close, fading colours, were smooth with no evidence of stepping. Skin tones were well reproduced, but there was slight banding, only evident on very close examination on just one of our photos. At regular viewing distances this would not be noticed, so we would have happily put it on the wall. It completed in four minutes 39 seconds.

The 50 text pages at normal quality appeared at a rate of one every 33 seconds, which was a little slower than we might have liked. That said, what appeared was crisp and dark and suitable for business use.

PowerPoint slides output to inkjet paper were a little disappointing – colours were muted, which was not what we would have expected after such a good showing in the photo test.

HP Photosmart 1215

PRICE £210.31 (£178.99 ex VAT) **CONTACT** Simply 020 8498 2100

PROS Fast; good photo **CONS** Epson does the standalone printer trick better

OVERALL A couple of months ago this was state of the art, but it's dated quickly

TEXT QUALITY ▮▮▮ **IMAGE QUALITY** ▮▮▮▮

SPEED ▮▮▮▮▮ **OVERALL** ▮▮▮▮

Photosmart by name, Photosmart by nature. This photo printer is a clever device with a basic LCD panel to the front and an infra-red eye to receive pictures from a suitably equipped Photosmart camera.

Unfortunately, the direct printing facilities are not up to the standard of the Epson Stylus Photo 895. There is a lot of scrolling through menus, but it does have the upper hand when it comes to paper handling, with HP's familiar front-loading paper tray, and a new lip on the output tray to catch fast-moving pages that would otherwise end up on the desk.

HP devices have usually featured lower dpi (dots per inch) counts than rivals, but this one tops out at 2,400 x 1,200. Its photo output is excellent. Colours are vibrant and realistic. Sharp edges are maintained and there is no bleeding of darker colours into light areas. Skin tones are reproduced as we would expect and there is neither banding nor graininess.

Epson has traditionally been proclaimed king of photo printers, but in this model HP is offering some serious competition. It took just seven minutes nine seconds to complete the job, but in this time the Epson 895 could still have run it out almost twice.

HP printers have never given us much cause for concern when it comes to text printing, and again the standard achieved here is good. There is slight feathering, but it's very minor, and you'd not be shy to use this for business documents. Text pages completed at a rate of one every 17 seconds, so it's far from tardy.

PowerPoint performance was a mixed bag. No complaints when you're printing to inkjet paper, but transparency performance was under par, with a mottled finish and haloes around white characters. That said where dark and light colours met they each kept very much to themselves.

Lexmark Z43 Hexaprint

PRICE £92.82 (£79 ex VAT) **CONTACT** Dabs.com 0870 429 3120

PROS Text quality; business graphics good **CONS** Lack of a bundled black cartridge

OVERALL Good at blocky graphics, good text, and poor photos. In all, a mixed bag

TEXT QUALITY ▮▮▮▮ **IMAGE QUALITY** ▮▮

SPEED ▮▮ **OVERALL** ▮▮▮

You can guess how many colours the Hexaprint swallows from its name – six, in one colour and one photo cartridge. If you want a separate black print-head to speed things up it's an optional extra. At 2,400 x 1,200 dpi it has the same top resolution as the cheaper Z33.

Connection is by means of parallel or USB interface, and drivers for both Windows and the Mac are bundled, as is a Print Gallery CD-ROM. Cynics would suggest this was simply a way of encouraging you to use more ink.

If you opt to do without the black cartridge you'd better make yourself comfortable. The final sheet of our 50-page text document didn't arrive until the Z43 had been churning away for one hour, 41 minutes and 35 seconds. To give it its due, the quality was very good, but it wasn't worth the wait.

The photo was a disappointment, too. Colours were washed out, and we could easily see both banding and grainy output. There was a lack of definition in darker colours – and this was using a photo cartridge. It completed the photo printout in 23 minutes 25 seconds.

PowerPoint performance was nothing short of excellent. Colours were smooth and even on inkjet paper and, although fairly slow at 10 slides in handout format in just under half an hour, it cast a shadow on much of the competition.

Sadly, when switching to transparency printing it was a different story. Ink gathered, creating a dappled and uneven picture, and where dark and light colours met there was significant dark incursion into light ink territory.

Overall, then, a very mixed performance from the Lexmark Z43. It's good for business graphics on inkjet paper, excellent for text on photocopy paper, but extremely slow using the default cartridges and really rather poor on our photo test.

1 Canon S450 2 Epson Stylus C20UX 3 HP Deskjet 845C
4 Lexmark Z33 5 Sharp AJ-1805 6 Canon S800 Photo
7 Epson Stylus Photo 895 8 HP Photosmart 1215 9 Lexmark Z43
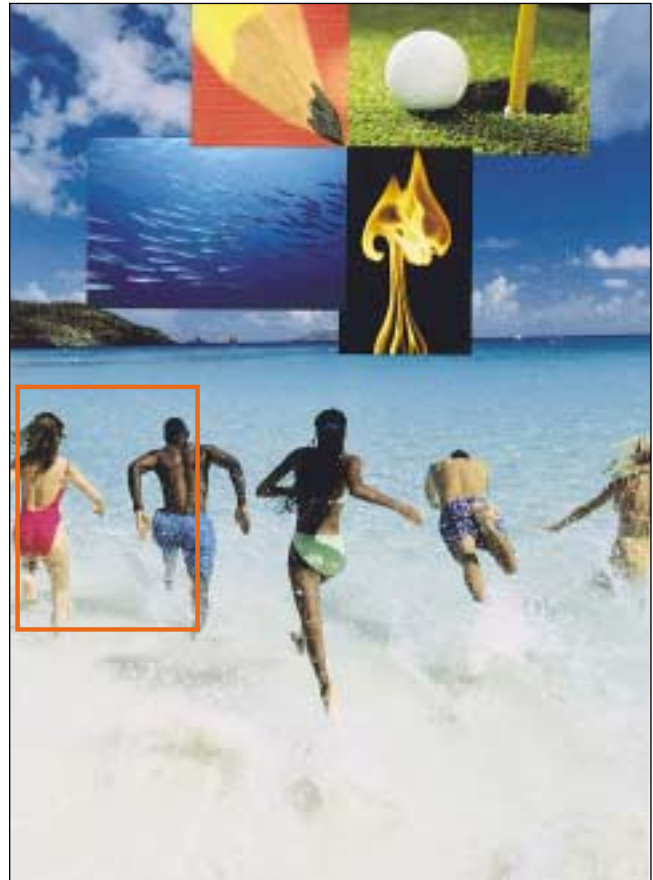
Photo: colours and skin tones should be realistic. Contrasts should be sharp but not exaggerated

1 Canon S450 2 Epson Stylus C20UX 3 HP Deskjet 845C
4 Lexmark Z33 5 Sharp AJ-1805 6 Canon S800 Photo
7 Epson Stylus Photo 895 8 HP Photosmart 1215 9 Lexmark Z43

PowerPoint slide printed on transparency: colours should be bold and smooth

1 Canon S450   **2** Epson Stylus C20UX   **3** HP Deskjet 845C
4 Lexmark Z33   **5** Sharp AJ-1805   **6** Canon S800 Photo
7 Epson Stylus Photo 895   **8** HP Photosmart 1215   **9** Lexmark Z43

Mixed text output: characters should be sharp on photographic paper. Images should be an even grey
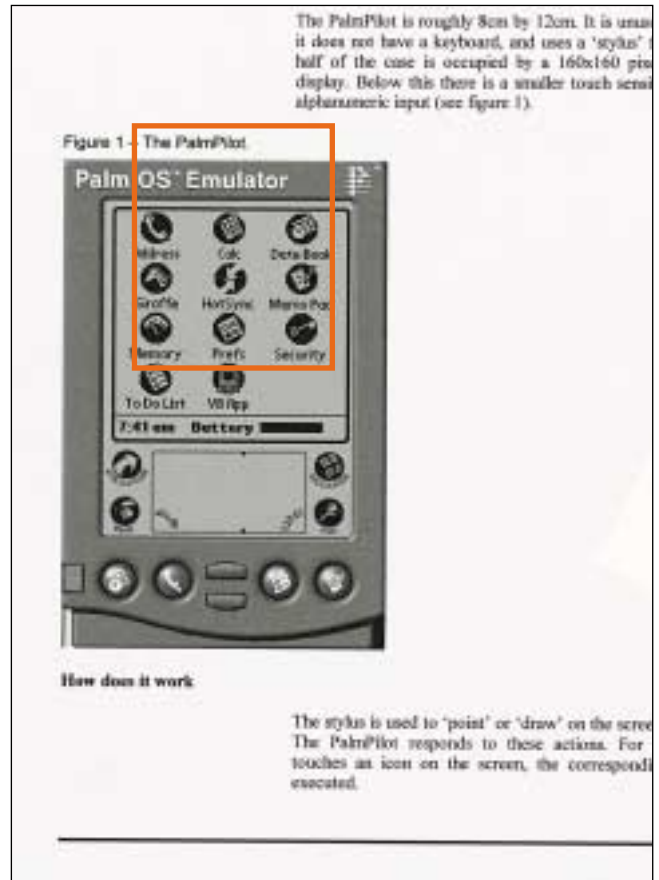
1 Canon S450   **2** Epson Stylus C20UX   **3** HP Deskjet 845C
4 Lexmark Z33   **5** Sharp AJ-1805   **6** Canon S800 Photo
7 Epson Stylus Photo 895   **8** HP Photosmart 1215   **9** Lexmark Z43

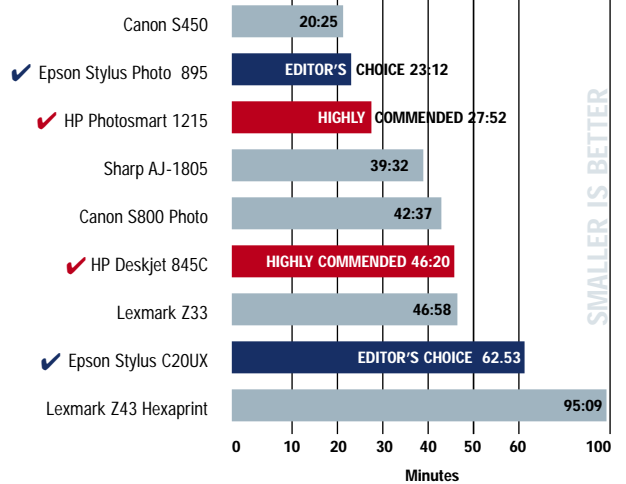**Pdf document: should render smoothly in smaller scale. Colours should be good on photocopier paper**

LAB RESULTS

Text printing speed results (50 pages)

SMALLER IS BETTER

Printer	Time
Canon S450	9:42
✔ HP Photosmart 1215	HIGHLY COMMENDED 14:10
Lexmark Z33	16:30
✔ HP Deskjet 845C	HIGHLY COMMENDED 16:48
Canon S800 Photo	24:57
✔ Epson Stylus Photo 895	EDITOR'S CHOICE 28:07
✔ Epson Stylus C20UX	EDITOR'S CHOICE 32:30
Sharp AJ-1805	49:43
Lexmark Z43 Hexaprint	101:35

Minutes: 0 10 20 30 40 50 100

Pdf printing speed results (50 pages)

SMALLER IS BETTER

Printer	Time
Canon S450	20:25
✔ Epson Stylus Photo 895	EDITOR'S CHOICE 23:12
✔ HP Photosmart 1215	HIGHLY COMMENDED 27:52
Sharp AJ-1805	39:32
Canon S800 Photo	42:37
✔ HP Deskjet 845C	HIGHLY COMMENDED 46:20
Lexmark Z33	46:58
✔ Epson Stylus C20UX	EDITOR'S CHOICE 62.53
Lexmark Z43 Hexaprint	95:09

Minutes: 0 10 20 30 40 50 60 100

Mixed output speed results (50 pages)

SMALLER IS BETTER

Printer	Time
Canon S450	12:39
✔ HP Photosmart 1215	HIGHLY COMMENDED 15:28
✔ HP Deskjet 845C	HIGHLY COMMENDED 21:15
Lexmark Z33	23:21
✔ Epson Stylus Photo 895	EDITOR'S CHOICE 25:23
Canon S800 Photo	25:42
Sharp AJ-1805	46:44
✔ Epson Stylus C20UX	EDITOR'S CHOICE 52:05
Lexmark Z43 Hexaprint	81:03

Minutes: 0 10 20 30 40 50 60 100
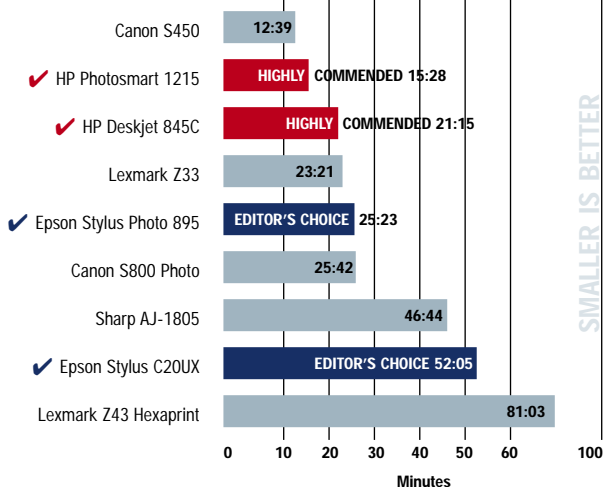
Photo printing speed results (1 page)

SMALLER IS BETTER

Printer	Time
Canon S800 Photo	2:28
✔ Epson Stylus Photo 895	EDITOR'S CHOICE 4:39
Sharp AJ-1805	4:40
Canon S450	6:27
✔ HP Photosmart 1215	HIGHLY COMMENDED 7:09
✔ HP Deskjet 845C	HIGHLY COMMENDED 7:22
L:exmark Z33	12:35
✔ Epson Stylus C20UX	EDITOR'S CHOICE 20:50
Lexmark Z43 Hexaprint	23:25

Minutes: 0 5 10 15 20
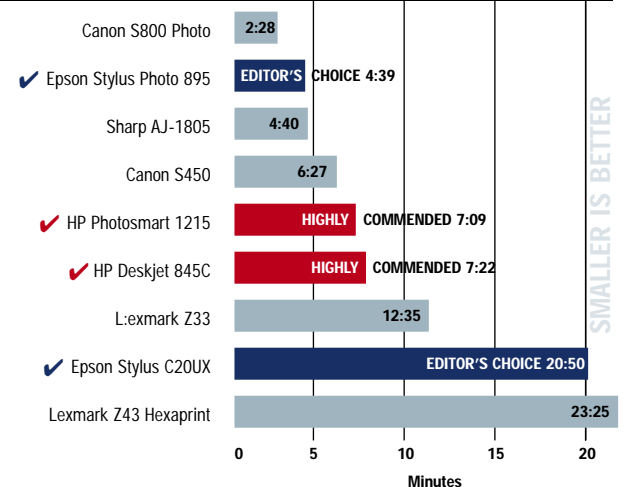
PowerPoint handout speed results (10 slides)

SMALLER IS BETTER

Printer	Time
Canon S800 Photo	3:15
✔ HP Photosmart 1215	HIGHLY COMMENDED 7:03
✔ Epson Stylus Photo 895	EDITOR'S CHOICE 8:50
✔ HP Deskjet 845C	HIGHLY COMMENDED 9:43
Sharp AJ-1805	11:02
Canon S450	14:26
✔ Epson Stylus C20UX	EDITOR'S CHOICE 16:26
Lexmark Z33	24:24
Lexmark Z43 Hexaprint	29:30

Minutes: 0 10 20 30 40
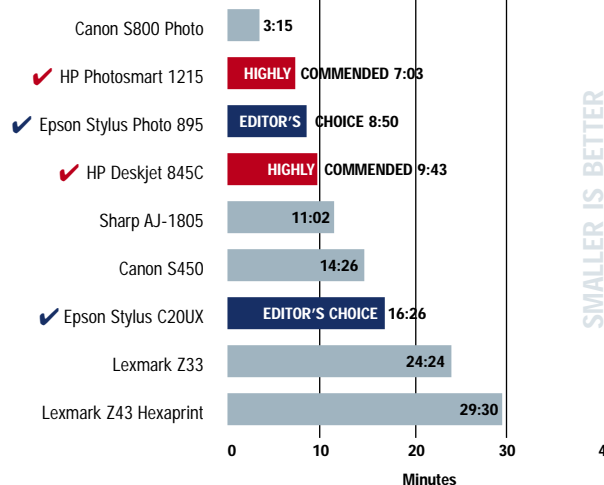
PowerPoint transparency speed results (1 slide)

SMALLER IS BETTER

Printer	Time
✔ Epson Stylus Photo 895	EDITOR'S CHOICE 2:31
Canon S800 Photo	4:19
Sharp AJ-1805	4:22
✔ Epson Stylus C20UX	EDITOR'S CHOICE 4:28
✔ HP Photosmart 1215	HIGHLY COMMENDED 5:12
Canon S450	5:36
✔ HP Deskjet 845C	HIGHLY COMMENDED 6:56
Lexmark Z33	11:33
Lexmark Z43 Hexaprint	14:58

Minutes: 0 5 10 15 20
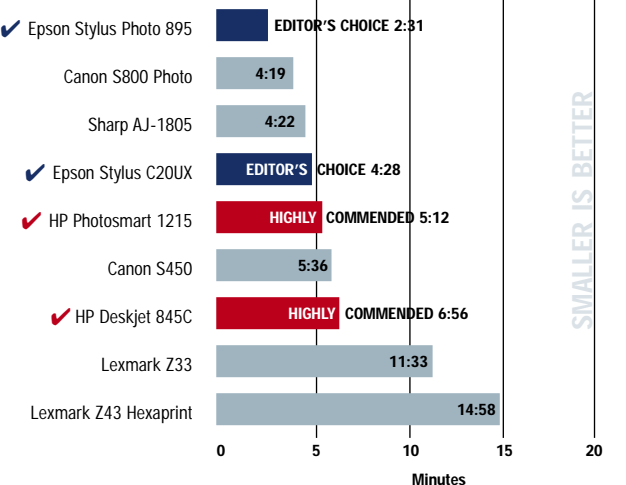
TABLE OF FEATURES

MANUFACTURER	CANON	EPSON	HP	LEXMARK
MODEL	**S450**	**C20UX**	**DESKJET 845C**	**Z33**
Supplier	Simply	Dabs.com	Simply	Dabs.com
Supplier phone number	020 8498 2100	0870 429 3120	020 8498 2100	0870 429 3120
Supplier URL	www.simply.co.uk	www.dabs.com	www.simply.co.uk	www.dabs.com
Price inc VAT (ex VAT)	£106.91 (£90.99)	£51.69 (£44)	£79 (£67.23)	£69.32 (£59)
Maximum resolution (dpi)	1,440 x 720	720 x 720	600 x 1,200	2,400 x 1,200
Parallel interface	✔	✗	✗	✗
USB interface	✔	✔	✔	✔
Input tray capacity	100 sheets	100 sheets or 10 envelopes	100 sheets	100 sheets or 10 envelopes
Output tray capacity	100 sheets	100 sheets	50 sheets	50 sheets
Cartridge types	Colour, plus photo – black optional extra	Four colour	Tri-colour and black	Tri-colour and black
Price of mono cartridge (ex VAT)	£8.22 (£7)	£10.49 (£12.33)	£21.14 (£18)	£21.14 (£18)
Price of colour cartridge (ex VAT)	£5.87 (£5)	£17.26 (£14.69)	£22.32 (£19)	£23.50 (£20)
Price of photo cartridge (ex VAT)	£5.87 (£5)	N/A	N/A	N/A
Estimated life of mono/colour cartridge	390 pages	300/150	495/430	600/270
A4 photo print margin	2mm top, 5.7mm bottom	3mm top, 13mm bottom	1mm top, 12mm bottom	1.5mm top, 13.5mm bottom
Maximum paper weight	225gsm	195gsm	200gsm	270gsm
Operating system support	Windows 9x/Me/NT/2000, MacOS	Windows 98/Me/2000	Windows 98/Me/2000/XP, MacOS	Windows 98/Me/NT/2000, Linux, MacOS 8.6+
Printer weight	4.1kg	2.5kg	5.2kg	2.3kg
Printer dimensions w x h x d (mm)	455 x 173 x 312	424 x 168 x 227	446 x 185 x 355	445 x 130 x 206
Technology used	Thermal inkjet	Piezo electric	Thermal inkjet	Thermal inkjet

HOW WE TEST

Many people who buy printers have one use in mind: printing letters and documents produced by their word processor or spreadsheet. They want good-looking results quickly and, perhaps more important, cheaply. With this in mind, we printed 50 pages of what in the *PCW* office constitutes fairly typical output – old group tests. The time it took each printer to complete these entirely text-based documents was recorded for comparison.

Next came the examination. Most people want to print using standard office paper rather than the more expensive coated inkjet paper, so we used packs of photocopier paper to simulate everyday use. We wanted to see if the printers could cope with this more fibrous, lower-quality paper and still produce solid dark characters with sharp edges. Some printers did well, but others feathered the output

and produced the sort of pages we would not be happy using in a business environment.

Image printing
For this test, we opted to use real photo paper, and to be totally fair we made sure we were using each manufacturer's own brand of paper wherever possible, as many tailor the chemicals in their inks to react in a particular way to certain paper types.

We used PaintShop Pro to print a copy of our standard test photo, the veteran of many inkjet group tests, which evaluates each of the four main composite colours individually. These are red, green, blue and composite black, since inkjets use cyan, magenta and yellow to make up these tones. To ensure a solid black, many also use their black cartridge or the black chamber of a photo cartridge to supplement the composite black shades.

Here we were looking for realistic skin tones, which are traditionally difficult for an inkjet to reproduce, and smooth shading between varying tones of a similar colour. A good-quality printer will make the transition from dark to light without any detectable edges.

We also didn't want to see any horizontal banding, where darker stripes run across the image as the top row of nozzles overlaps the area printed by the lowest set of nozzles on the previous pass. A good printer will never show banding like this.

Another equally undesirable form of banding is caused by a blocked nozzle or a tiny gap between each pass of the print head. Rather than a dark band this will cause a thin white stripe, and again it was something that we were looking out for in our tests.

If you look closely at a traditionally produced silver halide print you

should not be able to see any individual spots or dots making up the picture. This is called continuous tone and as far as inkjet printer manufacturers are concerned it is as close to the Holy Grail as you can get. We therefore marked down the printers that produced grainy images where the individual drops of ink were easy to spot.

We also looked at the image as a whole to judge how well balanced it was in terms of brightness, contrast and saturation. Everybody has an idea of what makes a good picture but it is easy to spot a saturated or washed-out image or one where particularly harsh contrast screams at you from the page.

Finally, using the inkjet paper, we produced a fairly typical 10-page presentation in PowerPoint using the package's wizard function and adding a few graphics of our own. We printed this as a handout, with

	SHARP	CANON	EPSON	HP	LEXMARK
	AJ-1805	**S800 PHOTO**	**STYLUS PHOTO 895**	**PHOTOSMART 1215**	**Z43 HEXAPRINT**
	Simply	Simply	Dabs.com	Simply	Dabs.com
	020 8498 2100	020 8498 2100	0870 429 3120	020 8498 2100	0870 429 3120
	www.simply.co.uk	www.simply.co.uk	www.dabs.com	www.simply.co.uk	www.dabs.com
	£81.06 (£68.99)	£293.74 (£249.99)	£173.89 (£148)	£210.31 (£178.99)	£92.82 (£79)
	1,200 x 1,200	2,400 x 1,200	2,880 x 720	2, 400 x 1,200	2,400 x 1,200
	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔
	150 sheets	100 sheets	100 sheets or 10 envelopes	100 sheets or 15 envelopes	100 sheets or 10 envelopes
	50 sheets	100 sheets	100 sheets	50 sheets	50 sheets
	Four colour	Six individual colours	Four colour	Tri-colour and black	Colour, plus photo or black
	£19.97 (£17)	n/a	£16.03 (£13.64)	£22.70 (£19.32)	£27.01 (£22.99)
	£9.39 (£8)	£8.22 (£7)	£16.03 (£13.64)	£27.01 (£22.99)	£34.06 (£28.99)
	N/A	N/A	N/A	n/a	£37.00 (£31.49)
	700/350	280 pages	540/220	415/450	600/270
	1.5mm top, 4.5mm bottom	3mm top, 4.7mm bottom	3.5mm top, 14mm bottom	1mm top, 12mm bottom	1mm top, 13mm bottom
	200gsm	245gsm	255gsm	200gsm	270gsm
	Windows 95/98/Me/NT/2000, MacOS	Windows 9x/Me/NT/2000, MacOS	Windows 98/Me/2000, Apple OS	Windows 98/Me/2000, MacOS	Windows 9x/Me/NT/2000, DOS, Linux, MacOS 8.6+
	6.5kg	5.9kg	5.2kg	6.5kg	4.7kg
	440 x 191 x 358	450 x 205 x 343	467 x 212 x 256	440 x 204 x 375	460 x 221 x 302
	Thermal inkjet	Thermal inkjet	Piezo electric	Thermal inkjet	Thermal inkjet

three slides to a page and room to take notes alongside each one. This tested each printer's colour reproduction abilities, whether or not it saturated the paper, and how well it coped with images that had been dramatically reduced in size.

Then we printed slide seven of our sequence on a transparency, again using the media provided by each inkjet manufacturer, to see how well the ink adhered when not using paper.

Mixed output

The chances are that your printing will not always be restricted just to text or graphics, but will encompass both on a single page. Our last two tests addressed this issue, mixing word-processed text and a range of images.

For both tests we switched back to using photocopier paper to more realistically simulate everyday conditions, and printed a 50-page university dissertation followed by a 50-page Acrobat format pdf. The dissertation used multiple font faces

and sizes and regularly interspersed the paragraphs with monochrome screenshots. Whether the printer chose to render these using the black cartridge or in composite form from the CMY chambers instead was not totally relevant – we were more interested in clean, sharp images. After all, this would have to be presented for marking at the end of

Continuous tone has always been a stumbling block for inkjet printers

the course and would count toward a final grade. We wanted to see output where the paper was not overly saturated and where the screenshots, many of which had a grey background, remained legible.

The Acrobat pdf was the first 50 pages taken from Apple's interface design document. This included a range of screenshots, some of which

had a lightly shaded background but, unlike the mixed-content dissertation, it also had a number of colour icons in the margins that acted as guides for the reader. This was the first time the printers had been asked to produce colour output on standard photocopier paper, so we wanted to see how well they managed to reproduce their colours when denied higher-quality media.

Judging

Although speed is always important, it was more relevant to the lower-end printers than the models aimed at 'professional colour users'. In all instances we were looking for clean, sharp output but we didn't want to have to wait all day to get it. The more expensive printers, however, are generally more suited to photographic use and in this instance the quality of the output is more important than the speed at which it arrives, and this fact was reflected in our judging and the way in which prizes were awarded.

Editor's Choice

Epson Stylus Photo 895

Epson C20UX

HP Photosmart 1215

HP Deskjet 845C

Testing nine printers involves, quite naturally, a lot of printing. Fifty pages of text, a 50-page Adobe Acrobat document, and 50 pages of mixed output in which text and graphics are combined. A full-page A4 photo is sent to photo paper at the highest quality setting, and PowerPoint slides are printed as both handouts and transparencies. It's an exhaustive set of tests, and not all printers make it through. Sadly, one dropped out halfway through testing, having serious problems keeping up with the competition. It was omitted from the reviews as a gesture of kindness.

What you see here, then, are nine top-quality products. All have done well to complete the course on which they set out, and any printer awarded just one or two stars in any part of the scoring system should not be written off outright. A one-star rating simply means that it was poorer than the others on test, not that its output was of low quality or that in isolation it would not suit your needs.

On the whole we were very impressed with nearly every result, and each of the units reviewed on the preceding pages would be a valuable addition to any home, if not always to every office.

We have chosen two overall winners – one in each of the colour professionals and home-user categories – and two runners-up, again with one being drawn from each section.

The winners

Our **Editor's Choice** award in the colour professionals category, therefore, goes to the **Epson Stylus Photo 895**. By far the most impressive photo printing device we have seen, its implementation of the PC-free ethos goes further than any other device seen at *PCW*. Its built-in control panel gives you instant feedback of what the device is doing, and its one-touch thumbnail option is a genuine timesaver. Add to this the PIM technology that has now been licensed by many digital camera manufacturers and Epson printers have the chance to dominate the inkjet output market.

HP earns itself a **Highly Commended** award for the **Photosmart 1215**. Again built with the digital photographer in mind, its front-mounted infra-red eye will accept photos beamed directly from compliant HP cameras, while its PC-free operation, although not as well implemented as the Epson alternative, was groundbreaking in its time and still holds its own.

In the home-user category it is a similar story with Epson taking top spot and HP earning a well-deserved Highly Commended gong.

The **Editor's Choice** winner, the **Epson C20UX** is a small and inexpensive device that, while perhaps not the most attractive printer on the market, still has a lot to offer. In terms of speed, it's not going to break any records, but that's more than a fair payoff when you consider the quality of its output. Its photo was particularly impressive, as you'd expect coming from the Epson stable – a company that has had more than its fair share of compliments in this area in the past. Epson has kept costs down by producing separate USB and parallel versions, meaning you get the printer to match your needs without having to pay for a port you're not going to use.

The newest printer in the group is the **HP Deskjet 845C**. This smart dark grey device uses the same shell as the old 700 series printers, but that's pretty much where the similarities end. Output quality is excellent, and we were unable to fault its text – text was by far the best of any budget printer in the group and so was a deserved winner of the **Highly Commended** award. We were a little concerned by the way it treated our pages, but are putting this down to one-off anomalies related to our test unit.

Ultimately, the purchase decision has to be your own, but weigh up carefully the balance between speed and quality. After all, what good is one without the other? A high-quality printer will be frustrating to use if it takes five minutes to print a page of text, and the output of a high-speed printer will be nigh-on useless if it's feathered and spattered with ink.

Other factors to consider are how much space you have in which to house your printer, how often you're going to use it and what your main use will be. If you really are into heavy duty text printing, then we'd recommend you consider a laser printer. The initial outlay will be higher, but it will be faster and cheaper to run.

Each of the units would be a valuable addition to any home