17-18in TFTs

We put 15 of the best 17-18in TFTs through our demanding tests

T he demise of the cathode ray tube has been much discussed. So-called experts declared the CRT a dying breed over ten years ago, but only now is that prediction starting to come true. If you need convincing, take a look at our 19in monitors group test last month (*see Labs, issue 96, p73*) – over half were more than a year old. TFTs, on the other hand, are being released left, right and centre, as technologies improve and prices drop.

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PHOTOGRAPHY Gary Kevin, Julian Hawkins

Be warned, however, that the prices of TFTs change dramatically. Unlike CRT monitor makers, a TFT manufacturer can't just ramp up output to match demand. There are only a certain amount of panels that can be yielded by any one factory. If all the manufacturers' stock levels become low, costs will rise and these will subsequently be passed onto you.

Fortunately, the current situation is more stable than it has been in the past, so if

prices rise from those stated in the review it should only be by up to £50 – in the past, we've seen prices leap £200 in a day.

Even if prices do rise, however, we can't deny these monitors' appeal. A flat, compact TFT is generally far preferable to a CRT, especially if it's connected to the graphics card by a digital DVI cable – issues like interference (due to the TFT trying to lock onto the signal) become a thing of the past, just like geometry and focus.

A digital connection doesn't guarantee a great image, though, which is why we rigorously test each TFT for its colour handling and its performance in real-world tests. For example, how well does it handle games and how good are its viewing angles? See Performance analysis on p80 to find out.

To find out which screen offers the best combination of image quality, features and value for your needs, read on.
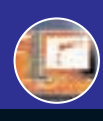
Performance analysis

How we test the TFT monitors and what the results mean in practice

Some people believe that one TFT screen is the same as the next, and that they all produce the same perfect, crisp images. This is far from true. As our results show this month, there are huge variations in how well screens handle colour, contrast and real-world tasks such as DVD movie playback.

One important factor is the type of connection used. We prefer a digital DVI connection to an analog D-SUB, for two very good reasons. First, the analog signal means that the clock and phase have to be synchronised to avoid the dreaded pixel jitter (this looks like a lack of focus). Second, there's no loss of information in the digital-to-analog, analog-to-digital conversion process.

The other big influence on image quality is the type of panel. It's not enough for the manufacturer to state 'active matrix', as this hides a multitude of technologies. The major offerings are TN+film, IPS (in-plane switching), MVA (multidomain vertical alignment) and Super IPS (*see TFT technologies*).

HOW WE TEST

We use DisplayMate for Windows Multimedia Edition 2 (available from **www.displaymate. com**) to examine each monitor. It's a comprehensive suite of tests for most types of computer-based display, and it generates hundreds of test patterns specifically designed to highlight flaws. As this test methodology is almost entirely subjective, two people assess each monitor independently.

We test each TFT screen at its native resolution of 1,280 x 1,024 at a 32-bit colour depth with a refresh rate of 60Hz. When using an analog connection, we make sure we use the cable supplied with the monitor, as its quality can have an effect on the image displayed. Each monitor is connected to our *PC Pro* test rig, which is fitted with a Matrox Millennium G550 graphics card. We connect each monitor in turn and install any colour profiles they come with before starting the tests. It's worth pointing out that we're not interested in dead pixels – the number we see will be different to the number in any other screen (see the Feature table for each panel's pixel fault tolerance)

All the results for the tests can be found in the table below, while the three graphs summarise the monitors' performance in the key areas of sharpness and resolution, colour and greyscale and other areas considered to highlight concerns similiar to real-world issues.

BASIC SETUP

Before testing, we make sure the contrast and brightness controls are correctly set by examining grey and black-level test screens. There's no need to set the geometry, thanks to the perfect alignment of pixels on a TFT screen. We then use 19 test images to examine the following areas.

Sharpness and resolution

Despite being exactly aligned, TFT screens have the ability to lose focus, particularly due to pixel jitter over an analog interface. Two of the tests in this section examine this effect, although we're pleased to report that none of the screens suffered from a lack of focus or a halo effect from over-bright blocks.

Where this month's analog-only screens fell down was in the pixel tracking and timing lock test. This displays a set of dark-grey, one-pixel lines; a set of mid-level grey, one-pixel dots; and a set of light-grey, one-pixel by two-pixel slots. It's designed to test the mapping of image pixels onto screen pixels, as the displays have to match the timing of the signal and accurately sample the centre of the pixel and then hold it in position. Problems in this area lead to wave patterns moving over the dithered areas. These can be adjusted using the clock and pixel-tracking controls in most OSDs, but they're almost impossible to remove altogether without using a digital connection.

● TEST RESULTS

|	ADI MicroScan L712	BenQ FP882	CTX PV700	Eizo FlexScan L565	Hansol H711	Hitachi CML170SXW	Iiyama AS4332UT BK	LG Flatron L1810B	Lite-On LitePanel 170A	NEC MultiSync LCD1700NX	Philips 170B2T	Samsung SM181T	Sharp LL-T1820H	Sony SDM-X82B	ViewSonic VX800
SHARPNESS AND RESOLUTION															
Halo effect (defocusing and blooming)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fine focus	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pixel tracking and timing lock*	2	2	0.5	2	0.5	2	2	2	0	2	2	2	2	2	2
COLOUR AND GREYSCALE															
Green colour purity	0.5	0.5	1	0.5	1	1	0.5	0.5	1	0.5	1	0.5	0.5	1	1
White colour purity*	1	1	1	1.5	1	1	1	1	1	0.5	2	0.5	1	1	1
Colour combinations*	1	1	1	1	1	1.5	1.5	1	1	1	2	1.5	1.5	1	1
Colour tracking	1	0.5	0.5	1	0.5	1	1	0	1	0	1	1	1	1	1
White-level saturation	0	0	0	1	1	0	1	1	0	1	0	1	1	1	1
Dark-grey scale test	0.5	1	1	1	0.5	1	1	1	1	1	1	1	0.5	1	0.5
256 intensity-level colour ramp*	1	1	1	2	1	1	0	0	1	1	0.5	1	0.5	0.5	0
256 intensity-level greyscale ramp	0	1	0.5	0	0.5	0	1	1	1	0	1	0	1	0	0
Colour scales	1	1	0.5	1	0.5	0.5	1	1	0.5	1	1	1	1	1	1
Colour spectrum	0.5	0	0	0	0	0.5	0.5	0	0.5	0.5	0.5	0	0.5	0.5	0.5
REAL-WORLD TASKS															
DVD movie	0.5	1	0.5	1	0.5	1	1	1	0.5	1	0.5	0.5	1	1	0.5
3D game (at XGA)*	1	1	0	1	1	1	1.5	1	1	1.5	1	0.5	0.5	1	0.5
Vertical viewing angle	0	1	0	1	0.5	0.5	1	1	0.5	1	0.5	1	1	1	0
Horizontal viewing angle*	0.5	1	0.5	1.5	1	1.5	1.5	0.5	1.5	1	1	1	1	1	0.5
Clarity of Desktop*	0.5	1	1	1.5	1	1	1.5	1	1.5	1.5	1	1	1	1	1
Ghosting	0.5	1	1	1	1	0.5	1	1	0	0.5	1	1	1	1	1
TOTAL QUALITY	13.5	17	12	21	14	17	18.5	17.5	13.5	18.5	18.5	17.5	17	18	14.5

*Distinction (two points) awarded in these categories. Guide to scores: 0 = failed by both assessors; 0.5 = passed by one, failed by another; 1 = passed by both assessors; 1.5 = passed by one assessor, distinction from another; 2 = distinction from both assessors
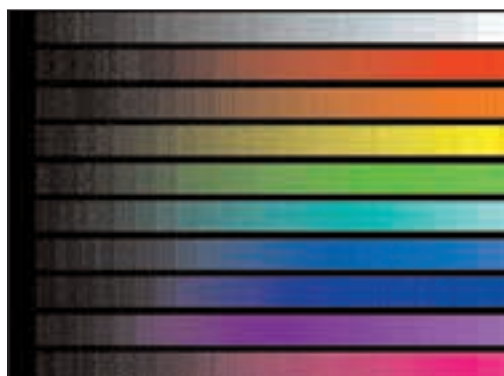
Each colour should fade out at exactly the same point to obtain accurate reproduction.

Colour and greyscale

The first two tests look at colour accuracy. Green and then white are displayed over the whole screen to check for dark patches. The patches are primarily caused by irregularities in the coating on the front of the monitor and the placement of the fluorescent tubes making up the backlight.

The next test looks at colour combinations. Some screens have difficulty in clearly displaying some colours on certain backgrounds. This test examines this and, while all the screens passed, some did so well they were awarded distinctions.

Next up is colour tracking. This checks that the red, green and blue channels should vary identically with the signal level. If they don't, some of the different intensity greys will display slight tinges of colour. In our tests, we found purple to be the most common tinge, indicating that the green channel was dropping to zero too soon.

The next two tests ensure that the light and dark ends of the spectrum aren't being clipped. The first test displays a white background overlaid with light-grey blocks. If there's a problem, the grey blocks at the higher end become indistinguishable from the white background. The second test does the

same, but with a black background and dark-grey blocks.

The following pair of tests looks at how well the TFT can ramp up the intensity. The first is for red, green and blue; the second for white. Problems manifest themselves as either vertical lines running through the ramp as the TFT switches between levels, or compression at the dark or light ends of the spectrum.

The next test is specifically designed to look at compression problems. Ten sets of gradually more intense colours are displayed, divided into discrete blocks. There are 25 blocks for each colour, covering the 256 intensity levels. If there's a problem, two adjacent blocks appear as the same colour, at the top or bottom of the scale.

The final test in this section is a colour spectrum. This is a full-screen horizontal fade from magenta through red, yellow, green, cyan, blue and back to magenta. It checks whether any colour or group of colours is over-intense and drowning out another. In monitors that performed badly, we typically found that red, green and blue spread too far into the cyan, magenta and yellow areas.

Real-world tasks

These tests look at how the monitors will perform in day-to-day situations. In the past, TFT monitors have been criticised for poor response times, leading to blurring and poor performance in 3D games and DVD playback. We use *The Fast and The Furious* to test DVD playback on the screens, as it includes fast motion and high-contrast elements. While some screens did better than others, all but a couple using old TFT technologies were perfectly watchable.

We use Quake 2 to test 3D performance, as we don't want to stress the graphics card or processor. Again, screens using old

TFT technologies

Three main types of TFT are represented in the screens in this month's Labs. The oldest type, TN+film, has relatively poor viewing angles and tends to have slower response times.
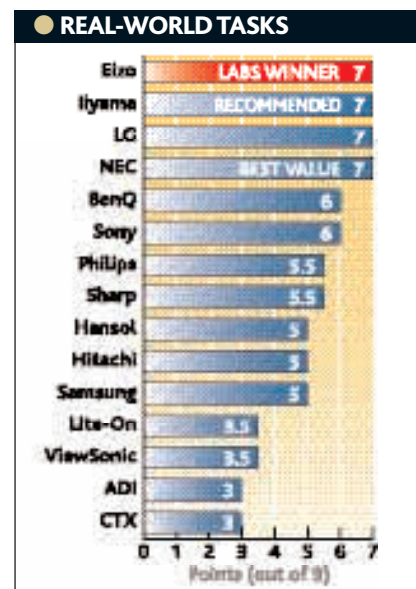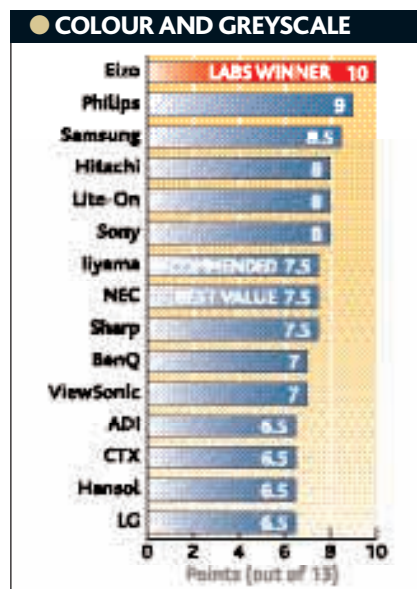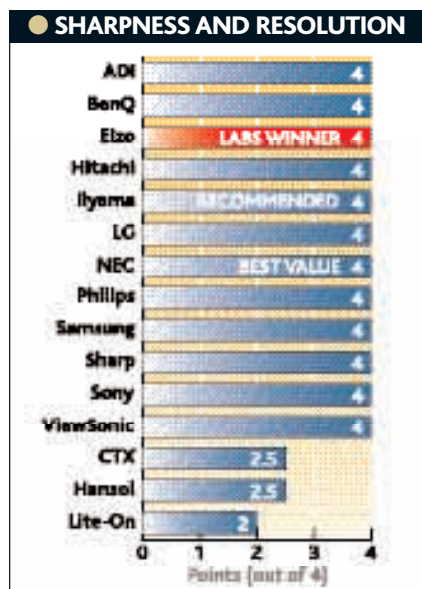
Next up the ladder is IPS, or in-plane switching. This is an improvement, mainly in terms of viewing angles. While ordinary active-matrix screens have viewing angles of around 115 degrees, IPS improves this to 160 degrees.
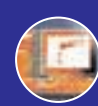
A slightly different method is used by MVA (multidomain vertical alignment) TFTs, where each pixel is given four areas. These areas adjust their intensity to even out the brightness when viewed from different angles. They also have viewing angles around 160 degrees and boast faster response times.

At the top of the pile are the screens based on Super-IPS TFTs. These are a development of the original IPS and give massive viewing angles of up to 170 degrees. They also boast even faster response times, generally providing the best DVD and games performance in our tests.

TN+film active-matrix panels did poorly, but most were acceptable and some were almost as good as a CRT.

Viewing angles were checked both horizontally and vertically and, for the most part, performance was in line with specifications and the type of TFT. General clarity of the Desktop was also rated and we tested for ghosting, which tends to affect IPS screens. However, only one panel failed this test.

SHARPNESS AND RESOLUTION	Points (out of 4)
ADI	4
BenQ	4
Eizo — LABS WINNER	4
Hitachi	4
Iiyama — RECOMMENDED	4
LG	4
NEC — BEST VALUE	4
Philips	4
Samsung	4
Sharp	4
Sony	4
ViewSonic	4
CTX	2.5
Hansol	2.5
Lite-On	2

COLOUR AND GREYSCALE	Points (out of 13)
Eizo — LABS WINNER	10
Philips	9
Samsung	8.5
Hitachi	8
Lite-On	8
Sony	8
Iiyama — RECOMMENDED	7.5
NEC — BEST VALUE	7.5
Sharp	7.5
BenQ	7
ViewSonic	7
ADI	6.5
CTX	6.5
Hansol	6.5
LG	6.5

REAL-WORLD TASKS	Points (out of 9)
Eizo — LABS WINNER	7
Iiyama — RECOMMENDED	7
LG	7
NEC — BEST VALUE	7
BenQ	6
Sony	6
Philips	5.5
Sharp	5.5
Hansol	5
Hitachi	5
Samsung	5
Lite-On	3.5
ViewSonic	3.5
ADI	3
CTX	3

● FEATURE TABLE

	ADI MicroScan L712	BenQ FP882	CTX PV700	Eizo FlexScan L565	Hansol H711	Hitachi CML170SXW	iiyama AS4332UT BK
Overall score	**93**	**100**	**98**	**110**	**99**	**104**	**108**
Street price* (inc VAT)	£527 (£619)	£659 (£774)	£425 (£499)	£565 (£664)	£449 (£528)	£480 (£564)	£579 (£680)
Supplier	TechnoWorld 020 8200 2000	dabs.com 0800 138 5182	TechnoWorld 020 8200 2000	dabs.com 0800 138 5182	Simply 0870 727 2100	NexNix 01403 756777	Simply 0870 727 2100
Supplier's website	www.technoworld.co.uk	www.dabs.com	www.technoworld.co.uk	www.dabs.com	www.simply.co.uk	www.nexnix.co.uk	www.simply.co.uk
Manufacturer's website	www.adiuk.com	www.benq.co.uk	www.ctxeurope.com	www.eizo.co.uk	www.hansol-uk.com	www.hitachidigitalmedia.com	www.iiyama.co.uk
Warranty	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site
Backlight warranty	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site
Pixel fault tolerance**	8	5 bright, 7 dark, 8 max	ISO 13406-2	5 subpixels, 0 pixels	6 single, 4 cluster	Not supplied	ISO 13406-2
DISPLAY							
Viewable diagonal (in)	17	18.1	17	17	17	17	17
Native resolution	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024
TFT technology	MVA	Hitachi IPS	TN+film	Hitachi Super-IPS	Super TFT	Hitachi IPS	ACE
Pivot support	✗	✗	✓	✗	✗	✗	✓
Viewing angle vertical (degrees)	160	160	115	170	120	140	160
Viewing angle horizontal (degrees)	160	160	120	170	140	150	160
Number of colours supported (millions)	16.7	16.7	16.7	16.7	16.2	16.7	16.7
Response time (ms)	40	50	45	30	50	50	35
Brightness rating (cd/m²)	200	250	250	230	250	250	200
Contrast ratio	400:1	350:1	400:1	400:1	300:1	400:1	350:1
CONNECTORS							
D-SUB	✓	✓	✓	✓	✓	✓	✗
DVI	✓	✓	✗	✓	✗	✓	2
Captive cable	✗	✗	✗	✗	✗	✗	✗
USB hub	Optional	✓	✗	✗	✗	✗	✓
USB downstream ports	✗	2	✗	✗	✗	✗	4
Extra connectors	S-Video	✗	✗	✗	✗	✗	S-Video, composite
CABLES SUPPLIED							
VGA signal cable	✓	✓	✓	✓	✓	✓	✓
DVI signal cable	✓	✓	✗	✓	✗	✓	✓
Other	✗	✗	✗	✗	✗	✗	Composite, USB
SPECIFICATION							
External PSU	✓	✗	✓	✗	✓	✓	✗
Typical power consumption (W)	34	<75	35	45	40	54	70
Power consumption in standby mode (W)	<3.5	<5	<5	<3	<5	5	5
Horizontal scan range (kHz)	31-64	31-76	30-82	24-80	31-80	24-80	25-80
Vertical scan range (Hz)	56-74	56-81	58-75	50-75	56-76	56-85	56-85
IMAGE ADJUSTMENTS							
Brightness	✓	✓	✓	✓	✓	✓	✓
Contrast	✓	✓	✓	✓	✓	✓	✓
Auto phase	✓	✓	✗	✓	✓	✓	✓
Auto positioning	✓	✓	✗	✓	✓	✓	✓
Auto contrast	✗	✓	✗	✓	✓	✗	✗
Zoom	✗	✓	✗	✗	✗	✓	✓
Colour temperature	✓	✓	✓	✓	✓	✓	✓
Extra adjustments	✗	Screen size, iKey (auto setup)	Smoothing	Saturation, hue, horizontal & vertical position, sRGB mode, OSD transparency, gain, audio controls	Sharpness, horizontal & vertical position	Sharpness, horizontal & vertical position, OSD transparency, horizontal & vertical pan	Sharpness, horizontal & vertical position
AUDIO							
Speakers	✗	2 x 1W	✗	2 x 1W	✗	2 x 1W	Optional
Headphone connector	✗	✓	✗	✓	✗	✓	✗
ERGONOMICS							
Tilt angle (degrees up, degrees down)	30, 10	25, 0	15, 15	30, 3	30, 3	15, 5	35, 0
Swivel angle (degrees left, degrees right)	✗	80, 80	✗	✗	✗	45, 45	30, 30
Standard VESA bracketing	With included mount	✓	✓	✓	✓	✓	✓
Kensington lock	✗	✓	✓	✓	✗	✓	✓
TCO 99	✓	✓	✓	✓	✓	✓	✗
Extra features	Wall mount	✗	✗	Slim bezel	✗	✗	Slim bezel, height adjustable, DVI to D-SUB adaptor
DIMENSIONS							
W x H x D with base (mm)	479 x 487 x 214	408 x 436 x 208	438 x 447 x 166	380 x 416 x 178	420 x 444 x 193	424 x 436 x 178	397 x 367 x 212
Weight with base (kg)	6	6.6	9.7	5.8	6.4	6.5	6.2

*Street prices were all correct at time of going to press. **ISO 13406-2 states that a maximum of four pixels and five subpixels may be defective.

	LG Flatron L1810B	Lite-On LitePanel 170A	NEC MultiSync LCD1700NX	Philips 170B2T	Samsung SM181T	Sharp LL-T1820H	Sony SDM-X82B	ViewSonic VX800
Score	**107**	**98**	**108**	**102**	**102**	**94**	**95**	**88**
Price	£565 (£664)	£419 (£492)	£472 (£554)	£565 (£664)	£611 (£718)	£955 (£1,122)	£856 (£1,006)	£876 (£1,029)
Supplier	dabs.com	MicroPlus Solutions	WStore	dabs.com	TechnoWorld	dabs.com	Insight	Insight
Phone	0800 138 5182	01827 68080	08700 113310	0800 138 5182	020 8200 2000	0800 138 5182	0870 700 7350	0870 700 7350
	www.dabs.com	www.mpsl.co.uk	www.wstore.co.uk	www.dabs.com	www.technoworld.co.uk	www.dabs.com	www.insight.com/uk	www.insight.com/uk
	www.lge.co.uk	www.liteontc.com.tw	www.nec-mitsubishi.com	www.ce.philips.co.uk	www.samsung electronics.co.uk	www.sharp.co.uk	www.sony-cp.com	www.viewsonic-europe.com
	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	3yrs RTB	3yrs on-site
	3yrs on-site	3yrs on-site	3yrs on-site	3yrs on-site	20,000hrs	3yrs on-site	✗	50,000hrs
	4 subpixels	4	ISO 13406-2	4 bright, 4 dark, 5 max	ISO 13406-2	ISO 13406-2	ISO 13406-2	ISO 13406-2
	18.1	17	17	17	18.1	18	18	18
	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024
	LG.Philips IPS	TN+film	Hitachi Super-IPS	R.G.B. Vertical Stripe	Samsung PVA	Sharp ASV	Hitachi IPS	MVA
	✗	✗	✗	✗	✗	✔	✗	✗
	160	115	170	160	170	170	170	160
	160	120	170	160	170	170	170	160
	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7
	40	50	40	40	45	45	30	50
	250	250	230	250	250	220	300	250
	350:1	400:1	400:1	400:1	500:1	400:1	400:1	600:1
	✔	✔	✔	✔	✔	✗	✔	✔
	✔	✗	✔	✔	✔	2	✔	✔
	✗	✗	✗	✗	✗	✗	✗	✗
	✔	✗	✗	✗	✗	✔	✗	✗
	2	✗	✗	✗	✗	2	✗	✗
	✗	✗	✗	✗	✗	✗	Second D-SUB	✗
	✔	✔	✔	✔	✔	✔ (VGA to DVI)	✔	✔
	✔	✗	✔	✔	✔	✔	✔	✔
	USB	✗	✗	✗	✗	✗	✗	✗
	✗	✔	✔	✗	✗	✗	✗	✔
	53	41	41	40	40	51	58	60
	3	<5	<4	2	3	3	3	<3
	30-80	32-86	32-80	30-82	30-81	32-81	28-92	30-82
	56-85	56-85	56-75	56-76	56-85	60-76	56-85	50-85
	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔
	✗	✔	✗	✔	✔	✔	✗	✔
	✗	✗	✗	✗	✗	✔	✔	✗
	✔	✔	✔	✔	✔	✔	✔	✔
	Horizontal & vertical position	Saturation, hue, flesh tone, horizontal & vertical position, horizontal size, fine mode, expansion, audio adjustments	Saturation, hue, flesh tone, horizontal & vertical position, horizontal size, fine mode, screen expansion	Horizontal & vertical position	Horizontal & vertical position, image size, OSD transparency	Horizontal & vertical position	Advanced Digital Smoothing, zoom, power saving, backlight control, Eco mode, RB gain control and gamma colour adjustment	Sharpness, horizontal & vertical position, horizontal size, scaling, audio controls
	✗	2 x 2W	✗	✗	✗	✗	2 x 1W	2 x 2W
	✗	✗	✗	✗	✗	✗	✔	✔
	30, 5	30, 5	30, 5	35, 5	20, 5	30, 5	80, 0	20, 5
	✗	✗	✗	✗	175, 175	45, 45	22.5, 22.5	✗
	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✗	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✗	✔	✔	✔	✔
	Slim bezel	✗	✗	✗	Slim bezel	Slim bezel, height adjustment, ICC profile colour management, 2-bit bit-depth expansion (BDE)	Eco mode	✗
	406 x 431 x 222	434 x 434 x 220	434 x 437 x 220	414 x 406 x 180	398 x 443 x 208	395 x 427 x 213	450 x 424 x 241	436 x 462 x 181
	7.8	6.3	6.2	7.0	5.8	8.9	8.6	6.9

ADI MicroScan L712

PRICE £527 (£619 inc VAT)
SUPPLIER TechnoWorld 020 8200 2000
VERDICT Disappointing results in our quality tests meant that the ADI couldn't regain the ground lost to other monitors costing less.

The MicroScan L712 from ADI is one of the few 17in screens submitted this month to cross the £500 barrier. Only Eizo, Iiyama and Philips are more expensive, but they use TFT technology a leap ahead of ADI and so can justify the premium to some extent.

The L712 uses an MVA panel. This stands for multidomain vertical alignment and is designed to increase the viewing angle over standard active-matrix screens. Unfortunately, now that Super-IPS is available, MVA no longer looks so impressive, and the ADI lost out in the viewing angle tests. It only gained a half mark in the horizontal angle due to significant dimming and colour accuracy changes as the viewing angle widened.

In the other real-world tests, the ADI produced lacklustre results. It only scraped a pass for its DVD playback quality, and again received a half-mark for the clarity of Desktop and ghosting tests. In common with most of the other screens, it flew through the sharpness and resolution tests, gaining full marks thanks to its use of a digital connection.

The L712 lost out most in the colour and greyscale tests. It failed the white-level saturation test, where bright greys merged into white, and the 256-level greyscale ramp. There were then too many half-marks for it to catch up and it finished last with the CTX, Hansol and 18in LG.

Although we doubt anyone will be hugely disappointed by this panel's image quality, the ADI would need something special to justify its price – only the bundled wall mount adds to its features tally. When the NEC LCD1700NX offers similar features and notably better image quality for £55 less, there's no reason to choose the MicroScan.

17in

PRO RATINGS
OVERALL
93
QUALITY	FEATURES	VALUE
89	84	94
100 IS THE AVERAGE

BenQ FP882

PRICE £659 (£774 inc VAT)
SUPPLIER dabs.com 0800 138 5182
VERDICT A strong, all-round performer, with decent image quality and a nice set of features, but a high price lets it down.

Taiwan has begun to steal the limelight from Korea and Japan as the hotbed of TFT monitor production in terms of volume over the past few years, driving manufacturers such as BenQ to the fore. In the early days, LCD monitors built in Taiwan were noticeably inferior to their counterparts, but that's no longer the case. BenQ's FP882 displayed a sharp, bright image, excelling in these tests, perhaps due to the IPS panel upon which it's based. Particularly impressive was its performance in our real-world checks – it was one of only five to clearly pass all six.

18.1in

However, it struggled slightly in our colour and greyscale tests, with high-intensity greys indistinguishable from white, and it didn't stand out in any of the other areas either.

Two USB ports and a pair of speakers helped the FP882 towards the top of the pack in terms of features. The OSD is tidy and easy to use, and there are two external buttons for controlling brightness and contrast for those who want to avoid the menu system.

The monitor design is easy on the eye as well. Although it doesn't feature the thin bezel of some displays here, it has a reasonably compact appearance, and many will like the dark-grey colour.

While not standing out from the crowd in many areas, BenQ's offering delivers a perfectly respectable performance across the board. But, sadly, this monitor won't be judged on these criteria. Its price will put many off, and you can certainly get more for your cash. If you're looking for an 18in screen, LG's Flatron is an obvious choice.

PRO RATINGS
OVERALL
100
QUALITY	FEATURES	VALUE
102	108	90
100 IS THE AVERAGE

CTX PV700

PRICE £425 (£499 inc VAT)
SUPPLIER TechnoWorld 020 8200 2000
VERDICT As the cheapest pivot-enabled screen, the PV700 could turn some heads, but the quality doesn't match up.

The ability to pivot a screen 90 degrees from landscape to portrait is a boon for many users, particularly those who work with print media and like to view full A4 pages on the screen at actual size. The CTX is the only monitor on test under £500 to include this facility, so we had high hopes that it might be the bargain of the month.

However, these hopes were soon undermined by its performance in our image quality tests. The first of its problems was in our sharpness and resolution tests, due to poor pixel tracking and timing lock generating unsightly patterns across the screen – an inherent problem with analog connectors and uncorrectable using the control in the OSD. In general use, this can make text look slightly fuzzy and is the main reason we prefer digital connections.

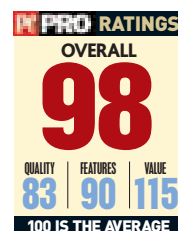Things didn't get any better in our real-world tests, with the CTX dropping to the bottom of the table. Although it gained full passes in both the Desktop clarity and ghosting tests, the older TN+film technology that lies behind this panel meant it struggled in both the game and the DVD tests, where quick response times are the order of the day. Its viewing angles were similarly disappointing. Results in the colour and greyscale section – the PV700 only failed two tests outright, but scraped passes elsewhere – meant it came last for image quality overall.

17in

With pivot support being the only thing that sets the CTX apart from other screens in this price range, the lack of a DVI connector and an outdated screen technology mean we can't recommend the PV700. Although this screen undoubtedly offers good value for money, we advise you choose the NEC LCD1700NX – it may cost £47 more, but the results are worth it.

PRO RATINGS
OVERALL
98
QUALITY	FEATURES	VALUE
83	90	115
100 IS THE AVERAGE

Eizo FlexScan L565

PC PRO A LIST

PRICE £565 (£664 inc VAT)

SUPPLIER dabs.com 0800 138 5182

VERDICT Superb colour handling marks this TFT out – and it even topped the charts in our other tests.

Outstanding. Excellent. Fantastic. These are the words we used when we first put the L565 to the test (*see Reviews, issue 93, p118*) and, despite fierce competition from Iiyama and NEC, we're just as impressed this time around.

In fact, the FlexScan came top or equal top in all areas of our quality testing. The DVI input ensures a crystal-clear, bright image, but even when using an analog source Windows' Desktop is admirably sharp.

17in

But superb sharpness is true of many of these TFTs. What set the FlexScan apart was its handling of colours, with exemplary fades and blends that mean graphics look exactly as their creators' intended. None of the other entrants could rival it here.

The FlexScan is also one of the best TFTs we've seen for keeping up with fast-action games and DVD movies. This is thanks to the incredible 30ms response time, one trait of the Super-IPS panel. Another trait is excellent viewing angles.

Thankfully, Eizo doesn't concentrate on image quality at the expense of features. There are two video inputs (with a button conveniently situated on the bezel for switching between them), a comprehensive and intuitive OSD, plus a pair of 1W stereo speakers. If you plan to use these for music playback, however, you'll be disappointed.

In an ideal world, we'd also wish for an integrated USB hub, but quality is the most important factor in any TFT-buying decision. With the L565 topping our image quality charts, not to mention its affordable price, Eizo looks set for a long stay on our A List.

PRO RATINGS
OVERALL
110
QUALITY	FEATURES	VALUE
117	102	112

100 IS THE AVERAGE

Hansol H711

PRICE £449 (£528 inc VAT)

SUPPLIER Simply 0870 727 2100

VERDICT A good-value TFT screen, but without the image quality and features of the higher priced models it can't compete.

Last month, Hansol's 19in 920P CRT monitor managed to gain a Best Value award thanks to its low price and commendable image quality. Despite a similar price advantage, the H711 can't pull off the same feat this month. It isn't helped by being based on older TFT technology. This gives it poor viewing angles compared to those based on Super-IPS panels.

Despite this handicap, the H711 was the best-performing analog-only monitor in the real-world tests, putting the CTX and Lite-On screens in the shade. Especially impressive was its performance in the 3D game, matching some of the more expensive screens with digital inputs. However, the analog input took its toll in the sharpness and resolution tests, with the H711 performing poorly in the pixel tracking and timing lock test in spite of our best efforts to adjust errors out using the OSD.

The colour and greyscale test results were

17in

more disappointing still. With outright failures in the 256-level greyscale ramp and colour spectrum tests, plus half-marks in several others, the Hansol was never going to challenge for an award. It isn't helped by a lower-than-average contrast ratio of 300:1, although its brightness is adequate at 250cd/m^2.

For such an expensive piece of equipment, it's disappointing not to see a Kensington lock slot on the monitor for security. The absence of speakers, although not a necessity, also counts against the Hansol in the features race.

While the NEC is also lacking in some features, it more than makes up for these in image quality. And since the 1700NX is only £23 more than the Hansol, it's a better choice than the H711.

PRO RATINGS
OVERALL
99
QUALITY	FEATURES	VALUE
90	87	113

100 IS THE AVERAGE

Hitachi CML170SXW

PRICE £480 (£564 inc VAT)

SUPPLIER NexNix 01403 756777

VERDICT Good image quality from the IPS TFT panel is matched by a decent set of features for the price.

Aside from the amazing-value NEC MultiSync, Hitachi is the only company to supply a TFT better than the simple TN+film type for under £500. In this case, it's an IPS TFT, a pre-cursor to the latest Super-IPS technology used in the Eizo and NEC units.
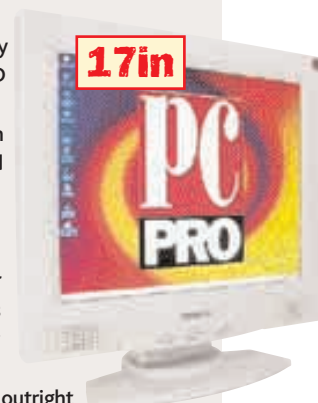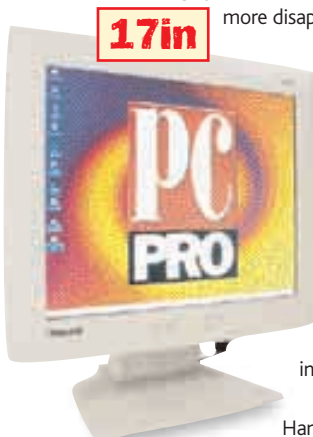
This gives the screen a viewing angle of 140 degrees at slightly reduced brightness. This was borne out in our tests, where the Hitachi passed on horizontal and scraped a pass for vertical. It performed well in both the DVD and 3D game checks, with no signs of lag in the game and reasonably bright and clear DVD playback.
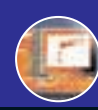
17in

In common with all the DVI-equipped screens, the Hitachi achieved full marks for sharpness and resolution. Its colour and greyscale scores were also superb for a screen costing less than most. The only outright failure was the white-level saturation test, where high-intensity greys were indistinguishable from white. The colour combinations test was well done – our assessors had no difficulty reading coloured text on different backgrounds.

When it comes to features, the Hitachi contains some surprises. First are the built-in speakers, which are just about capable of rendering music, but are best left for Windows' sounds. The OSD is even better. It includes all the necessary features and even allows panning around an image larger than the resolution of the monitor if your OS doesn't support it automatically.

Those wanting a low-cost, 17in TFT should look at the NEC as well as here, but the inclusion of basic speakers means the Hitachi should be on your shortlist if you don't need high-fidelity sound.

PRO RATINGS
OVERALL
104
QUALITY	FEATURES	VALUE
102	96	118

100 IS THE AVERAGE

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17in

PRO RATINGS
OVERALL
93
QUALITY	FEATURES	VALUE
89	84	94
100 IS THE AVERAGE

BenQ FP882

PRICE £659 (£774 inc VAT)
SUPPLIER dabs.com 0800 138 5182
VERDICT A strong, all-round performer, with decent image quality and a nice set of features, but a high price lets it down.

Taiwan has begun to steal the limelight from Korea and Japan as the hotbed of TFT monitor production in terms of volume over the past few years, driving manufacturers such as BenQ to the fore. In the early days, LCD monitors built in Taiwan were noticeably inferior to their counterparts, but that's no longer the case. BenQ's FP882 displayed a sharp, bright image, excelling in these tests, perhaps due to the IPS panel upon which it's based. Particularly impressive was its performance in our real-world checks – it was one of only five to clearly pass all six.

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Two USB ports and a pair of speakers helped the FP882 towards the top of the pack in terms of features. The OSD is tidy and easy to use, and there are two external buttons for controlling brightness and contrast for those who want to avoid the menu system.

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18.1in

PRO RATINGS
OVERALL
100
QUALITY	FEATURES	VALUE
102	108	90
100 IS THE AVERAGE

CTX PV700

PRICE £425 (£499 inc VAT)
SUPPLIER TechnoWorld 020 8200 2000
VERDICT As the cheapest pivot-enabled screen, the PV700 could turn some heads, but the quality doesn't match up.

The ability to pivot a screen 90 degrees from landscape to portrait is a boon for many users, particularly those who work with print media and like to view full A4 pages on the screen at actual size. The CTX is the only monitor on test under £500 to include this facility, so we had high hopes that it might be the bargain of the month.

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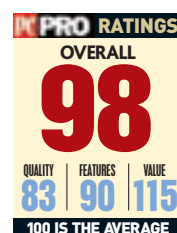Things didn't get any better in our real-world tests, with the CTX dropping to the bottom of the table. Although it gained full passes in both the Desktop clarity and ghosting tests, the older TN+film technology that lies behind this panel meant it struggled in both the game and the DVD tests, where quick response times are the order of the day. Its viewing angles were similarly disappointing. Results in the colour and greyscale section – the PV700 only failed two tests outright, but scraped passes elsewhere – meant it came last for image quality overall.

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17in

PRO RATINGS
OVERALL
98
QUALITY	FEATURES	VALUE
83	90	115
100 IS THE AVERAGE

Eizo FlexScan L565

PC PRO A LIST

PRICE £565 (£664 inc VAT)
SUPPLIER dabs.com 0800 138 5182
VERDICT Superb colour handling marks this TFT out – and it even topped the charts in our other tests.

Outstanding. Excellent. Fantastic. These are the words we used when we first put the L565 to the test (*see Reviews, issue 93, p118*) and, despite fierce competition from Iiyama and NEC, we're just as impressed this time around.

In fact, the FlexScan came top or equal top in all areas of our quality testing. The DVI input ensures a crystal-clear, bright image, but even when using an analog source Windows' Desktop is admirably sharp.

17in

But superb sharpness is true of many of these TFTs. What set the FlexScan apart was its handling of colours, with exemplary fades and blends that mean graphics look exactly as their creators' intended. None of the other entrants could rival it here.

The FlexScan is also one of the best TFTs we've seen for keeping up with fast-action games and DVD movies. This is thanks to the incredible 30ms response time, one trait of the Super-IPS panel. Another trait is excellent viewing angles.

Thankfully, Eizo doesn't concentrate on image quality at the expense of features. There are two video inputs (with a button conveniently situated on the bezel for switching between them), a comprehensive and intuitive OSD, plus a pair of 1W stereo speakers. If you plan to use these for music playback, however, you'll be disappointed.

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PC PRO RATINGS
OVERALL
110
QUALITY	FEATURES	VALUE
117	102	112
100 IS THE AVERAGE

Hansol H711

PRICE £449 (£528 inc VAT)
SUPPLIER Simply 0870 727 2100
VERDICT A good-value TFT screen, but without the image quality and features of the higher priced models it can't compete.

Last month, Hansol's 19in 920P CRT monitor managed to gain a Best Value award thanks to its low price and commendable image quality. Despite a similar price advantage, the H711 can't pull off the same feat this month. It isn't helped by being based on older TFT technology. This gives it poor viewing angles compared to those based on Super-IPS panels.
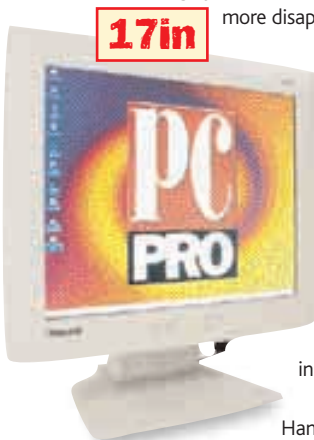
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The colour and greyscale test results were

17in

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For such an expensive piece of equipment, it's disappointing not to see a Kensington lock slot on the monitor for security. The absence of speakers, although not a necessity, also counts against the Hansol in the features race.

While the NEC is also lacking in some features, it more than makes up for these in image quality. And since the 1700NX is only £23 more than the Hansol, it's a better choice than the H711.

PC PRO RATINGS
OVERALL
99
QUALITY	FEATURES	VALUE
90	87	113
100 IS THE AVERAGE

Hitachi CML170SXW

PRICE £480 (£564 inc VAT)
SUPPLIER NexNix 01403 756777
VERDICT Good image quality from the IPS TFT panel is matched by a decent set of features for the price.
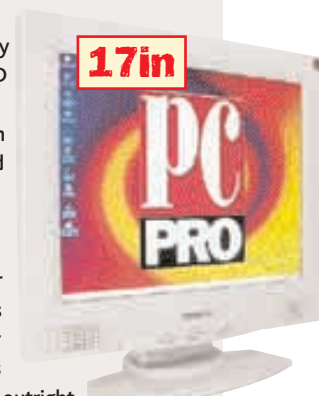
Aside from the amazing-value NEC MultiSync, Hitachi is the only company to supply a TFT better than the simple TN+film type for under £500. In this case, it's an IPS TFT, a pre-cursor to the latest Super-IPS technology used in the Eizo and NEC units.

This gives the screen a viewing angle of 140 degrees at slightly reduced brightness. This was borne out in our tests, where the Hitachi passed on horizontal and scraped a pass for vertical. It performed well in both the DVD and 3D game checks, with no signs of lag in the game and reasonably bright and clear DVD playback.

17in

In common with all the DVI-equipped screens, the Hitachi achieved full marks for sharpness and resolution. Its colour and greyscale scores were also superb for a screen costing less than most. The only outright failure was the white-level saturation test, where high-intensity greys were indistinguishable from white. The colour combinations test was well done – our assessors had no difficulty reading coloured text on different backgrounds.
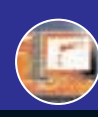
When it comes to features, the Hitachi contains some surprises. First are the built-in speakers, which are just about capable of rendering music, but are best left for Windows' sounds. The OSD is even better. It includes all the necessary features and even allows panning around an image larger than the resolution of the monitor if your OS doesn't support it automatically.

Those wanting a low-cost, 17in TFT should look at the NEC as well as here, but the inclusion of basic speakers means the Hitachi should be on your shortlist if you don't need high-fidelity sound.

PC PRO RATINGS
OVERALL
104
QUALITY	FEATURES	VALUE
102	96	118
100 IS THE AVERAGE

NEC MultiSync LCD1700NX

PRICE £472 (£554 inc VAT)
SUPPLIER WStore 08700 113310
VERDICT A Super-IPS TFT for less than £500. The quality isn't up to the Eizo, but is a match for many of the more expensive screens.

The 1700NX is unique in this Labs, as it's the only monitor to include a Super-IPS panel for less than £500. Cuts have been made elsewhere – there are no speakers or USB hub and it has a far-from-thin bezel – but for most people, quality is everything.

The massive viewing angle is what sets Super-IPS screens apart, and the 1700NX is no exception. It passed both viewing angle tests with flying colours and did well in the rest of the real-world tests too, with a distinction for the 3D game and general clarity. Not surprisingly, considering the DVI connection, it also gained full marks for the sharpness and resolution tests. It wasn't as good in the colour and greyscale tests though, failing the colour-tracking check thanks to a purple tinge to some greys. It only scraped a pass in the colour spectrum, with red, green and blue drowning out cyan, magenta and yellow. It gained half-points for whole-screen colour accuracy too, as dark patches were visible at the edges of the screen on both white and green tests.

The OSD is one of the more comprehensive this month, with controls for hue, saturation and flesh tones included as well as the more standard positioning and colour temperature controls. Another neat touch is that, once the screen is connected by either D-SUB or DVI cables and the separate power supply is plugged in, a cover can be fitted to the back of the stand to keep all the cables neat.

Although the NEC MultiSync doesn't boast enough image quality to win this month's main award, it's a great monitor for the price if you don't need the extras. This makes it our undisputed winner of the Best Value award in this Labs.

17in

PRO RATINGS
OVERALL
108
QUALITY	FEATURES	VALUE
107	95	123
100 IS THE AVERAGE

Philips 170B2T

PRICE £565 (£664 inc VAT)
SUPPLIER dabs.com 0800 138 5182
VERDICT Good image quality, thanks in part to the digital connection, but the feature set is lacking.

The 170B2T uses a 17in panel described by Philips as a R.G.B. Vertical Stripe TFT, although to us it looks suspiciously like IPS. This gives it official viewing angle figures of 160 degrees, both horizontally and vertically, along with a contrast ratio of 400:1 and a brightness of 250cd/m^2.

In the image quality tests, the Philips did well in the colour and greyscale section. It almost managed to match the Eizo's score, despite failing the white-level saturation and grey-scale intensity ramp tests. In the latter, the progression of greys from light to dark wasn't uniform. It gained two distinctions for white colour purity and colour combinations, though, and these pushed the score up. The 107B2T easily passed the sharpness and resolution tests thanks to the DVI input, but the real-world tests were more disappointing. With only half the available marks from both viewing angle tests and the DVD movie, the Philips lagged behind the top performers. A distinction for general Desktop clarity couldn't rescue it.

The dark grey bezel proscribes the Philips from TCO 99 ergonomic certification, as the fascia reflects more light than a beige one. This isn't a big problem, as the screen itself is reflection free. Of more concern, given the price, is the lack of features – there's no USB hub, no speakers and no advanced OSD options.

The 107B2T has good image quality, but a poor feature set. When you can buy the Eizo for the same price, the Philips can't be

17in

PRO RATINGS
OVERALL
102
QUALITY	FEATURES	VALUE
107	95	103
100 IS THE AVERAGE

Samsung SM181T

PRICE £611 (£718 inc VAT)
SUPPLIER TechnoWorld 020 8200 2000
VERDICT A good-value 18in TFT. However, with the same overall image quality as the cheaper LG, we can't recommend it.

The SM181T uses a panel based on Samsung's own PVA technology. This stands for patterned vertical alignment and increases the viewing angle in the same way as MVA, although Samsung claims a viewing angle of 170 degrees – the same as Super-IPS.

We found the horizontal viewing angle to be less than that of the Eizo and NEC screens, which both use the latter panel. Vertically, it did just as well, but this is a less useful measure. The only notable problem in the other real-world tests came in the 3D game. The Samsung showed significant ghost images around fast-moving objects – an indication of slow update speeds. The DVD movie showed similar artefacts, but not to the same extent.

The SM181T performed the colour and greyscale tests well. The only failure was in the colour spectrum, where red, green and blue overpowered cyan, magenta and yellow. The colour purity was also slightly suspect, but it coped easily in the colour combinations test.

The brightness of 250cd/m^2 is surpassed only by Sony's monitor, and the contrast ratio of 500:1 is similarly good. Only ViewSonic claims a higher figure, but this fails to translate into better overall image quality.

One factor that sets the SM181T apart is the stand's ability to rotate almost 360 degrees due to a plate on the bottom of the stand with non-slip pads. A 60-degree pivot on the stand would be more useful, though.

Although £611 is a great price for an 18in, Samsung is gazumped by LG. Its L1810B is cheaper and offers similar quality plus a USB hub.

18.1in

PRO RATINGS
OVERALL
102
QUALITY	FEATURES	VALUE
104	107	98
100 IS THE AVERAGE
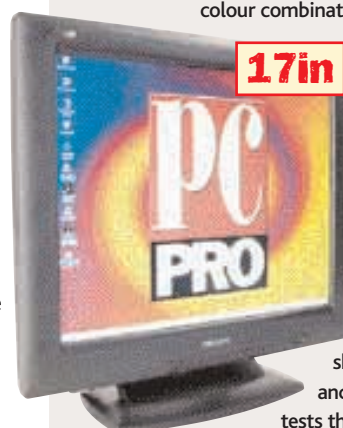
Sharp LL-T1820H

PRICE £955 (£1,122 inc VAT)
SUPPLIER dabs.com 0800 138 5182
VERDICT A huge range of features and a high-quality panel, but there's no way to justify the wallet-busting price.

Sharp knows a thing or two about TFT monitors. It's one of the world's most successful panel manufacturers and has developed the ASV technology that lies behind the LL-T1820H. It also knows about style, and this particular model benefits from a slim bezel and striking stand.

The stand isn't just about looks either. This is one of the few height-adjustable screens here, and the panel pivots clockwise. With a generous 18in viewable diagonal, twin DVI inputs, a choice of three colour modes (sRGB, standard and vivid) plus OSD control over gamma, hue and saturation, this is one of the best featured screens in this Labs. Oh, and did we forget the two-port USB hub? We were similarly impressed by its image quality. It coped well in the majority of our real-world tests, had good viewing angles and a sharp Desktop when using both a digital and analog source. We wouldn't recommend it for action-packed games, though.

At this high level, the area that separated the best panels from their rivals was colour handling and, although the LL-T1820H was a capable performer, it couldn't keep up with the Eizo. Despite it passing all but one of the tests, some compression of colours at higher intensities (for example, 95 per cent intensity red looked identical to 100 per cent intensity) lost it marks.

But what prevents this screen from challenging for awards is its price. When you can buy two NEC LCD1700NX displays for £944, why pay £11 more for one Sharp?

PC PRO RATINGS
OVERALL
94
QUALITY **102** | FEATURES **117** | VALUE **64**
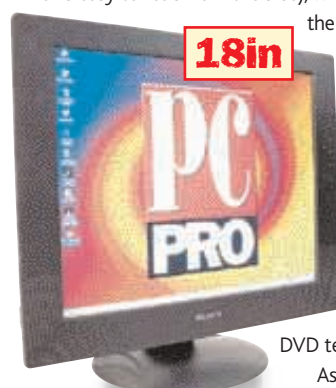100 IS THE AVERAGE

Sony SDM-X82B

PRICE £856 (£1,006 inc VAT)
SUPPLIER Insight 0870 700 7350
VERDICT Good image quality, nice speakers and a large 18in viewable diagonal are all in this monitor's favour, but it's too expensive.

The Sony SDM-X82B was one of the most consistent performers in this Labs, gaining clean passes in 16 out of our 19 test screens. Only the Eizo could beat this achievement, although the FlexScan edged ahead considerably overall due to its four distinctions from our judges.

One area where the Sony lost out slightly was viewing angles (though we doubt anyone will complain, as the X82B's panel was still clear and easy to read from the side), which is due to the older IPS technology. But its response times are still fast, which is why it coped well in the game and DVD tests.

As with so many of the panels here, its main problems came in the colour-handling checks. In particular, it tended to over-compress colours at the higher end of the intensity scale, so we wouldn't recommend it to photography professionals.

One neat touch that will appeal to the environmentally conscious is the Eco mode. This reduces the brightness level of the backlight, which means it should last longer and cost less to run. However, Sony claims a typical power consumption of 58W, so it was hardly the most energy-efficient panel in the first place. It's also worth noting that Sony is the only company here not to offer a backlight warranty.

This screen does at least benefit from one of the best pairs of speakers on test, although even the Sony stamp of quality can't prevent the inevitable tinniness. Other than this, there aren't a huge number of features to lift the SDM-X82B from the 18in crowd — only the OSD gamma adjustment stands out. With a price that's almost £300 over the LG, it's difficult to justify the Sony's extra expense.

PC PRO RATINGS
OVERALL
95
QUALITY **106** | FEATURES **104** | VALUE **70**
100 IS THE AVERAGE

ViewSonic VX800

PRICE £876 (£1,029 inc VAT)
SUPPLIER Insight 0870 700 7350
VERDICT Looks fantastic and has its fair share of features, but this isn't backed up by a similar level of image quality.

ViewSonic produces arguably the most glamorous TFT this month, with the VX800 dressed in a chic silver and black finish. Even the supplied DVI cable is black, while touch-sensitive OSD controls add to the feeling of class. The large, 18in panel also adds to its impact.

It started off well in our tests, producing the sharp Desktop image we'd expect from a DVI-equipped display. Even when using an analog source, the VX800's crispness only dropped marginally, although it's more difficult to adjust the brightness and contrast to their optimal settings.

If you want good colour handling, though, go elsewhere. Although it offers decent colour purity, the VX800 suffered from stepping in the colour ramp test, while primary colours dominate when it comes to blending.

We were again disappointed by its viewing angles. Although MVA technology is an improvement on the old TN+film TFTs, Super-IPS panels put it to shame. MVA panels wouldn't be our first choice for movies or games either, due to their comparatively slow response times, but providing you aren't expecting the highest quality you should be satisfied.

We were happier with the speakers, which provide some of the best sound this month — hardly hi-fi quality, true, but good enough for music playback in the office.

Sadly, these can't justify the VX800's price premium compared to the rest of this Labs. LG is selling an 18in TFT for over £300 less and beats the ViewSonic for quality, so you're paying over the odds for style.

PC PRO RATINGS
OVERALL
88
QUALITY **92** | FEATURES **103** | VALUE **63**
100 IS THE AVERAGE