



WORDS: MARK WALSH PICTURES: HUGH THRELFALL ILLUSTRATION: CHRIS DIAS

A sound choice

CONTENTS

- Stereo speakers**
- 130 Altec Lansing 2100
Creative SW320
TDK XS-iv S80
- 131 Yamaha MS201
How to set up surround-sound speakers
- Surround speakers**
- 132 Abit SP53
Altec Lansing 4100
Creative Inspire 5300
- 133 Hercules XPS510
Labtec Arena 530
Frequency responses
- 134 Philips A3.600
Umax 672 'A-Box'
Videologic Digitheatre LC
- 135 Videologic
ZXR-500 – **EXCLUSIVE!**
Yamaha TSS-1
Dolby Digital versus DTS
- High-end speakers**
- 138 Acoustic Energy Aego2
Creative Megaworks 510D
Mission MM1
- 140 Table of features
141 Top five PC audio tips
142 Editor's Choice
How we tested

You may have a high-spec PC but what about sound quality? Good speakers are important, so here's the lowdown on 17 multimedia offerings

Multimedia speakers have taken off dramatically in recent times and it's not just due to the rise in console ownership and the DVD player boom. PC owners make up a hefty chunk of the buying market, as it dawns on us that there's a lot more to life than dull, old stereo.

Speakers are often overlooked when buying a PC, with quality sometimes being disregarded in favour of 'value' sets. Now, though, multimedia speakers are of such high quality and value that there's no excuse.

Even Creative's much-loved DTT 2200 has been superseded, and it's not alone, as PC users demand quality just as much as hi-fi enthusiasts.

The players in this market are ubiquitous: Creative, Videologic, Yamaha and Altec Lansing. All are featured here, along with some less likely candidates: Umax, in particular, is better known for its scanners than speakers, so it's good to see the company expanding into new areas.

We have split the test into three sections: stereo (2.1-channel); surround (both 4.1 and 5.1-channel); and high-end, near-professional standard models. It's important to note that surround-sound speakers are not necessarily higher quality than stereo, or 2.1; many of the six-channel products here produced the worst sound on test. ➤

GROUP TEST SPEAKERS

Altec Lansing 2100

PRICE £99.99 (£85.10 ex VAT) **CONTACT** Eurotech 0870 458 0011 www.eurotech.co.uk

PROS Stylish **CONS** Poor treble response

OVERALL Impressive, but not great value

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

The 2100 is a very attractive set of speakers – and it's compact, considering its 40w power. The only slight letdown are the stands used to mount the satellites; there's little to them and they could very easily topple over.

The remote is neat, complete with its own stand, and takes control of just volume and power. All cables are a good length, outputting to RCA connections.

The stereo input is supplied with a mini-jack cable. Bass is controlled by a button on the subwoofer (on the 4100 set, it is on the remote control). This can be a pain,

particularly if the sub is located in a hard-to-reach spot.

Sound is crisp and clear, but high-end response is weak; hence both music and films lose their sparkle and everything feels quite compressed. The bass is powerful for a small sub (one of the smallest here), but the sound projected is more of a dull thud than the rounded twack we would expect. This spoils the effect of the high-quality satellites.

Aside from the high-end models, this is the best quality 2.1-channel set on test. However, considering Creative's SW320s are half the price, they might be a better option.

STEREO SPEAKERS



STEREO SPEAKERS

Creative SW320

PRICE £39.99 (£34.03 ex VAT) **CONTACT** Creative 0800 973 069 <http://europe.creative.com>

PROS Excellent value **CONS** Poor signal-to-noise ratio

OVERALL A simply superb value set, despite its minor flaws

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

You can't fault Creative when it comes to value, as all three offerings in this test are keenly priced and sound great. The SW320 set consists of average looking square satellites and a compact subwoofer.

At 4.5w RMS (root mean square) each, the satellites connect to the subwoofer by means of open wires (a sore point in our eyes). The sub connects to the sound card via a single stereo mini-jack. This connecting cable houses the 'remote control', which allows only volume adjustment.

The sub is approximately half the size of the DTT 2200s, roughly the same size as

that of the Inspire 5300s. The SW320's sub is also a shade quieter, outputting just 12w.

The SW320s sound remarkably like a 2.1 version of the popular Cambridge Soundworks DTT 2200s. Frequency response is better than many, kicking off at 42Hz, and stretching up to 20KHz. Sound quality is a slight letdown, though, as the Signal to Noise Ratio (SNR) is high, and there's a distinct tail-off on the high- and low-end frequencies, making everything sound compressed.

These are the best value 2.1 speakers here, though, with sound quality rivalling their more expensive peers.

TDK XS-iV S80

PRICE £79.99 (£68.08 ex VAT) **CONTACT** TDK 01737 771 212 www.talk.europe.com

PROS Compact and stylish **CONS** Weak bass

OVERALL A good-looking and compact set that is let down by slightly weak sound

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

This great-looking set is compact, yet outputs 80w total system power. The satellites feature NXT technology, which uses a flat panel to transmit vibrations instead of a piston-controlled diaphragm.

Treble, bass and volume controls are on the right satellite, which is powered by a Din connector, the left being fed by a mini-jack. The controls are small and fiddly, as is the mini-jack. That aside, it's a neat setup.

The S80s use TDK's new Tremor system, the drivers for which, TDK claims, emanate sound in all directions, increasing the size of the sweet spot (the point where the sound is

perfect due to the positions of the speakers and listener). Unfortunately, when out of the sweet spot, the sound is far from perfect.

Although the S80s do not sound tinny during music playback, they are treble-heavy – particularly around 1.5KHz. This is probably due to the size of the subwoofer. The 'Force Pipe' design allows little room for the sound to reverberate around the casing. The sound coming out is very punchy, but at times seems half-hearted and missing some lower-end frequencies, mainly around 100Hz. There is no distortion in treble when turned up loud, which impressed us.

STEREO SPEAKERS



Yamaha MS201

PRICE £39.99 (£34.03) **CONTACT** Yamaha 01923 233 166 www.yamaha.com

PROS Good signal-to-noise ratio **CONS** Unsightly

OVERALL Shame about the colour, but they sound OK

FEATURES **PERFORMANCE**

VALUE FOR MONEY **OVERALL**

Yamaha is the only manufacturer to continue to use beige, hence both sets in the test look somewhere between retro and embarrassing. The thin satellites on this model are a throwback to the 1980s, and the material covering the diaphragms may be distasteful to some.

Despite their atrocious looks, the MS201s make up a more than adequate sounding set. Although the major downfall seems to be that the treble and bass frequencies are poorly split between the satellites and subwoofer; the sub seems to handle too much of the sound and therefore

a proportion of the mid-range frequencies sound dulled. The sound is clear and crisp, possibly better than the Creative SW320 2.1 set, but there tends to be a lot of hiss coming from the satellites.

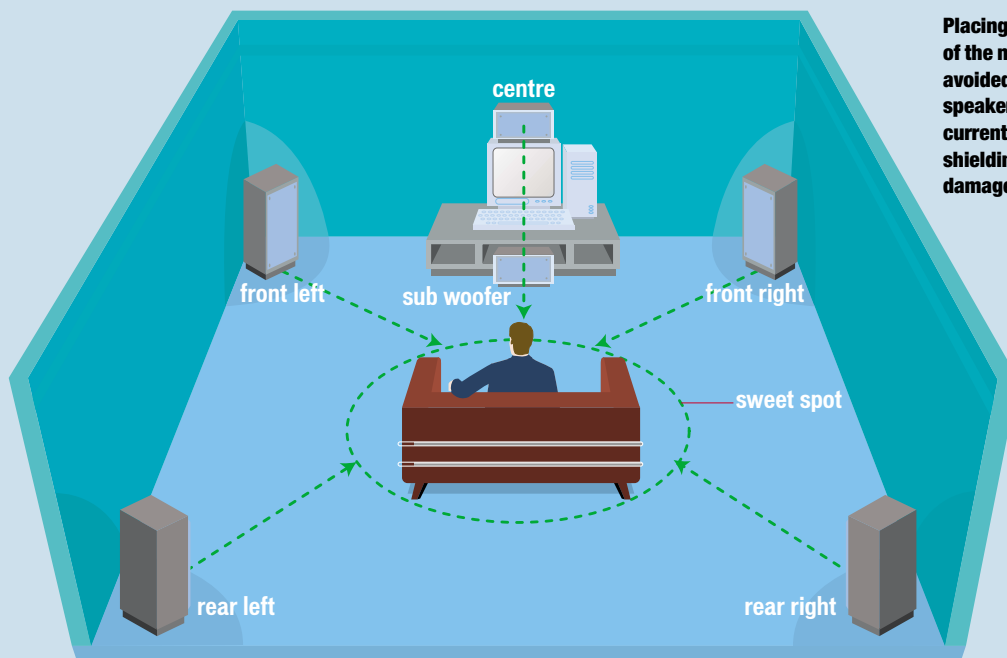
The sub gives plenty of power, and a bass level adjustment switch can be found on the rear of the sub. The right satellite has two connections – a Din for volume control and signal, and a mini-jack that leads round to the left satellite.

The MS201 sounds like a decent set of PC speakers, but they lose out slightly to the similarly priced Creative offering.

STEREO SPEAKERS



HOW TO SET UP SURROUND-SOUND SPEAKERS



Placing the speaker on top of the monitor should be avoided if at all possible – the speaker's electromagnetic current, regardless of shielding, could permanently damage the monitor

Rear speakers should be elevated above ear height so the sound will be received better

Nearly all new systems come with DVD drives, and many with six-channel speakers, making them ideal fodder for a Dolby Digital or DTS setup. But if these are not installed and positioned correctly, the end result is a muddled collection of sounds. Another vital aspect is volume. While cranking it up can add to the entertainment value, don't have your audio too loud; it doesn't enhance the sound experience. A decent setup does.

Ideally, satellite speakers should be placed in the farthest corners of a large room. The centre speaker needs to be in the middle, but beware: speakers have strong electro-

magnetic fields and can cause permanent damage if positioned too close to a screen. If possible, do not place it on top of the monitor or television. Mounting it on a wall is a far better option.

Many users hide the subwoofer under their sofa or other furniture. Its positioning is less relevant as we find it harder to determine where bass sounds are coming from. It also keeps it out of the way. It is advisable, though, to hide the subwoofer beneath the screen, as this tends to keep the focus on the action.

Our ears are designed to receive sounds better from below when they are in front of us,

but when they are behind, we receive them better from above. It is therefore advisable to position speakers to compensate for this, with the front left and right satellites slightly below ear height and the rear speakers towards the top-back corners of the room.

Finding the elusive 'sweet spot' between multiple speakers (where the sound is perfect) is never easy, especially in a confined environment. You're unlikely to remain within the sweet spot for long periods of time, but to get the best from your surround-sound speakers, point them in your general direction and try to stay in the middle as much as possible.

GROUP TEST SPEAKERS

Abit SP53

PRICE £52.17 (£44.40 ex VAT) **CONTACT** Abit www.abit.com.tw
PROS Vaguely inexpensive **CONS** Very disappointing sound quality
OVERALL These are cheap, but poor sound means you're not getting close to value for money

FEATURES ■■■■■ **PERFORMANCE** ■■■■■
VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

Motherboard king Abit also has a growing range of speakers, but while the SP50s disappointed (*PCW* November 2001 p90), this budget offering reached a new low.

At just over £50, they are the cheapest surround speakers here. Built as a compact box, the subwoofer is tall and slim, with an old-fashioned design. The same goes for the satellites: plain square black boxes. All volume controls are at the rear of the sub. Annoyingly, the sub, front, rear, and centre channels all have individual volume options.

The only input option is a G9 (a nine-pin) connection; something Abit has a

tendency to do with its speakers. The rarity of this connection limits you mainly to Abit sound cards, which, while cheap, use an aging Fortmedia chip, which impacts on sound quality.

As Creative's Soundblaster Audigy, the sound card we used for testing, does not have a G9 output, we used an AU10. In terms of testing sound quality, this does not make it a fair test, but even bearing that in mind we were sorely disappointed. The satellites are a little noisy, but acceptable. However, we could not live with their regular fits of crackling and the quality of the bass.



SURROUND SPEAKERS



SURROUND SPEAKERS

Altec Lansing 4100

PRICE £179.99 (£153.18 ex VAT) **CONTACT** Eurotech 0870 458 0011 www.eurotech.co.uk
PROS Great looking **CONS** Sounds compressed in mid-frequencies
OVERALL Great looking, but too expensive considering their quality

FEATURES ■■■■■ **PERFORMANCE** ■■■■■
VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

Big brother to the 2100 is this 4.1-channel set with a larger subwoofer and 140w power, compared to the 40w of the 2100. The satellites produce an astonishing output considering their size. But, as they are basically the same as the 2100, they have the same problems, namely a steep drop in the low- and high-end frequencies. The sound therefore feels very compressed; a major disadvantage, particularly when it comes to films.

The remote is connected via Din and has an easy-to-use button control with an LED status indicator, plus bass and treble

controls. The addition of a headphone socket is handy, saving you reaching round to the back of your PC to plug in for sound.

Aside from the rear and front mini-jack inputs, the subwoofer also has an auxiliary input. The outputs are through RCA cables attached to the satellites and the whole product is simple to setup.

The 4100s are excellent for gaming and DVD – positional information and, in particular, action sequences get a new lease of life. This system really packs a punch, but so does the price tag: £180. Taking that into account these just don't seem worth it.

Creative Inspire 5300

PRICE £99 (£84.26 ex VAT) **CONTACT** Creative 0800 973 069 <http://europe.creative.com>
PROS Excellent sound; great value **CONS** Quieter than we'd hoped
OVERALL The 5300s are easily the best-value 5.1 PC speakers on the market

FEATURES ■■■■■ **PERFORMANCE** ■■■■■
VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

Creative's reputation for speakers is unparalleled. The 5300's have three stereo mini-jack cables connecting the subwoofer to the sound card, a volume control and phono cables leading to the satellites.

The size, look and, above all, quality of the package is different to the Inspire 5300s. The sub has been halved in size – a major advantage as subwoofers tend to be oversized for the quality of sound they produce.

However, despite the fact that output has been increased to 48w (over the DTT 2200's 43w), the 5300s seem significantly quieter.

Sound quality has been enhanced – and it sounds impressive. Not only is it sharper, but the refinements make it brighter and more even throughout the whole frequency spectrum. Positioning is also far more accurate, although this is to the detriment of the size of the sweet spot; to get the full effect there is precious little space in which you can sit or stand.

The Inspire 5300s are a vast improvement over the already impressive original, the DTT 2200s. There is no reason to upgrade, but as a first-time buyer, you can't do better for your money than these.



SURROUND SPEAKERS

Hercules XPS510

PRICE £69.99 (£59.57 ex VAT) **CONTACT** Hercules 020 8665 1881 <http://europe.hercules.com>

PROS Long cables **CONS** Poor signal-to-noise ratio

OVERALL Poor noise levels mean these are nothing special

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

There seems to be a correlation between looks and sound quality; the better looking the speakers, the better the sound quality. This Hercules XPS510 set follows suit by being nothing special in either looks or performance.

Setup of these speakers is simple, with all mini-jack inputs and RCA outputs at the back of the subwoofer. The cables are incredibly long and therefore would be suitable for a big room. But long wires tend to act as aerials, picking up any radio waves in the vicinity. This contributed to the set's poor SNR.

In DVD playback, speech is occasionally muffled by background atmospheric noises; there are sudden jumps in sound level when focused on one speaker. Music is tinny, but an improvement over the Umass speakers. Loud bangs and crashes are sometimes slightly distorted.

There is a G9 connection option, but mini-jack cables are included as three separates, which adds to the clutter.

Not particularly impressive, these speakers are most appropriate for those who need 5.1 for games and to watch the occasional DVD, but little else.

SURROUND SPEAKERS



SURROUND SPEAKERS



Labtec Arena 530

PRICE £59.99 (£51.06 ex VAT) **CONTACT** Logitech 01753 870 900 www.labtec.com

PROS Easy to set up; good signal-to-noise ratio **CONS** Dull and muffled sound

OVERALL Simplistic and of reasonable quality

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

Recently bought by Logitech, Labtec is responsible for the low end of Logitech's new speaker range. This, the first set to emerge, sadly retains the cheap plastic feel of its Labtec predecessor.

The rear and front volume controls are oddly placed on the front-right speaker. Everything runs through mini-jack inputs, and each is colour-coded for easy setup, but they can easily get tangled. The satellites can be twisted through 180 degrees on their stands and then wall-mounted.

The satellites produce a particularly dull and muffled sound. There is also a slight

rattle from the subwoofer at particular frequencies. The sub's proprietary M3D option gives four-channel surround from any output – 2, 4 or 5 channels. This is unimpressive, as the effect is similar to simply amplifying the sound.

The satellites are very directional, so if you're not in the sweet spot, you've got very little chance of catching all the treble. In their defence, though, the SNR is good, with little undesirable noise heard even at full volume. They also handle surround effects well. While the sound quality lets these speakers down, for £60, they're really not bad at all.

FREQUENCY RESPONSE EXPLAINED

When it comes to the quality of speakers, frequency response is vital. The human ear mostly receives information at frequencies of between 20Hz and 20,000Hz, with both these end frequencies becoming harder to pick up with age and/or wear and tear. Typically, music tends to centre on 50Hz to 15,000Hz; radio sounds are inevitably more compressed.

What the human ear can hear is supplemented by frequencies surrounding this spectrum, which cannot be heard on their own, but the extra sparkle that these provide gives live music the edge over its recorded counterpart.

The measure of a well-manufactured speaker is how evenly it produces sounds across the frequency spectrum. The best speakers give a completely flat response over the spectrum. This is exceedingly difficult to manufacture, hence the high cost of some of the sets on test. Therefore the resulting sound can seem harsh, as it lacks the slight but oft-seen boost in the lower mid-range of the spectrum that gives a feeling of depth and warmth.



The top picture shows one second of an average .wav file.

The lower image represents the complete song it was taken from. Most speakers tend not to pick up the complete spectrum, favouring treble over the low-end bass frequencies

GROUP TEST SPEAKERS

Philips A3.600

PRICE £139.99 (£119.14 ex VAT) **CONTACT** Philips 0800 169 8430 pcstuff.philips.com

PROS Great looking **CONS** Slightly let down by the sound

OVERALL Good looking and versatile, but sound quality left us wanting

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

They're not cheap, and are verging on a case of style over substance, but the A3.600s certainly have their advantages. Unfortunately, the inputs cause a severe problem, as the only option is a G9 connection (S/PDIF adaptor is included), severely limiting this set's compatibility with mainstream sound cards. The aim, presumably, is to get you to buy this and one of Philips' Acoustic Edge sound cards and, while it is a good-quality card, your choice of speakers should never dictate your decision over internal PC components.

The A3.600's sound quality doesn't

warrant this, either. Very directional, they have a small sweet spot – if you're not right in the centre, you'll miss most of the treble.

The subwoofer uses Philips' proprietary WOOX system, which condenses the sub, using a dual-diaphragm method to bolster its output. This works to an extent, but bass seems weak and compressed.

In its defence, there are two auxiliary inputs, both fed by stereo mini-jack ports. This is the only set here with an infra-red remote control. The satellites are flat, look good and attach to the sub via an ultra mini-jack connection.

SURROUND SPEAKERS



SURROUND SPEAKERS

Umax 672 A-Box

PRICE £72.85 (£62 ex VAT) **CONTACT** Umax 0870 906 3300 www.umax.co.uk

PROS Inexpensive **CONS** Disappointing build quality; poor sound quality

OVERALL We cannot recommend these speakers, even at this price

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

These speakers feature a control box that handles all inputs (mini-jack) and outputs (RCA). It also controls overall volume, with separate controls for front speakers, rear speakers and the subwoofer. The volume button on our review unit was stiff and awkward to use, and fell off almost immediately.

Unfortunately, the plastic look and feel of the A-Box speakers is matched only by the artificial sound they create, which resembles a tinny radio. While they're not very loud, the main problem is that the sound lacks power in the low-end

frequencies, producing tinny treble, an unsubtle thud from the subwoofer, and lacking the key floor-shaking frequencies of around 50Hz.

SNR is poor, with quite a lot of hiss on playback. This could easily be put down to the poor-quality cabling; a distinct murmur emanates from both rear speakers, indicating weak wiring.

Used as a 5.1-channel setup, these speakers are quite distinct in terms of directional information, which may not be too bad for gaming, as positional information, rather than sound quality, is key.



Videologic Digitheatre LC

PRICE £129.99 (£110.63 ex VAT) **CONTACT** Videologic 01923 260 511 www.videologic.com

PROS Loud **CONS** Poor sound

OVERALL Just not worth the money

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

A popular choice with PC manufacturers, these Videologic speakers are packaged with a lot of systems. They are absolutely huge, so you're getting a lot of plastic for your money. The casing is quite thin, though, and while this makes them light (only 15kg), it throws up two major problems. First, it makes them very flimsy. Second, the plastic rattles and the reverberations give a nasty 'pseudo' feel to the sound.

On the plus side there is an aux input, so you can hook up your stereo and PC at the same time. The lack of a remote means you

have to reach down to the sub to switch over – a poorly thought-out implementation.

The mini-jack-to-phono cable that connects PC and subwoofer is short, so the sub must be directly beneath or on top of the PC. The wires connecting the sub to the satellites are open which can cause wear and tear: a decent RCA connection is safer.

As with the other Videologic set, speech appears muffled when playing 5.1-channel output, but optical works well, if a little strong on the centre speaker. Total system power, 62.5w, is loud enough, but the rattling cases let this set down heavily.

SURROUND SPEAKERS



Videologic ZXR-500**EXCLUSIVE!****SURROUND SPEAKERS****PRICE** £79.99 (£68.08 ex VAT) **CONTACT** Imagination 01923 260511 www.videologic.com**PROS** Excellent value **CONS** Strange colour**OVERALL** A vast improvement on their predecessor**FEATURES** ■■■■■ **PERFORMANCE** ■■■■■**VALUE FOR MONEY** ■■■■■ **OVERALL** ■■■■■

The ZXR-500s are priced to form part of the budget end of the Videologic range, and yet we feel they are superior to the company's other offering, the Digitheatre LC. They are also better looking and more compact.

The satellites come with large, detachable stands and are very sturdy. Both RCA and mini-jack-to-RCA cables are supplied, with all inputs and outputs being RCA on the subwoofer.

The sub is one of the largest on test, but is quite weak at 25w RMS. A real annoyance is the lack of an overall volume control, in spite of the fact that there are four controls

for front, rear, sub and centre. The lack of remote is a disappointment, too.

Performance, on the whole, is excellent. Frequency response is not particularly even, though, and slight distortion at around 700Hz was both surprising and disappointing. Atmospheric noises seem to prevail over speech during 5.1-channel playback, but there is less background hiss than expected for a sub-£100 set.

Despite these problems, which are relatively minor, at £80, the ZXR-500s are excellent value, and the only real rival to Creative's 5300 series.

**SURROUND SPEAKERS****Yamaha TSS-1****PRICE** £159.99 (£136.36 ex VAT) **CONTACT** Yamaha 01923 233 166 www.yamaha.com**PROS** Good value decoding system **CONS** Delay between front and rear**OVERALL** Great on paper, but perhaps let down by its age**FEATURES** ■■■■■ **PERFORMANCE** ■■■■■**VALUE FOR MONEY** ■■■■■ **OVERALL** ■■■■■

Yamaha's only 5.1 offering is starting to age a little, being around 18 months old, but at £160, and with a decoder for DTS, Dolby Digital and Dolby Prologic, this set is great value. The decoder is quite ugly, though, so hide it if you can.

This set features both optical and coaxial inputs for 5.1-channel sound with all the necessary cables supplied. A major disadvantage is that you can't input 5.1 analogue; there are only two mini-jack ports, allowing a maximum of 4.1.

There are centre, surround and subwoofer volume adjustments, along with an

overall volume. You can switch between digital, 4.1 and 2.1-channel output.

The subwoofer is the same as that featured with the MS201, and is fed both power and signal by the decoder box through an RCA lead attached to the back. This makes the whole setup similarly bass-heavy.

The satellites are RCA fed, and the SNR is good, but the satellites are treble-heavy – as was the case with the MS201. We noticed a very slight delay between the rear and front speakers; they had particularly long cables, but that's no excuse.

DOLBY DIGITAL VERSUS DTS

While Dolby is the originator of home surround sound, a lot has been made of relative newcomer DTS (Digital Theater System), and its alleged improvement over Dolby 5.1.

The difference between the two lies in the compression and decompression processes. Because of space limitations on a typical DVD, it is impossible to store six separate channels of PCM audio, and so the file must be compressed. Dolby Digital shrinks audio down to a maximum of 448Kbits/sec, whereas DTS encodes to a much larger 1.4Mbits/sec.

Part of the compression process is very logical and involves deleting sections of the track that are silent. For example, if frequencies of more than 10KHz are not used, they are deleted. This can make sounds more

distinct, but also deletes low-level background noise present in those levels, which can make the result feel artificial.

Regardless of either Dolby or DTS' claims, the fact is that Dolby's encoding methods cannot be efficient enough to produce a sound equalling DTS, given DTS' immense file size; a rough comparison would be MP3 and .wav files.

DTS claims its higher bit rate gives higher quality, and logic dictates that this is true; the more data there is the less compressed it will be and so the sound will come through cleaner and more precise. However, you'll also need a pretty sophisticated system to recognise the differences and benefits in each technology; only a few sets in this group test (and a discerning ear) will pick up

any of the differences. Also, the space required for DTS on a DVD is so large that it would take up most of the room that would otherwise be devoted to extra features, perhaps making it a less popular choice.

Commercially, Dolby has the edge over DTS, as in 1995 it became one of the two standard audio tracks on DVD, the other being PCM, the commonplace .wav stereo format. DTS versions are becoming more widespread, but DTS DVDs tend to come at an extra cost. The DTS software options are limited, as far fewer manufacturers make decoding software for DTS than Dolby.

All in all, DTS has the technical edge, but the cost involved in hearing the improvements means that, in the eyes of many, it is not worth the hassle.

GROUP TEST SPEAKERS

Acoustic Energy Aego2

PRICE £299.95 (£255.28 ex VAT) **CONTACT** Acoustic Energy www.aegoproject.com

PROS Stunning sound **CONS** Hefty price tag

OVERALL The best sounding and almost the best looking; but incredibly expensive

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

While this 2.1 set may cost you nearly £300, there's no denying it is truly stunning. Dressed in stylish white plastic, the satellites may look a little puny, but the sound they produce is better than anything else we've heard from multimedia (PC-specific) speakers.

Setup caused some initial confusion as the wires are kept open on the subwoofer (like on a hi-fi), and the RCA inputs are on the satellites; traditionally this would be the other way around.

There are 3.1 and 5.1 options, the 3.1 version using the same subwoofer (hence a

redundant centre speaker output). To the rear of the subwoofer are two buttons; one switches between stereo and mono while the other handles the bass level.

The Aego2 has the most even frequency response in the test. Music is shockingly precise, clear and crisp, without any peaks or troughs. But this can sound harsh, particularly on badly mixed records and games. It's when handling DVDs though that they really shine, giving easily the best playback in the group.

Output is very directional, it is therefore important to stay directly in the sweet spot.

HIGH-END SPEAKERS



HIGH-END SPEAKERS

Creative Megaworks 510D

PRICE £349.99 (£297.86 ex VAT) **CONTACT** Creative 0800 973 069 <http://europe.creative.com/>

PROS Superb quality, but... **CONS** ...this comes at a price

OVERALL They may be expensive, but they're the only set here to fully warrant the price tag

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■



While this is a huge sum of money to pay for a set of computer speakers, if you are serious about using your PC as the basis of your DVD setup, then these should be the ones for you. Giving an awesome 150w power from the subwoofer and 75w from each satellite, they certainly pack a punch, without affecting sound quality.

The setup is much the same as with the other Creative sets on test; mini-jack cables feed the sub. The sub outputs to the satellites using RCA cables which connect to the sub using open wires. We found this particularly annoying because the wires were not

soldered together at the ends, as they were on the Mission speakers. The remote controls volume, although it does not have a power button; you must reach around to the back of the sub to turn off the set. There is also an auxiliary input and a digital decoder.

Low-end frequency response is impressive, reaching down to 32Hz, but oddly the satellites only stretch up to 18KHz.

These are the best sounding surround speakers, with excellent SNR and truly outstanding frequency response. When it comes to sound quality, they're no Aego2s, but they still stand out from the crowd.

Mission MM1

PRICE £99.99 (£84.90 ex VAT) **CONTACT** Mission 01480 423 700 www.mission.co.uk

PROS Great treble **CONS** Weak bass

OVERALL Great value, even given their poor bass response

FEATURES ■■■■■ **PERFORMANCE** ■■■■■

VALUE FOR MONEY ■■■■■ **OVERALL** ■■■■■

Just as with the Aego2s, the MM1s are a case of 'you get what you pay for', and a good deal more besides. Rich without being bass-heavy, they give some of the best treble response on test, though they tend to focus too heavily on the treble frequencies. Frequency response, on the other hand, is admirable.

Mission was the first company to adopt NXT technology, which uses multiple vibrations on a single panel to generate sound, rather than the array of diaphragms in traditional speakers.

Despite its 2.1-channel setup, this set is

intended solely for desktop use. Bass really is quite quiet, and in terms of quality, more soft than dull; all the frequencies are there, they are just too quiet for our liking. They certainly miss the mark when it comes to explosions and such in DVD films.

When it came to setup, we found the input cable far too short. The use of BFA connectors was a surprise: a method more associated with even higher-end systems. The open wires that plug into the satellites have thankfully been soldered so they don't become messy through repeated removal and reinsertion.

HIGH-END SPEAKERS



TABLE OF FEATURES



	STEREO SPEAKERS				SURROUND SPEAKERS
MANUFACTURER	ALTEC LANSING	CREATIVE	TDK	YAMAHA	ABIT
MODEL	2100	SW320	XS-IV S80	MS201	SP53
Price inc VAT	£99.99	£39.99	£79.99	£39.99	£52.17
Price ex VAT	£85.10	£34.03	£68.08	£34.03	£44.40
Telephone	0870 458 0011	0800 973 069	01737 772 212	01923 233 166	N/A
Contact	Eurotech	Creative	TDK	Yamaha	Abit
Website	www.eurotech.co.uk	http://europe.creative.com	www.talk.europe.com	www.yamaha.com	www.abit.com.tw
Amplifier to subwoofer (watts RMS)	20	12	25	18	20
Satellites power (watts RMS)	10	4.5	7.5	6	5
Total system power (watts RMS)	40	21	80	30	45
Frequency response	40Hz to 20KHz	42Hz to 20KHz	60Hz to 20KHz	45Hz to 20KHz	30Hz to 20KHz
No of speakers	3	3	3	3	6
Input socket	Mini-jack	Mini-jack	Mini-jack	Mini-jack	G9
Output from subwoofer	Phono	Phono	Din (right) and mini-jack (left)	Phono	Phono
Supplied cables	Mini-jack, RCA x 2	Mini-jack, RCA x 2	Mini-jack x 2	Phono, Din, mini-jack	RCA x 5, G9
Remote control	✓	✓	✗	✗	✗
Remote connection	PS/2	Integrated into subwoofer input	N/A	N/A	N/A
Warranty	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware

TABLE OF FEATURES



	SURROUND SPEAKERS		HIGH-END SPEAKERS		
MANUFACTURER	VIDEOLOGIC	YAMAHA	ACOUSTIC ENERGY	CREATIVE	MISSION
MODEL	ZXR-500	TSS-1	AEG02	MEGAWORKS 510D	MM1
Price inc VAT	£79.99	£159.99	£299.95	£349.99	£99.99
Price ex VAT	£68.08	£136.36	£255.28	£297.86	£85.10
Telephone	01923 260 511	01923 233 166	N/A	0800 973 069	01480 423 700
Contact	Imagination Technologies	Yamaha	Acoustic Energy	Creative	Mission
Website	www.videologic.com	www.yamaha.com	www.aegoproject.com	http://europe.creative.com	www.mission.co.uk
Amplifier to subwoofer (watts RMS)	25	18	40	150	50
Satellites power (watts RMS)	8	6	20	75	25
Total system power (watts RMS)	65	48	80	500	100
Frequency response	40Hz to 20KHz	40Hz to 20KHz	30Hz to 20KHz	32Hz to 18KHz	40Hz to 20KHz
No of speakers	3	6	3	6	3
Input socket	Mini-jack	Mini-jack	Mini-jack	Mini-jack	Mini-jack
Output from subwoofer	Phono	Phono	Open wire	Phono	BFA
Supplied cables	Mini-jack x 3, phono x 3, RCA x 5	Mini-jack x 2, optical, RCA	Mini-jack to phono	Triple mini-jack	BFA x 2, phono x 2, mini-jack x 2
Remote control	✗	On decoder	✗	✓	✗
Remote connection	N/A	N/A	N/A	RJ11	N/A
Warranty	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware



ALTEC LANSING	CREATIVE	HERCULES	LABTEC	PHILIPS	UMAX	VIDEOLOGIC
4100	INSPIRE 5300	XPS510	ARENA 530	A3.600	672 A-BOX	DIGITHEATRE LC
£179.99	£99	£69.99	£59.99	£139.99	£72.85	£129.99
£153.18	£84.26	£59.57	£51.06	£119.14	£62	£110.63
0870 458 0011	0800 973 069	020 8665 1881	01753 870 900	0800 169 8430	0870 906 3300	01923 260 511
Eurotech	Creative	Hercules	Logitech	Philips	Umax	Videologic
www.eurotech.co.uk	http://europe.creative.com	http://europe.hercules.com	www.labetc.com	www.pcstuff.philips.com	www.umax.co.uk	www.videologic.com
40	18	20	15	2 x 25	20	25
25	6	8	4	10	5	7.5
140	48	60	31	100	45	62.5
30Hz to 20KHz	47Hz to 20KHz	35Hz to 20KHz	40Hz to 20KHz	40Hz to 20KHz	50Hz to 20KHz	50Hz to 20KHz
5	6	6	5	5	6	6
Mini-jack	Mini-jack	Mini-jack	Mini-jack	G9 and mini-jack	Mini-jack	Mini-jack
Phono	Phono	Phono	Phono	2.25in jack	RCA	Open wire
Mini-jack, RCA x 4	Triple line-in mini-jack, attached cables on satellites, attached Din cable for remote	Mini-jack x 3, RCA x 5	Mini-jacks, 4 attached, one separate	G9, G9 to S/PDIF, mini-jack x5	Mini-jack, RCA x 5	Mini-jack x 3, dual phono x 3
✓	✓	x	x	✓	✓	x
Din	Din	N/A	N/A	Infra-red	On control centre	N/A
2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware	2yrs limited hardware

TOP FIVE PC AUDIO TIPS FOR THE SOUND FANATIC

1 As with every PC component, the correct drivers are essential for a sound card to function at its best. Therefore regular visits to the manufacturer's website in search of the latest version is thoroughly recommended. The most recent version of DirectX is also recommended, as latency is reduced with each revision, which decreases the level of disparity between audio and video playback; a common problem with older models.

2 It is also wise to ensure that your whole system, particularly the motherboard, processor and memory, is running at optimum levels. This is because the sound card has little effect on the speed of sound production; the processor remains responsible for processing the large amount of data produced by audio. Sound cards focus more on the quality of the sound produced.

3 If you feel the quality of audio coming from your system is not living up to expectations, and you're not sure where the problem is coming from, there are many programs that will investigate it for you. Applications such as Soundchecker, which you can download from www.cl.spb.ru/asm104/downlod.htm (yes, 'downlod'), tests

audio equipment to determine the location of the weakness. It does this by checking for non-linear distortions (which appear as spikes in the waveform) and by measuring the amplitude frequency response and the all-important signal to noise ratio (SNR). Sound cards, mics, amps, speakers and headphones can all be checked.

4 Regardless of the quality of your internal sound card, speakers play a vital role, and their setup can cause just as many problems when it comes to the quality of the sound. Crackling, hissing and pops are all common problems, and can usually be fixed by simply turning the speaker volume down. This reduces the current transmitted to the speakers, therefore reducing the electromagnetism that

causes the hiss and crackle. It will also cut down on the number of sharp fluctuations in current that cause popping. Then you simply increase the level coming from the PC to compensate.

5 Ensure that microphones and other such devices are kept well away from the speakers as these can cause feedback when turned on. Also, placing speakers on top of monitors is unwise, because the electromagnetic currents that the speakers produce can cause permanent damage to the tube. Finally, as basic as this sounds, check which jack the speakers are plugged into. Speaker-out jacks are designed for non-amplified speakers; therefore, in most cases, the line-out socket should be used.



Editor's Choice

The speakers tested here took on various shapes and sizes and gave us performance results that, on the whole, seemed to be reflected by their cost. In terms of value, though, one manufacturer stood out: Creative. In both the 2.1 and surround sections, they delivered some of the best sound quality and ease of use.

In the 2.1 (stereo) speaker section, it was difficult to determine a winner. There was precious little to separate the best two sets: the Altec Lansing 2100s for great looks and above average sound; Creative's SW320 for stunning value. However, we felt that Creative had the edge over its competitor as, although it had weaker playback, the **Creative SW320** was £60 cheaper than its rivals, and therefore deserves the **Editor's Choice** for this section. While we had objections to the use of open wires to connect the satellites and the poor signal to noise ratio (SNR), these complaints fade if you consider the speakers' good value.

When it came to the overall winner in the surround-sound section, there were no surprises. The **Creative Inspire 5300** was the best set of speakers for both sound quality and value, winning an **Editor's Choice** award. Its price, at £100, is more than many of the other sets, but you get what you pay for, and more besides. SNR was vastly improved over this set's predecessor, the infamous DTT 2200s, and not too far off its dearer brother, the Megaworks 510D.

Videologic's ZXR-500 speakers certainly deserve a mention. Coming in at £80, they were £20 cheaper than Creative's masterful Inspire 5300 and, while the lower price was reflected in the disappointing sound quality, they were still impressive and deserve a **Highly Commended** award. Easy to set up, the speakers are far better looking than their predecessors. Positioning was accurate in 5.1-channel use, although this did hamper the size of the sweet spot.

In the high-end section, **Acoustic Energy's Aego2** speakers were, without a doubt, the most uplifting set we have ever heard, grabbing our final **Editor's Choice** this month. If cost were no object, we would easily opt for these. SNR was fantastic and playback gave the most even response we have

heard in multimedia speakers. But at a smidgeon under £300, you are paying through the nose for the quality – although the extra for these little gems is certainly worth it.

How we tested

While many may opt for testing frequency response with complex acoustic and electrical tests, the results such tests achieve can often have little relevance to how the speakers sound. The best way is to use them: send a variety of music, effects and film soundtracks through and simply listen.

We used the same pieces of music in each test, selecting tracks from various genres. Each was used to test the speakers' response to certain frequencies. Sound effects, such as crashes, bangs and other high- and low-end noises were also used to check for distortions at particular frequencies.

When testing how each set coped with surround sound, the same chapter of a particularly action-packed DVD was used. The speakers were put in the same places each time, in accordance with the guidelines in our 'How to set up surround speakers' box. They were then monitored for how well they coped with the information, in particular how even sweeping sounds were when they crossed from speaker to speaker.

One of the most important things to check for is the SNR. This is a measure of the amount of background noise generated by the speakers in comparison to the sound produced. The further we went down the price range, the worse this tended to become; this is closely related to the speakers' build quality.

We also looked at how easy the speakers were to set up. Colour coding the leads and inputs was a major bonus, making setup incredibly simplistic. We approve the use of mini-jacks, mainly because of their use throughout consumer audio equipment. However, the quality of sound produced through these tends to be weaker than other connections, such as full-sized jacks, or even BFA. This is because the jack is smaller causing the accuracy of the signal to be compromised. However, with sound cards there is rarely any alternative, as almost all cards output through mini-jack connections.



Creative SW320



Creative Inspire 5300



Acoustic Energy Aego2



Videologic ZXR-500

The Aego2s were the most uplifting set we have ever heard