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# T3



**WORLD FIRST**

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## BEWARE OF THE DOG!

WE SQUARE UP TO SONY'S MEANEST-LOOKING AIBO YET

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# BEWARE OF THE DOG

Sony's latest AIBO is its meanest looking mutt yet. We take an in-depth look at the tech inside it, and discover the past, present and future of the world's favourite robot

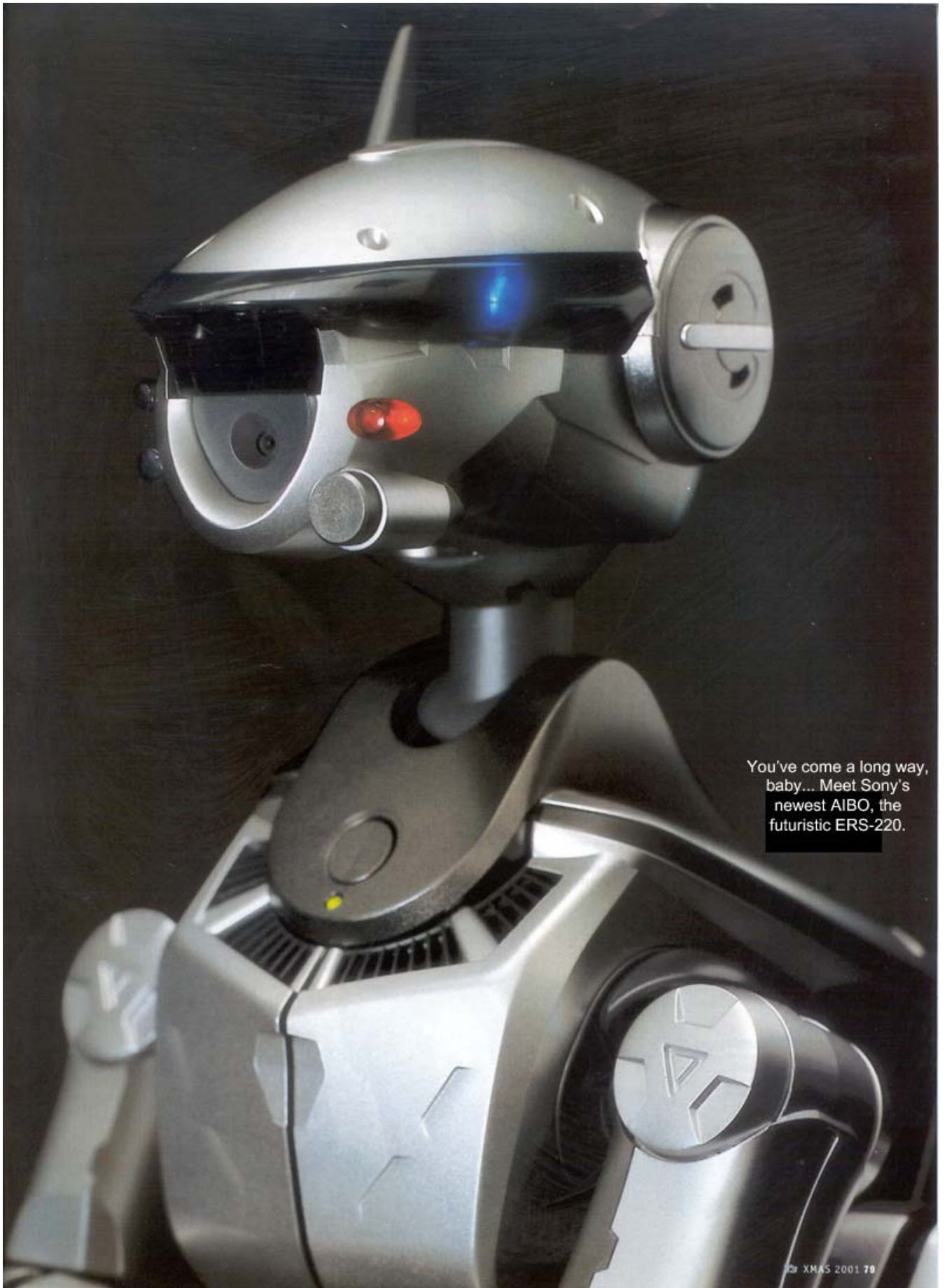
Words: Nick Renshaw Photography: Louise Broom

**KIT** AIBO ERS-220 **COST** 1,800 (£1,114) **CONTACT** Sony 020 7365 2938 **WEBSITE** [www.aibo.com](http://www.aibo.com) **AVAILABLE** December 2001

I'll let you into a little secret. I didn't initially subscribe to Sony's robot dog phenomenon. The first time I clapped eyes on the first-generation AIBO, I was the one at the back looking on sceptically as the rest of the team went gaga over the cutesy little pup. And that was no macho reticence; I just felt that Sony was peddling a glorified toy, way too desperate to be the first to show off new robotic technology. In my mind, a real robot should be able to deliver some kind of tangible labour, show signs of helping people in daily life rather than

just being an artificial pet pooch in a plastic body. I wanted more than mere entertainment, goddammit!

So it wasn't until a recent visit to Sony AIBO headquarters, three years on from the first pup's birth, that I became a convert. The unveiling of the fourth and most futuristic of the hounds, the ERS-220, somehow caught me unawares. All it took was a tilt of its head, a flash of LEDs, a volley of beeps and an inane grin appeared across my face. It finally dawned on me what Sony was preaching... 🐕



You've come a long way,  
baby... Meet Sony's  
newest AIBO, the  
futuristic ERS-220.



# AIBO

**VERTICAL HEAD SENSOR**  
This pressure-sensitive switch enables you to interact with AIBO.

**RETRACTABLE SPOTLIGHT**  
Appears when AIBO gets excited and goes into Boost mode.

**SIDELIGHTS**  
These six LEDs light up to display AIBO's emotions.

**INFRARED DISTANCE SENSOR**  
AIBO uses this to interact with his environment and judge how far objects are away from him.

**FACE FRONT LIGHTS**  
Enables you to tell if AIBO is paying attention to your commands.

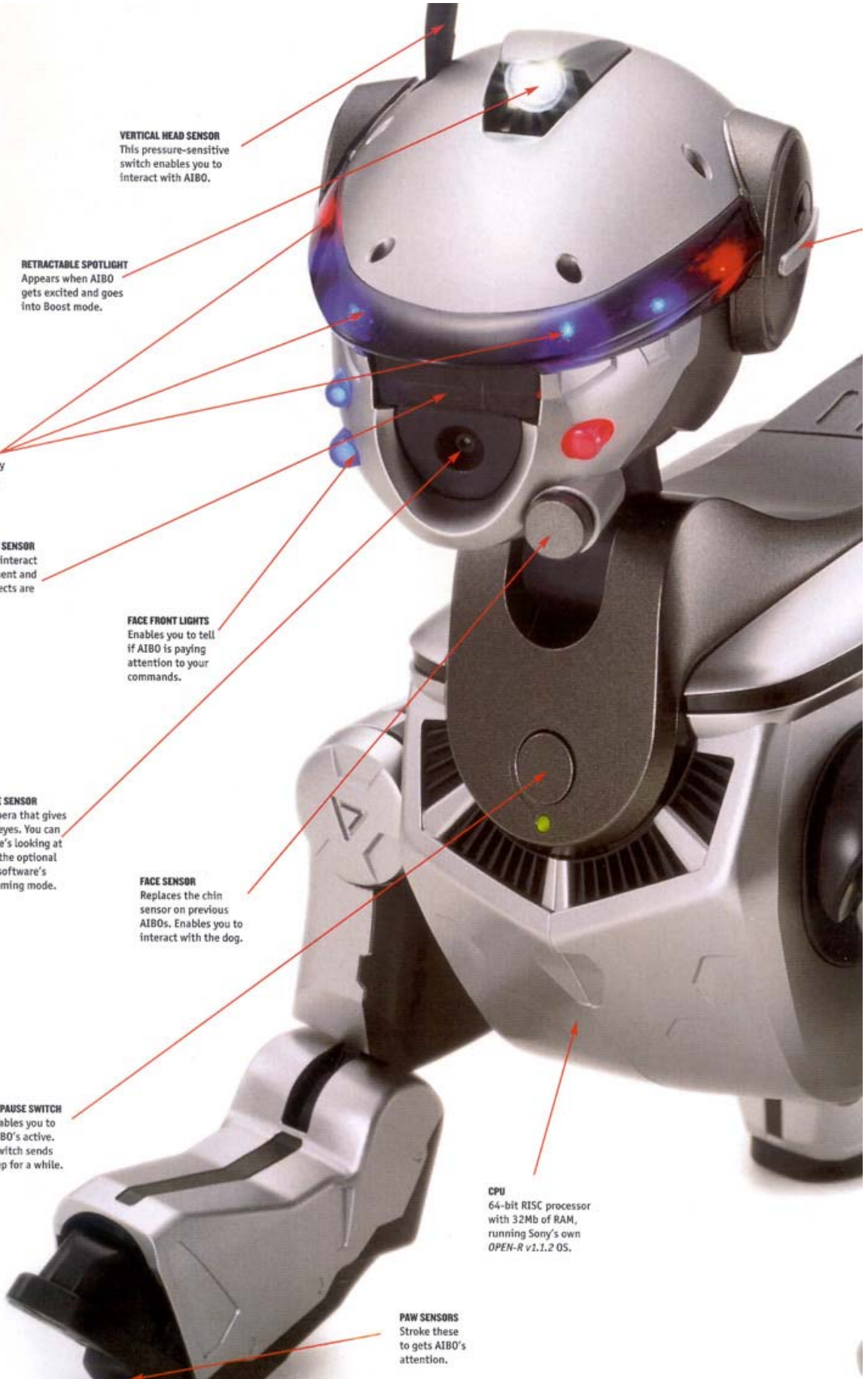
**CMOS IMAGE SENSOR**  
Digital camera that gives your AIBO eyes. You can see what he's looking at too, using the optional Navigator software's video streaming mode.

**FACE SENSOR**  
Replaces the chin sensor on previous AIBOs. Enables you to interact with the dog.

**CHEST LIGHT/PAUSE SWITCH**  
The light enables you to tell when AIBO's active. The pause switch sends AIBO to sleep for a while.

**CPU**  
64-bit RISC processor with 32Mb of RAM, running Sony's own OPEN-R v1.1.2 OS.

**PAW SENSORS**  
Stroke these to gets AIBO's attention.



**STEREO MICROPHONE**  
Enables you to communicate with AIBO via its voice recognition software.

**BACK SENSOR**  
Another touch sensor that enables you to interact with AIBO.

**TAIL LIGHTS**  
Like the sidelights on AIBO's head, these three LEDs show you how the pooch is feeling.

**BACK MULTI INDICATOR**  
Another six LEDs for increased expression and personality. This dog is one big light show!

### Puppy love

☐ Sony's Artificial Intelligence Robot, or AIBO as we now know it, first came to light in 1998 when the company leaked pictures of a six-legged prototype that resembled nothing but a bundle of wires and metal legs. The company didn't hint at what would follow until it rolled out the ERS-110 in July 1999. Nicolas Babin, general manager at Sony Entertainment Robot Europe asserts, "We ☐

## Behavioural software

**AIBO Life 2 for ERS-210/220** £64  
This enables AIBO to grow from a pup to a fully grown adult, developing his own emotions and instincts through interaction.

**AIBO Master Studio 1.1 for ERS-210/220/311/312** £350  
This programming kit enables you to create new behavioural patterns and expressions for AIBO, which you can send to him using the optional wireless LAN card (E200).

**AIBO Fun Pack for ERS-210** £71  
Only works in conjunction with *AIBO Life*. Use this to monitor AIBO's growth and look at his photo diary. Also enables your dog to alert you to birthdays, meetings etc.



**AIBO Navigator for ERS-210/220** £105  
Control AIBO remotely from your PC. Put the pink ball in front of the dog and he will walk towards it and kick or head it once he reaches it. Wireless LAN card required.

**Hello AIBO for ERS-210** £56  
If you can't be bothered to interact and nurture AIBO, this will turn him into a mature, fully functional robot. This upgraded version comes with 75-word voice recognition and a Boost mode.

**AIBO Party Mascot for ERS-210** £64  
This enables AIBO to entertain your guests with singing, dancing, party tricks or a round of 'scissors, paper, stone'.



**AIBO Messenger for ERS-210/220** £105  
Enables AIBO to read the email and website content on your PC. This text-to-speech and text-to-action app is controlled via voice recognition and a wireless LAN card.

**AIBO Explorer for ERS-210/220** £64  
Autonomous software for the 220 that gives your dog heightened instincts to explore and learn its surrounding environment.



## AIBO

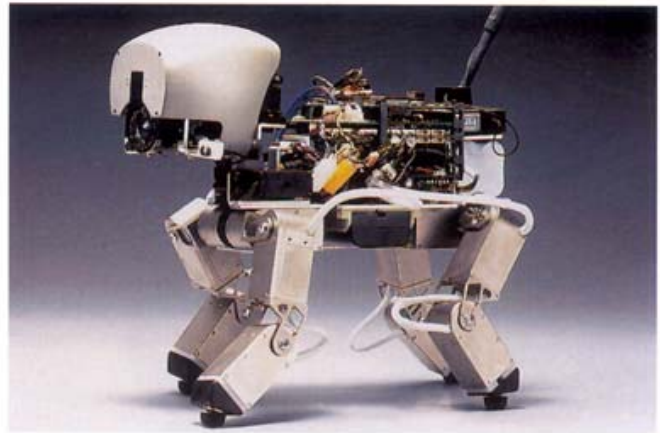
“I wanted to encourage communication between man and machine. Also to incorporate all of Sony’s technology in one product – digital camera, wireless LAN, Memory Stick – and obviously this has progressed through the years. That was the original idea.”

Of course, the mutt caused quite a stir around the technology globe. And Sony initially only put 5,000 units up for sale – 3,000 in Japan and 2,000 in the US – over the internet, just to test the water. Even Sony was shocked by the response – the sheer number of frantic consumers sent the system into meltdown.

By the new millennium, AIBO fever was in full swing. Sony celebrated the robot dog’s first birthday with a slap-up party in Tokyo where fanatical AIBO owners congregated to rejoice and grab a slice of AIBO’s special birthday cake. Just to finish the festivities off, an army of the talented mechanical canines conducted their own chorus of Happy Birthday.

And the madness continued; a magazine dedicated to the mutt was even launched in Japan. Called *AIBO Town*, the mag includes a regular poetry corner that frequently has you laughing into your PC. Photographs of AIBO shot against evocative Japanese backdrops were the stimulus for such beautiful verses as *Our ancestors found a beauty in shadows* and *The soft*

This is what the prototype of the ERS-110 looked like. As you can see, there was still a fair bit of work to do before AIBO became our cuddly friend.



*light passing through a paper screen pauses the flow of time.* It seemed AIBO had somehow achieved iconic status, even if somewhat comically.

### Mass hysteria

Such was the Japanese nation’s infatuation with the wee pup that Sony seized on the opportunity to develop its technology and deliver a more advanced robot. When the ERS-210 wandered out into the spotlight in October 2000, eschewing the doggy style for a more generic

animal appearance, it looked like gadget heads were going to fall in love all over again. And this time Sony was prepared. Unrestricted worldwide availability – though still only via the net – meant AIBO had become a mass market phenomenon. In technological terms, too, the ERS-210 had the 110 sniffing its balls. With double the memory (at 32Mb) and able to recognise as many as 40 spoken words, AIBO was starting to realise Sony’s robot entertainment vision – AIBO had evolved into a personality.

## AIBO family album

### ERS-110/111

The first generation that put Sony’s robot dog on the map. Only 5,000 were made available in the US and Japan on its initial release in late 1999, but such was the frenzied demand, Sony manufactured more. This floppy-eared canine went on to sell 45,000 worldwide and is now a collector’s item.



### ERS-210

The 110’s successor had us a little confused. This robot was based on a lion cub rather than man’s best friend. Still, it was more streamlined, and when those little ears twitched... ahhh! The 220 was also the first obedient robot with 40-word voice recognition. Sit! Stay! Fetch the pipe and sùppers! Well, almost.



As 110,000 people worldwide played with their ERS-110s and 210s, Japan was still leading the line in AIBO obsession (AIBO Town shops were now popping up, exclusively selling AIBO accessories). But Sony felt it was alienating certain members of the public – the ERS-110 at just under £2,000 was a little steep for the average punter, and the 210 at £1,059 didn't sit all that well with the bank manager, either – so the more affordable LM Series was created. Cute characters Latte and Macron were aimed at teenagers and women and could be yours for £700. Branded Hi-touch robots, these new pups concentrated on creating a bond with the owner rather than delivering any true functionality. They took AIBO to a new level of sickly sweetness.

However, with these new robots offering one type of companion, Sony couldn't rest on its laurels. And it's now we arrive at its latest family member, the ERS-220.

#### Family fortunes

As far from the LM Series as you can get, the £1,117 ERS-220 was born of a rallying call from the market. If you're making robot dogs, you shouted, why not make them look like robots? Sony obliged and forged the futuristic ERS-220. After the cutesy demeanour of Sony's existing line-up, the sleek space-age guise of the 220 is a

refreshing tonic, a major aesthetic departure for Sony. But who is it going to appeal to? Sony's Nicolas Babin again: "The reason we created 220 was to have a product that would reach more people. The LM series was launched in order to attract teenagers and females. We're hoping the 220 will appeal to owners of the 210 and IT-aware males aged between 25-45. We hope also that the 210 will appeal to more of the female IT literate crowd." So Sony seems to have it all under control, then.

### No more cuddles – this is the sort of dog Terminator would take for walks to scare the shit out of the local pitbulls

My first impression, as the 220 sat dormant, was how mean the mutt looked. No more cuddles for AIBO. It's the sort of dog Terminator would take for walks to scare the shit out of the local pitbulls. Until Sony fired it up I was wondering if even the IT crowd would go for its sinister cool. Once the 220 came to life though, it took on a whole new personality. Sony has fitted the dog with a litany of blue and red LEDs across its muzzle which give it a renewed expression. As it beeped and lurched into action its smoother movement and acute head gestures transformed the hound into a very amiable chap. But the

mongrel could act happy or belligerent, when the mood took it. It confounded even my expectations.

#### Give a dog a bone

Sony may have given the AIBO a futuristic makeover, but when it comes to the tech specs, the 220 has only really been tweaked here and there. Like its cousin the 210, it houses a 64-bit RISC processor, 32Mb of memory and a 1/6-inch CMOS digital camera. With only 16 degrees of freedom, compared to the 210's 20 (a lack of tail,

ears and mouth is Sony's way of distancing itself from the realistic dog look) it compensates with a legion of LEDs – ten LEDs on the face plus a further nine on its rear end. The 220 is also a touchy-feely fella, with an antenna switch on top of his head that you can flick or stroke, a chin sensor to press, four switches arranged around his hindquarters to pat, and four paw sensors that make him whistle with pleasure when stroked. Another new feature that gives the 220 an added expressive dimension is the boost mode. If communication goes well with another AIBO or its owner, a sound like a car starting is heard and

#### ERS-311/312

Looking more like a cartoon toy dog than a robot, the LM Series was released to attract teenagers and female fans alike. Latte and Macron are designed to form a bond with their owners through their 75-word voice recognition system and mimicking capabilities.



#### ERS-220

Sony's newest and baddest dog distances itself from the cute puppy look, in a nod towards what we perceive a robot dog should look like. The most advanced of the AIBOs, this latest mongrel will have you panting for its futuristic looks, 75-word voice recognition and updated software. K9 eat your heart out.





## Build your own

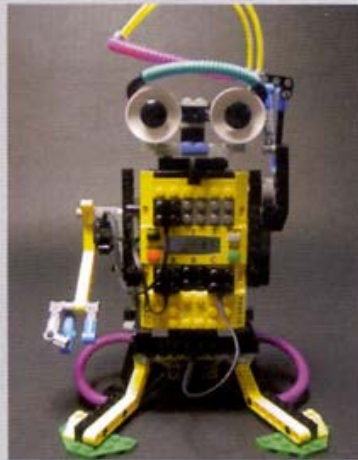
The DIY robot industry is a billion-dollar business in Japan. Here are their three top-selling robot kits



Kit: Movit Robot Arm MR-999  
 COST: ¥4,670 (£26)  
 WEB: [www.elekit.co.jp](http://www.elekit.co.jp)

Putting the Movit Robot Arm together represents quite a challenge, despite being designed as an introduction to mechanics and electronics. It is a fun kit to assemble and then play with for half an hour, until you realise you don't have any nuclear waste in your house requiring a robotic arm to pick up and dispose of... The Robot Arm comes with decent assembly instructions, so you can get to, ahem, grips with all 17 joints, and requires a little tweaking here and there to get it performing to its capacity. But overall this is a decent kit for beginners, especially at this price.

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Kit: Lego Mindstorms Robotics Invention System  
 COST: ¥23,300 (£135)  
 WEB: [mindstorms.lego.com](http://mindstorms.lego.com)

The RIS from Lego has taken the construction block route, pull out the shoebox full of Lego from the back of your cupboard, add it to the RIS and let your imagination run wild. The RIS comes with a USB-connected infrared control tower that enables you to send programmed functions from your Windows 98 or ME PC to your creation. It also comes with motors, sensors and enough wheels and cogs to make a Swiss watch. The beauty of this kit is that you can build the suggested models using the step-by-step instructions, or you can be as creative as you like. The downside is that you can never find that vital piece you need...

**T3** ★★★★★



Kit: Cube CAM-08 Perpetual Humanoid Robot  
 Cost: ¥15,000 (£85)  
 Web: [www.cam-system.jp](http://www.cam-system.jp)

According to statistics, this is the second most sought-after DIY robot in Japan. You have to give credit to its designers for creating a two-legged model that can walk forwards and backwards, but beyond this, the CAM-08 stinks. A cinch to put together, it takes no longer than ten minutes to click the panels in place on its legs, snap its arms into position and tighten a few screws. Pop his head on, and you're off. The CAM-08 doesn't really do much beside walk, flash a green light from his eyes and make a suspect sci-fi-sounding noise. But the above website is devoted to the little fella, and features a small movie showing him off.

**T3** ★★★★★

the spotlight hidden on top of his head will appear. This means your AIBO's emotions are running high and he'll paw the ground, hitch up his hips, shake and swing his head in elation.

The 220 is also perceptive to your commands, able to recognise some 75 words. To gain his trust you have to be quite expressive yourself. He recognises the tone of your voice and simply ignores your commands if you get too lackadaisical. Be stern but well-mannered, and the 220 will heed your every whim. It takes some practice.

## To gain his trust you have to be quite expressive yourself – he'll ignore your commands if you get too lackadaisical

Witnessing the 220 reading out your emails is also an impressive sight. A single command will instruct AIBO to recite your messages in one of three voice types (ranging from an effeminate Stephen Hawking to a butch Stephen Hawking) and speeds. But perhaps Sony's best achievement is getting the different models to interact with

each other. We know previous models packed an infrared sensor to negotiate obstacles and depth of field, well now this has been used for AIBOs to get chummy. With either the *AIBO Life* or *Hello AIBO* software installed, the 220 can interact with other AIBOs using infrared. It can walk up to Macron from the LM series, for example, and the two dogs will imitate each other and even have doggy conversations. Surely the next logical step would be for AIBO to have spontaneous conversation with its owner or fellow AIBOs?

"The 210 could only recognise 50 words, now the LM series and 220 can recognise 75. Considering that the first generation didn't have voice recognition, the progress in 12 months is absolutely amazing," Babin gushes. "In another year's time I don't know where we will be, let alone five, ten, twenty years' time. As for carrying

out a spontaneous conversation, if the market believes it then we'll do it. Five years ago did you think we would be here talking to robots?"

### It's a robot world

In such a competitive climate, Sony is staying tight-lipped about immediate developments. We reported on its robot man prototype, the SDR-3X Sony Dream Robot in issue 61, although Sony is adamant a commercial release for the SDR is not imminent. This pint-sized, autonomous bi-ped is most people's stereotype of how a robot should look and act.

Although we're a long way off having full-sized autonomous robots carrying out chores for us, Sony, by taking the 'entertainment' tack, may just be slowly preparing us for that eventuality. The sight of a puppy-sized robot scampering around is not such a shock as seeing a six-foot humanoid dressed like a butler making your bed and fixing you lunch. It all sounds great and fantastical, but ask yourself this, are you really ready for that future? **T3**