



T3: Tomorrow's Technology Today is a new magazine all about new gear and great gadgets, and the technology that creates them.

In this file you'll find samples of the cover, typical contents page, news section, features (on digital cameras) and reviews (of Sharp's new MiniDisc recorder), all taken from issue one of the magazine.

If you like what you see, why not nip out and buy the current issue? Or print out the subscription form in this file for a money-saving offer.

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PS, Why not visit our web site at:

<http://www.futurenet.co.uk/t3.html>

T3

TOMORROW'S TECHNOLOGY TODAY

p110 CD and Video **p88** Home cinema **p52** Mad gadgets



Objects of Desire

From digital camcorders to crazy hi-fi, T3 is crammed full of the coolest gear!

You're Nicked!

The gadgets *they* don't want you to buy...

Voltswagon

An electric sports car? No, really - it's red and everything

How to...

Make your £200 speakers sound like they cost £2,000

How the Hell...

Do Global Positioning Systems work?



We played with

A 64-bit games machine
Dolby Digital AV amp
Digital Video camcorder
LaserDisc player
Weird MIDI hi-fi
APS cameras
and tons more kit...



INSIDE!
The hardware with the highest wow-factor revealed!

Components

INSIDE THIS ISSUE OF T3: TOMORROW'S TECHNOLOGY TODAY

THREE GRAND'S WORTH OF DIGITAL CAMCORDER!

Panasonic's gorgeous new digital camcorder pushes back the boundaries of portable movie making. And now YOU can be one of the first people to own this stunning hardware. T3's simple-to-enter compo is on page 29, now!



ISSUE TWO ON SALE
14 November 1996
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November 1996

November 1996

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Dodgy Gadgets

Shops can sell them, you can buy them, but turn them on and you

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Voltswagon

General Motors is about to launch its EV-1 electric sports car: 0-60 in nine seconds, and 90 miles on a full tank of electrons. T3 goes for a whirl

Some electric cars have a tendency to turn transparent. All those spare electrons, y'know...



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It's taken over a hundred years, but photography is entering a new era. Digital cameras are useable, available and affordable! T3 points shoots... 'n' shoots...



Find out why Canon's £300 Powershot 600 is T3's choice of camera.



The Fujix takes the best pictures. But guess how much it costs?

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Network Computers have been hyped as the future of computing. But what the hell can you do with a machine that has no hard drive and very little RAM? Find out if T3 gives NCs a vote of 'No Confidence'

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T3's review section is crammed full of the sexiest kit money can buy



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Talk about technolust. If this thing had legs and lips we'd give it one



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A monster amp for monster sound. Impressed? You better be



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A satellite decoder for round-the-clock CD quality music - in Flemish



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TAKING THE TERM 'DESKTOP COMPUTER' TO ITS LUDICROUS EXTREME

The ultimate desktop accessory is the Powerdesk. It comes with a built-in Intel PC, flat LCD screen and slide-out keyboard. An infra-red mouse does away with cabling, while CD and disk drives are hidden inside. Choose your PC configuration, select the type of wood and then hand over £1,500. Contact Powerdesk (01273 814284)



TECHNOLOGY GONE MAD

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PRE Toshiba stuffs cinema into a box

Over there, they're *de rigueur*. Over here, rear projection TVs are still a thing of wonder. T3 checks out Toshiba's brand new beauty

Kit: Toshiba 55"
Cost: £3,500
Company: Toshiba



Energy saving? Compact new design? Stylish engineering? Puh. The Tosh is enormous and proud of it.

Pentagon phones for Chinese
The military headquarters of the world's remaining superpower uses telephones made not, as you would expect, in special space labs but in the Jiangsu province in eastern China. The Zhongqun telephone. Equipment. Company, which set up shop just 12 months ago, now churns out a startling 2.5 million blowers every year. ZTE started shipping phones to the States in February and one client in particular – the Pentagon National Defence And Extreme Retention Company of Washington DC – is worth £20 of them. Now whenever the five-star general makes a phone call, it's over too soon and they want to dial again an hour later.

Unlike America, where budgets, homes and egos are large enough to accommodate them, the UK has seen relatively few rear projection TVs. The field has been left almost exclusively to Pioneer and Philips to propagate a healthy, if small, market for monster (like, 48-50 inch) sets.
Last year, however, Sony entered the arena with its award-winning KP-SA112 box – 41 inches across and £2,800 deep. And now the ante has been upped once more by Toshiba with its awesome 55-inch (135cm visible screen size), Pro Logic TV – the very first of its kind to be unleashed on the cash-wielding British public.

Complete with satellite speakers and on-board Dolby Pro Logic system, the SP916B is about as near to an all-in-one home cinema system as you can get. Tosh's new Hi-Brite screen technology goes some way to removing the 'sweet' viewing spot required by other projection sets and the production model seen at T3 was up there with the best in terms of picture quality.

Stomping in at a hefty £3,500, the 55P916B is no impulse purchase; but remove the cost of a separate AV amp and four speakers, and it doesn't look such a bad buy ('No love, really, look at it as an investment...'). However, the case it sports built-in front speakers (rated at 50W RMS – not particularly hefty given the asking price) and – unlike Tosh's large screen CRT sets – no centre speaker. The logic being that

if you're spending this much cash on a TV, you've probably already got a top notch centre and probably more power than you know what to do with...
Pro Logic functionality is backed up by Toshiba's five-mode DSP, and it features digital picture processing, pure NTSC playback for those tricky LaserDiscs, 100-channel tuning, auto-scan, Fastext and on/off timer. And it's made in Plymouth as well, so that's one

in the eye for our American/Japanese cousins. A smaller (bah) 48" set will also arrive slightly later with a much-reduced price tag of £3,000, but otherwise with the same spec.
The first sets start denting shop floors around September time but don't bother rushing down to your local Comet – they've all already been sold. Next move to Sony – anyone fancy a 65-inch in their living room?

CAN I BORROW YOUR PEN? AND YOUR PHONE BOOK, YOUR...

It's a pen! It's a PDA! It's wacky and zany! This rather chunky ballpoint from the US also happens to double as a simple but usable personal organiser. All very nice, but what's the real reason? Is, just where the hell do you put the refills?



WALK ON WATER...

Fancy a stroll across the pool? The Walk on Water competition in San Diego produced a plethora of 'Jesus shoes' – 8-foot long buoyancy devices you strap to your feet for improved aquatic mobility. But such stuff costs at a price. Cost to you, square, just under \$300 (£200) and http://www.networld.net/~tasakar/www.html

GOLD (GOLD), ALWAYS BELIEVE IN YOUR SOUL

Technics turntables have long been the choice of mixing DJs in clubs across the land, and the SL1200MKII the most sought-after of all. In recognition of this fact, the company has issued 1,000 Limited Edition Special gold-plated turntable units.
The £1,000 SL1200LTD comes with gold tonearm and DJ headshells, plus a commemorative set of DJ headshells, plus a commemorative set – just in case you forget that you own one.
Contact Technics on 0980 357357 to order your 'Goldie' special.
Okay, it may not be new technology, but it is very shiny.

TOYS FOR THE BOYS

T3's regular look at the stuff that's designed for kids and bought by adults...
Independence Day Alien Supreme Commander
£30, Forbidden Planet (0171 8364178)
You've seen the film, now fiddle with the toy. US plaything manufacturer Trendmasters has decided to forgo the false-secure, 15-mile-wide alien slips in favour of a more manageable stand-up version of the extraterrestrial's supreme commander.
Now, to the casual observer, this looks like a bit of a crap toy. It's all spindly, it doesn't stand up very well and it ain't exactly Action Man when it comes to striking dramatic poses. But wave your hand in front of its motion sensor and the creature lets out a scream to curdle the thinnest blood, while the exoskeletal carapace swings open to reveal the weirdy little alien inside. Urgh.
As a present for kids kids it's right up there with the transparent human showing off its internal organs in one of those luscious creepy crawly which sit at the end of the bed and grin at you with the flaming red hair, pale face and wide, staring eyes.
Yes, anyway. This thing would be ideal for sitcom next door.

Tiny Pilot takes off

PALM'S NEW PDA IS SMALLER THAN A SMALL THING

Think US Robotics and you probably think 'Sportster', closely followed by 'modems'. And maybe 'incredibly popular owing to cheapness and reliability' if you're a particularly literate thinker. Soon, though, that thought should be 'personal organisers', as the redoubtable firm muscled its way into the handheld PDA market.
Pilot is the name of USR's first major product to emerge from its Palm Computing division, which previously came up with the (ahem) 'Landy Zoomer'. Rather than a fully-ledged PDA with keyboard, spreadsheet, modem and so on, it's intended to act as a portable accessory to the PIM (Personal Information Manager) on your PC.
The most noticeably striking thing about the Pilot is its size – it's really not much bigger than a playing card, and only 0.7-inch thick, so it fits easily into a shirt pocket.

The UI has been designed to be as simple as possible. For instance, there's no on/off control – you just press one of the four main function buttons to access the built-in to-do list, calendar, notepad, address book and

calculator. Data input can be performed using either an on-screen keyboard or USR's award-winning text recognition software *Graffiti*.
Graffiti is a little different to other systems; rather than learning your handwriting

through training, you have to learn a stylised alphabet. Before it will work, USR reckons it takes about 20 minutes to learn most of *Graffiti*, and the advantage is it's then 100% accurate – up to speeds of 30 words per minute.

Pilot also has a handy-clardy HotSync function. Stick it in its cradle which is attached to your PC or Mac, press the Sync button and the data on both your computer and Pilot are synchronised automatically.

Windows/Mac PIM software is included with the Pilot, which also integrates with most popular PIM packages. It also runs Palm's OS, enabling developers to write new applications.
The £249 Pilot 1000 has room for 750 addresses and a year's worth of appointments; although for just £50 more you can get the 5000 model which holds 5,000 records. A 1MB memory upgrade is also available for £129.

Contact US Robotics (0800 225252), http://www.usr.com/palm

Suggestion: do not put the Pilot into your new jeans pocket unless you enjoy spending £300 on a regular basis.



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November 1998

Independence Day Alien Supreme Commander

£30, Forbidden Planet (0171 8364178)

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Yes, anyway. This thing would be ideal for sitcom next door.

Lightyear (£26, The Disney Store), on a shelf in your home cinema room – or you could always buy it for your sister's kiddishome bar.





Forget winchesters full of arcane chemicals and endless developing times. Digital photography has arrived...

Taking the pixels

Chuck those old 35mm cameras in the bin – digital photography is here, and it's going to take over. Probably. Dave Pearman tries out today's cameras, and looks at tomorrow's technology

You might think your latest autofocus SLR camera – or even your brand new APS compact – is a miracle of modern technology. But at the end of the day your pictures are still recorded on a mix of environmentally-unfriendly chemicals, stuck to a base made from boiled-up dead animals, just as they were a hundred years ago. Conventional film is damaged by heat or light, and has a limited life, in more ways than one.

Forget it. It's yesterday's technology, and it's going to die out real soon. Well... maybe. Digital photography is the future. Especially if you want to do more with your pictures than pass around tedious collections of holiday snaps.

Your friends will thank you for it too, as will your PC. And your PC will thank you for it too, as there's no easier way to get pictures onto the screen than using a digital camera. Take the pictures, plug the



camera into your computer, and paste the pictures straight onto documents.

Like most things digital, this is all new stuff. Before the war, digital cameras were unheard of—the Gulf War, that is. Now they're all the rage, with all the photo and computer big knobs falling over themselves to launch neater and better models. Corporate willy-waving on this scale can only mean one thing—they all expect to make massive great wedges of cash out of this, and they probably will.

No bad thing, either, as digital photography brings some real benefits. Imagine a system with virtually no moving parts. No chemicals (mostly). No running costs (probably). And the chance to fix all the things that are wrong with your pictures, such as lampposts growing out of heads, red eyes, wonky horizons and pale skies. It's not just for happy snaps though—digital photography is creeping into the commercial world. Imagine images from the Olympics beamed by satellite to UK picture desks in just a few minutes, and composite wedding pictures where everyone is smiling at the same time. Spooky.

Digital cameras chuck out all the old fashioned chemical stuff. They have

lenses, just like in the photographic stone age, but images are produced on a charge coupled device, or CCD (think of a computer display in reverse, where light is converted into electrical signals), and saved in memory. But, as is the case with real cameras, all digital cameras are not created equal, and what sorts out the men from the boys is the resolution, or the number of pixels (picture elements) in each image. The more information you store, the better the pictures. A typical computer screen has a resolution of 800x600 (480,000) pixels, and 35mm film is the equivalent of 15 million pixels... (See the box 'How does it all work then?' for more complicated and instantly forgettable facts on what makes a digital camera tick).

Get kitted out

So, what do you need to set yourself up for some digital snapshots? Unlike ordinary cameras you can't just swan into GrottySnaps and get your film turned into a bundle of prints for a few quid. Oh no. You'll need a computer. You know the sort of thing—you probably bought one to do the home accounts and search for dubious content on the Internet. If it's an IBM-compatible PC, that'll probably do, ◇



A swift bit of photo manipulation can remove unsightly telephone lines, cars and people.

DIGITAL IMAGE STORAGE

One of the biggest problems with digital images is their sheer size, and for the best quality, the bigger the better usually. High resolution images from the Fujix DS-515 are around 2.5Mb, and from the Polaroid PDC-20000 over 5Mb!

As well as needing a lot of storage space in the camera, these large files are difficult to transfer from camera to PC, or from one computer to another. The most common standard used at the moment is the PC Card (formerly known as PCMCIA). This uses either memory cards, which are small and expensive, but usable in almost any PC Card-equipped camera or computer, or hard disk-based, with much more storage at much lower prices. The latter, though, aren't usable in many cameras. They're also relatively bulky, which is a problem in very small cameras.

A new technology which is trying to establish itself as a standard is the SanDisk CompactFlash, a memory-based system in a tiny cartridge, not much bigger than a couple of postage stamps. These will be able to fit into the smallest cameras, and are highly portable, but still expensive. Confusingly, there's a similar, but incompatible system from Intel.

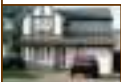
KODAK DC20 - £349



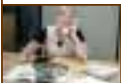
Low-res pics are just about useable.



The CD is crammed with useful software.



For outdoor pics, the DC20 is just fine.



Flesh tones can suffer under office lighting.

The DC20 is a fun camera, and it's so tiny you feel a bit of a fool using it, as if you've borrowed it from a five year old. Equally foolish is the viewfinder, which is awful. It's hard to tell what will appear in the picture, especially when wearing glasses (you, not the camera). The £10.99 disposable Fuji reviewed on page 102 has a better viewfinder than this.

It's a bit more sophisticated than it looks, though, as the exposure is adjusted automatically, even indoors without flash. Just as well,

because the DC20 doesn't have one. It works well enough in standard office or home lighting without flash, but watch out for subject or camera movement in low light.

Up to eight images can be stored in memory, or 16 at a lower resolution, which is pretty good considering the low price. Still, you'll often end up standing in front of a subject, unable to take pictures because the memory is full - which is pretty frustrating. When you get back to the house/office/notebook, you download your pictures to a PC or Mac using a serial cable.

As focus is fixed, tight close-ups are not ideal, although people pictures at three feet are OK. For anything beyond that, the DC20 does a good job - better than you'd expect for the size and price. Colours and sharpness are good, given the lowish resolution of 493x373 pixels. The pictures are far superior to the almost-as-small-and-cheap Casio QV-10, with no obvious distortion. For almost any on-screen use, they're fine. Printed pictures are pretty poor above thumbnail sizes.

The little Kodak really excels in the software department, with a CD bursting with useful and fun applications for PCs and Macs, including a good image editor. Best of all is Kai's outrageous *Power Goo*, which is capable of performing an infinite variety of abominable distortions on people's faces, creating unbelievable new images and even movies in the process.

Our verdict

With something this cute, you want it to succeed, and, within its limits, the Kodak DC20 does just that. If you want to grab pictures for instant loading onto a Web page, or to take, distort and print wacky pictures at a party, it's perfect. And, in this company, cheap! This camera is likely to be a big hit with home users, especially as the street price is already under £300.

T3: Cheap and cheerful 7/10



Looking like 'My First Camera', the dinky Kodak is still a good performer. Shame about the viewfinder, though.

HOW DOES IT ALL WORK THEN?



With a normal SLR camera, light is focussed onto light-sensitive film. The silver compound film coating is physically altered by the light and is later 'fixed' by chemical treatment.



In digital cameras the light hits a CCD matrix array which detects light levels and colour. The signals are converted from analogue to binary digits and stored electronically.

Digital cameras are relatively simple products in concept, if not in execution. The heart of any such camera is a Charge Coupled Device, or CCD, which converts light into electrical signals. Very similar systems are used in video cameras, although with moving images. It's the size and resolution of the all-important CCD that determines the ultimate quality (and probably the price) of the camera.

As with conventional film, the more information that's recorded the better. Digital cameras store this information as individual pixels, or picture elements - and more pixels equals higher resolution, and better pictures. Once the image has been captured, it needs to be stored in memory. This is where large, high resolution images cause problems, as more memory equals higher prices. If the camera doesn't have some form of removable storage, you can only take as many pictures as will fit into memory, before you need to

download them to a computer.

All cameras use some form of image compression, which fits more pictures into the available space, but the higher the compression used, the more obvious the effect on the pictures - it's another trade-off.

The photographic features of the camera work in just the same way as on a conventional model. You'll find fixed focus and autofocus cameras, with and without zoom lenses. More advanced models even have interchangeable lenses, just like 35mm cameras. Exposure is determined automatically on most digital cameras, with manual override on some up-market cameras.

Many of the professional models are in fact derived from equivalent 35mm SLR cameras, such as the Nikon F90 or Canon EOS-1, and fit right into these camera's systems, using their lenses and accessories. The range of prices is vast, from under £300 to over £30,000, and this reflects the different markets they're aimed at.



The Sharp is actually a tad smaller than this pic, but it makes better recordings than your Nakamichi, mate. And try putting that in your shirt pocket.

Praise be to MD

Forget everything you've read about MiniDisc. It's not dead and it sounds great. This is one pocket recorder you'll worship



Kit: MD-MS100H
Cost: £400
Company: Sharp

Praise the Lord for I am reborn. I have seen the digital light, and will forever be true to the numerical faith. I confess, brother, that I had begun to doubt; the temptations of the pagan

analogue had offered much and the flesh is weak. I believed what they said about the harshness of digital. I even, preserve my soul, believed them when they said that it was not possible to have a digital compression system that didn't sound awful.

But now you have delivered unto me the Sharp MD-MS100H Minidisc recorder. I see the error of my ways and pray forgiveness for my lack of faith. Look, forget anything you might have

couldn't even tell there was any switching. It's brilliant!

This tiny Minidisc Walkman makes recordings that are, to all intents and purposes, perfect, with all the dynamic range, fine detail and hiss-free silences which you expect from digital. And that's using its regular analogue line-in socket - in theory, at least, the recordings should be better still using the optical digital input. (The Sharp can't make exact digital clones of CDs - there's still the

"The Sharp MD-MS100H is the

read about Minidisc having noticeably poorer sound quality than CD. I'm sitting here with a CD playing on my Marantz CD63SE

and the Sharp playing a Minidisc which was recorded from the same CD five minutes ago, and as I switch from one to the other I cannot hear any difference at all. I got my wife to do the switching, and I

compression to be done - but the digital input avoids running the sound through two sets of conversion chips on the way.)

ultimate personal stereo"

Such unimpeachable sound comes from what is a very small gadget (smaller than a regular Walkman). It has all the Minidisc advantages over CD and tape -

MICROPHONE

Takes an external mic, but bizarrely emits an internal one. Nevertheless, the perfect add-on for the mixing desk to record your band's Oasis covers down at The George on Wednesday night.

X-BASS/DELETE

Switch between loads-of-bass, shidoads-of-bass and yobs-in-a-Ford-Escort-on-Saturday-night. Also controls the anti-skipping system.

HOLD SWITCH

Avoids embarrassing accidents when you have the Sharp in your trousers. Like hitting record by mistake.

DISC EJECT

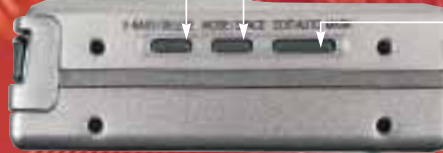
Quaintly manual in an otherwise super-high-tech device.

MODE/SPACE

Changes to the normal disc-like Random and Repeat Play modes.

EDIT

You can add titles to songs, delete tracks, re-order the music you've recorded or even blank the whole disk in one (swiftly regretted) keystroke.



tiny two-inch disks which are easily pocketable, an anti-jogging system which still works if you treat the player like a tomato ketchup bottle, and the ability to make recordings that never wear out.

Recording is simple. You can record tracks in any order, and then re-arrange them on the disc as you wish. Level setting is manual, but in practice you wouldn't move the settings from the default - it's set up for recording from CD. And the 'Synchro Start' feature uses the anti-jogging buffer to ensure that you never miss the start of a track, making recording a one-button affair.

It's hard to find fault with this cool device, but if I had to I'd point to the proprietary battery, which means that when the power goes (after just over three hours) you need the mains for a recharge - there's no nipping into a garage for a packet of AAs.

And it seems a waste in a recorder that can record in mono for two and a half hours continuously on one disc to lack the internal mic which would have made it the perfect interviewing machine.

It's far from cheap, but if you need



to justify the expense then it's more than good enough to replace any tape deck under £500, and probably ones a lot more expensive than that. And there's no messing around with Dolby S or fine tuning of the bias settings to be done here.

The Sharp MD-MS100H is the ultimate personal stereo. To hear it is to want it. Badly. It seems that Minidisc is far from dead. Thank heaven.

Stuart Anderson **T3**

- Use:** Recording is a dream **8/10**
- Lust:** See, want, buy **9/10**
- Tech:** It's digital **9/10**
- Wow:** Never heard better **9/10**
- T3:** Portable perfection **9/10**

Name that tune

If you are of a particularly analytically retentive turn of mind, Minidisc lets you label each track (and indeed the disk itself). The names appear on the LCD display on the player. With about 300 words storable per disc, perhaps this will signal the return of (digitised) sleeve notes?

For fax sake...

...stay in touch wherever you are, with a fax to e-mail service

Kit: Fax to e-mail service
Cost: Around £8 a month
Company: JFax

Believe it or not, there are some people who don't do all their communication via computer. Some even use the phone! People that unadvanced are beyond help, but there are a few fax users who can still be saved. Invented in 1911, fax machines didn't become common until the '80s, when vast reams of paper were needed to write down the salaries of the people using them.

Finally, the fax machine has come of age and you can now send and receive faxes without ever using paper.

JFax is a service which accepts fax messages from paper-heads, and turns them into e-mails which arrive at your computer moments later - wherever you are.

When you sign up with JFax, you receive a central London (or New York, or Sydney, or Tokyo...) phone number which you hand out willy nilly. This is your personal fax line, so there are no worries about missing important phone calls while long faxes arrive. JFax's computer receives the fax and transmits it as an e-mail to your cyber pigeonhole. In order to read the fax you need to download some free software from JFax's web site, but be warned you'll also need decompression software (*Stuffit Expander*) which you'll have to track down elsewhere.

Once decompressed, the fax appears - lifeseize - on your monitor. You can zoom in or out, or squeeze it so it fits on one screen. The quality is high (probably higher than your fax machine), and it's easy to make out tiny text and feint handwriting.

JFax is a simple, quick service. It will probably be of most use to executives in a hurry or small businesses that have computers but can't quite justify the cost of installing a separate phone line. After all, in ten years time who'll be using fax machines at all?

Mark Harris **T3**

- Use:** Simple once set up **7/10**
- Lust:** For men in grey suits **4/10**
- Tech:** Virtual paper **7/10**
- Wow:** Clutter cutter **6/10**
- T3:** Cheaper than fax **6/10**

MYSTIC MEGABYTES

The thing which makes CD pretty useless for portable use (apart from the size of the players and the size of the discs, that is), is that if you so much as breathe on them, they jump. Minidisc gets around this by using ESP. No, it stands for Electronic Shock Protection. The player reads some ten seconds or so 'in front' of what it's playing down the headphones, and stores the music in memory, or a 'RAM buffer' if you must. If the disc is knocked, it has a few seconds to find its place again, meanwhile the music in the buffer plays and the listener is none the wiser. CD players are now incorporating a similar mechanism, but Minidisc's seems to work more effectively.

SKWEEZE ME, PLEEZE ME

Minidisc fits the same amount of music on a disc as there is on a CD with twice the diameter, thanks to the new science of compression.

Once you've got information into a digital format, you can play with it so it takes up less room. You can do that by removing redundant information, like spaces, or by moving some of the data that hopefully won't be missed too much. Minidisc uses the latter technique - called 'lossy' compression because some of the data is, er, lost in the process. The art lies in removing parts of the sound that can't be heard by the human ear. When Minidisc first came out, many reviewers said they could hear the loss of the missing bits of sound. But things have improved, and the system used (called ATRAC for Adaptive Transform Acoustic Coding, if that helps) is now, to this reviewer's ears, inaudible.



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