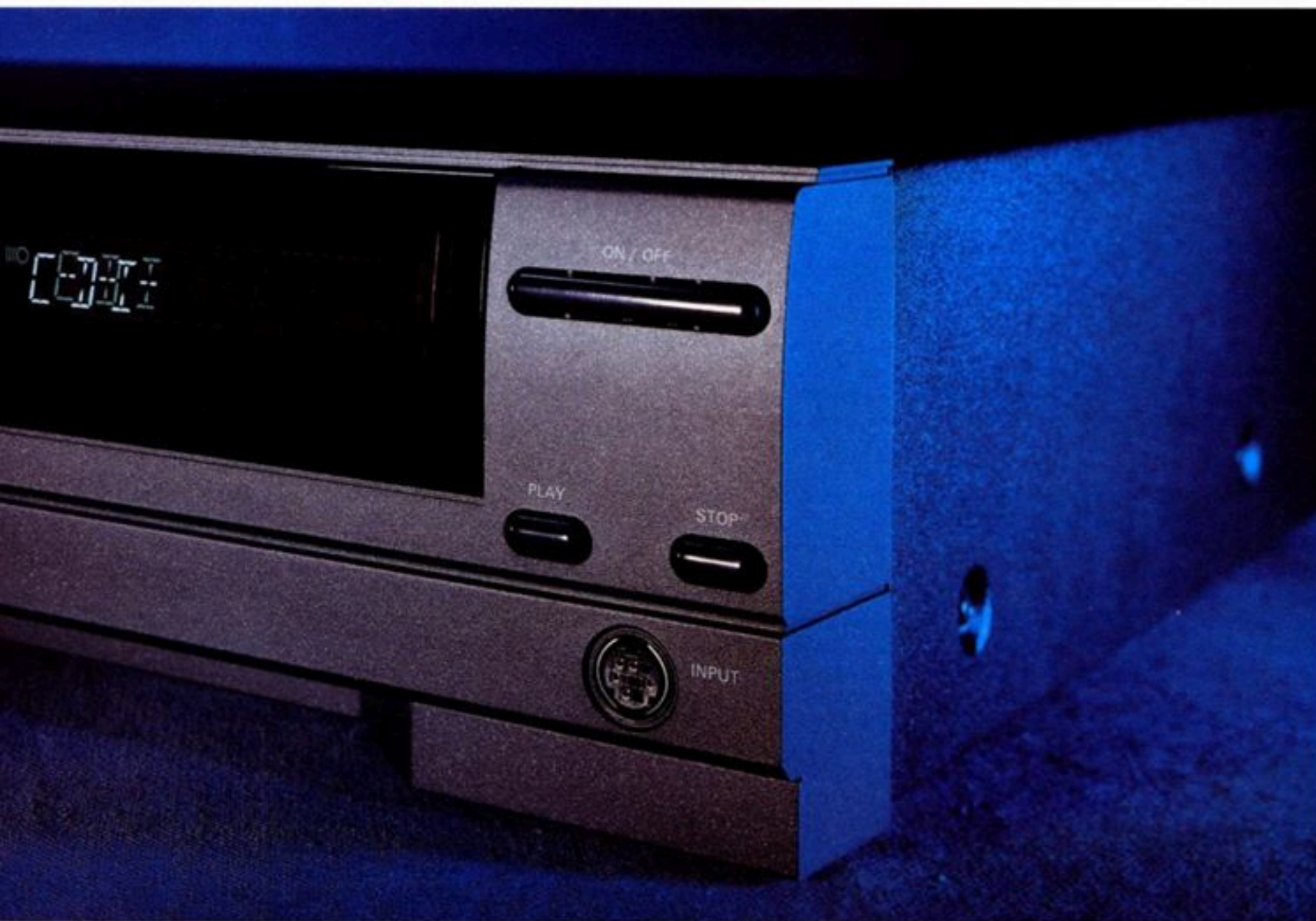


The CD-i is in many ways the poor relation of the CD family. Conceived as an all-purpose multimedia platform, it has seen its birthright plundered by its more glamorous console cousins. **Edge** follows the format's fight for self-improvement



CD-i

Philips
r invents



At its launch, Philips' 16bit CD-i machine was trumpeted by its creators as a revolution: an all-singing, all-dancing CD system that would provide a short cut to the multimedia world of the future. Such optimism soon faded, though; in a market that was demanding pure games platforms, CD-i looked likely to suffer the same fate as Commodore's abortive CDTV. Now, however, against all the odds – and thanks largely to a £3,000,000 advertising budget – CD-i seems to be undergoing something of a renaissance. But with the much-vaunted 'next-generation' machines on the horizon, even the introduction of the new console-styled 450 CD-i may not be enough to ensure the format's survival.

CD-i as a concept made perfect sense when it was first mooted in the

mid 1980s. Despite Philips' collaboration with Matsushita on the development of the Digital Compact Cassette (DCC), the Dutch-based multinational recognised that the CD (also created by Philips, together with Sony) was the medium that would dominate the foreseeable future.

And it was a future that was already upon them. Video, photographs and application software were starting to be stored on CD, as well as audio recordings. This made a truly multimedia system a viable proposition. With audio already well established in the marketplace, Philips' reasoning was that it wouldn't take much to persuade the public to make the conceptual leap between the simple audio CD and its multimedia offspring.

Although CD-i wasn't launched until the end of 1991, the first provisional spec for the machine had been issued more than five years earlier, in June 1986. Philips and Sony then proceeded with development work on the full functional

spec, which came to be known as the Green Book and was finalised in November 1988.

Considering the current ferocity of CD platform rivalry, it's ironic that three of the biggest corporations involved – Philips, Sony and Matsushita – announced in May 1989 that they would join forces. The promotion and marketing of Interactive Compact Disc was given as the primary reason for this move, although the aim of further technical development was also an important factor. However, corporate politics eventually saw the alliance dissolve.

Throughout this period of development, what Philips envisaged finally marketing to the consumer was a player that would simply link into existing home entertainment systems. Hence its initial, deeply mundane styling: the machine took the form of a largely featureless box, which could be placed on top of a VCR or added to a hi-fi stack without looking out of place. However,



Philips were unprepared for the difference between their projected market and the people who actually bought the machine.

What Philips firmly believed at the outset was that demand for CD-i would

follow the model for audio CD, which during the period of CD-i's development had completely overwhelmed vinyl. It was a reasonable assumption on Philips' part that, like audio CD, CD-i would first make an impact on the middle to upper income brackets, consisting of people with relatively mature and conservative tastes, before beginning to penetrate the 'lower' social strata. But they were wrong.

'What we discovered from day one,' says **Simon Turner**, senior vice-president, Europe, Philips Media Distribution, 'is that our profile is absolutely a massmarket profile. Right from even the first year we found that 40% of buyers had family incomes of below £17,500. Right now, if I look at our owners, 40% of them are Sun readers. We have a profile much more like the satellite market than the traditional growth in the audio areas.'

And what that basically translates into is a demand for games.

The first

consumer CD-i player, the 205, was launched in the US in October 1991, with a UK launch in May 1992. It was slightly bulkier than the 220 player which superseded it within a couple of months as manufacturing costs came down, although essentially there were no technical

differences between the two. In line with Philips' preconceptions about how the market would behave, it was designed as a multipurpose player. It was not designed as a games engine. Simon Turner confirms this: 'It is not supposed to be a games machine. It was never designed to be and we will never position it as such.'

A good job, too, as the poor standard of software available at launch and the design limitations of the 220 player as a games platform meant CD-i was thoroughly outclassed by Sega and Nintendo. To Philips' credit, though, especially considering the debacle of the 3DO and CD³² launches, the company managed to ensure that there were approximately three dozen titles available on the launch dates on both sides of the Atlantic. The problem was that few of them were distinctive enough to grab any attention. As **Julian Lynn-Evans**, Philips' senior vice-president, games, admits: 'I think it's fair to say that Philips didn't properly appreciate the key role of games in their software catalogue. They sidelined games development when they should have mainstreamed it.'

Of all the features that ensured the initial model's unsuitability for games, the most glaring one was probably the provision of only one joystick port. (Indeed, the best-selling game of last year,

Infogrames' *International Tennis Open*, initially only had a oneplayer option.) There was a serial port at the back of the machine that could be used for a second joypad, but it took quite a long time for anyone to actually realise this. Then there was the

joypad itself. Philips initially experimented with an infrared control device modelled on a TV remote control, which was fine in theory but proved to be one of the most unresponsive joypads ever foisted onto the market

Both of these drawbacks were

rectified with the launch of the far more ergonomically designed touchpad controller, and the addition of a dedicated second port to the refined 210 player (which also boasted a far sleeker design in recognition of its increasing use by consumers as a games platform).

But other problems remain. The CD-i consumer model (which conforms to the Green Book standard, otherwise known as the Base Case system, co-authored by Philips and Sony) streams data off the CD at only 170K/sec – just over half the speed of Philips' major rivals, like 3DO. And these companies are themselves going to have trouble matching the speed offered by new storage media currently in development, so it's a real problem for anyone trying to develop CD-i software. For example, when animating images in DYUV, the most powerful of CD-i's four graphics modes,

'It needs to have a good range of FMV material. Provided the range is there, it's a format that will continue to grow'

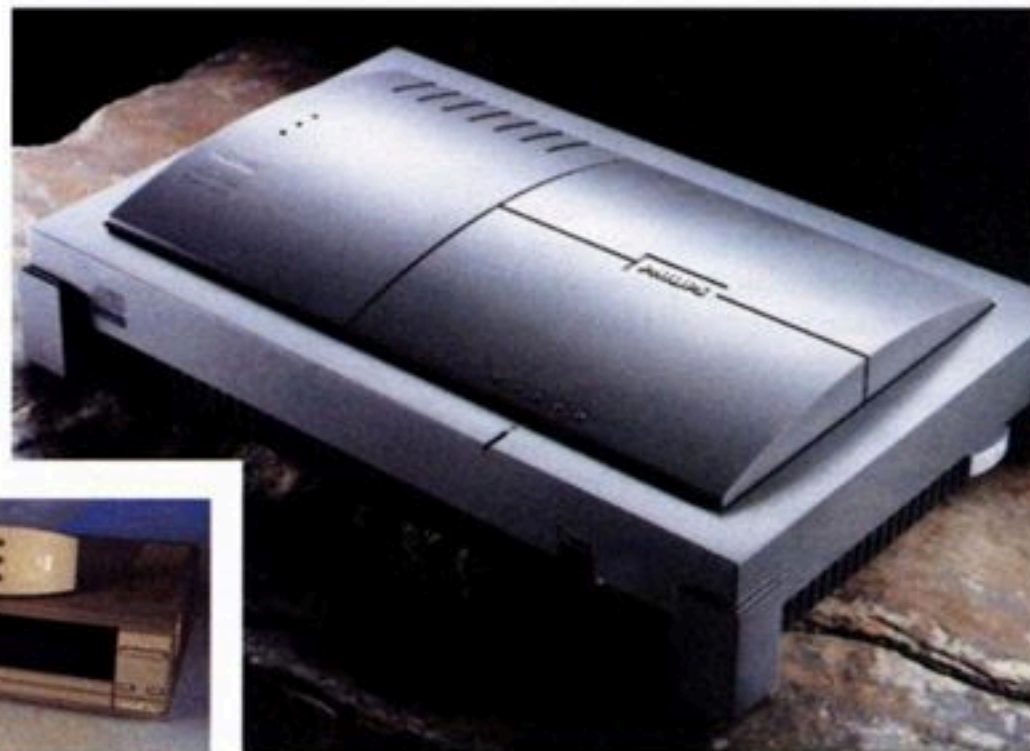
Peter Jones, *Mirage*

The Philips 450: CD-i's next step

The Philips 450 player (right), launched at the Summer CES in Chicago, is the next-generation CD-i machine. Technically, there's no difference between it and the 210 player – all the changes are purely cosmetic – but it is a fair indication of the emphasis Philips are placing (albeit belatedly) on the games market.

One of the criticisms always levelled at the 210 (inset) was its styling. From a gamesplayer's perspective, it is just not sexy. The design of a product is a crucial part of its overall marketing, and Philips have specifically targeted the 450 at the 16-25, predominantly male, gamesplayer. The company are also marketing a restyled, dedicated DV cart to coincide with the 450's launch, as well as a new range of remote control options.

The machine comes with a built-in modem link and will sell in the US for \$299. A UK launch is expected at the end of August, with a retail price of around £300.





At the rear of the CD-i 210 are: a 21-pin SCART socket, audio and composite video RCA sockets, and the accommodating recess of the FMV port, for connection to the DV card

which offers true colour from a palette of 16.7 million, the 170K/sec limitation would mean the display running at 12.5 frames per second on only 13% of the full screen. Okay, so the MPEG compression routine can bypass this problem, but anything fast has to be pre-loaded into the machine's 1.5Mb of onboard RAM, which can lead to major headaches.

'Basically,' says **Denise Proctor** of Perfect World, who developed the *Worlds Of...* music disc for CD-i, 'because you've only got that amount of memory to play with, you can't always take realtime images off a disc. You have to write stuff to memory so it's there immediately you need it. The trick is juggling everything, using the memory to the best ability, but it's incredibly difficult.'

According to Denise, 3Mb of RAM would significantly ease the problem, but juggling is a way of life for CD-i programmers – balancing the available memory in RAM with the four different graphics modes and four audio options. Realistically, to have moving images onscreen you have to at least descend to the Colour Look-Up Table (CLUT) encoding method, which selects 256 colours from the full palette. For fullscreen animation, though, you have to descend even further to the Run-length 7 mode, which only provides 128 colours – unless the FMV option is employed.

Also, the standard CD-i has no custom chips for polygon generation. Routines for this have to be encoded in game software and then run through the CPU (a 15.5 MHz Motorola 68070).

Despite these disadvantages, CD-i still has its supporters. 'I think there are some very good features in the hardware,' says **Ian Hadley** of Gremlin Graphics. 'My single complaint about it would be that I believe that the processor is

underpowered for the kind of game software we'd actually like to put on the platform. Because there are no auxiliary processors, for instance, and there's no blitter available – everything is done by the processor – we have to limit the amount of animation, the amount of sprites we can move and the amount of pixels we can change and sustain a good frame rate.'

Managing director of Mirage, **Peter Jones**, whose company is currently developing *Rise Of The Robots* for CD-i release later in the year, is also optimistic, 'I think people look at the processor and think, "Ah, that's not as strong as the PC, it's not even as big as an Amiga", and all those criteria, and completely forget about the fact that here you've got FMV.'

If the technical specs of CD-i (apart from FMV) fall short of the new wave of platforms with double-speed drives, larger onboard RAM caches and custom polygon generation, the software is lagging too. Initially, the software catalogue assembled by Philips was targeted mainly at the ABC I social group and the best way to describe it is as 'worthy'. Games, such as they were, were very basic, the software in general being heavily biased towards titles dedicated to such subjects as opera, French cookery or learning 35mm photography.

But games have now become crucial to CD-i's existence, and Simon Turner acknowledges the importance of the games market in any further growth. This is borne out by the fact that games now account for 65% of total CD-i software sales (as opposed to the meagre 15% contribution of the worthy/boring sector). But although the number of games available has increased, the quality remains suspect.

The problem has been in attracting developers to CD-i. The development of



Philips' £150 Digital Video cart, which includes the MPEG1 chipset

CD games is a costly business and one which no-one really wants to enter if the installed userbase is tiny. Philips tried to jump-start the whole process, as Julian Lynn-Evans recalls: 'A lot of the early titles – all of the early titles – were published, financed and distributed entirely by Philips.'

That situation is starting to change now, with far more co-publishing arrangements being put in place as the userbase increases, but so far little of real interest has turned up on the CD-i. In fact, the games available to date have generally trod the low-cost, low-risk path, with most of them being simple ports. The most disastrous ones, ironically, stemmed from a licensing arrangement with Nintendo which gave rise to *Link: Faces Of Evil* and *Zelda: Wand Of Gamelon*, but both they and last year's bestsellers, *Palm Springs Open* and *International Tennis Open* (followed by *Tetris* and *Battleships*, for God's sake) are hardly the sort of product to whip up the games market into a buying frenzy. They might have shipped a respectable number of units (Lynn-Evans gives a figure of 100,000 for *Palm Springs Open*), but they have conspicuously failed to generate enough excitement to have people rushing out to buy the actual players. Adventure games *Kether* and *Inca* are probably the pick of the bunch, but even their gameplay is limited and they only stand out because of the paucity of the competition.

But things are slowly changing on the software front. Argonaut's *Creature Shock*,



Mirage's *Rise Of The Robots* and Cryo's *The Lost Eden* are all slated for CD-i release. The fact that they are being produced in the developers' own studios corrects one of the major flaws in Philips' software programme.

Much of the conversion work on recent titles has taken place at Philips' in-house studios in Dorking. The reasons for this are twofold. Firstly, due to the risks inherent in developing for CD-i, software houses have maintained an arms' length relationship with Philips. And secondly, Philips have basically been running the operation as a training programme – about 1,000 people have taken courses there, all part of Philips' huge effort to make the platform attractive to developers.

This is all well and good, until something goes wrong. A Philips document entitled CD-i: Frequently Asked Questions guesstimates that porting from CD-ROM to CD-i is 25-50% platform specific and 50-75% platform independent. Despite that lowish rewrite percentage, though, Virgin's CD-ROM-based *7th Guest* ran into major problems. **John Norledge**, software manager at Virgin, puts this down to

'teething problems. I think *7th Guest* was the first non-linear MPEG project.'

It was very galling for Philips, though. The company had hoped that the game would be their flagship release for the traditional pre-Christmas sales bonanza.

Indeed, it featured heavily in their TV campaign that autumn, before being hastily replaced by *Kether*. But worse was to come. In the snowball effect that the game's delay had – due both to the Dorking set-up and the game's prioritising by Philips – programmers were pulled off other projects to the extent that, in

January '94, Philips failed to release a single title. Not good news for a company in the middle of a £3 million advertising campaign.

7th Guest was finally released in June. As industry weekly CTW stated: 'It takes the patience of a saint, and the skills of a clairvoyant, to work out the realities of Philips' release dates.'

'Philips didn't properly appreciate the key role of games... They sidelined games development when they should have mainstreamed it'

Julian Lynn-Evans, vice-president, games, Philips

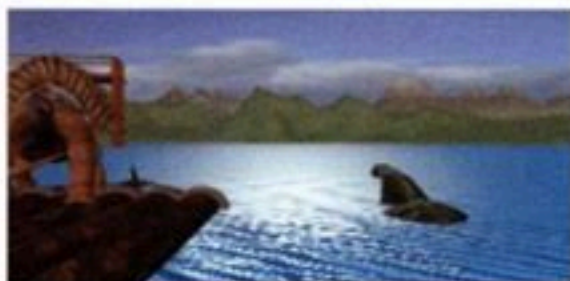
significantly increases the options for games developers.

'What CD-i does exceptionally well,' says Mirage's Peter Jones, 'and what will establish it in the marketplace... is to be able to encrypt video sequences or long cinematic sequences that are becoming more important to games.'

CD-i players have four display planes: a foreground cursor plane; two 8bit image planes; and a background plane. FMV is displayed using the background plane, allowing whatever is being run there to be merged with, for example, sprites on the other planes. MPEG compression allows 74 minutes of VHS-quality video and CD-DA audio to be stored on one disc. This is annoying for film buffs who find that most films are longer than 1 hour 14 minutes, but Philips, recognising the importance of movies to CD-i's success, are introducing a carousel player later this year.

But the potential of the FMV games market could be even greater than the movie one. Peter Jones again: 'If you look at the way forward for CD product, at the moment the two main avenues are using FMV or using pre-generated, raytraced images like those in *Rise Of The Robots*. On these two main avenues for exploitation in games, CD-i comes up trumps.'

Most of the DV games released so far – *World Of Boxing* or *Space Ace*, for example – haven't exactly been world-beaters. But if developers learn to unlock some of the potential of FMV and make it an integral part of the game's structure rather than a pretty extra, the situation could improve. Indeed, with a brace of higher-quality ports in the offing, and the



Games are improving rapidly for CD-i: *Burn Cycle* from Trip Media (top), *Infogrames' Chaos Control* (middle), and *The Lost Eden* from Cryo should all help the CD-i cause

It would

probably have taken a clairvoyant, too, to have predicted the upswing in CD-i's fortunes at the tail end of 1993. Philips claim to have sold 2,000 units a week in the pre-Christmas period in the UK, and are currently bandying around a global userbase figure of 400,000.

The CD-i's relative success in that period is attributable partly to Philips' TV advertising campaign and partly to the company's increasingly aggressive targeting of the games market. But in terms of the longterm survival of CD-i, the most important aspect is the release of the format's own FMV option.

Gremlin's Ian Hadley agrees: 'The advent of the FMV cartridge turned things around. If I were Philips, I would just put that chipset into every box I shipped. I would not sell a unit without it. It was the creation of the FMV chip which I think gave the CD-i its boost in the marketplace.'

Philips' MPEG decoder, the Digital Video cart, subscribes to both the Green and White Book standards – although it didn't at first. The global MPEG compression standard is intended to give the consumer interchangeability between platforms, but initially Philips' FMV discs failed to work on other machines.



In the face of strong competition from Sega and Nintendo, Philips attempted to improve the CD-i's image, and the result was the 210 player. Boasting a sleeker design and an extra joystick port (but the same dreadful bundled controller), this is the machine that's currently available

prospect of *Creature Shock* and the heavily touted *The Lost Eden* appearing later in the year, CD-i is almost in danger of having some quality software appearing on it.

FMV is hardly a technological ace up Philips' sleeve, though; both the CD³² and 3DO are also MPEG I compatible, with Jaguar scheduled to follow by the end of the year. However, what Philips have but no-one else does is 70% of Polygram, the record company.

The concept of the interactive music CD is something that is gradually percolating through the recording industry. CD-i is the only format so far making extensive use of a music base, and some interesting work is being done. Perfect World's *Worlds Of...* was a worthy attempt to incorporate elements of interactive gameplay into a music CD; Todd Rundgren's *No World Order* attempted the interactive angle (but failed); and Peter Gabriel's much-lauded CD-ROM, *Xplorer 1*, is in line for conversion. Add to that the techno-psychedelia of Hex's *Pulse* and The Digital Nomad's *Interactive Club Environment* and you have the beginnings of an interesting new artform.

An important one as well. Paul Sanders, spokesman for The Digital Nomad, states: 'I don't see how CD-i can succeed if it doesn't exploit the music market.' The simple fact is that this is one area of the interactive market where CD-i really fits; where Philips' original marketing strategy, promoting CD-i as something akin to a high-quality audio product, has some relevance. CD-i supports full CD-DA audio, and it was designed to integrate with

hi-fi systems. When Philips' record company tie-ins are added to the equation, it becomes difficult to see where the machine could go wrong.

But industry insiders reckon interactive music won't hit its full potential



Poor CD-i MPEG encoding often results in blocky visuals. It's hardly a threat to VHS

until about four years hence, and CD-i has to do something in the interim. But, reckons Ian Hadley, it already has one major advantage: 'It exists. It actually sits there in the high street and you can buy it.'

To an extent, CD-i has forced Philips to reinvent themselves; they have been transformed from a hardware manufacturer into a hardware manufacturer with an active role in the development of games software. The quality of that software is still their stumbling block, but if, in the next few months, *The Lost Eden* et al can improve

that situation, Philips may have a nicely bunkered position to survive the autumn onslaught of the 32bit generation. Philips themselves seem bullish; with a £6 million advertising budget for the UK alone, the company is preparing for battle.

Many pundits think the CD-i can pull it off. 'It needs to have good software on it,' states Peter Jones. 'It needs to have a good range of FMV material. It needs audio/visual material on it as well. Provided the range is there, and it's handled correctly, I think it's a format that will continue to grow.'

If it does, it will be largely due to the general move towards CD. Developers are now geared up to preparing projects from inception to completion for CD formats, and, as Julian Lynn-Evans points out: 'When that's done properly, doing a CD-i version is not an enormous difficulty.'

And with new hardware in the pipeline, Philips seem to be committed to expanding their market. The 450 player is the first market-specific machine to be launched, but a hi-fi system with a built-in CD-i capability is already in the offing, and Macintosh and PC cards are due to be released later this year. If any technical upgrades are on the way, Philips are keeping them firmly under wraps, but it is hard to see CD-i thriving in the approaching format wars without 32bit architecture and a double-speed drive, whether it is a games platform or not.

In the final analysis, CD-i is an excellent machine for delivering MPEG I digital video and CD-DA audio. Whether that will prove to be enough is another thing.

