

VINTAGE TECHNOLOGY

History of computers, video games, calculators, radio, TV & audio in the digital age
Issue 5 - April 2008

Vintage VHS Video Recorders Why we love them

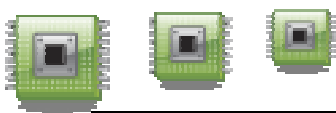


Videotex
Brave New World

Teasmades
Whatever Happened
to them?

**Sega Master
System**
Worthy rival to NES

PLUS: ZX80 – 1st computer under £100 • Collectible hard disks • '70s Sanyo calculators
Vintage hi-fi headphones • Retro games for Xbox/Playstation review • Have a retro-tech party



Vintage Technology

WELCOME

I am sorry to say that this will be the first issue which doesn't have a print-based counterpart. We hope, however, to produce the print version again in the future, but with a lot of improvements. This will go hand in hand with enhancements to the website which will offer additional content.

In this issue, following on from last month's feature on teletext services, we look at 2-way videotex services.

The review of retro games for the Xbox/Playstation also follows on from the previous review of modern dedicated retro game consoles.

We also have the usual mix of interesting vintage subjects – from headphones, VCRs to teasmades. Happy collecting!

Abi Waddell – editor

Contact:

Exaro Publishing
67 Marksbury
Bath
BA29HP

Email:

info@vintagetechnology.co.uk
www.vintagetechnology.co.uk

©Exaro Publishing 2008. Reprinting any part of matter appearing in Vintage Technology is strictly forbidden. The publisher makes every effort to ensure that the magazine's contents are correct. However it cannot take responsibility for any effects from errors or omissions. Product information is correct at time of going to press and may be subject to change. All rights are reserved and are the property of the publisher. All material is credited to source/authors where applicable. Please contact us if you wish to reproduce material from this magazine.

Contents

Regulars

News	3
Events	34
Book review	35

Vintage Computing

The brave new world of videotex	8
Sinclair ZX80 – first computer for under £100	12
Hard disks – humble, but collectible	13

Vintage Gaming

Sega Master System – worthy rival to the NES	14
Review of retro games for the Xbox & Playstation consoles	16

Vintage Calculators

1970s Sanyo calculators	19
-------------------------	----

Vintage Audio, TV & Radio

Vintage VHS video recorders – why we love them	20
A quick look at some vintage hi-fi headphones	22
1980s novelty radios	23

Interview

Interview with Dave Johnson, ColecoVision games designer & programmer	24
---	----

Miscellaneous Vintage Technology

Whatever happened to the teasmade?	27
Lets party retro-tech style!	29

Repair & care

Transistor radio repair tips	30
------------------------------	----

Museums & collections

Nova Scotia museum, Canada	33
Retro game commercials and video website	

Nostalgia

Memories of the Imagination Machine	34
	and writers etc which were all managed by!

Commodore 64 knocking down Virtual Console door



Commodore 64 fans have been teased with the idea of the vintage gaming experiences of their younger years replicated on the Wii for a while now. In 2006, System 3 first confirmed its plans to remake Epyx Games classics like California Games and Impossible Mission for Nintendo's latest console.

While those projects haven't materialized on the Wii yet, the 1982 home computer is getting another crack at contemporary audiences as Nintendo confirmed that original C64 titles will be debuting soon on the system's European Virtual Console downloadable game service. These titles join classic gems from the likes of Nintendo, SEGA, Turbografx and NEOGEO already available via the Wii Shop Channel.

Commodore 64 games will share the same prices as most Nintendo Entertainment System games on the Virtual Console, clocking in at 500 Wii points (\$5) per game. The first wave of titles to appear on the service will include Uridium and International Karate, and Commodore Gaming is promising that more titles from the legacy system's library of more than 4,000 games will be added to the Virtual Console on a regular basis.

Bala Keilman, CEO of Commodore Gaming, commented, "By working with

Nintendo of Europe, we are ensuring that future generations of gamers can play some of the best and most popular titles that kick-started the computer games revolution and so keep the C64 legacy in gamers hearts."

For the moment, there has been no statement regarding the availability of C64 software on the Virtual Console in other regions.

Baer and Alcorn speak at GDC '08



GDC (Game Developers Conference) this year was honoured to have present Ralph Baer, inventor, and the original patent-holder of interactive games to be played on televisions (his "Brown Box" prototype became the basis of the Magnavox Odyssey console in 1972) and Al Alcorn, the engineer from Atari who worked to create Pong and later the Video Computer System, aka the Atari 2600.

Though the two men didn't work together directly, their marks in the history of the game industry are unforgettable, and to see them

together was, well, also pretty unforgettable.

Baer related how he came to invent the Brown Box and then the Odyssey. More information on the Brown Box was shown, such as photos and a rare film of Baer demonstrating the controls and rules of the Brown Box tennis game with an associate in 1969.

Al Alcorn told his story on how he was hired by the enterprising Nolan Bushnell and how this led to the production of Pong and then the Atari VCS.

To close out the session, Baer and Alcorn played tennis on a Brown Box replica (Baer repeated his line from the 1969 clip: "Well, here we are, playing games when we ought to be working"). Both struggled with the controls, but it was a good show nonetheless. And then there was a surprise for Baer: an award from the *Guinness World Records: Gamer's Edition* recognizing him as the inventor of the first home videogame console. The audience was definitely in agreement, giving Baer a standing ovation.

Phantasy Star Added To Wii Shop Channel

Phantasy Star II, originally for the Sega Genesis, has been added to the downloadable games list for the Wii and costs 800 points.

Phantasy Star II is an RPG that features an epic story line and turn-based battles. Play as Rolf, Nei, Rudo or several other



characters as you navigate through the Algol starsystem battling the evil Dark Force. Build your characters, select the right weapons and armor, and take on the forces of evil through various missions as you find the right combination of characters to complete each objective.

The day of digital reckoning is near; is your television up to the task?

It's coming. And if you enjoy watching television, you'd better be ready.

A year from now, the signal that sends pictures to your set will be switched off at all television stations. Starting Feb. 17, 2009, the only signals sent out will be digital. This raises the question: will your television pick up the signal? If you have an older "tube" (cathode ray tube) set it won't work unless you get a digital converter box.

If you don't know if your TV is digital, check for a label. Some form of the phrase "digital tuner" or "digital receiver" is a good sign. Or look for "DTV," "HDTV" or "ATSC." However, if the label says your TV is digital "ready" or has a digital "monitor," there's a good chance it's not equipped to receive a digital signal.

If you have a tube TV, here's another question: do you have cable service? If so, chances are, you're still OK.

A survey by the Nielsen Co. estimates that more than 13 million households in the U.S. receive television programming over the air on non-digital sets, and another 6 million households have at least one such set. The survey found that 10 percent of all households would have no

access to television signals if the transition occurred today. There are discounts available for the converters, which are estimated to cost from \$40 to \$70. A government-issued \$40 coupon for a converter is available through the U.S. Commerce Department's Web site, www.dtv2009.gov, or call (888) 388-2009.

The converters should be available soon at major electronics stores.

Or you can buy a new television.

Cable companies, and television stores, see the switch-over as an opportunity to increase their business. Weissman, of Comcast, said the company will begin to "aggressively reach out to consumers who are not cable customers" to explain that cable is the best way to continue to view their broadcast channels.

Rick Dougherty, of Dougherty's TV/Video in

he said. Viewers won't be able to tell the difference, he said. "Half of them think you have to throw away your TV in a year," Dougherty said.

Now that prices on new TVs have come down, "If you're looking for an excuse to replace your television, now's the time to do it," Dougherty said.

Dave Abramson, of Chester Springs, Pa., has a large collection of vintage TVs, including 15 that are still in use. His connection to Comcast will keep the signals coming after the switch-over.

Abramson said most people can't tell the difference between a digital picture and an analog picture, but he can. "This stuff drives me nuts," he said, noting that a digital picture is like a photo being downloaded by a computer, pixel by pixel, "only a lot faster." He said if he looks up close to the screen, he can see pixilation of lettering.



Norwood, Pa., said people are constantly calling to find out if their old televisions will be any good. The multiple solutions can be a little confusing he said.

"That's kind of blowing their minds a little bit," Dougherty said. But he tells them that if they have a digital converter, the transition will be seamless,

There will be some customers who will struggle with the switch-over. But "they'll get rid of their analog sets; they'll buy a new set, which will solve their problem," said Abramson, who is the chief engineer at the Philadelphia Phillies' Citizens Bank Park. John Wilson, of Brandywine Television Service, in

Wilmington, said if people buy a new television, they should buy an extended warranty, because the parts are expensive.

To all vintage TV collectors – now's the time to start hunting for those throw-away TV sets!

Arcade auction doesn't mean it's 'game over'



Recently the 3000 square foot Apollo Amusements arcade in Bradenton, Florida, held an auction to sell off most of its vintage and modern gaming items.

The owner lays the blame for his travails squarely at the feet of the struggling housing market. Homes are not selling and thus fun-loving adults are not furnishing their new digs with the machines they grew up playing with.

The owner, Russo, said "The housing thing is very critical to me because very few people who buy from me are renters...I need to raise some cash because I'm behind on a few bills like everyone else these days."

Businesses large and small are feeling the pinch from lagging home sales, high gas prices and a general sense of worry about the economy -- something that has been clearly seen in the Christmas-led decline in consumer spending, said Sean Snaith, director of the Institute for Economic Competitiveness at the University of Central Florida.

"Anything that was sort of buttering its bread off the housing market is certainly suffering a significant decline," Snaith said. "I don't think it's surprising to hear

this business has taken a downturn."

Small, specialty retailers like Apollo are most at risk because their products are not necessary to have, like milk, food or baby clothes, Snaith said.

Businesses like Russo's generate about 50 percent of the nation's nonfarm gross domestic product.

The U.S. Small Business Administration is seeing the economic struggle taking place nationally with a declining expansion of the businesses it services.

Russo plans to continue operating a much smaller outlet and rely more heavily on Internet and phone orders.

Arcade Flyers for Sale

Recently the website The Arcade Flyer Archive (www.coinopvideogames.com) has been auctioning off many of its several thousand arcade game and pinball flyers. Proceeds will go towards purchasing the more expensive flyers from Japan.

Interested buyers should go directly to the website as none are being put on Ebay.

Council Bill To Require Electronics Recycling

The sight of ancient computers, broken monitors and outdated television sets sitting curbside and waiting to be hauled away by garbage trucks might soon disappear from New York City streets. Thanks to new legislation passed by the City Council last week in a 47-3 vote, New York City could be the first in the nation with a comprehensive electronics recycling law.

If approved by Mayor Michael Bloomberg — who recently threatened to veto the bill — the legislation would keep litter



off the streets and help protect the environment, Council Speaker Christine Quinn said. "(It) will provide a way to recycle this electronic waste and prevent it from pumping toxic chemicals into our air or water."

The bill requires manufacturers of electronic products to collect items that consumers return and recycle them at their own cost. Quinn called this an added bonus because it prevents further burden on consumers or taxpayer money. If the bill is signed into law, manufacturers would have to present recycling plans to Department of Sanitation officials next summer, and to set up Web sites and toll-free telephone numbers to inform people about their individual collection and recycling plans. Manufacturers would also have to recycle 25 percent of what they sell by 2012. Companies that do not meet the goal by then could be fined \$50,000 for each percentage point below the requirement.

Spokesman John Gallagher of the mayor's office told the New York Post last week that the bill "penalizes the wrong people — the manufacturer

who can't control whether customers are recycling or not."

New York City residents' electronic-device consumption is estimated to produce 25,000 tons of electronic trash annually, according to the Environmental Protection Agency. Currently, less than 10 percent of that waste is being recycled and about 70 percent of heavy metals contained in landfills originate from electronic waste, the EPA said.

Included in the 12 million electronic items people buy each year are televisions, computers and MP3 players that could contain lead and mercury. Improperly dumping or recycling these products could be dangerous, Quinn said, which is what makes this law necessary.

A typical computer or television set contains up to four or seven pounds of lead, respectively, according to the EPA. Council members asserted in the bill that if those toxins leak when the items are disposed, they become airborne and can contaminate the city's air quality.

Device lets video fans say goodbye to old VHS tapes

The speed of technological innovation means many of our treasured home movies and videos are locked in formats that are hard to access and becoming obsolete.

And although cell phones, computers, video-game consoles and portable video players are increasingly a favored place to watch TV shows and movies, it's not easy to move this content between devices, unless you want to pay for multiple copies of the same movie or show.

The Neuros OSD is an affordable Swiss army knife for these problems and more. The curved black device can legally record from any video component that outputs via the familiar red, white and yellow RCA jacks. That means VCRs, DVD players, digital video recorders or TiVos, satellite and cable TV and even video-game consoles and camcorders.

The device records to the digital MPEG-4 format, which is a universally recognized standard that is the equivalent for video that MP3s are for music. Video files are recorded directly onto the external storage location of your choice — a memory card, USB flash drive or external hard drive.

Using the highest recording settings on the OSD, one hour of video creates about a 1GB file. That means you

Once you've got your movie or TV show recorded onto a storage device, you can pop the memory card or flash drive out of the OSD and into a computer where you can watch the video, edit it, post it online or burn it to a CD or DVD. You can also use the OSD and your attached storage to play back recorded video on another TV.

But wait, there's more. When setting up a recording, the OSD lets you choose if you intend to play the video back on a television or computer, iPod, cell phone or PlayStation Portable, and it automatically records the video with the right settings for your chosen device.

At about \$230 (or less at <http://www.amazon.com> or <http://www.frys.com>), the OSD is an good value.

It records in real time, so it



could store an entire video collection on a single external drive and get rid of those VHS tapes collecting dust on the shelf. The quality of the recording depends on the quality of your original source, but generally DVD recordings look the best.

takes an hour to convert a one-hour movie. But you can set timed recordings and even pair the OSD remote with your cable box so the channel will change automatically when it's time for a scheduled recording.

Although Neuros officials said the two most common uses of the OSD are digitizing video collections and transferring programs off a DVR, the OSD has many other functions that will excite advanced users. One is the ability to connect the OSD to your home network, which allows you to record directly to a computer and to remotely access content from your computer, such as photos, music and videos.

Rare Entex Adventure Vision sells for \$5,500 on Ebay

Recently a mint condition Entex Adventure Vision tabletop game sold for \$5,500 on Ebay. It had 4 game cartridges (all that was ever made for it) and is fully working. It was originally found in a toy distribution warehouse in Colorado and had never been shipped out to any stores.

Guinness launches videogame record book



If you think eight hours a day sat in front of a computer screen is tough, try staring at a game of *Space Invaders* for over 38 hours. That's just one of the historical gaming nuggets revealed in an edition of the *Guinness World Records* that's devoted entirely to videogames. Dubbed *Gamer's Edition*, the book is a sort of who's who of gaming accomplishments.

While one gamer may have played *Space Invaders* for over 38 hours, that doesn't mean he holds the highest score. That award goes to one Donald Hayes, who achieved a score of 55,160 points in 2003.

The book also reveals that the *Super Mario* franchise is the best-selling game series in

history, with 145m units sold globally. If you don't care how many Xbox 360 consoles

Microsoft has sold so far, you may be more interested to know that 466m Xbox Achievements had been won by November 2007, which makes a

combined global score of 11bn. But if you've ever felt guilty for eating a whole pizza during a marathon *Halo 3* session then don't, because staff at the game's developer Bungie ate around 20,000 pounds of pizza during the 36 months it took them to create it.

Other curious facts of gaming history include the revelation that gaming legend Sonic the Hedgehog was originally called Mr Needlemouse, while Lara Croft's ample bust is apparently the result of a programmer's 'error' with percentages.

Guinness World Records Gamer's Edition is available in the UK from all reputable booksellers for £15 (€20/\$30).





The brave new world of videotex

Getting and giving information online pre-Internet seemed to be only for the brave or rich or both. Brave because it required a fair degree of technical ability, and rich because it was seen as a costly non-essential luxury.

The following looks at the rise of interactive videotex or viewdata services which distributed computer-based information on computer screens or specially adapted TV sets through the phone line. These services could be queried by users who would also have to pay for a subscription.

The earliest services provided information on private mini computers to existing time-sharing corporate users in the mid to late 60s. DIALOG, ORBIT and CompuServe all started off this way.

CompuServe were the largest service provider and offered applications to go with the basic time sharing services such as financial forecasting,

sales analysis, inventory analysis and experimental design. They also offered custom portals for the airline industry lawyers and other professions.

When personal computers became more popular in the late 1970s, CompuServe, along with rival service The Source, were offered to home users in the USA.

MicroNet was marketed primarily to Radio Shack's TRS-80 computer users who had to pay \$5 per hour after an initial \$9 start-up charge, which would also give them each 128K of storage on the service.

CompuServe allowed dialup connectivity to the largest

selection of national and international points, but this came at a cost. It was not unusual in the early 1980s for a business user to have to pay a \$30-per-hour charge to connect to CompuServe.

At this time a user could access online pages on a variety of subjects including news, email, games, financial services, stock quotes, weather, medical information, legal services and a searchable index of all services. There were also Special Interest Groups (SIGs) for lawyers, doctors, pilots, and writers etc which were all managed by Sysops.

By the mid-1980s CompuServe was one of the largest information and networking services companies in existence, and was the largest consumer information service in the world having the 100,000 subscribers.

In 1986 CompuServe expanded internationally, to Japan (with its Japanese version Niftyserve) and then the UK and Germany. It was at this time they introduced the GIF image format for sharing 8-bit images online.

British Telecom (BT) and the Post Office developed the world's first two-way viewdata service in 1978 - called 'Viewdata' originally, but later changed to 'Prestel' ('Press Telephone), as the term viewdata was considered too generic.

The service used an adapted TV set to display information in a window of 40x24 text characters, with some simple graphics, conforming to the CEPT1 standard. Many third-parties provided information including the government, The Economist, W.H.Smith and British Rail. The information was entered on a central located in London, and then mirrored onto a number of satellites located throughout the country.

Prestel data was transmitted via telephone lines to a TV adapter set-top box or special viewdata terminal, and while this enabled interactive services and a crude form of e-mail to be provided, it also involved purchasing a suitable terminal, and paying both a monthly subscription and the cost of local telephone calls. On top of this, some services (notably parts of Micronet800) sold content on a paid-for basis. Each Prestel screen carried a price in pence in the top right-hand corner. Single screens could cost up to £1.

Only a handful of Prestel terminals were ever sold as they were very expensive. In the 80s however, when more people had microcomputers, it was possible to use a modem, a Prestel ROM/adaptor and Prestel software to access Prestel this way.

It was not very quick to get online however but luckily back then expectations were much lower! If you had an acoustic coupler your connection could easily suffer from external line noise which would corrupt the screen data, and each full page of information took 9.6 seconds to transmit from the server to the TV set or monitor.

Users navigated through the screens or 'frames' using the menus or entering the

specific frame number of the screen they wanted and could also bookmark or 'tag' pages. There were around 30,000 Micronet800 frames.

It was possible for users to create pages, and do this offline for later upload, but they needed special editing software and had to meet Prestel's strict guidelines. Email was available but in the early days users needed to type in the 9-digit account number of the recipient's terminal (as opposed to their name), as the address. Users could also download software and on the Micronet 800 service it was possible to play a multiplayer space game called Starnet.

Prestel had just over 90,000 subscribers, with the largest user groups being Micronet800 with 20,000 users and Prestel Travel with 6,500 subscribers. It would have undoubtedly been much more popular however, had the cost of using it been much lower. For home users the basic Prestel subscription was £26 per year and for business users £72 per year. On top of this were connect time charges of 6p per minute peak times.

In the late 1980s the system was re-focused as a provider of financial data, and eventually bought out by the Financial Times in 1994. The closed access videotex system based on the Prestel model was developed by the travel industry, and continued to be used almost universally by travel agents throughout the country.

In the USA one of the earliest videotex services was the Radio Shack service (which preceded the TRS-80 Color Computer) which at first required a specially adapted videotex terminal costing around \$400. This did not sell well however.

Although there was no common standard in the USA for videotex transmissions, the services here used alpha geometric graphics for the screen images which could represent true curves, as opposed to the simpler alpha mosaic images used in the UK by Prestel etc.

Commodore 64 owners could use the Compunet service from which shopping, banking and software downloads could occur. A typical download would take 10 seconds for every 1K downloaded.

StarText was an online service that was launched in 1982 by the Fort Worth Star in 1997.

Originally there were no graphics or colors and subscribers, who first had to use a Tandy Model II or Timex 1000 computer with a 300 baud modem to access it, had to pay \$5.0 a month. Although there were only 3000 subscribers in the early days, it was innovative in that it allowed the publishing of relatively uncensored content by users.

In 1985, General Electric's Information Services division launched its GENie service. This time there was nationwide access as the General Electric servers were based all over the USA. Many of the original StarText users migrated to Genie until eventually the StarText service closed in 1997.

The French Teletel (popularly known as Minitel after the name of the dumb terminals used) videotex service created in 1980 by France Telecom was pretty successful in that subscribers were given, free of charge, the dedicated Minitel terminal needed to access the service. These terminals had a 1200bps receive/75 bps send modem, a fold-up keyboard and either a colour or black and white screen. Later on,



personal computers could be used to access the service. As the service was created to replace the paper-based phone books, FT made money by saving on printing/shipping costs. Users could access not only phone directory listings but also news, transport schedules, stock prices and other information.

Bell Canada introduced Minitel to Quebec as Alex in 1988 which was initially received very enthusiastically owing to the free two-month sign up period, but then died out after two years because of the high cost of subscribing and the lack of any useful

applications such as home banking and news feeds. Almost 9 million terminals/computers had access to Minitel by the end of 1999.

The Brazilian information service created by the telephone company Telecomunicações de São Paulo in 1982, was successful because the content was provided by many third parties. The phone company in this case, only provided the basic access and phone directory listings.

The Japanese CAPTAIN information service was another example of not living up to initial promises. Subscribers who were initially excited at the prospect of being able to do home banking and telecommuting, were let down by these applications failing to materialise. The information available was also tightly controlled by the government and the interface was poorly designed.

The Prodigy service, created by CBS, Sears and IBM, offered access (via a microcomputer) to news, weather, shopping, bulletin boards, games, polls, expert columns, banking, stocks,



travel, and a variety of other features. It was one of the first online shopping services and in 1990 had 465,000 subscribers and was one fo the first to offer a graphics-only as opposed to text-based service. It was quite popular in that users only had to dial a local number to access it and usually only pay a low fixed monthly fee for unlimited use. The service had a graphical front end and in this sense was like an early Internet portal. Prodigy utilised a lot of banner advertising on the pages.

The service was let down by the lack of consumer confidence in online shopping in general as online payment standards and trust schemes were not well established. Also, the poor image quality of shopping products for sale hindered sales. Advertisers did

not commit a huge budget to the service either as it was seen as very experimental. One its most popular applications however was the message boards and email, but when they charged hourly rates, subscribers left the service in large numbers.

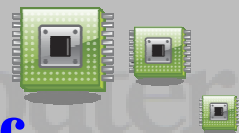
It seems that the keys to a successful videotex service in the early days were cheap or free access and ability to communicate with other users. As modems were slow, it was often quicker to refer to paper based information than go online. What started off as an online service usually led to email and message boards as being the most popular aspect.

Those services which allowed more content from third parties seemed to also be more

successful and was a natural progression to the World Wide Web where information was no longer centralised. Indeed videotex evolved from being highly centralised and censored to being provided by everyone like the WWW. Online services gradually allowed access to the WWW, ftp and email and subscriptions were monthly as opposed to being usage-based. There were also more closed or private membership videotex services to start with than open ones that were used by the general public.

Ultimately while videotex services were slow, impractical and expensive, they were a step in the right direction for building the foundations of the present day Internet.■





The Sinclair ZX80 – first computer for under £100

The Sinclair ZX80 wasn't particularly innovative – just very efficient and cut down. It was the first no frills computer for the average (albeit fairly technically literate) person on the street and served to whet the budding appetite for home computers that was to follow.

Sinclair Research of Cambridge, England, launched the ZX80 in January 1980 for £99.95 or for £79 in kit form. It was very popular in the beginning and there was a waiting list for orders as the company hadn't anticipated the level of interest.

Measuring a small 9" by 7", it ran on a Z80A CPU, had 1 Kb of RAM and 4 Kb of ROM containing the Sinclair BASIC programming language, editor, and operating system. It connected to a TV set for the display and a cassette player could store/load programs. The later ZX printer could also be connected to it.

There was no sound or colour and programming functions were limited – ie there was a lack of floating point arithmetic. By adding the later optional 8Kb ROM module, however, the ZX80 could function almost the same as a ZX81. 16Kb RAM packs could also enhance the small memory.

A one-piece membrane on the top served as the keyboard, and BASIC commands could be selected by pressing specific keys instead of needing to type them out in full. Whenever a key was pressed however, the screen would black out to provide the necessary RAM to the command process.

There was very little software that one could buy for the ZX80 – the user mostly had to type in program listings from books or magazines. In one magazine there is a chess game to fit into the 1K of RAM, but this required 2 people to play against each other rather than use the computer as an opponent. Other programs included Budget Analyst, 2-D Lander, Space-Docking and Mazes

There were some problems with the ZX80 – mostly owing to the fragile nature of the case. In this respect, chipped case edges, overheating, and expansion pack connections being too wobbly happened with some frequency. The touch sensitive keyboard was also not very popular with users.

The ZX80 was exported to the USA and soon after the Microace clone was produced which later had to stop production because of legal action from Sinclair. Microdigital of Brazil also made the TK82 clone.

Around 70,000 ZX80s were sold in the first year, mainly through mail order

The ZX80 effectively came along at the right time and at that time, had no competitors. It was very small, very cheap, and didn't need advanced technical skill to put it together as it could come ready assembled. When all a user could chose from was a computer kit or a £400 larger home computer, it bridged the gap between these sides nicely.

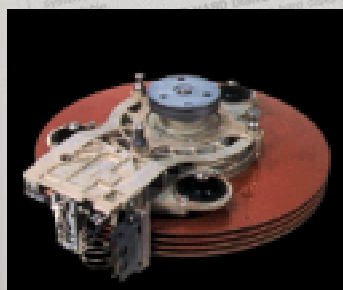


Hard Disks – humble, but collectible



Before you discard an old PC, check the hard disk – it might be historically significant. Here are some noteworthy hard disks that might be worth collecting:

- 1956 IBM 305 RAMAC (Random Access Method of Accounting and Control) disk which was the first computer disk storage system. This system had a capacity of 5MB spread over fifty 24-inch diameter disks.
- 1963 IBM 1311 which was the first 14" disk drive.
- 1965 IBM's model 2310 was the first disk drive with a removable disk pack.
- 1966 IBM 2314 was the first disk drive with ferrite core heads.
- 1973 IBM 3340 Winchester hard drive with a capacity of 60MB which was named after the 30-30 Winchester rifle. This was the first drive to use low mass, low load heads and lubricated media, and is predecessor to today's hard disks.
- 1980 IBM 3380 the first gigabyte-capacity disk drive,



They might look a bit dull and innocuous, but computer-usefulness owes as much to its storage capacity as to its speed. A linear increase in computer capability with hard disk storage can be traced since the first digital computers were developed.

Before you discard an old PC, check the hard disk –

which cost \$40,000.

- 1980 Seagate Technology introduced the first 5.25" form factor hard disk drive for microcomputers, the ST506, which had a capacity of 5MB.
- 1980 IBM ST412 hard disk which had 10MB, a 5.25" form factor, and was the first widely used hard drive.
- 1983 Rodime RO 352 which was the first 3.5" form factor disk drive.
- 1984 first 16-bit controller cards in IBM AT computers which enabled higher drive access times.
- 1983 Quantum 3.5" 'Hard Card' which had a capacity of 10.5MB. This was the first Integrated Device Electronics (IDE) hard disk as the drive and controller were all on the same unit.
- 1986 saw the first SCSI connections for hard drives.
- 1988 Conner introduce the first one-inch high 3 1/2" hard disk drives.
- 1988 PrairieTek introduce the first 2 1/2" hard disks.

- 1990 IBM 681 was the first hard drive to use

magnetoresistive heads and PRML data decoding.

- 1991 IBM's "Pacifica" mainframe drive is the first to replace oxide media with thin film media on the platter surface.

- 1991 Integral Peripherals 1820 which was the first 1.8" form factor hard drive.

- 1992 HP C3013A which was the first 1.3-inch hard disk drive.

- 1997 Seagate introduced the first 7,200 RPM, Ultra ATA hard disk drive.

- 1999 IBM Microdrives were introduced in 170 MB and 340 MB capacities.

Let's not forget those seldom bought external hard disk drives for the 8-bit and 16-bit micros – in particular for the Commodore, Atari and Amiga computers.

It's not only the disk itself that could be historically significant, but of course the data held within, so think about saving this data before you 'format c'! ■





Sega Master System – worthy rival to the NES

The Sega Master System (SMS) was a prime example of being at the wrong place at the wrong time. Whilst it was successful in some countries and was technically superior to competing consoles, it went to market too late and without experienced marketing backup.

The SMS was an 8-bit console created from the Japanese SG-1000 Mark III to compete directly with the Nintendo Entertainment System (NES)/Famicom in Japan. It was launched in 1986 in the USA at a price of \$200, but because it was a few months after the release of the NES, it missed out on sales to a lot of potential consumers who had already bought the NES.

The SMS used a Z80A CPU, had 8K RAM, could use up to 32 simultaneous colours from a palette of 64, had a game card, cartridge and expansion slots. It was the use of game cards and 3D glasses that made this console unusual.

The 3-D glasses plugged into the console via the card slot, and allowed 3-D visual effects for specially designed cartridge games – although only six such games were ever made. The 3-D glasses used a shutter system to close the left and right lens rapidly to create the 3D effect.

Various standard controllers were available, as was a Light Phaser light gun, 3D glasses and adapter, Rapid Fire Unit, Sports Pad trackball controller, Handle paddle controller and the SG Commander which was a standard controller with built-in rapid fire.

The 'pause' button was on the console itself and this was considered a design flaw as it made it difficult to get to in a hurry during game

play. The controller cord also went out from the side which was not as practical as emerging from the top of the unit.

Clones included the Grandstand Programmable Computer (Europe and Australia), the Mark III Game System (New Zealand) and the Mark Video Game System (Finland).

Some 220-300 games were made for the SMS. Most games came on the cartridges rather than the Sega game cards which were mostly used for smaller (32K or less) games. On some console versions, there was a hidden game, Snail Maze, that was built in, and could be accessed when there were no cartridges in the system and by pushing "up" on the control pad while pressing buttons 1 and 2 simultaneously.





period. The SMS became the top selling 8 bit console in Europe and Nintendo had to license some of the popular SMS game titles for the NES. In Australia, the Sega distributor Ozisoft, had strong ties to retailers which further boosted their market share.

The most successful market for the SMS however was in Brazil, being marketed by Tec Toy. By the time it came off the shelves in 1997, over 2 million units had been sold.

Despite its technical superiority to the NES, the SMS also suffered from the lack of quality games. At this time Nintendo had most of the biggest third party developers tied into contracts with then which prevented them from developing games for other consoles. This was later declared illegal by the US government and developers then had more freedom to develop for other consoles. The other problem caused by Nintendo's developer monopoly was that there was no 'killer app' for the SMS.

The SMS sold only 125,000 consoles in the first four months as opposed to the

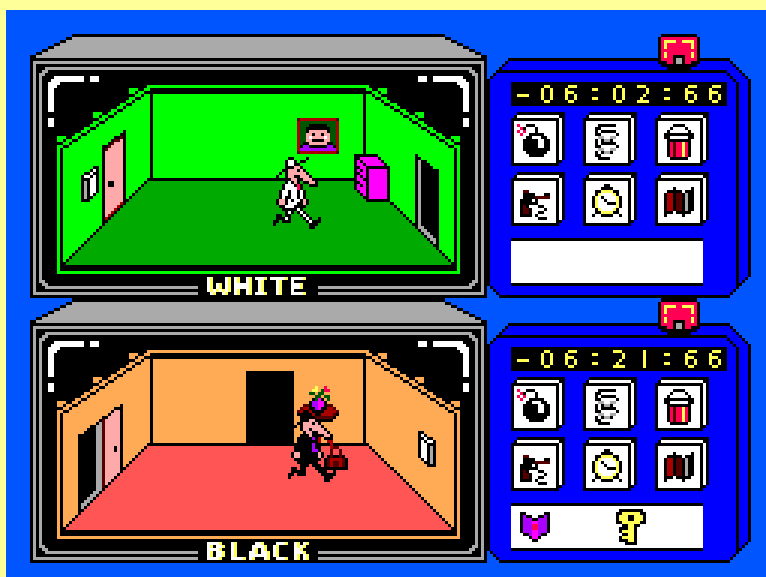
2,000,000 that NES sold. In this respect Nintendo had 90% of the North American video game market.

In 1988, the rights to the SMS in North America were sold to Tonka the toy manufacturer, but this was a mistake as Tonka failed to market the system adequately and as a result its popularity continued to decline. Sega eventually bought back the rights but this had little effect on sales.

In Europe and Australasia, however, the SMS outsold the NES as it had more third party development support. This support also allowed the SMS to be sold for a much longer

The subsequent Master System II was an improvement on the first system, however it came too late as the world was now looking at 16 bit consoles.

The SMS had the potential to claim as much video game market share in North America as Nintendo in the late '80s but unfortunately bad timing and lack of development support prevented this. In the end Nintendo wanted to license games from Sega and this, along with the European, Brazilian and Australasian sales proved that the SMS was more than a match for the rival NES. ■





Review of retro games for the Xbox and Playstation consoles

This month we look at what's on offer for retro gamers using their Xbox or Playstation consoles

Xbox

Atari: Atari Anthology

Games include: over 80 games including Centipede, Asteroids and Adventure.

Pros: good gameplay and good value for money, good sound and graphics.

Cons: would be better with the original controllers; Battlezone is not very faithful to the original

Overall: 7/10

SVG: Intellivision Lives!

Games include: over 60 games including Baseball,

Astrosplash and Space Battle
Pros: includes historical information on the CD and unreleased titles.

Cons: not very faithful sounds or graphics. The controller is very different to the original and most think not very easy to play the games with. Some of

the classic games are not included, like Tron Deadly Discs.

Overall: 8/10

Namco: Namco Museum 50th Anniversary

Games include: 14 games including Pac-man, Ms Pac-Man, Galaxian & Galaga

Pros: graphics and sound are good for

the Pac-Man games. The arcade machines/marquees are replicated and bonus games including Galaga '88 are included.

Cons: load times are long.

Overall: 8/10

Capcom: Capcom Classics Collection Vol 2

Games include: over 18 games including Avenger, Street Fighter and Last Duel

Pros: history of each game is included and there are wireless multiplayer options for each game.

Cons: some of the games included are not that interesting or fun.

Overall: 8/10

Empire Interactive: Taito Legends

Games include: 29 games including Space Invaders, Jungle Hunt, Operation Wolf, Phoenix

Pros: includes historical information, interviews and sales flyers for the games.

Cons: the lightgun games aren't good without an actual lightgun. Too many of the



games are uninteresting and the sounds are poor for the Phoenix game.

Overall: 4 /10

Capcom: Capcom Classics Collection

Games include: over 20 games including Final Fight, 1942, Commando and Ghosts 'n Goblins

Pros: good value for money.

Cons: quite a few of the games are uninteresting and not much fun. Street Fighter's load time is very long.

Overall: 7 /10

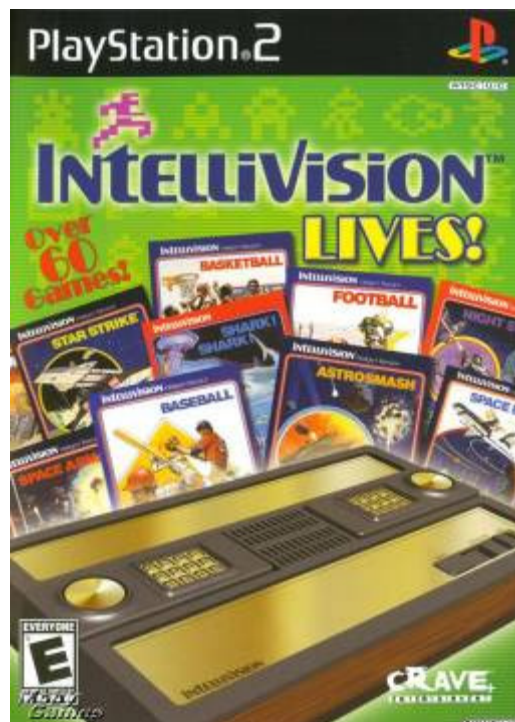
Playstation

Namco: Namco Museum 50th Anniversary

Games include: 14 games including Pac-man, Ms Pac-Man, Galaxian & Galaga

Pros: bonus games including Galaga '88 are included.
Cons: no historical information is included. There is some sound and control issues with some of the games and some slow load times.

Overall: 8/10



Sega: Sega Genesis Collection

Games include: 30 games including Comix Zone, Sonic The Hedgehog, Altered Beast, Bonanza Bros.

Pros: interviews with developers are included and overall it is good value for money.

Cons: too many action platform games included, but with notable omissions – Streets of Rage and Outrun.
Overall: 9/10

Empire Interactive: Taito Legends 2

Games include: 40 games including Space Invaders, Puzzle Bobble and Elevator Action Returns

Pros: good value for money and the games are responsive to the controls.

Cons: poor menu presentation.
Overall: 8 /10

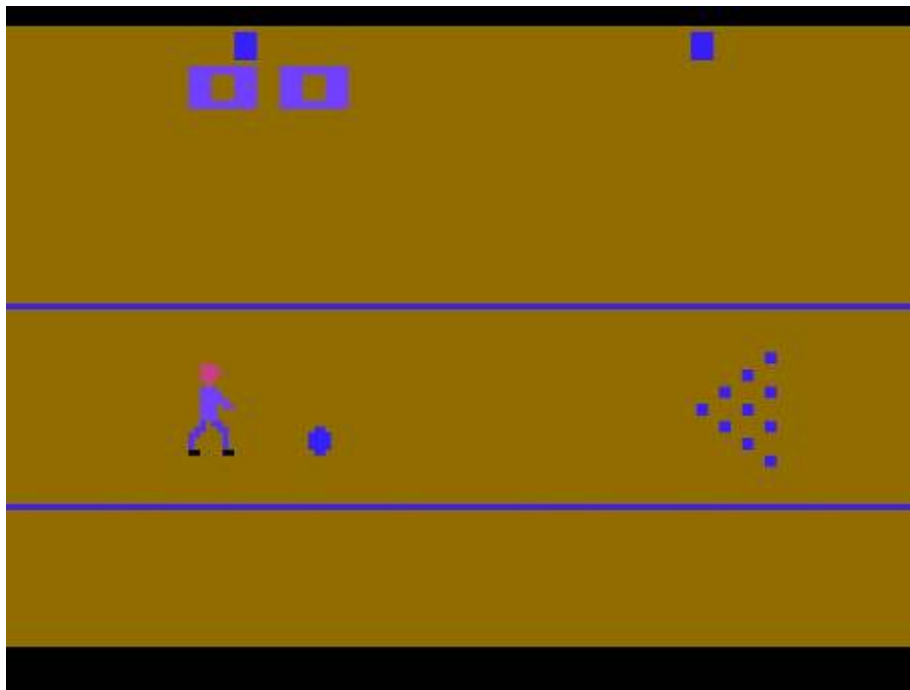
Capcom: Capcom Classics Collection Vol 2

Games include: 20 games including Dragons Side Arms; Street Fighter 1 & II, Turbo Strider

Pros: most of the games are fun to play.

Cons: when you lose all your lives, you just carry on playing from that point on rather than restarting from the beginning.

There is no historical information. The Street Fighter games seem overly difficult to play and the



controller is awkward to use at times.

Overall: 7 /10

Midway: Midway Arcade Treasures

Games include: Spyhunter, Defender, Joust and Gauntlet

Pros: some history of the games are included. Most of the games fun to play and are faithful to the originals.

Cons: There is some controller difficulty.

Overall: 8.5/10

Atari: Atari Anthology

Games include: 85 arcade and VCS games including Centipede, Asteroids and

Adventure

Pros: good collection of fun games which give good value for money.

Cons: there is a complicated menu system and there are some sound/graphics differences to the originals. The joystick can't control the player very well in some games – particularly those that originally used a paddle or trackball.

Overall: 7/10

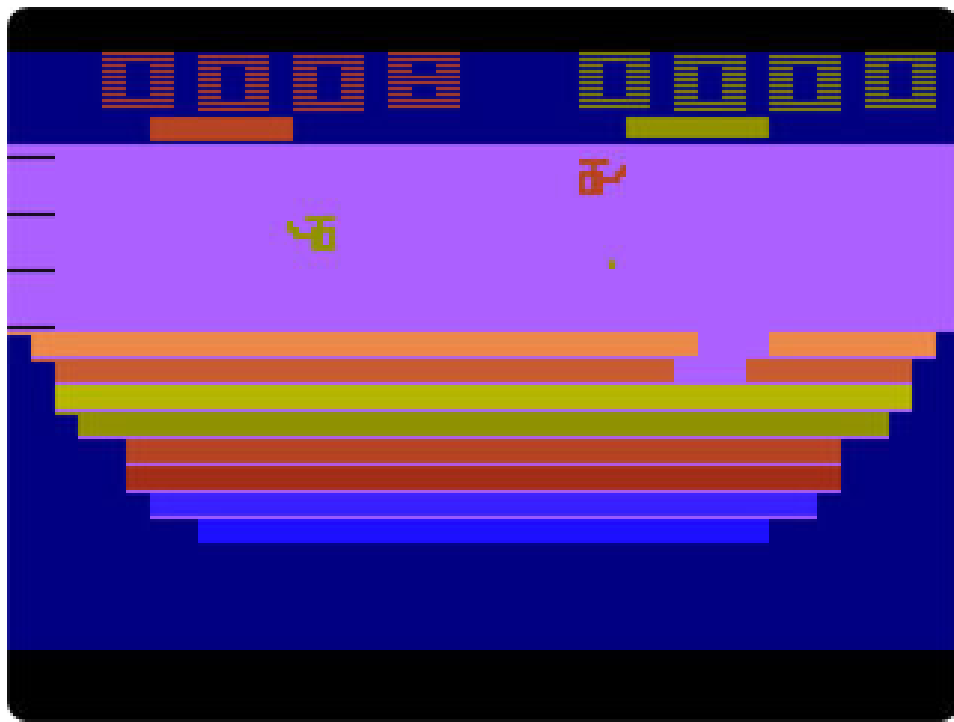
Sega: Sega Classics Collection

Games include: 10 games including Alien Syndrome, Golden Axe and Outrun

Pros: good value for money.

Cons: sounds/music/graphics are not very faithful to the originals and seem very obviously to be remakes of the originals rather than good emulations. It is also not easy to use the controllers for some of the games.

Overall: 4/10



Midway: Midway Arcade Treasures 2

Games include: 20 games including Spy Hunter II, Gauntlet II, Mortal Kombat 3
Pros: includes historical information and interviews. Good value for money.

Cons: Mortal Kombat seems much more difficult than the original and there are slight differences to the original games. There could be more instructions on how to play some of the games.

Overall: 7.5/10

Crave

Entertainment:

Intellivision Lives

Games include: over 60 games including Astrosmash, Baseball and Space Battle

Pros: historical information and original commercials included.

Cons: game control doesn't translate well with the PS2 controller and there could be more instructions on how to play some of the games.

Overall: 7/10

To conclude, those with a Playstation will have more

choice as there are more retro game offerings for this system. Also – the highest two ratings have been awarded to the Sega Genesis and Midway Arcade Treasures collection games, both which appear to only be available for the Playstation.

As in our previous review of modern remake retro TV

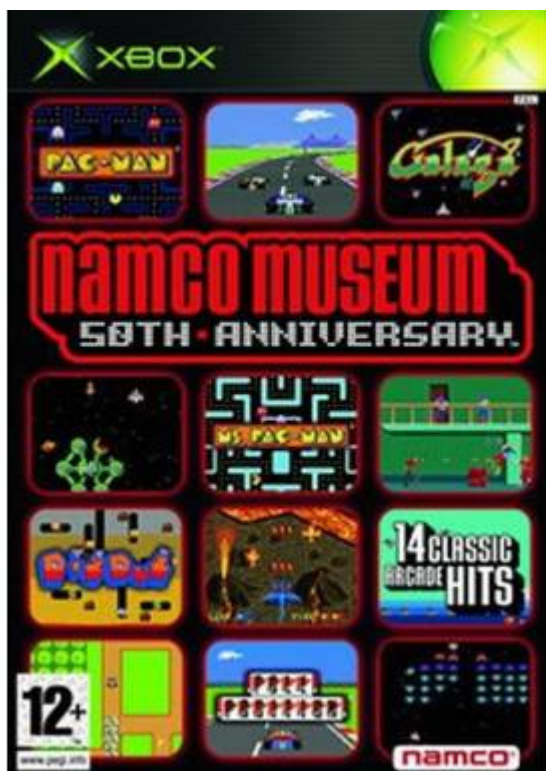


consoles, the biggest problems faced by manufacturers of these original conversion games packages are the following:

- Frequently popular titles are left out, (usually because the original license could not be obtained).

- Some gamers have a particular nostalgic favourite game which is not in the compilation.
- Original controllers don't generally translate well to modern controllers.
- Sound, graphics and even game-play are not quite the same as the originals, so manufacturers need to stop underestimating the long term memory of nostalgic gamers.
- Manufacturers need to make to clear whether the games are re-mastered copies or true emulations.
- Instructions need to be included along with a clear list of game titles in each compilation.

Overall though, these games present pretty good value for money for a bit of instant nostalgic action. ■





1970s Sanyo calculators

Robust, reliable and with distinctive designs, Sanyo calculators tend to be skipped over by collectors in favour of the more prolific calculator makes of the time such as Sharp.

Sanyo started producing mini (as opposed to pocket sized) calculators in 1970 starting with their very expensive (\$500 plus) ICC 82-D and ICC-0081 calculators. These Japanese-produced calculators could only handle the four basic arithmetic operations, weighed around 2Kg and had nixie gas-discharge tubes with yellow digital display.

The ICC-0081 had rechargeable C cell batteries and a built-in AC adapter, a flip up display cover and a battery level meter just below the display. They all came in sturdy but very high quality cases.

Just before this time however, Sharp had introduced their model QT-8B and so Sanyo lost out to the first wave of portable calculator customers.



Some of these early calculators resembled portable transistor radios of the time – in particular because of the carry handle at the top which could be pushed back into the case or folded out to prop the calculator up at one angle. All had General Instruments' circuits within.

Sanyo relabelled some of their calculators for the Dictaphone company and these were sold as the Dictaphone 1680.

By 1973/4, Sanyo calculators were getting smaller and lighter and were using AA size batteries. Displays were green or blue VFD (vacuum fluorescent display), semi reverse polish

notation was used in calculations and there was a percentage function. Keys were large enough and easy to use, if somewhat oddly labelled.

Mid '70s Sanyo calculators tended to have a white or silver outer case with white buttons for the numbers and blue/red function keys. The first scientific Sanyo calculators appeared now and featured square root and memory functions. All were manufactured in Japan.

From 1979 solar cells were used to power many of the calculators and LCD displays replaced the VFD and LED displays. ■





Vintage VHS video recorders – why we love them

It's all very well having a state-of-the-art DVD player to play your films on - films which have high quality images and can be manipulated variously with a remote control, - but let's think twice before we bin our hulking VCR machines.

The VHS format was introduced in 1976 by JVC and claimed the bulk of VCR buying customers as it allowed long playing and recording times. Because VHS had a lower recording density the tapes were cheaper and simpler to make.

Once the big stores started backing VHS, there were also more VHS tapes than other formats to choose from. Most people rented VCR machines as consumers didn't want to risk buying an expensive machine that might soon become redundant whilst the Betamax/VHS war was continuing. Betamax machines were not as available in the shops as VHS machines and eventually VHS became the dominant industry standard. By 1980, VHS had captured nearly 70% of the market.

The first VHS machine was the JVC HR3300 launched in Japan in 1976 and the USA in 1977. The first VHS machine to come to the UK was the JVC HR-3300EK in 1978 at a cost of £620.

These earlier machines were usually top-loading, enabled



pre-programming of a recording event up to 24 hours in the future, required the pressing of the 'stop' button before pressing either the fast-forward or rewind buttons, and made the screen go black when the pause button was pressed. The outside was usually silver or wood grain effect.

The early '80s saw front loading tape machines, black outer casing, ability to record many days in advance, audio dubbing, tracking controls, soft touch controls, automatic stop/rewind and switch off, infra-red remote control and


power failure back up.

A number of different VHS formats popped up – the VHS-C in 1984, SVHS in 1988 and the D-VHS but these didn't really take off as the machines and tapes cost more and when DVD players became more popular, people transferred from the analog to the digital players.

So where's the comparison between DVD and VHS you may say? Vintage VCRs are chunky, slow and primitive, DVD discs take up little space in your living room and DVD players allow efficient viewing of quality images. Well let's look at some of these comparisons between modern players and VHS VCRs...

Older VCRs were simpler. They only had a handful of (usually large) buttons on them that you ever needed to use. Yes if you really want to do advanced fine tuning it's all





there on a DVD player – but for most people who just want to stick in a film and press play it seems quicker and easier to use a VCR. All you usually need is stop, play, fast-forward, rewind and record and on modern DVD players you often have to think twice to work out if you are pressing the right buttons.

Even the remote controls only had the essentials on them. Unlike today's remote controls which look as simple as the inside of the cockpit of a Boeing 747. On the subject of remote controls – some of the older ones were not wireless, rather they were plugged into the VCR and had a long lead. At least this way they couldn't often be misplaced.

DVD players today don't cost the earth. VCRs in comparison cost loads in their day. How many people will mourn the loss of their DVD player as a result? You can go to the supermarket, bung a DVD player in with the shopping, break it the next week and chuck it away without looking back. VCRs however, command respect and loyalty. At the price they were, they didn't fail often and were pretty robust.

Let's look at the recording medium – VHS tapes were

chunky and dust magnets, but DVD discs can get easily scratched. More scratched DVD discs get thrown out in this way than faulty VHS tapes.

Also when you want your film in a hurry all you had to do with a VHS box is open it and the tape could be tipped out easily into your hand. With DVD discs you have to first push that circular thing in the middle and then make sure you handle it by holding it at the edges.

DVD discs only have 120 minutes of recording time whilst VHS tapes can have 210 to 300 minutes. True – there are longer 4 hour DVD discs, but these are much more expensive.

What about the so-called speed that a DVD can be loaded up and seen? It takes far longer to put a disc in, scroll through the TV output options (past the PC, Ext1, Ext2 TV options), be made to watch initial anti-piracy warnings without the ability to fast forward through this, then select the film or episode you want to see from a screen menu.

Fast forward/rewind on some DVD players isn't instinctive and frequently means the wrong buttons are pressed and

the whole exercise is abandoned.

Fancy recording a program using DVD players? Well, depending on your machine, you might be best off forgetting the exercise! When the manual describing the instructions for recording (even basic recording off the TV in real time) is several pages long, you are lucky if you can understand it enough to get it right. Even knowing which type of DVD disc to use (there are many) is not obvious. At least with VHS it wasn't hard to find the right kind of blank tapes.

Let's also pay tribute to the internal mechanism of the VHS VCR. First you load a tape and then when you press 'play' you hear a nice reassuring 'load-up' noise. A clever analogue ballet then ensues as the tape is lifted away from the tape head drum. Then during play, you get to hear a gentle hum.

Perhaps it's a testament to our fondness for our old VCRs that it's not often you find working vintage VCRs for sale. People will keep their VCRs as long as they still live – and long may they live! ■

A quick look at some vintage hi-fi headphones

Headphones were originally designed to isolate both the user from external noises and other people from hearing the sounds coming from the headphones. Sound quality and comfort were second place to sound isolation.

Originally, headphones were used variously with gramophones, for industrial uses (telephone operators, pilots etc) and for people watching TV.

It wasn't until the late 60s however that headphones became commonly used with home hi-fi. 10 years before this, the first stereo headphones were invented by jazz musician John Koss. These were very basic – just small loudspeakers covered in cardboard and held in place by a headband.

In the early 70s headphones cost between \$10-\$100 and varied little in features offered, compared with today's

headphones which have a many functions and differences.

Typical headphones of the time had a curly lead to connect to the hi-fi and were fairly heavy. The 'portable' ones were usually just smaller as opposed to being collapsible. Some had a stereo/mono switch, a headphones/speaker switch and/or independent volume controls.

There were improvements to headphones in the 80s but they were still fairly large and heavy. The exception was walkman headphones which were very light and small but had very poor sound quality.

In 1990, Koss introduced its first cordless headphones that used an infrared signal to link the amplifier to the headphones.

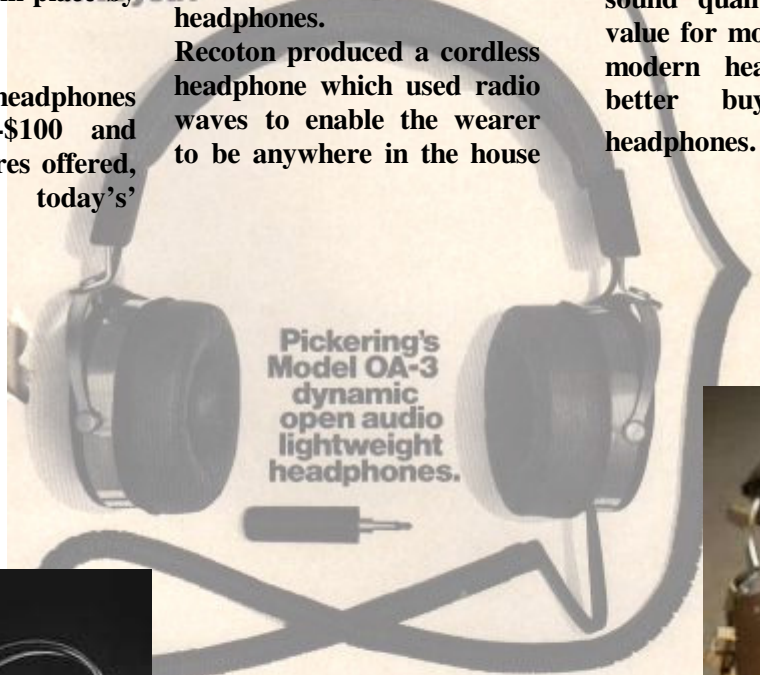
Recoton produced a cordless headphone which used radio waves to enable the wearer to be anywhere in the house



and still pick up sound up to 150 feet away.

Vintage headphone collectors mainly concentrate on pre-1960s varieties, but it's still interesting to look at how the design and features have evolved in the digital era.

For the average hi-fi listener at home, it seems that the sound quality, comfort and value for money provided by modern headphones are a better buy than older headphones. ■



SR-84 (SR-80 + SRD-4)



Listening Enjoyment. Just plug the adapter into the earphone jack of any portable Recorder, Portable Radio or TV and the OA-3 into the special adapter. Total sound everywhere you go. So slender. So light. So comfortable over long periods of time.

Sound Perfection. You have to listen to believe. Open Audio. Enjoy the sound. Yet, be part of what's going on around you. That's the big thing about "open audio".

Prediction. The OA-3 will be your favorite "component" in your hi-fi stereo system. \$39.95

For information write to: Pickering & Co. Inc., Dept. PE, 101 Scarsdale Blvd., Plainville, New York 11803



"For those who can hear the difference"
CIRCLE NO. 29 ON READER SERVICE CARD





1980s novelty radios

Previously we looked at novelty radios from the 1970s – ‘novelty’ - because they are representations of an object, either in miniature or true scale, with a radio hidden within. Novelty radios typical of the 1980s are similar, but had more functions and reflected the culture of the time.

cartoon/TV characters popular in the 1980s. This would have included Ghostbusters, Barbie, Transformers, Dukes of Hazzard and the like. In this respect, novelty radios were principally marketed to younger consumers.

In the business world they

would often be used as advertising gimmicks for employees, corporate gifts or as part of promotional material.

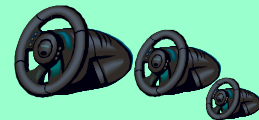
Novelty radios at this time were very basic like the 1970s ones, but occasionally there would have been an extra function to the radio such as a night-light.

Usually they were battery powered, had tuner and volume dials and were made of durable plastic. More of these radios had both AM and FM capability. ■



Radios were sometimes put inside models of everyday objects or represented





Interview with Dave Johnson, ColecoVision games designer and producer

Dave Johnson was the Director of the Video Graphics department at Coleco Industries from March 1982 to July 1985. While at Coleco, he helped design and produce over 100 video games for the ColecoVision console, ranging from Donkey Kong to Spy Hunter. Nathan Kozlowski interviews...

How did you initially join Coleco?

I started in 1982, shortly after the ColecoVision concept was introduced at a Toy Fair. I had no previous video game experience, but not many people did at that

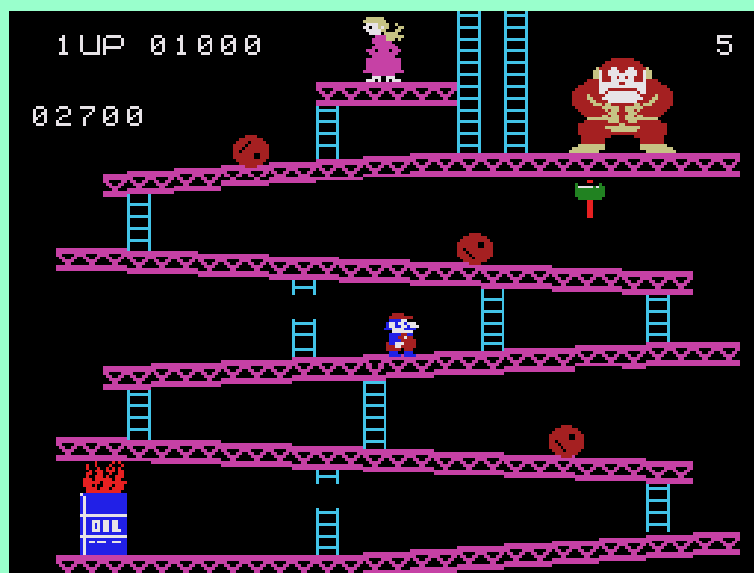
that manufactured small backyard pools, which was not too far off the mark. It was only after I saw an early demo of Smurf that I realized the ColecoVision's graphics capabilities and was won over.

adamant about keeping the ARD group free from interference. Eric ran a very tight ship and there was a great deal of overtime in the early days in order to have the console and some carts ready for the first Xmas season. It was not

COLECOVISION™

PRESENTS NINTENDO'S
DONKEY KONG

© 1982 COLECO



time. I had studied computer graphics at Syracuse University and owned an Apple II computer. The job was listed in the New York Times. I had never considered working for a video game company and thought that I would eventually work in television or film.

What were your first impressions of Coleco and the ColecoVision?

I was very suspicious. The demos that were shown at the Toy Fair were laugh-out-loud phoney animatronics of cardboard figures jumping around the screen. I think the fact that I pointed this out to Eric Bromley at my initial interview may have helped to secure the job. Since I was originally from Hartford, I was familiar with Coleco and thought of them as a cheesy toy company

What were some of the first projects that you worked on?

When I started, some of the graphics for Donkey Kong had been developed but they had to be re-worked many times. As Art Director, I was also responsible for managing the art department so that took a lot of my time. I was basically involved, in some form, with the development of graphics for all of the early games. Smurf was pretty time-consuming for the Art Department since it was an original game and fairly graphic intensive.

What was it like working at Coleco?

The department I was in was called Advanced Research and Development and was run by a VP named Eric Bromley who was

unusual for me to get a call in the middle of the night from a programmer who couldn't find a particular graphics file or needed to have some graphics reworked. Luckily, I lived nearby. All-nighters were not uncommon but there were rarely any problems with motivation, working late or getting the job done. We were having fun.

In general, how were the arcade games translated to the ColecoVision?

When the rights to a game were purchased, we would get a coin-op unit and not much else. We had a roomful of machines known as the game room. Of course, they did not require quarters and one of the first things anyone in the game division would learn was how to trip the coin lever to rack up the game credits

We were never given source code or any other documentation. The basic technique for documenting a game was to have one person play it while another videotaped it. Keep in mind that the games, both coin-op and console, were written in assembly language and were running on different chipsets so any code conversion was pretty much out of the question.

Although the original claim was that the ColecoVision games were “just like the arcade” there were substantial differences. Most arcades used a monitor with a vertical aspect ratio (a TV turned on its side) and we had nowhere near the memory, resolution or number of colours available on the arcade machines. So, levels and intermissions were deleted, characters and backgrounds had to be completely redrawn and game logic had to be simplified.

In the old building, the games were all housed in one tiny room filled wall-to-wall with dozens of coin-op video games. It actually became a problem on weekends with people sneaking into the building to play games and security guards caught climbing over the partitions in order to get in.

What was the timeframe usually given to the design of a game?

A game usually took 3-4 months to develop. The only games that I remember having an especially intense schedule were the first six that were released simultaneously with the console.

How do you think Coleco differed in operation from the competition?

Keep in mind that all of these companies were in constant flux so it's difficult to pin down specific operations. I can't say much about Intellivision but it was well known that, after Warner Brothers purchased Atari, the majority of the programmers bolted and formed Activision.

Also, there was a bit of an East Coast vs. West Coast mentality and Coleco was somewhat isolated from the more prolific West Coast



video game community. I went to one early game development conference in LA and was received somewhat reverentially by the competitors because everyone wanted to work on the ColecoVision hardware.

What were some of your favourite ColecoVision games? In your opinion, which games did not turn out well?

That's a very difficult question because it's so hard to separate playing the games with developing them. By the time a game was completed, anyone involved was usually hoping to never see it again. With that in mind, I think Smurf was pretty cool and groundbreaking. It was the first side-scrolling game and wonderfully non-violent. I thought Frenzy was the best translation. I thought the Super Action Controller was ill conceived with way too many buttons.

Can you talk about the projects at Coleco that never saw the light of day? Which of these projects made it to the working prototype phase?

There were many demos and a few games brought to completion that were not brought to market. I think Tac-Scan was completed but not released (Frank Lam is still bitter about that one) and there may have been a few others. I know there were a few versions of arcade knock offs that were developed for the other systems but not released, because it was decided that the hardware couldn't support the game concept and graphics. I remember a version of Zaxxon for Intellivision that was exceptionally lame.

The super module was an interesting project that seemed to generate a lot of rumours and controversy. My recollection is as follows: The expansion module was basically a “stringy-floppy” wafer storage device that had been around as a third-party, less expensive alternative to floppy drives for the Apple II computer among others. It was a tiny tape cassette that would stretch out after repeated use and proved to be completely unreliable.



We had developed several “super versions” of the popular games that contained levels and intermissions scenes that had been left out due to cartridge space restrictions. Keep in mind the expansion module added nothing to the capability of the basic console except more storage. Think more, which is not necessarily better.

What were the highlights and lowlights of working at Coleco?

In the beginning, no one knew if the product would be successful or even noticed by the public. Atari seemed like an incredibly successful company and it was hard to imagine how a little toy company from Connecticut could compete. It was very rewarding to see ColecoVision take off. The lowlight was the company’s location. I was originally from Hartford, and desperately wanted to be back in NYC where I now live.

How long did you work for Coleco? What were the reasons for you leaving?

I was there about 4 years. I was let go, along with everyone else in ARD, when Coleco decided that there was no future in video games.

Did it come as a surprise or was everyone sort of expecting it?

It had been coming for a while.

What were some of the last games you worked on?

There was a version of Super Gorf, which I don't think was ever released. There were some educational software projects based on children's books notably the Berenstain Bears, Richard Scarry and Dr. Seuss.

If the video game crash never happened, how long would you have continued to work at Coleco?

That's hard to say. It was a fun job but, believe it or not, I was a pretty tired of cranking out video games after 4 years.

Do you own a ColecoVision today?

No, I kept mine around for several years, but Manhattan living does not afford the luxury of much storage space. I was very happy to discover the various emulators available online and was able to get screen shots to use in my portfolio.

Do you still keep in touch with anyone from your Coleco days?

I am in touch, tangentially, with the game community and get occasional news about the old gang. I am still good friends with Debra Doorack (formerly Martorelli) from the educational software department. I worked on several game projects with artist Frank Lam in the late 90's and I get sporadic emails from artist Debra Lazarus. ■



Whatever happened to the teasmade?

Once so popular in the '60s and '70s in the UK, teasmades or 'teesmades' are synonymous with retro has-beens that never should have seen the light of day. Strangely however they are making a comeback...

Teasmades are basically an alarm clock attached to a kettle/teapot arrangement. The user would have it in the bedroom, set the alarm to the desired waking time and upon waking would be presented with a fresh cup of tea.

Automatic tea makers were first invented at the turn of the last century being marketed as 'clocks that make tea' and used the principal of using an alarm clock to trigger the heating element of the kettle to come on and then use the steam to force water out through a tube into a teapot.

The Goblin company, from 1936, were the first to use the term 'teasmade' when they produced the first mass market 'Teasmades', and this term is commonly used to refer to any automatic tea making appliance.

Teasmades in the 50's and 60's commonly had the addition of a lampshade attached to the top of the appliance. Most had a chrome kettle and ceramic teapot and some had optional matching crockery. On the front of the appliance was just a large analogue clock and the kettle/teapot was placed at the rear.

Main brands at this time were Goblin, Russell Hobbs and Teeboy (from Teeboy Engineering).

1970s teasmades had smaller analogue clock faces (some made from brushed stainless steel), with function buttons/dials on the front and priced between £15 and £50. The teapots were either stainless steel or ceramic, and they came with a built-in light (so no need for the lampshade) and the kettle had 1.5 to 2 pints

capacity. The Swan BSR company took over the Teasmade trademark from Goblin and produced their Swan tea makers, but using Goblin made kettles and tea pots. Main brands were Goblin, Russell Hobbs and Pifco. Philips made a 'Tea for Two' teasmade at this time which had two mugs.

The peak of teasmade production was in the mid 1970s where just under half a million teasmades were sold every year.

Part of the teasmade demise could be attributed to their reputation for being faulty – especially in the late 70s when many Goblin teasmades were returned from the stores for having a variety of faults.

In 1979 the Goblin 870 was the first tea maker to feature a



radio so one could be awoken by a buzzer alarm, radio and/or lights coming on.

1980s teasmades were characterised with the teapot being placed at the side of the clock rather than at the back, luminous clock faces, built-in radio, and with a smaller kettle capacity (1 to 1.5 pints). The compact Russell Hobbs model 7106 didn't require a teapot at all and just used the kettle.

The smaller capacity, in this respect, perhaps reflects how these appliances were seen as too bulky to have by the bedside and that it was quicker to heat up a smaller kettle? It also seemed as though it would have been quicker to pop downstairs and make a cup of tea in the kitchen than wait for the teasmade to do its stuff, on some of the earlier models.

There was a sharp decline in sales from the late '80s. There were still a few tea makers available, more with digital as opposed to

traditional clocks, in the '90s. The last Goblin tea maker, the 10610 Teasmatic, was withdrawn in 1998.

In the USA, tea makers weren't really made or sold. The Goblin 860 was exported in the '70s and the kettle in these was converted for coffee. The only home grown variety were the Mrs Tea tea makers which were introduced in 1995 but are no longer in production. Mrs Tea allowed the strength of the tea to be adjusted using a steeping lever and either loose tea or teabags could be used. The warming plate kept the teapot warm.

So if you are desperate to have that early morning cuppa on first waking though, rest assured that you can still buy a brand new teasmade. Some are bought these days because they are seen as retro, but until people drink the level of caffeine-based tea that was consumed in the 60s and 70s, there will not be the huge level of sales seen as before. ■



Lets party retro-tech style!

If you need some ideas to make your retro-tech bash the best – look no further



Venue: Anywhere with a lot of power outlets. Not too many bright lights either – sufficient lighting will be provided from screens (TVs/computers etc)

Dress code: Guests must wear an item of clothing or an accessory that has a retro company/organisation logo or image on it, or wear a retro gadget (e.g. LED watch). Failing that, the minimum must be something with a modern image portraying something about the retro era – e.g. a computer museum or website which sells retro-tech stuff.

Music: Kraftwerk or similar. Must be played on 80s stereo system or 70s decks.

Films: Have a large screen on one wall showing a suitable film either on mute or with full sound e.g. Midnight Madness; War Games; Soylent Green, Tron etc.

Games: If you have a stand up/cocktail table arcade machine, then great. If not, try and hire at least one. Have some TV consoles lined up featuring at least one recent-vintage variety like an NES and a couple of oldies like a ColecoVision or an Atari VCS. Try to hook them up to 70s or 80s TV sets instead of modern TVs.

Food: Pizza, burgers, crisps, chocolate - and for the health conscious, the same, - but less of it.

Drink: Water, beer, cocktails with umbrellas.

Competitions: Have a high score competition for some of the games on offer. Also a

raffle with the winner being announced at the end. Other ideas: guess the age competition (use anything retro-tech); Pac-man piñata; game or hardware charades; quizzes etc. Offer up retro games as prizes.

Cake: No party is complete without a cake. Make your very own unique vintage tech designed cake – it's a lot easier than you think. The only things you probably don't have in your food cupboard that you might need to buy is: brown and black food colouring, liquid glucose, general purpose icing sugar and greaseproof paper.

Just make 2 normal square sponge cakes (preferably Madeira sponge as it is sturdier to work with), cut the sponge to the shape/sizes desired; stick the sponges together with apricot glaze or heated jam. If desired, you can slice the centre of the sponge and fill with butter icing,



chocolate icing, jam or apricot glaze and sandwich them together. Spread jam/apricot glaze on the outside of the sponge.

Make up some sugar paste icing with some egg white/glucose and icing sugar, colour accordingly and roll out to cover the cake. With either

pipings bags made from the greaseproof paper or just cocktail sticks, make up some glaze icing to make the finer detail/writing on the cake. Different coloured and shaped shop-bought sweets can also be used for any other detail e.g. bootlaces, Tic-Tacs, Dolly Mixtures. Some cake ideas

include vintage calculator, computer, video recorder, mouse and mobile phone.

Alternatively, make cupcakes and decorate with retro motifs on the top e.g. numbers to represent calculator keys, Pac-Man game ghosts etc. ■





Transistor radio repair tips

Radio fizzing, cackling or dead? Try the following before you give up on it...

- Radio seems completely dead

Check the battery connector to see if detached from battery or overly corroded; the on/off/volume control switch; the earphone jack (because it cuts off the speaker when the earphone is inserted) and the speaker itself. In all cases, clean these areas where possible.

If the set is silent, the first check is whether power is reaching the set. Connect a multimeter on the 200mA DC current range in series with the battery. If the current consumption is between about 8mA and 20mA, power is reaching the set and it is probably drawing around the right amount of current.

If the current is a lot higher, power is reaching the set but something is wrong. Quickly feel around the output stage to see if anything is getting warm, and then disconnect the battery otherwise it will run flat fairly quickly. If anything is warm, that's the area where the problem lies.

If the current is zero, power is not reaching the set. Check the on/off switch, battery leads, and any switching between internal and external power supplies that may be included.

If there is power reaching the set but it is still completely silent, check the speaker with the meter on the lowest ohms range. The resistance should

be similar to the impedance marked on it. There may be a pop sound when the meter is connected and disconnected – (this is more likely with an analogue meter). To further check the speaker it can be disconnected from the set and a 1.5V battery be momentarily connected to it. There should be a healthy 'pop' as the battery is connected and disconnected. Or the speaker could be connected to a known working radio.

If the speaker is OK, check the earphone socket. It is quite common for the contacts that open to mute the speaker when the earphone plug is inserted, and to remain open when the plug is removed. The open-type sockets used on Far-Eastern models can usually be fixed by retensioning the contacts, whereas the enclosed type used on British sets cannot normally be repaired. If this is the problem, bypass it for now so that the speaker is connected directly to the output stage.

Still silent? A fault in the output stage is the most likely. The output coupling capacitor could be dried up. Measure the voltage drop across the output transistor emitter resistors (if fitted). It'll be fairly low - tens of millivolts probably - if all is well. Check the biasing of the output transistors (voltages are normally on the service data).

The driver or output transformer could be faulty, but this is unlikely unless they are physically damaged.

Resistance checks will prove the point.

- Radio switches on but hisses

Check the antenna (see section on broken aerial below).

- Radio comes on only intermittently

Replace electrolytic capacitors with a modern equivalent as these often leak. If the rubber piece at the positive end is squeezing out of the can, then it is likely that the capacitor is no good. These capacitors can also dry out, with the effect that the capacitance decreases and the impedance increase to the point where it is doing nothing useful. A multimeter can help pinpoint fault capacitors – the voltage across a faulty one will often be lower than they are meant to be.

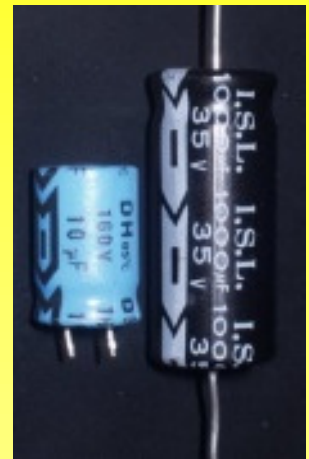
- Numbers/markings on controls/dials rubbed off

Draw over where markings used to be with a sharpened crayon.

- Dull radio case

Polish with Brasso/Novus or similar plastic polish solution. Take care not to polish over brass or painted areas.

- Leaking batteries



If the leakage has spread to the PCB and components outside of the battery compartment, it may be a lost cause to try and fix it. For minor residue, use a foam cleaner and old toothbrush, and household lime scale remover will sort out battery connector discolouration. It is possible to replace the original battery leads with modern equivalents if necessary.

- Cracked or broken PCBs

Broken tracks can be repaired by soldering lengths of tinned-copper wire across the broken section, preferably from one component connection pad to another. Inspect tracks in the area of the damage carefully, with a magnifying glass. You will sometimes find that the crack has extended further than you thought. If necessary the board can be strengthened with epoxy resin, but this can make subsequent repairs more difficult.

- Broken ferrite rod aerials

Use superglue if the break is clean and somewhere near the middle. There will be a slight reduction in performance with this sort of repair, but not enough to worry about. If the rod is broken into several pieces it should be replaced. The fine wires from the coils on the ferrite rod aerial can become broken, and the break is not always visible. If in doubt, check with a multimeter.

- Radio makes a pop or click when switched on or off but nothing else is heard.

If the set is consuming the right current and makes a pop or click when switched on or off, try operating the other controls. Does it crackle when the waveband switches or volume control are operated? If so, the audio stages are probably OK. To check further, set the volume control to maximum, hold a screwdriver with your finger against the blade and touch the tip onto the centre connection (wiper) of the volume control. If the audio stages are OK you should get a buzzing noise. If

not, voltage checks around the audio stages may help to identify the fault. Dried up capacitors between the volume control and the AF stage or between the AF stage and the driver stage are a possibility too. Remember to tap the transistors with the handle of a small screwdriver to

see if they are intermittent.

Voltage checks should help narrow down the problem stage - again the expected voltage should be on the service data. If not, compare the voltages between the two IF stages - the circuits are similar so the voltages should be too. Generally the emitter will be a little above 0V, the base will be about 0.2V higher than the emitter and the collector will be a little lower than the supply voltage. For the mixer-oscillator the base voltage may be the same as the emitter or possibly a bit lower, if it is oscillating. The main clue here is that the collector voltage is a bit lower than the supply voltage, indicating that the transistor is passing some current, so a bit of voltage is being dropped across the IF transformer and oscillator coil in the collector circuit.

- FM not working

Check and replace the transistors in the FM front end.

- FM working but sounds distorted

Check the FM detector circuit. Either the electrolytic capacitor has dried out, or one of the diodes is getting tired. If there's a small variable resistor for balancing the circuit, make sure this is OK too. If replacing the capacitor doesn't work, try replacing both the diodes.

- Adjusting MW/LW alignment

Tune the set to a station on MW that is fairly weak but still clearly audible - music is generally better when adjusting for maximum volume by ear. Carefully adjust each of the IF



transformer cores, starting at the mixer-oscillator and working forward, for maximum volume. Only adjust each core once then move forward. Don't go back round and do them all a second time.

Now tune to a known station near the low frequency or high wavelength end of MW and check it is at the right position on the band. If it is not correct, make sure the tuning mechanism is working correctly and that the pointer or whatever is moving properly from one end of the band to the other. Also make sure it's going the right way - highest wavelength or lowest frequency when the tuning capacitor is fully closed. If the station is a little way out, adjust the oscillator core to bring it into line. If the station is some way away from where it's supposed to be there may be something else wrong.

Now tune to a known station near the high frequency or low wavelength end of MW and check it's in the right place. If not, adjust the trimmer capacitor on the oscillator section of the tuning capacitor to move it back. Now recheck the first station again. It may need readjusting two or three

times.

The RF alignment will need to be peaked. Tune to a weak station at around 1500kHz or 200 metres, and adjust the trimmer capacitor on the RF section of the tuning capacitor for maximum volume. Tune to a weak station at the other end of the band and adjust the position of the MW coil on the ferrite rod aerial for maximum volume.

Switch to LW and adjust any trimmers and cores that are only used on LW for maximum volume. Also move the LW coil on the ferrite rod for maximum volume.

With all these adjustments, if anything is sealed assume it's correct. The only reason for an adjustment to be out is if someone has been at it. If there's no evidence of this, leave it alone.

- Adjusting VHF/FM alignment

Connect a multimeter on the 10V DC range across the electrolytic capacitor in the ratio discriminator circuit.

With the set tuned to a medium strength signal, carefully adjust each IF core in turn for maximum indication on the meter. If the sound is distorted, very carefully adjust the core of the final IF transformer slightly in each direction to see whether there is any improvement. With a quiet programme this should correspond with maximum reading on the meter, but the peak may not be that clearly defined. If there is



better audio quality with the adjustment significantly away from the maximum meter reading, something else is wrong with the ratio discriminator.

- No volume until volume control is well advanced or volume too loud

Check to see if volume control parts are worn, especially the carbon wiper surface.

- Volume too low

Check the audio coupling capacitor from volume control to driver transistor also audio driver transistor emitter bypass capacitor

Most transistor radios can be fixed by replacing defective transistors and electrolytic capacitors, repairing bad solder joints, and resolving corrosion/oxidation problems.

It is handy to have a hex nut driver and earphone jack removal tools and a small wattage soldering iron for any transistor radio repairs. ■

Thanks to Paul Stenning of www.vintage-radio.com and Sarah Lowrey.



Nova Scotia Computer Museum

In this far eastern corner of Canada there is what appears to be the only physical museum devoted to old computers. Set up by a computer collector in 1999, it is interesting because it

has seven original Kenback-1 computers. The Kenback-1 personal computer, produced in the early 1970s, is rarer than the Apple 1 as only 40 were ever made. So this is the place to visit if you want to know more about the Kenback-1. There is also a collection of vintage robots here.



For more information visit Annapolis Royal, Nova Scotia, Canada, or <http://www.computermuseum.20m.com>

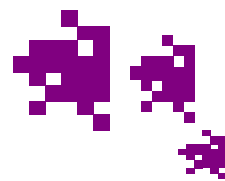


Retro game commercials and videos site

This site is guaranteed to put a smile on your face! It is an interesting celebration of video in the world of retro games. Not only can you instantly see an old Atari commercial, but you can see what playing a certain game on a certain console looks like.

Visitors to the site can upload any videos they have and browse the collection under various categories – for instance under consoles, computer type, time period or type of video (e.g. commercial, TV show, game play video etc). Through the on screen video player, you can view the films straight away. Well done guys for a great site! <http://www.retrogamevideos.com/>





The Imagination Machine

The only computer with color, sound, user programmability and expandability at \$599.

A built-in, dual-track cassette tape deck with 1500 baud rate, for APF's digitally recorded, "simulated" tape programs. A built-in sound synthesizer. And two, built-in, game style controllers, with joysticks and numeric keypads.

When you want to go beyond APF's library of educational, home- and personal management or entertainment programs... when you want to create your own programs... you can. The Imagination Machine is programmable in BASIC and 6800 machine language. The Imagination Machine

is also expandable. Just add our "Building Block" - an optional, four-port expansion device, and you can hook up a printer, telephone modem, and additional memory cartridge or mini-floppy disk drive.

For the name of your nearest Imagination Machine dealer call: TOLL FREE: 1-800-223-1264. (New York residents call: (212) 758-7550) or write: APF Electronics, Inc., 444 Madison Avenue, N.Y., N.Y. 10022.

\$599. Manufacturer's suggested retail price.

APF electronics inc.

"YOUR LIFE WILL NEVER BE THE SAME!"

Memories of the Imagination Machine

Ron Stalma recalls...

"Back when Atari was King, in the pre-dawn days of the C-64, my imagination soared, as did the imagination of many other wannabe hackers.

I originally bought my M-1000 game console in the fall of 1981, because it was cheaper than the Atari 2600. If I remember correctly, the Atari 2600 was selling for around \$130.00 - \$150.00. I paid close to \$90.00 for my M-1000 game unit from the JC Penney Catalogue, and chose it over the Atari because it was cheaper, and it could later be expanded into a fully-fledged computer. To this day, my wife would probably still enjoy a game of Catena as it was her favourite.

One day back in 1982, I got bored (of course) with the basic M-1000 game unit, and I called APF to see if I could

purchase the computer console that would turn it into a real computer.

They quoted me a price of around \$300.00, and I decided that I was going to save my pennies and turn into a real hacker.

Well as it turned out, I called APF again about four months later, and hit the jackpot! APF was going bankrupt, and the whole warehouse was up for sale really cheap. I bought the computer console for \$50.00, and also bought 12 game cartridges, a few cassette programs, the "building block", a serial printer interface (which plugged into the building block), and a technical manual, complete with schematic diagrams. I also wanted a disk drive, but back then, I didn't realize what one even was, or

the benefits of having one, so I didn't buy one. Altogether, I think I spent around \$150.00.

The tech manual was well-written, and I soon figured out the APF's innards. I wondered why they originally charged so much for the computer-console portion, as the M-1000 game unit was really the heart of everything - containing the CPU, ROM, 1K RAM, and Video. The computer console contained the extra 8K RAM, keyboard, cassette, and associated hardware. My guess is that originally, it was the 8K of RAM in the console that pushed the price up. APF also gave me the address for a nationwide users group that published a newsletter and exchanged ideas and programs with each other.

I learned to program in BASIC and machine language on my Imagination Machine, and soon, I was creating my own (lame) games, using machine-language routines for speed, called up from within a BASIC program. I remember that it was easy to program in either BASIC or machine language.

When I made the jump to a C-64, the ML programming was harder, but then the C-64 was a more sophisticated piece of equipment than the APF was.

The APF's designers had looked ahead to future upgrades when they designed the computer, and they incorporated bank-switching into the original hardware.

Soon, I had my MP-1000 running with 24k RAM!! I also bought a Gorilla Banana dot-matrix printer from Protecto, and had it running from the serial port. I also used a word processor that was written by one of the newsletter group's members.

Well anyway, along came the Commodore 64 (I still have the C-64), and in 1984, the M-1000 went into the closet after I

Effectively the C-64 put the death blow to the Imagination Machine with its superior graphics and sound.

I do wish that I kept my Imagination Machine though... it would have been a nice piece

of computer history. I had a lot of fun with it. Though the game unit itself could not compare to the Atari, the keyboard console more than made up for it!" ■



Vintage technology events

April 4-5th, 2008

Mason, Michigan, USA: Telephone Collectors TCI Spring show. Social/pizza evening followed by Starbucks/Krispy Kremes on the Saturday.
<http://www.telephonecollectors.org/events/events.htm>

April 12-13th, 2008

Chicago, USA: 17th Annual 'Last' CocoFEST organised by the Glenside Color Computer club.
<http://members.aol.com/clubbbbs/glenside/>

April 26-27th, 2008

Munich, Germany: 9th annual Vintage Computer Festival, Europe (VCFe). Speeches, exhibition, flea market, supercomputer excursion, trivia challenge
<http://www.vcfe.org/E/>

May 2-4th, 2008

Indianapolis, IN, USA: Antique Telephone Collectors Association spring show
<http://www.atcaonline.com/events.html>

May 4th, 2008

Reading, PA, USA: Too Many Games (TMG) convention
<http://toomanygames.com/>

May 11th, 2008

Leamington Spa, UK: National Vintage Communications fair. Features early radios, TVs, gramophones, telephones, valve hi-fi and other electrical collectibles. Over 200 stallholders present. This appears to be the biggest vintage electrical event in the UK and is held annually.
<http://www.nvcf.org.uk>

May 24th, 2008

Fairview Park, OH, USA: The Classic Computing and Gaming Show. Buy, sell, trade, play, and see classic video games, computers, peripherals, memorabilia, and more.
<http://www.ccagshow.com/>

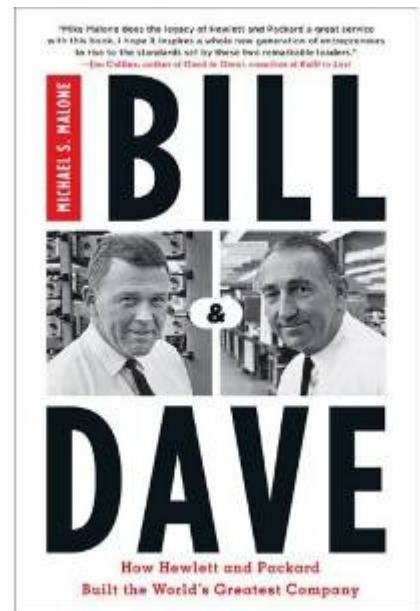
Bill and Dave: How Hewlett and Packard Built the World's Greatest Company

by Michael S. Malone

William Hewlett and David Packard co-founded Hewlett Packard with \$538 in 1938, in a garage in Palo Alto, California. Their first product was an audio oscillator and one of their first customers was Walt Disney Studios which purchased eight of them to use during the creation of Fantasia.

This book chronicles the history of HP, crediting the company's objectives, employee trust, and firm self-appraisals with enabling its success. It also lists some lessons to be learnt in the world of company management.

The author can be a bit too sentimental and overly



enthusiastic but there is plenty of historical information.

Published by Portfolio, April 2007; hardcover; 352 pages; price £11.04 on Amazon ■

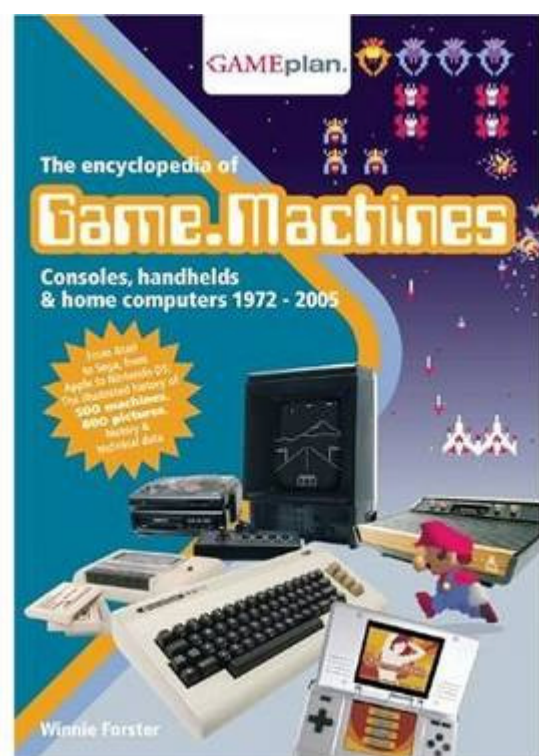
The Encyclopedia of Game Machines: Consoles, Handhelds and Home Computers 1972-2005

by Winnie Forster

More than 450 dream machines, from million-dollar sellers to exotic variants, are celebrated in this exhaustive reference to video gaming systems. Beyond just images of the gaming decks, the book covers classic software, as well as key technical facts for each console and operating system.

There are lots of photos and a variety of content on video games and home computers. However the English translation from the original German is not as smooth in places as it could be and there are some minor historical errors. There is a lot of systems covered, including little-known ones, but apart from this, there is nothing to make this book stand out among the already numerous catalogue-type books on old computers and games systems.

Paperback; published by Hagen Schmid March 2005; 224 pages; price £30.50 on Amazon ■



COMMODORE



In a convenient 24 X 36 poster.

"The History of Commodore Computers" poster is the culmination of three years of work and research. The Commodore systems have been professionally photographed specifically for this poster and the photos appear nowhere else.

This poster is ideal for any vintage computer fan, Commodore Computer collector, classic or vintage memorabilia display. This is a limited edition poster and will not be re-printed!

Poster includes hi-resolution images of rare and hard-to-find systems including the KIM 1, PET 2001, PET 4016, PET 8032, VIC-20, C-64, C-64C, SX-64, C-128, C-128D, B-128, CBM 256-80, P-500, Plus/4, C-16, C-116, VC-20, Amiga 500, and selected diskette drives. \$19.99 plus shipping.





Vintage Computer Festival Europa

The ninth annual European Vintage Computer Festival awaits you!

Our mission is to encourage the preservation of obsolete computer hard- and software of years past, to promote interest in researching and documenting the history of the computer age ... and to have fun playing with old iron.

The Vintage Computer Festival is not only a fixed entry in the Silicon Valley timetable, but it has also become a European event, celebrating our computer heritage.

This year's focus is: **Game Computers - Computer Games.**

Exhibition

Speeches

Flea Market

Nerd trivia challenge

Where	Mehrzweckhalle des ESV München Ost		
	Baumkirchner Straße 57		
	81673 Munich		
When	April 26th, 2008 from 1000 to 1830		
	April 27th, 2008 from 1015 to 1700		
Admission		Pre Registration	At the Door
One person -			
	- One Day	-	EUR 5,-
	- All Days	EUR 8,-	EUR 10,-
Family -			
	- One Day	EUR 8,-	EUR 10,-
	- All Days	EUR 15,-	EUR 18,-



RADIO VINTAGE RADIO DAZE & ELECTRONICS



- Books • Capacitors Of All Kinds • Chassis-Aluminum/Steel
- Chokes • Custom Cloth-Covered Solid/Stranded Wire
- Decals • Dial Belts & Cord • Dial Lamps & Sockets
- Diodes • Enclosures • Fuses & Fuseholders • Grillecloth
- Hardware • Kits • Knobs • Potentiometers • Power Cord
- Power Plugs • Refinishing & Restoration Supplies
- Reproduction Dial Scales • Resistors Of All Kinds
- Service Supplies • Sockets • Soldering Items • Speakers
- Switches • Technical Data • Terminal Strips • Tools
- Transformers - Classic Audio, Power, Filament, Isolation, etc.
- Vacuum Tubes - One of the largest inventories of NOS tubes
- and much, much more !!

Full PDF Catalog Available at www.radiodaze.com



Radio Daze, LLC • 7620 Omnitech Place • Victor, New York USA 14564
Inquiries: 585-742-2020 • e-mail: info@radiodaze.com • Web: www.radiodaze.com
U.S. Orders Toll-Free: Phone 877-OLDTUBE (877-653-8823) Fax 800-456-6494

RETROGT



REMEMBER THE 80'S? REMEMBER PAC-MAN, SPACE INVADERS, SPECCY VS. C64?
REMEMBER MANIC MINER, DIZZY, FIDDLE WITH THE VOLUME CONTROL ON
YOUR TAPE DECK AND LEAVING THE ROOM TO GET A GAME TO LOAD?
HOW ABOUT THE 90'S? STREET FIGHTER 2 AND THE FIRST TIME YOU
PULLED OUT A HADOKEN. WAITING WITH EAGER ANTICIPATION FOR
THE SNES RELEASE? GAMEBOYS IN THE PLAYGROUND AND SWAPPING
AMIGA DISKS WITH YOUR FRIENDS?
WE REMEMBER. SO WE MADE THESE AWESOME T-SHIRTS.
CHECK OUT OUR SITE FOR LOADS OF GREAT DESIGNS.
RETROGT.COM - YOUR CHILDHOOD IN T-SHIRT FORM.



RETROGT.COM - FREE WORLDWIDE DELIVERY