

**Neil Brennan**

- » Age: 45
- » Occupation: Senior software engineer
- » URL: majitek.com
- » Favourite composition: *Samurai Warrior/Usagi Yojimbo*
- » All-time favourite SID: "Anything by Rob Hubbard"
- » Favourite record: *The White Album* (The Beatles)



**Ben Daglish**

- » Age: 43
- » Occupation: Musician and programmer
- » URL: ben-daglish.net
- » Favourite composition: *Trap*
- » All-time favourite SID: *Masters Of Magic*
- » Favourite record: *Domino Theory* (Weather Report)



**Jonathan Dunn**

- » Age: 41
- » Occupation: Executive producer
- » Favourite composition: *Total Recall* (title)
- » All-time favourite SID: *Spellbound*
- » Favourite record: *Backfired* (Masters at Work)



**Martin Galway**

- » Age: 43
- » Occupation: Freelance audio director
- » Favourite composition: *Wizball* (title)
- » All-time favourite SID: *One Man And His Droid*
- » Favourite record: *The Flat Earth* (Thomas Dolby)



**Fred Gray**

- » Age: 55
- » Occupation: Care worker/admin worker
- » Favourite composition: *Madballs* (title)
- » All-time favourite SID: *Sanxion* (sub-tune 2)
- » Favourite record: *Wish You Were Here* (Pink Floyd)



**Jon Hare**

- » Age: 43
- » Occupation: Games designer
- » Favourite composition: *Oh No!*
- » All-time favourite SID: *Parallax*
- » Favourite record: *Everyone Is Everybody Else* (Barclay James Harvest)



The SID chip was revolutionary, and the musicians that made it sing laid the foundation for modern videogame music. Craig Grannell rounds up a dozen SID stars to find out their thoughts on the evolution of SID music

» The MOS Technology 6581/8580 SID (Sound Interface Device) was a behemoth in the days before sampled digital audio.



In the battle for 8-bit supremacy, the SID chip became the C64's main weapon. While other platforms offered more speed or better graphics than Commodore's bread bin, the SID brought the earliest examples of high-quality videogame music to home gaming. As the years went by, relatively simple ditties gave way to hugely complex compositions, created by programmers and musicians that became 8-bit celebrities: Hubbard, Galway, Whittaker, Huelsbeck and many others. A great soundtrack could sell a game, and, increasingly, the SID sold the platform, with gamers

drawn to its chip-tune charms. Rather than tell the story of SID ourselves, this feature brings together 12 top talents from the C64 days, who reveal their memories about how they laid the groundwork for videogame soundtracks for years to come.

**» Why was the SID chip great?**

**Rob Hubbard:** It was one of the first sound chips, and music evolved as the games were being pioneered. A whole culture developed around the C64 and the people involved with it.

**Martin Galway:** It was the most advanced sound synthesiser of its time, had unique features not found elsewhere, and was designed with an approach completely different to its rivals, which gave it a unique sound quality.

**Chris Huelsbeck:** The designers upped the ante, going beyond the norm, which was a cheesy digital style put into early arcade machines and computers. Yannes wanted to create a real synth, and he went on to build synths for Ensoniq. I recall he'd originally planned to put eight SIDs into a case with a keyboard, but it came out too noisy, but Commodore jumped on it. The design had a real filter, three oscillators, and sounded so much better than anything that had come before.


**Rob Hubbard**

- » Age: 53
- » Occupation: Musician
- » Favourite composition: *Sanxion*
- » All-time favourite SID: *Rambo*
- » Favourite record: "Too many to list"


**Chris Huelsbeck**

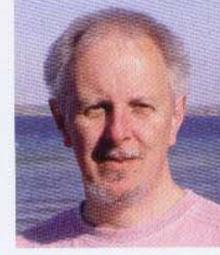
- » Age: 41
- » Occupation: Videogame composer/sound designer
- » URL: huelsbeck.com
- » Favourite composition: *Starball*
- » All-time favourite SID: *Monty On The Run*
- » Favourite record: *Please* (Pet Shop Boys)


**Graham 'The Mighty Bogg' Marsh**

- » Age: 43
- » Occupation: Electronics test engineer (team leader)
- » Favourite composition: Bits of different tunes
- » All-time favourite SID: *Aztec Challenge*
- » Favourite record: *Dirty Boy* (Cardiacs)


**Reyn Ouwehand**

- » Age: 36
- » Occupation: Record producer
- » URL: reyn.net
- » Favourite composition: *Deadlock*
- » All-time favourite SID: *Nightdawn* (sub-tune 2)
- » Favourite record: *OK Computer* (Radiohead)


**Martin Walker**

- » Age: "Stopped counting"
- » Occupation: Composer, sound designer, technical writer
- » URL: yewtreemagic.co.uk
- » Favourite composition: *Armalyte* (title)
- » All-time favourite SID: *Delta* (in-game)
- » Favourite record: *Close To The Edge* (Yes)


**Dave 'DialogueGuru' Whittaker**

- » Age: Old
- » Occupation: Head of audio, Traveller's Tales
- » URL: ttgames.com
- » Favourite composition: *Glider Rider*
- » All-time favourite SID: *Master Of Magic*
- » Favourite record: *Equinoxe* (Jean Michel Jarre)



**Ben Daglish:** It was the first sound chip you could do groovy things with. Before that, you got a square wave with a bit of an envelope, but with SID you've got all sorts of lovely sounds. It was my first proper electronic instrument and was groundbreaking.

**Jon Hare:** The C64 was the first games machine that could make anything that sounded even remotely like music. It had a unique sound of its own, which made it seem very futuristic at the time. It's the biggest leap in videogame sound I can remember.

**Graham Marsh:** I liked having three voices built in. Previously, I'd used the Spectrum and had to use an add-on box to do proper chords. The SID improved games no end – just play *Castle Of Terror* to feel the atmosphere good sound and music can create. *Aztec Challenge* used music progressively – the further you got, the more the music developed, which is a great device and a good incentive to keep playing!

**Neil Brennan:** It was certainly a relative joy to compose for the SID 'beepatron' after the horrible deficiencies of the Z80's 'clickatron'. White noise, filters, ring mod... all lovely. I would have killed for one more channel, though.

**Martin Walker:** It could be frustrating working within the SID's limitations, but that's what taught

you to make the most of what you had – good advice generally in life! For me, the most special aspect of the SID was its ring modulation and sync features, which allowed me to create metallic, 'speech-like' sound effects, such as the 'Meanwhile!' so many gamers commented on in *Hunter's Moon*.

**Fred Gray:** At first, I was more intrigued with the C64's sprites, and so my original music driver didn't fully exploit the SID's capabilities. It wasn't until I heard amazing things others were doing that I decided to write a more comprehensive driver. I always thought gameplay was the most important part of a game, but the SID intensified this with music. A good example is in the *Mutants* maze – it's like having a clock ticking in your brain. I think all SID programmers aimed to play psychological games with their listeners, especially Martin Galway with his moody pitch bends and thumping beats.

**» How did you get into C64 music?**

**MG:** I was working on the BBC Micro, which was used in schools. I didn't think much of the C64 – it was, by comparison, bereft of support for easy programming. But Ocean's development manager David Collier shoved a C64 in my face and said,

'Program for this instead!' I guess I was obliged at that point!

**RH:** I had a strong background in analogue synths and started playing music when I was a kid. I started doing games and eventually specialised in audio, since most of it was so bad.

**BD:** I was at school with Tony Crowther, and he asked me for the music to the death march for a game. I



**"We laid the groundwork for videogame sound. That it's still honoured is a testament to what we did"** *Chris Huelsbeck*

# The SID Crowd

## PLAYBACK

### HVSC AND SOASC Authentic SID Collection (SOASC=)

Download project based on High Voltage SID Collection (HVSC) up to file

SOASC / SOASC= advanced search

BASE: ALL • SOASC • SOASC= • Detailed list • Full search

Search criteria: Songtitle, Composer, Releaser, Format, Raw data, Duration, Year, Path/Filesname

Search results (10): 144 search hits 1: 8,400,000 seconds

| Songtitle                             | Download Mp3 | Composer                | Releaser | Duration | Year | Format |
|---------------------------------------|--------------|-------------------------|----------|----------|------|--------|
| Arkenoid 1/20 混音 補正 REE SID -0:58 MB  |              | Martin Galway + Imagine |          | 02:17    | 1987 | RSID   |
| Arkenoid 2/20 混音 補正 REE SID -2:08 MB  |              | Martin Galway + Imagine |          | 01:17    | 1987 | RSID   |
| Arkenoid 3/20 混音 補正 REE SID -0:21 MB  |              | Martin Galway + Imagine |          | 00:07    | 1987 | RSID   |
| Arkenoid 4/20 混音 補正 REE SID -0:11 MB  |              | Martin Galway + Imagine |          | 00:04    | 1987 | RSID   |
| Arkenoid 5/20 混音 補正 REE SID -0:19 MB  |              | Martin Galway + Imagine |          | 00:06    | 1987 | RSID   |
| Arkenoid 6/20 混音 補正 REE SID -0:10 MB  |              | Martin Galway + Imagine |          | 00:03    | 1987 | RSID   |
| Arkenoid 7/20 混音 補正 REE SID -0:07 MB  |              | Martin Galway + Imagine |          | 00:02    | 1987 | RSID   |
| Arkenoid 8/20 混音 補正 REE SID -0:15 MB  |              | Martin Galway + Imagine |          | 00:05    | 1987 | RSID   |
| Arkenoid 9/20 混音 補正 REE SID -0:07 MB  |              | Martin Galway + Imagine |          | 00:02    | 1987 | RSID   |
| Arkenoid 10/20 混音 補正 REE SID -0:07 MB |              | Martin Galway + Imagine |          | 00:02    | 1987 | RSID   |
| Arkenoid 11/20 混音 補正 REE SID -0:03 MB |              | Martin Galway + Imagine |          | 00:01    | 1987 | RSID   |
| Arkenoid 12/20 混音 補正 REE SID -0:05 MB |              | Martin Galway + Imagine |          | 00:01    | 1987 | RSID   |
| Arkenoid 13/20 混音 補正 REE SID -0:07 MB |              | Martin Galway + Imagine |          | 00:02    | 1987 | RSID   |
| Arkenoid 14/20 混音 補正 REE SID -0:05 MB |              | Martin Galway + Imagine |          | 00:01    | 1987 | RSID   |
| Arkenoid 15/20 混音 補正 REE SID -0:15 MB |              | Martin Galway + Imagine |          | 00:03    | 1987 | RSID   |
| Arkenoid 16/20 混音 補正 REE SID -0:05 MB |              | Martin Galway + Imagine |          | 00:01    | 1987 | RSID   |
| Arkenoid 17/20 混音 補正 REE SID -0:07 MB |              | Martin Galway + Imagine |          | 00:03    | 1987 | RSID   |
| Arkenoid 18/20 混音 補正 REE SID -0:07 MB |              | Martin Galway + Imagine |          | 00:03    | 1987 | RSID   |

For when SIDPlay isn't authentic enough: SOASC.

For SID playback, SIDPlay is suitable for most, but emulation isn't entirely accurate. Binary Zone ([binaryzone.org](http://binaryzone.org)) offers CDs of SID recordings, but Stein Eikesdal's Stone Oakvalley's Authentic SID Collection ([www.6581-8580.com](http://www.6581-8580.com)) aims to offer the High Voltage SID Collection ([hvsc.c64.org](http://hvsc.c64.org)) in MP3 format. "The project records SIDs on real C64s, with no attempts to improve the sound, but subtle noise reduction," says Stein. "The result is a 150,000-plus MP3 archive of music."

Stein says his aim was to provide the "sound as it would have appeared if you connected a C64 to a modern audio system", and although he'd been happy with SIDPlay, he changed his mind in 2006. "I found a site that showed the severe differences between emulation and real hardware, and this made me search for more authentic recordings." On discovering that no one had converted the HVSC, he did it himself.

wrote out the notes and he then asked for some Jarre. I started thinking I could write stuff myself – and I did. Dave Whittaker: I started with making VIC-20 games and progressed to other major formats, eventually specialising in just audio.

FG: As I was discovering the C64, I was also trying to sell VIC-20 games to Tim Best. He liked the mood of my crude games, which he said was down to the music. One day, he told me to forget the VIC-20 and that we were off to Imagine – he wanted me on board to compose music for C64 games. I became an in-house music programmer, and it was a dream come true. All the musical experience I had at that time was with cheesy cabaret bands, but I loved music and programming. It was easier than playing live and I got to show off my creativity.

MW: I'd done some programming at university and had six C64 games published. But I'd been a musician for years before getting the programming bug, and so I created music and effects for my games. It seemed a natural progression to offer those services to others.

Jonathan Dunn: I was at college studying music and programming, and I combined the two things, sending demos to publishers. Before I knew it, I was getting commissioned and got an in-house job at Ocean. Initially, I intended to go to university a year later, but I never went.

Reyn Ouwehand: I'm not a programmer, and so it was SoundTracker that got me hooked, years after Hubbard was done making his classics. I was involved with demo groups – Blackmail, Scoop Designs – and through them I got hooked up with System 3 and Boys Without Brains, which led to commercial work.

CH: I always loved synth music and wanted my own synth, but my family couldn't afford one. I was also interested in videogames, read about the C64, and was taken in by the description of the sound chip. It took a year to get the machine, and my gran gave me the last 50 bucks! Soon after I started programming, a friend needed sound for his new game, *Planet Of War*, and so I worked on that.

### What were your main influences?

RH: I had many musical influences from all kinds of things, but there was a lot of electronic synth pop music in the Eighties that everyone copied.

NB: I was heavily interested by David Sylvian's band Japan at the time – and yes, it really shows!

MG: I spent my formative musical years listening to loads of electronic music, such as Jarre, Tangerine Dream and Thomas Dolby. This affected my compositions, although as I'd grown up listening to rock and roll and enjoyed fiddly guitar solos, it was natural for me to try to emulate those too.

BD: My parents ran a folk club, and as a baby I was famously bounced on the knee of various folk luminaries. I played in orchestras and listened to lots of heavy metal in my teens, and then electronic stuff. It all sort of merged together. You do make distinctions between genres and styles, but it's all notes, really. And that's part of being a professional musician: you do what the job calls for. But I suppose 'orchestrally folkly' was my natural state.

MW: My main influence was the SID chip itself, since this determined what I could write.

RO: I was raised in a very 'amusical' household, and my influence was mostly what other SID musicians did. I also think the SID's sound was very significant. It really has its own style and

### EPIC SOUNDTRACKS



« [C64] Miami Vice: epic soundtrack; awful game.

Many SIDs were short loops and ditties due to memory limitations, but by utilising cunning looping techniques or applying lengthy soundtracks to relatively simple C64 games, SID musicians occasionally unleashed an epic. Hubbard's fantastic Pink Floyd-inspired 12-minute in-game *Delta* soundtrack remains a stunning piece, regardless of its chip-tune nature, and it isn't alone. Galway's ambient *Miami Vice* and intense *Parallax*, Matt Gray's filmic *Driller*, and Wally Beben's 26-minute piece for *Tetris* stand out from the crowd. And then there's the *Last Ninja* series – while its tunes are only a few minutes long, they helped in making the games seem like more than they were.

### LIFTED BY MUSIC



« [C64] Comic Bakery: great if you ignore everything but the music.

As Ben Daglish notes, C64 music was appreciated, and sometimes a composer's output could be so good that people would buy games primarily for their soundtracks. Hubbard classics graced iffy arcade conversion *Commando*, the mediocre *Knucklebusters*, budget failure *Rasputin* and rubbish shoot-'em-up *WAR*, lifting these turkeys from the mire. And even with divisive games like *Delta*, gamers tend to agree that Hubbard's music is sublime. Similarly, Galway's sterling efforts for Ocean ensured that *Miami Vice*, *Comic Bakery* and *Highlander* weren't complete disasters. Luckily, anyone today with a hankering to play these tunes can circumvent the games and just load the music in SIDPlay.

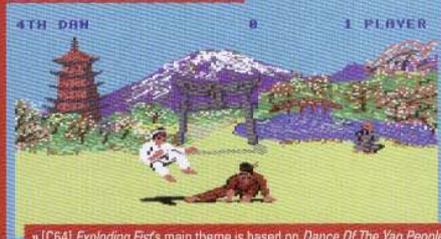
### SAMPLE CITY



« [C64] Turbo Outrun offers a successful mix of samples and SID.

At the time, samples proved divisive, with some SID composers considering them a technical feat, but not one with any real musical merit. Today, the low fidelity of C64 samples sticks out like a sore thumb, but top composers nonetheless managed to use the technique to add to their SIDs in a meaningful manner. Witness Hubbard's rocking guitars in *Arcade Classics* and *Skate Or Die*, the crunchy percussion in Galway's *Arkenoid*, the loops behind the SID in Huelsbeck's *To Be On Top*, and Jeroen Tel's funky, sample-infused *Magical Sound Shower* update for *Turbo Outrun*. All great examples of SIDs where samples add character rather than detract from the synth sounds.

### COVER VERSIONS



« [C64] Exploding Fist's main theme is based on Dance Of The Yao People.

C64 game tunes often 'appropriated' tunes by chart-topping acts and synth legends like Jarre. Some covers, however, are more obscure. Daglish's popular *Cobra* theme, for example, is taken from the movie, and the main theme from Neil Brennan's *Exploding Fist* is lifted from *Dance Of The Yao People* from Phases of the Moon. Many famous Hubbard tracks are also borderline covers: *Delta* is Philip Glass's *Koyaanisqatsi* sped up, *International Karate* borrows from Ryuichi Sakamoto's *Merry Christmas, Mr Lawrence*, and *Zoids* and *Master Of Magic* are based on Synergy tracks. However, due to the nature of the SID and C64 composers, even these tracks take on a life of their own.



## “I had many musical influences from all kinds of things, but there was a lot of electronic synth pop music in the Eighties that everyone copied”

Rob Hubbard



can sound so funky – and the phrasing of melodies is so SID.

**GM:** My first *Bogg Album* was cover versions of chart songs, but *Bogg Album 2* was all original stuff. I was listening to Depeche Mode, John Foxx, Gary Numan and Human League, so was influenced by them. I suppose my music had a certain style. I liked to mess around with odd chord changes, or weird out completely with ring mods. Music has to be stimulating for me to listen to it and I'm always trying to work out what's going on. Once I work it out, I'm bored with it.

**FG:** I can't say I had many influences, although I did like to borrow from the classics – I owe Bizet big time for *Foxx Fights Back!* But most of my music was purely me: I'd get a tune in my head and work on it, sometimes for days, trying to get it how I heard it in my head. Sometimes I'd strip them down into small, repetitive tunes for high-score tables. But I must admit Mike Oldfield inspired the *Mutants* main tune!

### ☞ Did you consider the SID a synth, or were you trying to ape real-world instruments in your compositions?

**FG:** I often imagined orchestral pieces or rock arrangements, but rarely tried to emulate individual instruments – the SID chip had a sound all of its own.

**NB:** The SID is pretty limited. I loved synths when they sounded like new instruments you hadn't heard of yet, but I was never satisfied by what we got on the C64. It didn't help that every C64 seemed to have its own unique filter values. There can't have been much quality control in the SID chip factory!

**DW:** I just treated it as a restricted synth – you couldn't really emulate any 'real' instruments.

**MW:** Drums were feasible by changing between noise and other waveforms 'on the fly', but in general the sounds were out and out synth-like in nature, so I went with the flow. Given that most games were futuristic shoot-'em-ups, synth music was the perfect choice anyway.

**BD:** I went for trying to get 'realish' instrument sounds, but there were definitely two camps: people like me, and those into pure SID. Often, those sounds became the basis of a piece, but I'm into notes. I don't care what they're played on. Generally, I'd come up with the tune and notes, then play with settings until everything sounded halfway decent. The one exception was *Deflektor*: I came up with a really nice cowbell sound and decided I had to write a piece around it. 'TOK TOK TOK-N-TOK!' You gotta do something with that, right?

**JH:** What was great about the SID was it being a crossover instrument between techie bleeps and regular electro-synth music. It's interesting in the SID'80s band I play in that Mark Knight's electric violin sounds close in tone to some of the synth lead voices used by C64 composers.

### ☞ What process did you use when composing?

**RH:** I played most of the games and then used an assembler program and typed everything in using database statements. I used my own code – I was one of the first to use sampled instruments, and



» [C64] Ben Daglish's classic music for *The Last Ninja's* first level set the scene for an astonishing 8-bit filmic soundtrack by four composers across three games.

to try and get tunes that sounded like they had more than three voices.

**DW:** I used my Yamaha CX5 and Roland Jupiter 6, and then machine code and assemblers – but no MIDI – on the C64. I coded everything, although I did share and swap players with Rob Hubbard for a couple of different formats.

**MG:** I had an all assembly language, no fancy editors, hard-work approach to putting in tune data. This allowed me to custom-modify program code for each tune, but slowed development considerably. Complex tunes could take a month to complete.

**JH:** For a lot of the *Wizball* music, Martin got Chris to play lead guitar and me to play bass, and then transposed our music on to the C64.

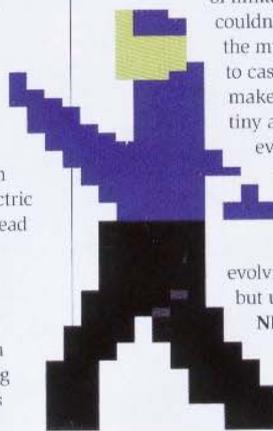
**MG:** I also used a Seiko synthesiser that was lying around the office, but it wasn't closely connected, technologically – it was just a keyboard I could rehearse on. My code was my own, and I believe I invented the fast arpeggiation technique for mimicking chords, first released in *Kong Strikes Back* in 1984.

**GM:** I started off using DATA statements, playing notes on my synth, and converting them into numbers from the *C64 Programmer's Reference Guide!* Hundreds of lines of numbers, all hand-coded in BASIC! Later, I got a version of Hall & Oates' *Maniac* that played on interrupts. I was so amazed at music playing in the background while I typed BASIC routines that I found out which program created it and got a copy. That was Master Composer, which I used for everything after that.

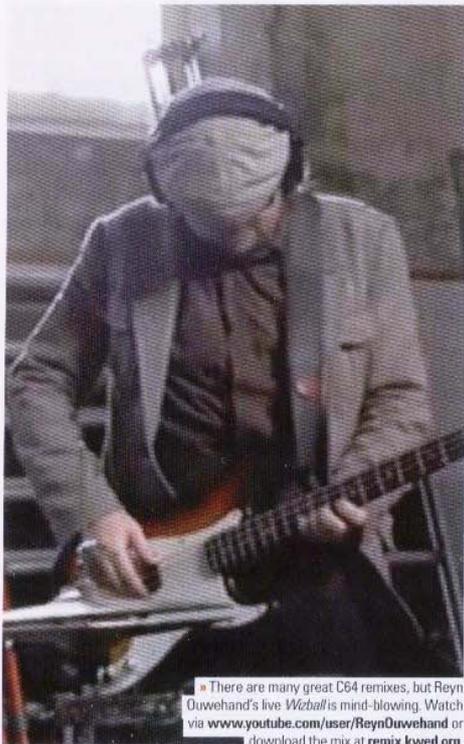
**MW:** I just started entering data and creating the music in situ, so I could hear right away how the final result was going to sound. I've always been disappointed when composing on one platform and rearranging the music on another with its own set

of limitations. With only one C64, I couldn't play games while working on the music, but I'd sometimes record it to cassette and play that alongside to make sure it fitted well. Also, with the tiny amount of RAM I was allocated, every byte counted, so I often used polyrhythms – two loops of slightly different lengths that played against each other, resulting in long sections of evolving music before they repeated, but using very few bytes.

**NB:** I'd meet with Fred Milgrom, who'd brief me regarding what he was after. I'd then hide in my bedroom with a four-track cassette recorder and lots



# The SID Crowd



There are many great C64 remixes, but Reyn Ouwehand's live *Wizball* is mind-blowing. Watch via [www.youtube.com/user/ReynOuwehand](http://www.youtube.com/user/ReynOuwehand) or download the mix at [remix.kwed.org](http://remix.kwed.org).

of keyboards and guitars. A couple of days later, I'd play him my ideas and we'd choose which to port to the C64. I'd transpose my four polyphonic tracks into three mono ones in the music language I'd written and implemented for the C64.

**FG:** I'd find the backbone of a tune on the keyboard, but most arranging was done on the C64, tweaking note and effects data. I used my own drivers and got interesting original effects by using pitch envelopes, as in *Nodes Of Yesod*. When I rewrote my driver, I made great use of ring modulation, as shown in *Mutants*.

**RO:** I'd studied piano, so I mostly composed on the piano and then put the notes in the computer. But I'm a bad programmer, so I had to wait for others to create players and routines for me, which was a hassle. I think it was easier for Hubbard and Galway to make C64 music, because they were very good programmers. Sometimes, I got to play the games. I custom made music for *Last Ninja 3*, and when Cyberdyne made a game, we stayed in this house and worked together, trying to make the music in sync. But mostly you'd get a fax detailing what was needed: the number of levels, and maybe what kind of atmosphere there should be.

**CH:** When I got the C64, I played games for a year and programmed a little BASIC. But I really wanted to become a games designer, and so I started assembly programming and made myself a player. When making tunes, I'd usually play around with a bass line, play with cool sounds, make a beat or something,

and develop a melody over it. I think my music is more melody-driven than the background – the background's kind of interchangeable. Regarding the sound itself, an important thing with SID is pulse-width modulation, which makes one voice sound very fat, like when you detune a few normal synth voices and play them together. Almost everyone used that to enhance their sounds, and I had that figured out very early. When Galway did his arpeggios, I was already thinking about altering the frequency very fast to get a chord impression. When I heard his *Ocean Loader*, I coded that stuff in and it made a huge difference.

**BD:** I did it all in my head. I used to sit down with the text editor and type notes out. If things got very complicated, I'd maybe grab an instrument and see what something sounded like, but generally it was from the head to the page. Tony Crowther wrote a nice driver for me to type in things like 'C2, 10, D2, 13', and we adapted it to add structural stuff – loops, phrases – and define different sounds. I worked with that and other drivers at Gremlin, before I wrote my own, which then made it easier to port code to different platforms.

## 🎵 What are your thoughts regarding samples within SID tunes?

**RH:** Sampling used too much CPU to be practical, but it was a new effect. It was limited, but it did add something to get away from the 'generic' SID sound.

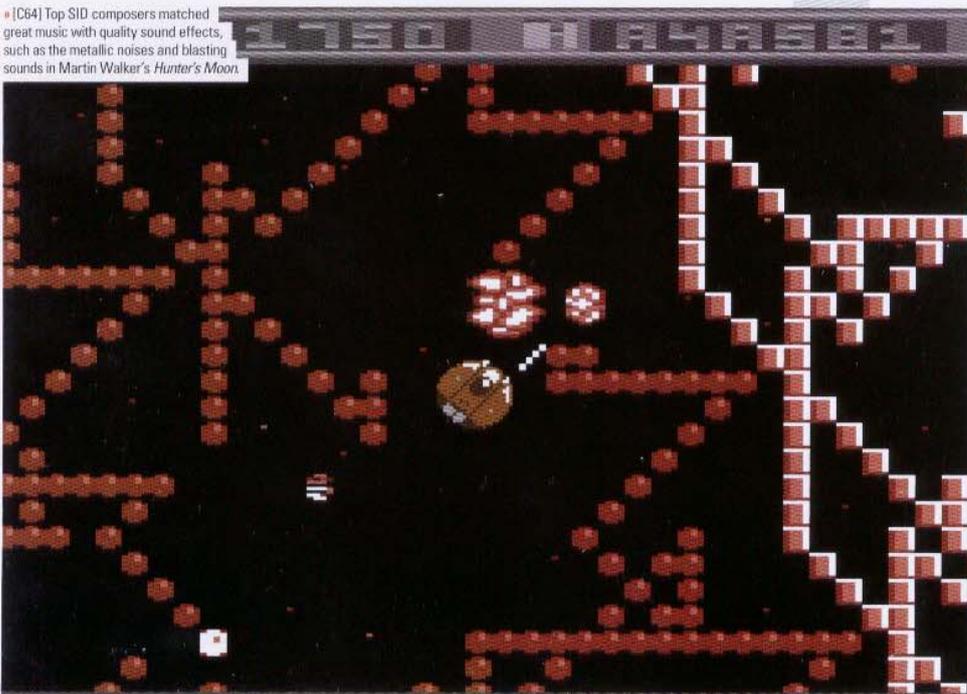
**CH:** Samples were a discovery I had in my early days at Rainbow Arts. I was researching new ways of enhancing SID sounds and discovered Digidrums. The main program was BASIC and there were assembly routines for the playback of the drums. I found how the drums were triggered and played with the program and realised you could activate SID voices behind the drums. That gave me the idea to combine a SID tune with sampled drums. With a friend, I hacked together a sampler on the C64 user port, sampled my own digi drums, had my own playback routine and combined that with my player. We had this cool stuff laying around for a few months, waiting for a game to put it in, and I imagined the reviewers would go bananas when they heard it. And then Galway's *Arkanoid* came out just before we released our stuff! His technique was based on the same principle as ours, only his drums were more synthesised.

**RO:** I was never into the digi thing, because I thought it sounded crap. If you want to do the real thing, do it

**"I imagined orchestral pieces or rock arrangements, but rarely tried to emulate instruments – the SID chip had a sound all of its own"** *Fred Gray*



[C64] Top SID composers matched great music with quality sound effects, such as the metallic noises and blasting sounds in Martin Walker's *Hunter's Moon*.



real. If you want real drums, guitars and basses, record real instruments. For me, the fun thing about SID was that it sounded like a SID – it had its own distinct sound. On the Amiga, you could use samples, but they didn't sound like the real thing, so that's when I quit computer music, got a proper sampler and focused on real music production.

**BD:** Another problem with samples was the space they took up, not leaving much room for a game. It was technically impressive what people managed to do, but not necessarily musically impressive. It was more about sounds than notes, which was never my bag. **MG:** When sample playback was discovered, the musicality went away to a degree, because sample fidelity was low, but it was an unstoppable technological development and couldn't be resisted.

### 🎵 What were the biggest constraints when working on SID music?

**BD:** Three voices! What could you do in three voices? I wanted an orchestra! [laughs] There was the fun aspect, the challenge – you'd use wobbly chords with really fast arpeggios, and work around the limitations, but it was hard writing good harmonies. And then you'd drop one voice if you wanted sound effects. Deciding which was going to be the least important voice... They're all important! You don't need your explosions – just listen to the music!

**GM:** I quite like limitation. With current PC recording studios and unlimited sounds, I never get started. You had three voices and you just got on with it.

**RO:** Limitations give the best results. Nowadays, everything's possible and everything sounds the same. The SID's limitations gave it its own sound and also originality.

**MW:** The lack of memory was a problem: you were lucky to get a couple of kilobytes for your player code and music data. With few simultaneous channels, I ended up combining several instruments into single musical lines to add depth, like a sampled drum loop today. I'd follow a kick drum with a bass note, then a snare drum hit, another bass note, and so on, while another channel played the melody and a third was dedicated to multiplexed chords. But occasionally memory constraints were so severe that I had to strip features from my player, such as vibrato, to claw back the bytes to squeeze in another tune!



**MG:** No stereo panning...

The filter could only be clearly applied to one voice... I found the ADSR programming tricky too. I

adapted compositions to meet the needs of the chip, which meant they don't translate perfectly on other setups without the same limitations. I sometimes imagined a larger tune was in there, but only three notes at any one time could get out.

**JD:** For me, the biggest constraint at Ocean was the time you had to do something. We were churning out games, and I'd work on platform conversions of tunes. But one of the fun aspects of making music for 8-bit games was pushing the hardware. If we wanted to do something different, we had to work out how to do it.

### 🎵 How did you approach music for arcade conversions?

**RH:** I always tried to write music to maximise the target hardware. And so if I had to convert some other music I tried to adapt it to suit the C64.

**DW:** I hated doing arcade conversions. You never got the musical scores – you just had to listen to every single note, again and again. Painful!

**JD:** Amazingly, we did occasionally get scores for some conversions, although we'd mostly transcribe from tape.

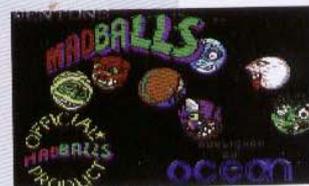
**MW:** It was a nightmare! Sometimes I got an inch-thick pile of music manuscript paper with scores from Japanese companies, but mostly you were lucky to get a poorly recorded cassette of each tune, made by placing the in-built microphone nearby while someone played the arcade game. Inevitably, they forgot they were recording the music, so you had to fathom out the notes while people chatted, groaned and chortled over the top!

**FG:** I thought converting arcade tunes was fun – they were a challenge. I once remember hearing a Joplin tune and discovered it was in F-major. I went to the library and found a Joplin anthology, and the first tune in F-major was the music I was after. I quickly converted the dots to numbers and had my music – easiest money I ever made! And there was always some of your own style in the conversions, which was part of their charm.

### 🎵 When it comes to C64 music, what was your proudest moment?



• [C64] Delta's mix-e-load mini mixing desk for Rob Hubbard tunelets. So good, you'd stop loading the game just to mess about with it.



## NUMBER CRUNCHING

Bob Yannes designed and completed his work on the initial version of the SID chip in **1981**

Advanced for its time, the SID chip provides **3** independent oscillators with **4** available waveforms each, **1** multi-mode filter, **3** ADSR volume controls and **3** ring modulators

The SID went through **8** known revisions during its life, some of which dramatically changed its output. For example, samples are significantly quieter on the **8580** revision

Zzap!64 gave Rob Hubbard's audio for Monty On The Run **99%**, calling it "Aurally am-m-m-azing, technically perfect"

The SID had the US patent **4,677,890**, although this expired in 2004

At the time of writing, the High Voltage SID Collection contains nearly **37,000** SIDs

**RH:** The full orchestral arrangement that I did of *International Karate* was a lifetime ambition. It's a pity it wasn't recorded.

**DW:** Hearing my music in a game, for the first time, at computer shows.

**MW:** The first time I heard my music incorporated into someone else's game, along with all the sound effects, and realising how much it enhanced the whole gaming experience.

**NB:** That moment when you first play a just-completed game, stand back, and feel you've contributed to the full experience. I was proud of songs I created for games that good friends had written, and that I'd contributed to something they were proud of too.

**FG:** The fact that fans still love what I created back then – the wonderful mixes, rearrangements and live performances 25 years on. It could have easily been forgotten – you guys are the best, listeners and musicians alike!

**RO:** For me, the whole journey was great – especially, as a teenager, being invited to London for a business trip to make music for cool games!

**BD:** The number of emails I get from people who say they became a musician because of me. It's amazing to feel you've influenced so many people and turned them on to music. It was a great period, before game music became background 'film' music you don't notice is there. In the Eighties, game music was important – it was something games were scored on. People really appreciated it.

## Are you still involved in music and did composing SID music inform your subsequent work?

**CH:** My basic compositional approach is similar. I've learned more and can do more sophisticated compositions, but you still hear my music and think: 'That's a Huelsbeck composition!'

**BD:** Writing hundreds of tunes was good composition practice – the C64 taught me about writing music and developing tunes, and the workmanship/craftsmanship aspect. SID music was also good training in utilising minimal resources, helpful for when I started writing for video and theatre. I'm now good at taking a bunch of actors who have never played anything before and getting them to create their own music.

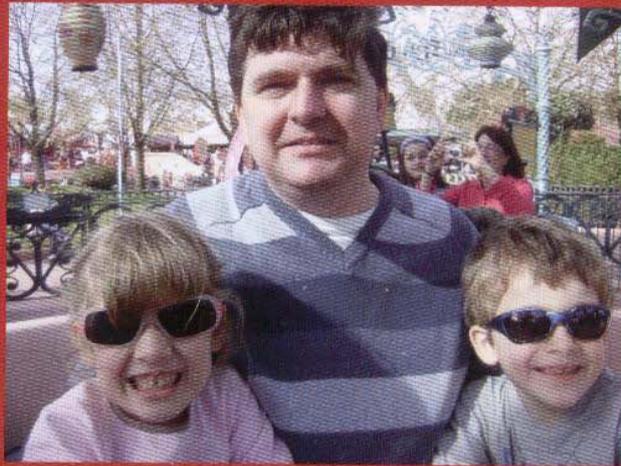
**JH:** I'm working a lot with music right now. Along with SID'80s, Ben Daglish and I are launching *sensiblesoundware.com* in December 2009, featuring 30 albums of material from games people and collaborators.

**MW:** Many people haven't realised the Martin Walker who writes for *Sound On Sound* and *Audio Technology* magazines is the same one who

created those C64 games and music! I'm also working on my fifth album of ambient music for *Yew Tree Magic*, and recently took up sound design again. With that, I've ironically turned full circle, again trying to squeeze the last drop of creativity out of a particular sound engine, just as I used to years ago with the SID.

**JD:** I'm still involved in music and the games industry. I've been releasing

# CONTEMPORARY SID



## Chris Abbott of C64audio.com provides insight into the SID's role in contemporary music, from the C64 remix scene through to SID samples in commercial chart-toppers

### What's your background regarding C64 audio?

I started as a wannabe composer, took the initiative with the CD everyone was waiting for, and accidentally moved into publishing and C64 live events.

### What are your thoughts on the longevity of SID tunes?

There's a niche of creative individuals deeply affected by C64 music. It combined with our lives to become a unique soundtrack. It's good this link to the past isn't lost and that artists use the C64 scene for artistic growth.

### Why did you create the original *Back In Time* CD?

Everyone had wanted a CD like that for ages. There were technical and budgetary limitations, but getting Rob Hubbard to cover his own stuff was mind-blowing at the time. It remains the bestselling album I've done, and for many people I think it kind of sated them forever.

### What are your thoughts on the remixes available today?

It's a glut. The days when someone could release

something stunningly game-changing are over. People buy less C64 music than they used to, because you can gorge yourself online. But it's good it's there, and the scene's main players work together, so it's a stable environment.

### There's a dark side to C64 remixing – recording artists using SID samples without permission, such as *Zombie Nation*. What's your thinking on this?

Actually, *Zombie Nation* was later granted permission to use *Lazy Jones* in *Kernkraft 400*, but he went way beyond that permission. In the way he acted, it's like renting out your house and finding the tenant later claims to own it, changes the locks, and threatens you

with legal action if you try to get another tenant. Then, when threatened, he offers to hire you a room back.

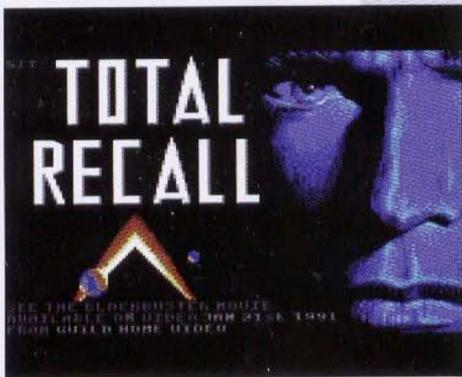
### What about Timbaland sampling a SID for Nelly Furtado's *Do It*?

That fiasco – sampling Glenn Rune Gallefoss's SID cover of *Acidjazzed Evening* by Tempest – is more typical. It's not surprising to see how a record company and rich producer can behave, but it is disappointing. There's a trial in Miami in 2010 where it will all come out, and hopefully by then someone will have examined Timbaland's master project file. The chances of him having recreated *Acidjazzed Evening* independently with other equipment – making it so similar to the original that it sounds sampled – are zero. But lawyers have to claim ridiculous things and pretend to believe them, and judges often know or care even less about important technical issues. To sum up, when I hear about it, I think 'Not again', rather than 'Hey, a pile of money to be made suing people'. Court action is expensive, uncertain, lengthy and stressful. I'd rather people asked permission and negotiated fairly in advance.

### What are your thoughts for the future of SID in a modern context?

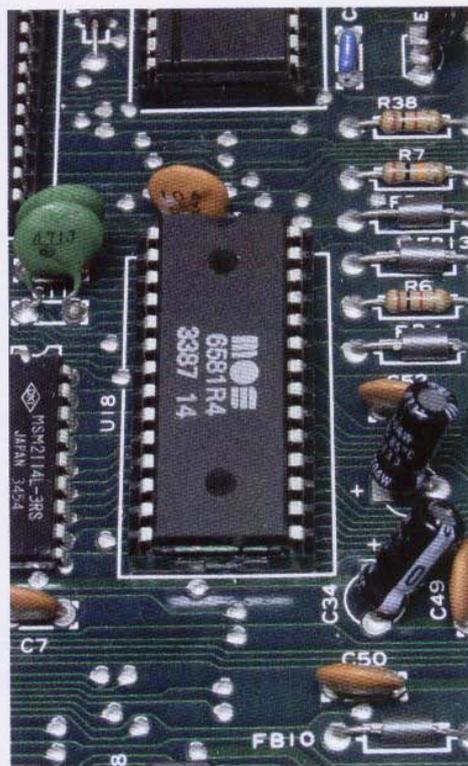
If it breaks out of its niche, it will be by SIDs being cannibalised into modern hit songs. The possibilities are wide, though these days every man and his dog wants to do *Lazy Jones*. Lazy bastards, more like.





» [C64] Paul Norman's *Forbidden Forest* is one of the earliest videogames with a contextual soundtrack changing as events unfold.

**“I sometimes imagined a larger tune was in there, but only three notes at any one time could get out”** *Martin Galway*



house music for ten years, and my work has appeared on labels like Hed Kandi and TV shows *Grey's Anatomy* and *CSI: New York*.

**NB:** I've had bands for years and still occasionally play. The SID years were the first time I'd been paid for being a composer and arranger, and made me a better musician than I'd otherwise have been. I hated the limitations, but the C64 made me work harder, to distil the necessary essence of a song down to the smallest number of constituent parts.

**🗣️ What are your thoughts on the longevity of C64 music?**

**DW:** It's nice people still take an interest, but it is a long time ago!

**NB:** I find it a bit hard to believe. My life's moved on so far that it's like it happened to another person. I got a call from a fan in Denmark a few years back, and it's one of the most surreal experiences of my life: 'Commodore 64 still rocks in Denmark!'

**BD:** It's great. When I wrote the tunes, I imagined orchestras and rock bands, and now remixes are being done like that. It's such a gas playing stuff I wrote 25 years ago with SID'80s and making it sound good. Sometimes, when I look back with my 25 years of musical sophistication [laughs], I sometimes think 'Oh my god', but they were good tunes with good melodies. People could sing them and people enjoy a good song they can sing. If you can pull that off on stage, it's great.

**GM:** I'm amazed that people are still interested. I abandoned the C64 around 1987 and don't entirely understand the C64 scene now - things have moved on. I'm not complaining, though. It's nice to be remembered.

**MW:** I'm touched people not only remember, but still take the trouble to email me with their thanks for the enjoyment my music has given them over the years. I'm particularly chuffed with the remixes I've heard.

**MG:** I'm amazed that they're still getting referred to. Most gamers of the era are my age, and regard this thing as a way to remember their childhoods. But there are younger 'retro enthusiasts' who like the sound of early gaming chips! I'm not sure what it all means. Maybe there's an innocence that was lost when more powerful systems came out.

**JH:** It's nice that SIDs are remembered, but a little sad they're regurgitated. I wish people would focus on creating their own amazing new thing and just listen to old stuff for inspiration. But, overall, it is flattering people even care.

**JD:** I love the fact that people are still interested enough to remix my old work. If you'd told me 20 years ago that people would be doing this, I wouldn't have believed you.

**RO:** In the end, it's nostalgia. We all grew up, but with the internet we can stay in our childhoods a little longer. For me, personally, I see SID remixes as an exercise. I respect the original SID and imagine how it would sound today if the composer were in the studio. It's nice when Galway or Daglish tells me my remix is pretty much what they had in mind when they composed their SID.

**CH:** Until recently I never thought about it. I focus on my career to get to the next step and live off my work. But we all laid the groundwork for videogame music and sound, and being part of a pioneer phase is very cool. That it's still honoured by the fans is a testament to what we did back then.

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