Interpreting the Synthesizer
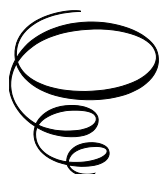
Interpreting the Synthesizer:

Meaning Through Sonics

Edited by

Nick Wilson

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FOREWORD:
MEANING THROUGH SONICS

TIM DALTON

As a 55-year-old ex-punk rocker, my relationship with synths has taken a complicated journey, starting out with outright hatred, moving to aloof fascination, and eventually arriving at complete adoration. My musical awakening as a teenager was solely based on the electric guitar, preferably played as loud and aggressively as humanly possible. The synthesizer held zero fascination for me, being the esoteric, incredibly expensive tool of long-haired, bearded prog-rock bands who played ridiculous songs about Stonehenge and goblins. However when punk succumbed to the lure of celebrity and money and morphed rather awkwardly into post-punk and a plethora of other genres, the synth reappeared on my radar.

My journey to synthesizer adoration, from first becoming aware of this instrument through to my most recent professional synth experience, was strangely bookended by two encounters with Keith Emerson.

My connection to Keith begins with my childhood in Hull, East Yorkshire. My hippie parents always had very eclectic taste in music and I remember them playing the Emerson Lake & Palmer album *Pictures At An Exhibition*[1] on heavy rotation in 1972. As a ten-year-old I found this a very difficult piece of music to comprehend. ELP's iteration has become one of the seminal documents of the progressive rock era, making its way into the collections of millions of high-school kids who had never heard of Modest Mussorgsky. It introduced the new genre of classical rock to millions of listeners, while some of the classical community regarded it as something akin to an armed violent assault. What really stuck in my mind was track four, a short original Moog synthesiser interlude which was never part of the original Mussorgsky composition. Little did my parents

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[1] Emerson, Lake & Palmer. *Pictures at an Exhibition,* Island Records HELP 1, 1971, vinyl.

know they were hegemonically pre-programming me to love synth-based music once I had made it through my punk-inspired ideological opposition. Fellow misanthropic Hull resident Philip Larkin was possibly right about parents.

There is an oft-repeated quote from BBC DJ John Peel calling Emerson, Lake and Palmer "a waste of time, talent and electricity", with which I was in agreement, my views on synths being collateral damage in Peel's dismissal of these icons of prog-rock excess. Was there an epistemic moment that marked my change in attitude? Absolutely not, but my fascination started in 1979 after witnessing Public Image Ltd 's performance of several songs from their new *Metal Box*[2] album on The Old Grey Whistle Test. PIL avoided being simply the Johnny Rotten backing band by virtue of its idiosyncratic members, with Keith Levene as *lead architect of their unfathomable sound*. It was Levene who added a Sequential Circuits Prophet-5 to enrich PIL's soundscape and, perhaps knowingly, used this instrument, loaded with its previous connotations, to alienate the punk audience.

Every unwanted feature resulting from the inherent nature of a particular instrument is unwanted only until someone breaks the cultural code. That is, until someone notices that an out-of-tune piano can sound attractive or that ear-splitting feedback can be used as a powerful artistic effect. With synthesizers, their nature as instruments has been highly contested through practice, with different discourses on music, sound art, instrumental practice and physics overlapping and intersecting. PIL's performance on the Old Grey Whistle Test[3] certainly showed this phenomena in action.

Emerson's use of the synthesizer to me personifies Bakhtin's notion of the "carnivalesque"[4]. He would interact with his instruments in the most physical way possible, often wrestling them to the ground like some bizarre mating ritual. In complete contrast, Levene appeared to have as little contact with his Prophet 5 as humanly possible, his playing strictly limited to one or two finger sharp stabs at the keyboard to produce

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[2] Public Image Ltd. *Metal Box,* Virgin METAL 1, 1979, vinyl.
[3] Particularly their song "Careering" seen at 3'50" in at "Public Image Ltd.- The Old Grey Whistle Test," LDF8 Killer Television,
https://www.youtube.com/watch?v=aDKDc5zq53k
[4] As outlined in Mikhail Bakhtin, *Problems of Dostoevsky's Poetics*, trans. Caryl Emerson (Minnesota: University of Minnesota Press, 1984), 149-163,
https://archive.org/details/problemsofdostoe00bakh/mode/2up.

dystopic metallic noise and discord. To me this seemed an act akin to Brechtian Epic theatre in its intent towards alienation.

The synthesizer seems to have had particular susceptibility to its reconfiguration as an instrument as artists came to grips with its multifarious uses. Programming the first generation of analogue synths in the 1960s and early 70s was painstakingly slow and the knowledge required to undertake this task was largely absent. Creating useable sounds relied greatly on the tactics of trial and error, with the sounds of analogue synthesizers typically borne out of the interaction between the constantly experimenting programmer and the always slightly unpredictable machinery. In the 1980s, with the introduction of microprocessors, the programming of digital synthesis algorithms proved to be much more difficult than adjusting the parameters of analogue synthesizers. As a result, pre-programmed sounds became the norm. At this point the musician became separated from aspects of musical sound creation that in acoustic instruments had seemed instinctively natural or organic. Missing was the sense that the musician could directly affect timbre through physical interaction with the instrument during real-time performance.

In my talk at the *Synthposium*, I explored how the incorporation of the synthesizer into the modern recording process has contributed to both hyperreality and simulacra in popular music. I have always been fascinated by the role of the synthesizer in popular music's diasporas of the recording studio and live stage. New audio technologies, and in particular synthesizers, have elevated audio recordings beyond realism into a form of hyperrealism—a simulacrum[5] of the diegetic performance. I suggested that the role of synthesizers can be split into two distinct categories. Firstly, it can function as a tool to synthesise already familiar sounds (simulacra), or secondly as a tool to create new and previously unheard sounds (hyperreality).

Recorded popular music today is emblematic of both the hyper-real and the simulacrum. Sample libraries, synthesizers, and the other recording techniques and technologies we now take for granted, have led to music which transcends traditional Western music frameworks. Synthesizers have become a powerful tool for the transmission of meaning through

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[5] As outlined in Jean Baudrillard, *Simulacra and Simulation*, trans. Sheila Faria Glaser (Ann Arbor: University of Michigan Press, 1994), 1-42.

sonic channels, widening the gap between prior and new conceptions of music reality.

ELP's *Pictures At An Exhibition* makes a compelling case for how modern popular music can create a simulacrum from classical pieces of music. There is a popular rock history myth that one effect of this record was to significantly increase sales of Mussorgsky classical recordings. Though there are a plethora of rock instruments and a smattering of "traditional" instruments on the record, Emerson's modular Moog synthesizer dominates the sound stage, indeed providing the fundamental building blocks of this simulacrum, with a sound now widely heard in the synthesized orchestral scores dominating video game and movie soundtracks. *Pictures At An Exhibition* serves as a tantalising glimpse into the future.

We can follow the continuing emergence of the synthesizer as a vehicle for simulacra through the plethora of synth presents that entered the pop music sonic vocabulary from the 1980s onwards. We can see this in the use of Korg Triton presets by The Neptunes, subsequently widely adopted as go-to synth sounds for turn-of-the-century hip-hop, or the quest of modern EDM producers for the perfect "pluck" sound.

My own brush with the synthesizer and the creation of hyperreality occurred in 1998 when working with Liverpool composer, musician, songwriter and producer Andy McCluskey on a project that would eventually become the group Atomic Kitten. When their album *Right Now*[6] was released in 1999 its success led to a call from the EMI imprint Innocent Records telling me "*Tim, I want you to put the band out on the road*". Unwittingly we had become prisoners of our own hyperreality. The record was nothing more than a curated collection of synth sounds. The band was actually a single person, lots of synthesizers, a computer and three singers hired as the visual façade for performance. How could you put a band on the road that didn't actually exist? My job during this period was to find a way to make this piece of digital hyperreality into a tactile simulacrum. The band that I assembled for the live tour became a simulacrum of a simulacrum; in fact they were even better than the real thing.

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[6] Atomic Kitten, *Right Now,* Innocent CDSIN6, 2000, CD.

The world is an extremely strange and unpredictable place and so it came to pass that in 2002 I would work with Keith Emerson for almost the whole year as his tour manager and de-facto go-to guy. The tour was to be billed as *Keith Emerson and The Nice*. Original Nice members Lee Jackson and Brian Davison were augmented with seasoned session players Dave Kilminster on guitar, Phil Williams on bass and Pete Riley on drums. I hired a road crew, broke into Keith's lock-up to liberate his long-retired equipment, and commenced rehearsals at JHE. The lock-up was synth nerd's utopia, with floor to ceiling of long-disregarded instruments. Keith had been a long-term personal friend of Robert Moog and they had collaborated together on the development of various synths. While rooting through the detritus I came across a hand-held ribbon controller for his Moog synth that was capable of housing pyrotechnics which Keith could fire via a hidden button.

It was on day one of rehearsals when I met Keith face-to-face for the first time. Soberly dressed in Prada, he came across as a quiet successful businessman, rather than a show business exhibitionist. Keith was interested in all aspects of the tour, scrutinising my budgets, logistics, venue information, crew backgrounds and everything else connected to the tour. I found the right-coloured tour bus that met his very exacting requirements and made sure that hotels and transport details were precise. I enjoyed my time with Keith as he was always polite, punctual, fair, humorous and strangely introverted, often bordering on shy. On a personal level I found him annoying at times, especially his inability to undertake everyday tasks such as opening a door or making mealtime menu decisions, and his constant requests for "tepid water". I guess that middle class upbringing and all those years as a world famous, high-living rock star resulted in some aberrant behaviour. During the tour Keith would regularly throw me curveballs, such as announcing that he wanted to travel by train just as we were about to depart on the tour bus I'd carefully selected at his earlier request.

Off stage I found Keith very quiet. He spent almost every spare minute on the tour clacking away on a small portable keyboard with a sly smile and his headphones on. His offstage personality was in direct contrast to his stage persona. On stage he was a maniac and the audience loved it. He fought his Hammond organ every night, stabbing it with daggers until it howled with pain, and forcing weird and wonderful sounds from his six-foot tall Moog synthesiser. Our merchandising was as eclectic as the music. The biggest selling item was Keith's self-penned book *Pictures of*

an Exhibitionist,[7] which we literally shifted by the truckload. Not many rock 'n' roll tours can claim that their biggest selling merchandise item was a high-priced, 350 page piece of literature. He signed my copy "To Touring Tim lots a luv careering, Keith" (purposefully confusing himself with the other Keith mentioned earlier in this piece). When the tour arrived in Glasgow, we recorded a live album which became a three CD box set. While on our way to the Croydon Fairfield Halls gig we stopped off for afternoon tea and scones with his lovely elderly mum. Touring with Keith Emerson was full of these wonderful surprises.

Keith made an indelible impression on me. I saw his vulnerable side and spent a number of sleepless nights when I learnt about his suicide. The degenerative medical condition in his right hand, resulting in his inability to play keyboards, had taken him to a very dark place. Of course he could have bought a cheap plastic USB keyboard, smashed notes into a computer programme with a single finger and let software do all the work, but that wasn't Keith. He was a perfectionist.

He only played three instruments on the tour but they were quite specific. He absolutely insisted we have a Steinway 8' 6" grand piano, so we built the world's biggest flight case and shipped the thing around the globe. This was played to great effect as the audience entered the auditorium while Keith chatted with audience members, posed for photographs and replied to comments with a casual "Hi, great to see you". Once the piano was wheeled offstage Keith would transform into the over-the-top showman with the band as he worked his way through material by The Nice and ELP. The musical tools for this section of the show were a Goff Professional Hammond C3 with four Leslie cabinets. But the star of the show, standing centre stage each night, was Keith's original Moog. This piece of musical electronics would draw audible gasps of breath as the audience entered the hallowed auditorium. The lighting designer would light the instrument as if it was alive and a central member of the band. Over the three-hour show Keith's inner Id would emerge to dominate the stage. He would often use a small aluminium stepladder to reach up to the Moog to make miniscule adjustments to the settings.

What was the meaning of this fetishisation of antiquated technology, I wondered? Finally, after witnessing this ritual nightly, I understood why

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[7] Keith Emerson, *Pictures of an Exhibitionist*, (London: John Blake Publishing Ltd, 2003).

this antique synth was so important to both Keith. This was not just a musical instrument. It was his talisman, channelling a brave new world of infinitely malleable sonics, and it enabled the audience to partake of this sonic transfiguration.

My structuralist brain has always been fascinated by how meaning is created. I consider that throughout my forty years of audio engineering I have provided a conduit for the storyteller. I have been inspired by writers such as Philip Tagg[8], Richard Middleton[9] and Robert Walser[10] who have given attention to the ways in which sounds or sonics themselves communicate meanings within an audio composition or soundscape. More often, when recorded music has been analysed semiotically, discussion has focused on the textual analysis of lyrics, with broader analyses examining the creation of meaning through areas such as image, fashion and video. *Synthposium 2: Meaning Through Sonics* deviated from these well-trodden paths by examining how the invention of the synthesiser introduced new sounds into our sonic "language". Often seen, at least initially, through the prism of a modernist perspective, these new synthesized sonics were used to communicate ideas and attitudes, providing new vistas within our compositions and soundscapes and raising the question of whether these constituted a new form of musical meta-language. These synthesised sonics provided, and still provide, rich potential for the creation of meaning.

Synthesizers occupy a unique cultural space born out of modernism and expanded during postmodernism. They now have one foot in the past and another firmly in the future. My personal journey has seen me change my view of synthesizers. I now accept that in the modern audio production environment synthesizers are not the sole domain of nerdy geeks but a ubiquitous and liberating expressive tool. The papers presented at *Synthposium 2* were utterly fascinating and I hope that you enjoy reading them as much as I enjoyed listening to them.

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[8] Philip Tagg, *Analysing Popular Music*, (Cambridge, UK: Cambridge University Press, 1982).
[9] Richard Middleton, *Studying Popular Music*, (Buckingham: Open University Press, 1990).
[10] Robert Walser, *Running With the Devil*, (Middletown: Wesleyan University Press, 1993).

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Introduction:
Meaning Through Sonics

Nick Wilson

Leafing through a random selection of entry-level books on synthesizers and synth-programming, it seems both surprising and unsurprising that there is a seeming reluctance to define what a synthesizer actually is[1]. Unsurprising because synthesizers are now firmly embedded in the fabric of modern music, heard constantly in pop music, soundtrack production, advertising jingles, club music and more. What is ubiquitous surely doesn't need defining. Or does it? Would we need a definition of a piano in a book about pianos or a definition of a guitar in a book about guitars? Yet this still seems surprising to me. As an instrument the synthesizer seems somewhat fuzzy in definition, and certainly still mysterious to some. Perhaps this is what fuels the attraction for those of us who have wrestled with their synth obsession over years or even decades.

The most succinct definition of a synth I have come across is, as one would expect, from Bob Moog, writing in *Keyboard* magazine in the mid-1970s, calling it "an electronic musical instrument that offers the musician direct control over the basic properties of musical sounds, and thus allows the musician to build up his (sic) sound material out of its component parts".[2] However this definition comes from a time when synthesizer designs were limited to a handful of manufacturers, all more or less following the broader brushstrokes of Moog's design.

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[1] My survey included the publications Simon Cann, *Becoming a Synthesizer Wizard: From Presets to Power User* (Cengage Learning: Boston, 2010); Mark Jenkins, *Analog Synthesizers: Understanding, Performing, Buying* (Oxford: Focal Press, 2011); Martin Russ, *Sound Synthesis and Sampling,* 3rd ed. (Oxford: Focal Press, 2009); Mark Vail, *The Synthesizer* (New York: Oxford University Press, 2014).
[2] Bob Moog, "What is a Synthesizer?" in *Synthesizer Basics*, ed. Tom Darter (Cupertino: GPI Books, 1984). 12.

How can we characterise what is unique about synthesizers? And does that fall short of telling us what the synth actually is? The differences between, say, the new Moog One hardware synthesizer and Sonic Charge's Synplant software synth are arguably more qualitative than quantitative, and could be listed in some detail. To define what it is that these two instruments have in common might be somewhat more challenging. And if we were to compare this exercise with defining the commonalities and differences between particular guitar models, we might start to get a sense that the term synthesizer shouldn't be thrown around so freely. Is it possible that the idea of the synthesizer as an instrument is breaking down and that it is more useful to think of it as a general category of instruments, in the same way that we would consider percussion?

We could look beyond the synthesizer's methods of sound production for other aspects of uniqueness, examining instead how a musician interacts with it. The synthesizer established a new demarcation between an instrument's interface, as used by the musician, and the actual sound production hardware, which had not previously needed to be conceptualised.[3] This separation plays itself out in the cognitive disconnection of audiences who cannot easily link a musical gesture to the sounds produced by a musician using a synthesizer. The malleability of sound production, indeed the promise of an unlimited palette of sounds, further serves to cut music audiences adrift from their conceptual frames of reference in how to understand the meaning of electronic music. As pointed out by Joanna Demers, electronic music removes sounds from the framing that conventional music could rely on to determine their meaning.[4]

Let us return to the sounds produced by these instruments. Demers makes the point that the electronic music pioneers of the early 1950s "would probably never have dreamed that frequency oscillators and their digital progeny, tools for sound construction, would by now have accrued cultural associations".[5] Yet even a casual listener to electronic music can today locate the sounds of synthesizers within reasonably well-defined music genres, such as techno, experimental or ambient, and associate the sound of synthesizers with broader cultural discourses, such as retrofuturism, transhumanism or technological determinism, to name a few.

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[3] Discussed in Paul Thebarge, *Any Sound You Can Imagine: Making Music / Consuming Technology* (Middletown, CT: Wesleyan University Press, 1997).
[4] Joanna Demers, *Listening Through the Noise: The Aesthetics of Experimental Electronic Music* (New York: Oxford University Press, 2010), 13.
[5] Demers, *Listening Through the Noise*, 46.

The activity of playing a synthesizer also merits further examination. There is a body of work which examines the semiotics of rock instrumentation, exploring meaning in stylistic features such as amplifier distortion and guitar virtuosity.[6] It is our contention that the semiotics of synthesizer practice likewise merits further examination. Of course the perennial question of whether musical (or non-musical) sound can convey meaning is never far away once this discussion is opened.[7]

A symbiotic relationship between electronic music and the technology used to create it is an area that has received the attention of Mark Brend[8], who notes a symbiotic relationship. One could argue that this has always been the case; we conceptualise music styles at least partly through the qualities of the instruments used. However the synthesizer's extreme malleability as an instrument and the accelerating pace of technological and musical evolution over the period covering the synthesizer's development and popularisation, suggests further examination of this relationship. Certainly the synthesizer made accessible the performability of electronic music, an aspect I explore in my own contribution to this volume.

At the *Synthposium,* held at SAE Institute's Melbourne Campus on November the 15th, 2016, we aimed to open up the discussion around synthesizers beyond a purely technical focus, broadening the discussion to the aesthetic and cultural understandings that surround their use. A lineup of emerging and established electronic music academics and practitioners convened at SAE Institute's Melbourne campus, with the event culminating in some practical synthesizer workshops and a jam session using classic synth hardware.

Contributions from Ian Dixon, Mike Exarchos, James Gardner and myself look at some of the historical contexts surrounding synthesizer use.

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[6] For example, see Theodore Gracyk, *Rhythm and Noise: An Aesthetics of Rock* (London: Duke University Press, 1996), 118-124; or Deena Weinstein, "Rock's Guitar Gods: Avatars of the Sixties." *Archiv Für Musikwissenschaft* 70, no. 2 (2013): 139-54.

[7] For example, Linda Ioanna Kouvaras states "sound art is arguably *the* postmodern genre *par example*: sound entrenches itself in the creation of meaning while remaining elusive to signification": *Loading the Silence: Australian Sound Art in the Post-Digital Age* (Abingdon, Oxfordshire: Routledge, 2016), 40.

[8] Mark Brend, *The Sound of Tomorrow: How Electronic Music Was Smuggled into the Mainstream* (New York: Bloomsbury Academic, 2012), x.

Dixon's paper examines David Bowie's use of synthesizers on a track from his influential *Low* album, examining its contribution to the record in reference to the concept of hauntology.

Mike Exarchos re-evaluates aspects of the history of hip-hop, pointing out that the genre's historical narrative has emphasised sampling while its use of the synthesizer has been neglected despite its integral importance.

James Gardner documents the history of EMS (Electronic Music Studios) in the UK, focusing on their advertising from the late 1960s into the 1970s to illuminate the rapidly evolving discourses surrounding the synthesizer during this era.

My contribution looks at the synth solo as a notable feature of the instrument's use in late 60s and 1970s rock music, asking whether the synthesizer's introduction into pop of new methods of sound production provides lessons for its use today.

Nino Auricchio, Paul Borg, Warren Burt and David Prescott-Steed examine aspects of synthesizer use in today's environment.

Nino Auricchio and Paul Borg focus on the area of modular synthesis, considering audience perceptions of live performance using these instruments and how musicians themselves can conceptualise modular synth performance.

David Prescott-Steed examines the attitudes of synthesizer users (and non-users) towards acquiring electronic music equipment, considering whether a seemingly psychological imperative potentially stimulates or hinders creativity.

Warren Burt looks at app-based synthesizers through the perspective of his own compositional interests, considering this relatively new domain of synth design and its applicability to microtonal work.

And, to conclude, a short word on spelling. The more widespread American spelling of "synthesizer" is predominantly used throughout this publication. However the British spelling of "synthesiser" has been retained for James Gardner's chapter, given that the focus here is specifically on those instruments produced in England by EMS during the late 1960s and early 70s.

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CHAPTER 1

PEDDLING THE PUTNEY:
THE EARLY MARKETING OF THE VCS3
SYNTHESIZER

JAMES GARDNER

Introduction

The VCS3 launched by Electronic Music Studios (London) Ltd. in November 1969, was Europe's first commercially produced synthesiser. I say "commercially produced" but it is worth bearing in mind that all four synthesiser manufacturers at that time—Moog, Buchla and EML in the USA; EMS in England—were small-to medium-sized cottage industries, and their instruments were essentially hand-built.

The VCS3 was a compact and modestly priced package. It sported an array of sound-producing and sound-modifying devices that could be freely interconnected by means of a 16x16 pin-matrix patchbay, and offered real-time physical interaction via its complement of knobs, button and joystick X-Y controller. Significantly, it had no integrated keyboard; EMS did not manufacture one until some seven months after its launch.

Overviews of EMS of varying reliability may be found in many publications,[1] and I have recently written a detailed account the origins of the VCS3. A summary of the synthesiser's genesis and development may

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[1] e.g. Peter Manning, *Electronic and Computer Music* (Oxford: Oxford University Press, 1985), 235–239; Trevor Pinch and Frank Trocco, *Analog Days: The Invention and Impact of the Moog Synthesizer* (Cambridge: Harvard University Press, 2002), 276–301; *What The Future Sounded Like,* directed by Matthew Bate (Adelaide: Porthmeor Productions 2006), DVD; Ian Helliwell, *Tape Leaders: A Compendium of Early British Electronic Music Composers.* (Cambridge: Sound On Sound, 2016), 183–189.

be in order, however.

Three people were behind EMS and the design of the VCS3. Peter Zinovieff had worked with electronic music in his own studios since 1963. His interests in controlled randomness, probability and sequencing led him in 1967 to purchase a DEC PDP-8/S computer in order to act as a sort of "super-sequencer"; he now had the only computer music studio in the country, at his house in Putney. The electronics engineer David Cockerell first entered Zinovieff's orbit around September 1966, building custom hardware for the expanding Putney studio. Composer Tristram Cary, meanwhile, was befriended by Zinovieff towards the end of 1966. Cary had been active with electronics and manipulated recordings since the late 1940s and had built his own studio in Norfolk. He was experienced in both conventional instrumental composition as well as in electronic music, and had provided music and sound effects for films and TV, including *Doctor Who*. Since its debut in 1963 this programme had established a reputation for innovative electronic music and sound design, largely thanks to the BBC Radiophonic Workshop,[2] and Cary was one of the few people in the country whose own studio could produce work of a comparable technical standard.

Zinovieff's Putney computer studio was very expensive to run and equip. Although he had access to considerable wealth, an additional source of revenue soon became necessary. Zinovieff, Cary and Cockerell were aware of Bob Moog's and Don Buchla's modular devices, but as Cary noted in a *Guardian* article at the time, their cost rendered them "quite out of the question for most British customers," adding that "we have our own brilliant designers who would produce better and cheaper systems if they turned their attention to it."[3]

It seems likely, then, that sooner or later the EMS trio would have begun to design and sell some kind of commercial electronic music equipment. But in Autumn 1968 a catalyst arrived to speed up that process: impoverished Australian composer Don Banks, who came to Zinovieff and Cary requesting a synthesiser-like package for about £50.

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[2] See Louis Niebur, *Special Sound: The Creation and Legacy of the BBC Radiophonic* Workshop, (Oxford: Oxford University Press, 2010), 96–102.
[3] Tristram Cary, "Wanted: a national workshop of electronic music," *The Guardian*, 13 August, 1968, 6.

The team designed, and Cockerell built, the Don Banks Music Box (hereafter DBMB) as a compact and cost-effective collection of electronic music devices. It included a noise generator, one high- and one low-frequency oscillator, a filter/oscillator, ring modulator/VCA, attack/decay generator, spring reverb and microphone pre-amp., all housed in a standard Lektrokit metal case. Two more identical units were made later.[4] In accordance with Cary, Zinovieff, and Banks's aesthetic outlook on electronic music, the DBMB did not include either an integrated keyboard, an easy way of producing specific discrete pitch sequences or the straightforward control of pitch from an external keyboard.

The DBMB was sufficiently well-received by those who used it to encourage the team to develop a more sophisticated and commercially viable synthesiser, which they designed during the winter of 1968–69. By spring 1969, a hand-made prototype had been built. The VCS3 was "productionised" during the summer, launched[5] in November and the first deliveries to customers were made in December.

As in the DBMB, Cockerell's oscillator designs were informed by the musical aesthetics of Cary and Zinovieff. Neither composer was overly concerned in their electronic music with stable, equal-tempered pitches, so Cockerell's designs did not prioritise pitch stability, much to the chagrin of later melodically-orientated owners. Space does not permit a discussion of "the keyboard problem"[6] but the prolonged debate about whether to include a standard keyboard—a "bone of contention", according to Cockerell[7]—was symptomatic of the uncertainty surrounding the purpose of, and market for, the VCS3 .[8]

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[4] For more details see Gardner, "The Don Banks Music Box", 219–222.
[5] Julian Bray's extravagant description of the VCS3 launch in Mark Roland, "The Birth of the VCS3," *Electronic Sound*, March 2017, 46–51, seems in fact to be an embroidered account of the Synthi A launch of 26 May 1971. Julian Bray, e-mail message to author, 23 February, 2017.
[6] For more details see Gardner, "The Don Banks Music Box", 225.
[7] David Cockerell, interview with author, *These Hopeful Machines*, transcript, 20 May, 2010,
http://www.radionz.co.nz/concert/programmes/hopefulmachines/audio/201812323/interview-david-cockerell.
[8] Similar concerns about the wisdom of attaching a conventional keyboard to an electronic instrument surrounded the work of Don Buchla from the 1960s onward, and that of Jörg Mager and Friedrich Trautwein during the 1920s and 1930s. See

During the development stage there seems to have been no serious attempt to pitch the VCS3 prototype to anyone from the world of popular music. There was a demonstrable interest from Universities and art-music composers, but we must ask: what *was* the "pop market" for synthesisers in the UK at this point?

Historical context

It has been well argued that in the USA and UK during the 1950s and 1960s the *sound* of electronic music in broadcast drama and advertising was becoming more commonplace.[9] In the States this was due largely to the work of composers such as Raymond Scott and Eric Siday,[10] and in Britain to the team of composers working at the BBC Radiophonic Workshop.[11] While electronic sounds were becoming more domestically pervasive around this time, actually *creating* electronic music in the UK was still a rarefied activity. Purpose-built equipment was costly, and tertiary institutions were only just setting up their own electronic music studios. For example, fairly rudimentary studios were belatedly established at Manchester University, Goldsmiths College, York University and the Royal College of Music between 1967 and 1969.[12] Ian Helliwell has, however, recently documented the surprisingly large hobbyist subculture that was creating electronic and tape music in the UK in the 1960s as well as the significant number of amateur or semi-professional private

Thomas Patteson, *Instruments for New Music: Sound, Technology and Modernism*, (Oakland: University of California Press, 2016), 166.

[9] Electronic sounds, especially those of the Theremin, had, of course, appeared in many Hollywood film scores from the 1940s onward. For an alternative perspective on the pervasiveness of electronic music in the USA in the 1950s see Tara S. Rodgers, "Synthesizing Sound: Metaphor in Audio-Technical Discourse and Synthesis History" (PhD thesis, McGill University, 2010), 180–188, digitool.library.mcgill.ca/thesisfile97090.pdf.

[10] see Mark Brend, *The Sound of Tomorrow: How Electronic Music was Smuggled into the Mainstream*. (London, New York: Bloomsbury, 2012), 108–112; Timothy D. Taylor, "The Avant-Garde in the Family Room: American Advertising and the Domestication of Electronic Music in the 1960s and 1970s," in *The Oxford Handbook of Sound Studies*, ed. Trevor Pinch and Karin Bijsterveld, (New York: Oxford University Press, 2011), 387–410.

[11] Brend, *The Sound of Tomorrow*, 79–88; Niebur, *Special Sound*, 3–119; Helliwell, *Tape Leaders*, 193–95.

[12] Nicola Candlish, "The Development of Resources for Electronic Music in the UK, with Particular Reference to the bids to establish a National Studio" (PhD thesis, Durham University, 2012), 106–118, http://etheses.dur.ac.uk/3915/.

electronic music studios then in existence.[13] Nevertheless, this was still a niche activity.

Walter (now Wendy) Carlos's all-Moog *Switched-On Bach*, released in October 1968, was an undeniable success in the US, reaching No.10 during its 59 weeks on the *Billboard* pop album charts.[14] It has often been credited with making Moog a household name. While that may be true in the US, the album did not even make the UK top 75. The record was certainly influential for some British musicians, such as Keith Emerson, but it was not the mainstream breakthrough that it was in Carlos's homeland.

In the wake of Paul Beaver and Bernie Krause's demonstrations of the Moog synthesiser at the Monterey Pop Festival in June 1967, The Monkees, The Byrds, The Rolling Stones and others all bought and dabbled with Moogs,[15] and the instrument made a number of appearances on US pop and rock albums during 1967 and 1968.[16] It can thus be reasonably claimed that this marked the beginning of rock music's association with the synthesiser.

In the UK, however, as late as mid-1969 very few popular musicians had used synthesisers. Indeed at this point there were only about four Moogs in the country.[17] The first had gone to the University of Manchester; others were owned by the Rolling Stones, Mike Vickers and George Harrison. Harrison released his esoteric all-Moog album *Electronic Sound* in May 1969,[18] while The Beatles' *Abbey Road*, with Moog featured prominently on a number of tracks, did not appear until September 1969. That same

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[13] Helliwell, *Tape Leaders*.

[14] Chris Morris, "Wendy Carlos Takes Her Moog Music To East Side Digital," *Billboard,* 3 October, 1998, 69.

[15] See Pinch and Trocco, *Analog Days*, 116–23; Brend, *The Sound of Tomorrow*, 162–3; Bernie Krause, interview with author, *These Hopeful Machines*, transcript, 30 March, 2010,
http://www.radionz.co.nz/concert/programmes/hopefulmachines/audio/201812325/interview-bernie-krause.

[16] Thom Holmes, 24 April, 2013 (blog) "Moog: A History in Recordings by Thom Holmes."
http://moogfoundation.org/moog-a-history-in-recordings-by-thom-holmes-part-two/.

[17] And, as far as I have been able to determine, no Buchlas or EMLs.

[18] The authorial attribution of at least one side of this LP is contested—by Bernie Krause: see Pinch and Trocco, *Analog Days*, 123–125.

month, BBC TV's primetime technology show *Tomorrow's World* broadcast a feature on the Moog,[19] with Mike Vickers demonstrating the unfamiliar instrument in what was almost certainly its first appearance on UK television.

Even in 1970, the Moog was viewed by UK rock critics as a baffling novelty instrument. Vickers's synthesiser made its live UK debut in October that year played by Keith Emerson of The Nice. Richard Green of the *New Musical Express* wrote:

> The Moog was introduced for the first time on a British stage during "She Belongs To Me." It's a weird thing, resembling a switchboard and takes some playing. Mike Vickers, its owner, was on hand to programme it and Keith got laughs when he almost made the thing talk à la Sparky's "Magic Piano."[20]

The point I am making here is that there is a clear distinction between the invention, availability, adoption and widespread use of any given technology in any given country.[21] Following a simple "timeline" approach to such matters is inadequate to place the synthesiser in general—and the VCS3 in particular—into its sociocultural context. The meaning and usage of the voltage-controlled synthesiser, particularly with regard to popular culture, was still being developed and negotiated at least five years after its introduction.[22]

It is too easy to think that because the Moog appeared on some US pop/rock albums in 1967 and 1968 that the synthesiser immediately gained prominence in popular culture, including the UK. In fact it was not until

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[19] BBC TV *Tomorrow's World*, 30 September, 1969.
[20] Richard Green, "The Nice: Royal Festival Hall, London," *New Musical Express*, 14 February, 1970. See also Brend, *The Sound of Tomorrow*, 201–2.
[21] David Edgerton usefully distinguishes "invention," "innovation," "diffusion" and "pervasiveness" with regard to the history of new technologies. David Edgerton, *The Shock of the Old: Technology and Global History Since 1900.* (London: Profile Books, 2006), ix–5. He gives such examples as rockets, the cycle rickshaw, electric cars, and the tenacious and widespread use of the horse rather than the tractor in the twentieth century.
[22] I would argue that possible meanings of the synthesiser continue to be renegotiated and developed, long after the arrival of any specific notionally "stabilised" physical manifestation. In the case of the VCS3, it now sits, with its retro-chic patina, in the pantheon of vintage synthesisers, surrounded by virtual/digital manifestations of itself in a wholly different sociocultural context from that of its birth in 1969.

1971 that synthesiser-heavy albums by King Crimson, ELP, Yes, and The Who appeared in the UK album charts; and it was only in the following year that the synthesiser really went mainstream, when four Top Five singles featured the instrument. This run started with Chicory Tip's chart-topping "Son Of My Father" in January 1972 and continued with the hits "Popcorn" by Hot Butter, Hawkwind's "Silver Machine," and Roxy Music's "Virginia Plain"—the last two featuring the VCS3.[23]

To the creative musician, however, the very unfamiliarity of the synthesiser presented an opportunity to exploit, and begin to define, the new possibilities afforded by the device. This was particularly true when it was not simply viewed as a novel keyboard instrument.[24] In perhaps the earliest UK music-paper interview to mention the VCS3, King Crimson's lyricist Pete Sinfield announced:

> We've also got a new toy […] you can play instruments into it and mix them with various tones to get very unusual sounds […] unheard of guitar sounds […] we can also put electric piano though it and maybe even vocals.[25]

And indeed VCS3 -processed vocals can be heard on "Happy Family" from King Crimson's *Lizard*, released in December 1970. Sinfield's role as "non-musician/synthesist"—modifying the live sounds of other band members—foreshadowed the similar function that Brian Eno more famously served in Roxy Music. Eno has described the fluid, non-prescriptive nature of the synthesiser at that time:

> The VCS3 […] was a fantastic thing to have for someone like me, who couldn't actually play any conventional instruments. There were no rules for playing synthesizers, so nobody could tell me I couldn't play one. Nobody else could play one either. It was an instrument you made up yourself… its role was waiting to be invented. [26]

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[23] The heavily increased use of (EMS) synthesisers for *Doctor Who* incidental music and sound effects in 1972 also supports the case for this being the year in which the synthesiser went mainstream in the UK.
[24] A surprisingly militant editorial in the May 1970 issue of *Studio Sound* speculated on the future mass-production of the keyboardless synthesiser, whereby "The hegemony of the electric guitar might then be ended, and with it might go the tyranny of the piano keyboard. The VCS3 doesn't have one."
[25] Nick Logan, "KING CRIMSON – biggest one man band in the business," *Melody Maker,* 6 June, 1970.
[26] Brian Eno, "On Bizarre Instruments," *Daily Telegraph*, 15 October, 2011.

If the synthesiser's roles were "waiting to be invented," how did the VCS3's makers go about marketing and promoting the instrument? What uses did they envisage?
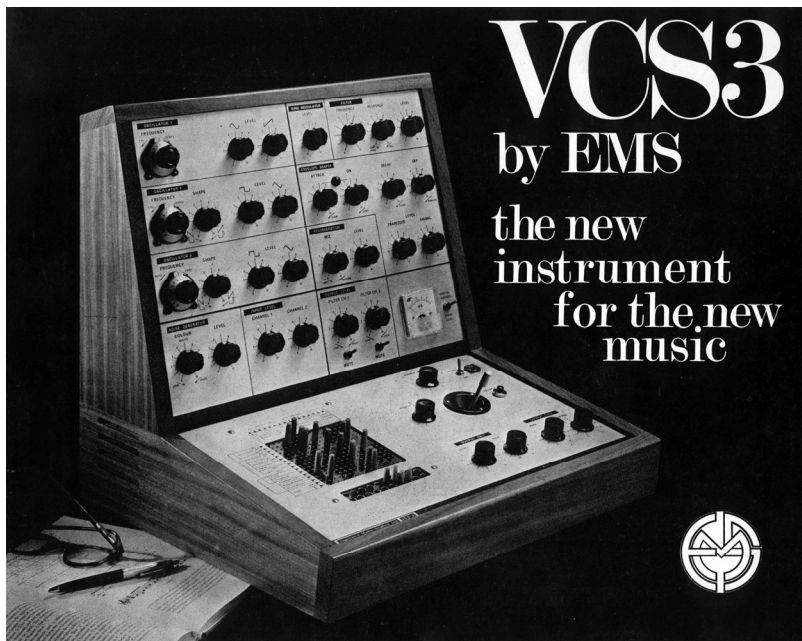

Figure 1-1 1969 VCS3 brochure

The VCS3 launch, and pricing

At the outset, Cary and Zinovieff viewed "avant-garde" composers as their principal market, and this, along with budget restraints—and Cockerell's pragmatism—shaped the design of the VCS3. Satisfying the perceived wishes of this "market" was not the only determinant, however. The education market was also in their sights. Interviewed in 2003, Cary said "we thought we could design a package that would appeal not only to composers but also to schools and people like that. A very good teaching instrument for acoustics and so forth."[27] In a footnote to "The Social Construction of Facts and Artefacts," Pinch and Bijker note that:

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[27] Tristram Cary, interviewed by Gabriella Smart, 3 September, 2003.

Advertisements seem to constitute a large and potentially fruitful source for empirical social studies of technology. The considerations which professional advertising designers give to differences between various 'consumer groups' obviously fit our use of different relevant groups.[28]

In the spirit of such an empirical study, then, let us see how the VCS3 was presented and promoted in the UK and USA in first 16 months of its existence.[29] Tristram Cary wrote the text of the first VCS3 brochure, dated November 1969, and it's clear from the cover photo at least that the instrument was being pitched squarely at the "serious composer." Its iconography is clear: horn-rimmed glasses, a pen—and the VCS3 itself—rest on an opened book about computer music, showing a notated musical example (Fig. 1-1). Cary's text does, however, attempt to appeal to a wide range of potential users, noting that the VCS3's design made it "particularly suited" to five apparently distinct applications:

1. As a complete unit in itself.
2. As an electronic music studio
3. As a live performance instrument.
4. As a sound effects generator.
5. As a teaching aid.

Cary also emphasises its design credentials and cost effectiveness:

The VCS3 Electronic Music Studio is the result of two years collaboration between musicians and electronic engineers and embodies circuitry which cannot be equaled by instruments costing four or five times its price.

This appeal to authority, and the notion of a collaboration between the musician/composer and the engineer/technician was a common early synthesiser sales trope, serving to legitimise an instrument that was still viewed with suspicion—especially in art-music circles. Similar rhetoric had been used on the 1967 Moog demonstration disc:

The R. A. Moog 900 series modular electronic music instruments were designed and built with the composer in mind. They were developed over a twelve-year period with the consultation of many experienced composers

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[28] Trevor Pinch and Wiebe Bijker, "The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," *Social Studies of Science* 14.3: 399–441. 1984, 439n92.

[29] i.e. November 1969 to February 1971. During this time the VCS3 and DK-1 keyboard were effectively EMS's only products.

and technicians.[30]

The very earliest VCS3s were priced at £285, but within weeks £330 was established as the first settled price. While this represented a substantial outlay—over ten times the average UK weekly wage—the VCS3 still cost less than one fifth of a similarly featured Moog. For a short time at least, the VCS3 had no real competition in the UK and Europe, and found a small niche in the US market.

The earliest press announcement for the VCS3 I have seen is from *Music Business Weekly* dated 22 November 1969. At this point *any* synthesiser tended to be compared to the Moog[31] and the headline ran "British studio makes Moog equivalent." The national pride about a "British-made" synthesiser, at "a fraction of the cost" of the "controversial American-made Moog" is evident. The appeal to authority is again made: Cary, "a professor at the Royal College of Music," and Zinovieff, "who specializes in electronic composition for the movies,"[32] are mentioned as co-operating on the design, and we are told that "Pop and classical musicians are showing a keen interest" in the VCS3. Quite who those "pop musicians" were remains unclear, though Paul McCartney had visited Zinovieff's studio in 1966[33] and it is possible that Dave Gilmour of Pink Floyd may also have visited by this time.[34] An early instance of the VCS3 being used

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[30] R. A. Moog Company, Trumansburg: "Moog 900 Series Electronic Music Systems Demonstration Record," 1967.

[31] Announcing the VCS3 in May 1970, *Studio Sound* refers to it as a "Minimoog" some months *before* Moog's Minimoog appeared.

[32] This is a puzzling description. It *may* refer to the work that Zinovieff did on Sam Wanamaker's *The Executioner* (though that film was not released until June 1970) or perhaps to *Takis Unlimited*, a film about the artist Takis (Panagiotis Vassilakis) shot in 1968 and broadcast on BBC2 on February 1 1969. The latter included excerpts of Zinovieff's electronic music.

[33] Brian Hodgson, interview with author, *These Hopeful Machines*, transcript, 19 April, 2010,
http://www.radionz.co.nz/concert/programmes/hopefulmachines/audio/201812324/ interview-brian-hodgson. See also: Steve Turner, *Beatles '66: The Revolutionary Year*, (London: Ecco, 2016), 390–392; and Brend, *The Sound of Tomorrow*, vii–ix, and 175–177.

[34] Other candidates would include members of King Crimson, and The Moody Blues, but this is an area for further research.