Introduction

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Electronic music is the mainstream. From musique concrète to audio-visual sampling, from elektronische Musik to minimal techno, from the Telharmonium to the laptop, electrical technology[1] has facilitated more than a century of original music, spawning a multitude of new styles, instruments and methods. Fruitful crossovers with other media and arts have allowed it to reach new audiences and to become an accomplice in many forms of expression. It appears ubiquitous, from mobile phones, television and podcasts to the art gallery and other unorthodox performance spaces. In many ways, electronic music is now so well accepted and integrated into contemporary practice that it is transparent to the observer. Yet on the periphery of musical exploration it remains highly visible – from sonic art, to live electronics, to new advances in computational music.

Whilst electronic music would not restrict itself to computer-mediated art, much current work in this area is related to computational applications and the boom in accessibility of personal computing. The last seventy years have seen a move from rare electronic music studios to commonplace bedroom studios. As if the thought experiment about Shakespearian monkeys has come true, millions of composers are at large exploring a multiplicity of software and devices in the pursuit of their own musical worlds. The entry cost of an electronic music hobby is no longer the hard graft of acoustic instrument practice, but a simple willingness to explore musical outputs within predominantly visual software paradigms. The influence of computers in compositional techniques, sound analysis and processing, performance interfaces and concert practice is astounding.

Yet the mass of software and hardware recording and performing tools are resting on a wonderful heritage. The most indispensable musical devices of the twentieth century have often been proclaimed to be microphones and loudspeakers.[2] In this era, the mass availability of electronic music-making tools is such that to create musical items is a daily occurrence: from composing ring tones on a mobile phone, to selecting and adding sound media to visual presentations and video, through to creating sophisticated works of expressive value that incorporate original sound processes.[3] Whilst not all musicians care to delve into the background and latest developments in this field, living with the common manifestations of

the technology without critical complaint or luxury, for the curious reader, this companion should deliver access to a powerful territory of inspiration and excitement.

A rich history underlies electronic music, full of radical inventors, pioneering composers and daring innovators. Modern-day musicians indiscriminately employing the technology might only know Karlheinz Stockhausen as a face on the cover of *Sgt. Pepper's Lonely Hearts Club Band*, Raymond Scott from incidental music in Warner Bros cartoons, Delia Derbyshire from her electronic orchestration of the *Doctor Who* theme, and be unaware of the contribution of Lee Scratch Perry to the history of remixing. However, the worldwide success of electronic dance music and other electronica has raised the profile of the pioneers of electronic music and increased our curiosity about the foundations of this subject area. And as new experimental music inevitably proves itself in time (or dissolves from view) the cutting-edge research of today will inform new musical movements of the future.

Given such a vibrant tableau, this book can only attempt to survey and analyse a proportion of the developments. We have gathered here what we hope is an exciting collection of perspectives on electronic music. We have tried to encourage novel approaches to the more well-trodden topics, taking in the distant history and origins of electronic music, the relation of computers to music, and highlighting fascinating figures such as Halim el-Dabh, Laurie Spiegel and Gottfried Michael Koenig. We have also commissioned chapters on some less widely represented themes from the research front. Topics vary from DIY and live electronic music making, through audiovisual and crossmedia practice, to aspects of interactivity, musical analysis and network music. Whilst there may be some overlap with familiar notions and history of electronic music, we have tried to avoid duplicating the content that can be found in already well-known books (a representative sample of which are included at the end of this introduction).

Indeed, in this manically communicating world the target is moving quickly. For instance, the proliferation of dialects and idioms is nowhere more publicised than in electronic dance music, where new genres are promoted each week in a desperate bid to put space between producers and their rivals for economic advantage. This rapidity of advance may eventually make writing any book impinging on contemporary topics an exponentially difficult task.

Rapidity is also fun however; there is no need to be bored or uninspired, look at all the activity! Far more recordings are released each year than you could ever listen to in multiple lifetimes. And look at the fads and fashions of devices: vocoded vocals, Roland x0x's, Euroracks, Max/MSP with nato,

Max/MSP with Jitter, Max for Live, Minimoogs, mainframes, a Kim-1 or Amiga.[4] We could profitably hold a moratorium on the technological head charge and just experiment with what we have; you could spend another lifetime exploring all the freeware and shareware music programs available from the World Wide Web.

To guide us in our coverage of the subject, the contributors to this book range widely across a number of generations of academics, writers and composers, from many locations in the world. An international flavour befits the current age of mass participation and mass communication, and we hope to see a truly global accessibility and a globally intensive exploration of electronic music in the future. In alliance with such an aspiration, we have gathered a series of artists' statements, showcasing diversity across many styles of electronic music. Whilst it remains true that many accounts and explorations of electronic music have involved European and American artists, the wider world has not been idle, even if the media coverage and technological apparatus have not always been of the same order.

We have also deliberately engaged with media beyond sound alone. Though the acousmatic is covered on its own terms, we have also reserved two chapters for audiovisual art. This is not just because such practice is an exciting area of contemporary activity, but because its history is interleaved with that of electronic music; indeed, early experiments with optical soundtracks predate magnetic tape. We have also pursued an active approach to live electronic music, as opposed to fixed recordings; the latter medium remains an area where traditional Western classical music might (however misguidedly) claim superiority over electronic experimentation. We wish to show how much interesting work has been undertaken to confront the possibilities of electronic music for concert use, and to honestly appraise the issues involved in the union of machines and musicians.

It seems pertinent at this point to confront one division in contemporary musical life which is the subject of much discussion, and stress to some: the polarity of *electroacoustic*, caricatured as serious academic art music, and *electronica*, as popular electronic music,[5] also including many forms of experimental electronic music. In reality, various continua stretch between these forms. Perhaps there is a certain amount of posturing going on for economic and artistic reasons; this can lead to a certain sociological resistance to new states of play in musical affairs. Electronic music is joyfully accessible to anyone with a computer of even limited power – an instrument today as intuitive to some as the electric guitar was to previous generations. For others, it can be threatening that those lacking formal training still produce fascinating electronic music; many successful practitioners learn as they go.

What does this mean in practical terms? Well, perhaps we should relax a bit, but what you'll find in this book is some mingling of electronica and electroacoustic in a bid to defuse some of the dangerous divisionism. That's also why Kevin Blechdom's statement is next to Karlheinz Stockhausen's.[6]

In truth, we hope to reconcile the electroacoustic and electronica worlds. We may show that electroacoustic composition is nothing but 'academic' if it doesn't acknowledge what is happening in the popular ambitus, and that electronica is inconsequential and disposable if it doesn't learn from the history of electronic creativity.[7]

This book is structured in three parts broken up by artists' statements, though these divisions are not meant to be overly prescriptive, for chapter authors discussing practices or foundational themes will also delve into the history, and vice versa. Whilst we hope that these chapters will be accessible to a reader previously unfamiliar with electronic music, the authors have not shied from making original assertions and bringing in subjects of controversy and contemporary research.

We've provided a chronology which draws together many events mentioned in this book.[8] It is particular to this book; like any history, it is just one view amongst many. And in a field that actively develops at the pace of electronic music, that engages with a great plurality of techniques and approaches, and indeed, isn't adverse to the odd algorithmic game, readers are encouraged to find their own personal tapestries of works and experiments. Part of the charm of this area is that it is very much alive and continually transforming, and the most fascinating works may be yet to come; indeed, from readers of this book!

Postscript: Second Edition

Ten years on, we wouldn't add much to the Introduction to the first edition. No overthrow of electronic music has taken place to remove it from the centre ground of musical development. The last decade has seen an explosion of interest in DIY music making, the further consolidation of computers at the heart of studios and much live performance, including with applications for mobile phones and web browsers, and much work in sound art (as fine art practice in the medium of sound) and music information retrieval (the machine understanding of music across large databases of examples), amongst other subfields. There has also been healthy academic activity in investigating the history and analysis of electronic music, often promoting less widely known and overlooked paths, for example, with a recent conference championing Alternative Histories of Electronic Music (AHEM, held April 2016, The Science Museum Dana Research Centre in London),

or in the acknowledgement of the importance of female artists within that history (Rodgers 2010).

New chapters added to this edition reflect this continued development, and new artists' statements have been added to further convey the rich tapestry of electronic music. We have generally tidied up the first edition, and quietly dropped two chapters, but made room for four more. We hope you'll enjoy this book, in whatever order you care to browse it, and whatever electronic music you personally create.

Notes

1 There is a certain pressure to define and delimit electronic music, which we will sidestep. Electronic music has sometimes been technically differentiated from any music that might utilise electricity (in one sense, the brains of acoustic violinists use electricity!); for instance, the Wikipedia entry on electronic music founds its definition on the restriction of the IEEE standards body definition of 'electronic' (as referring to low-power components like transistors and integrated circuits). Whilst the main focus of our investigations in this book will refer to electronic circuits, and especially those modern-day hyper-miniaturised computer chips, we shall not refrain from discussing any electromagnetic and electromechanical technologies, especially where related to the history of electronic music, but also in contemporary work.

2 In one inspiring example of custom electrification and amplification, the ensemble Konono no.1 feature hand-built microphones salvaged from old car parts, and distorting sound systems incorporated into the essential fabric of their music (Congatronics, Crammed Discs).

3 In this book we will often emphasise such real-world examples, on one hand to support the ideas discussed, and on the other to serve as searchable topics for the Google/Wiki/YouTube/Facebookfriendly generation.

4 A large number of artists proudly declare that they bought the first or second Synclavier or Fairlight in the country…

5 This is especially true of the categorisation of electronica in the United States; elsewhere, it can connote a wider spirit of experimentation more readily.

6 At the time of writing, they both lived in Germany, after all!

7 In another angle to such debate, fine artists who work with sound have entered into, well, not exactly competition, but correspondence and engagement with many of the same areas that musicians have explored. As we have discussed already, the music conservatoire education is not a necessary prerequisite for work in electronic music. It is often around the arena of electronic music where much of the sound art crossover takes place. Our own approach to this is pragmatic – everyone should learn about everyone else's work and background. It is now entirely normal practice that sound installations are cited as examples of work as well as tape pieces and live performances.

8 Further chronologies are provided in Cox and Warner (2004) and Shapiro (2000), or online.

Further reading

Chadabe, J. (1997) *Electric Sound: The Past and Promise of Electronic Music*. New Jersey: Prentice-Hall

Cox, C., and Warner, D. (eds.) (2004) *Audio Culture: Readings in Modern Music*. New York: Continuum

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