EXPERIENCING MUSIC TECHNOLOGY
UPDATED THIRD EDITION

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Preface

“By looking for the structure in signals, how they were generated, we go beyond the surface appearance of bits and discover the building blocks out of which image, sound, or text came. This is one of the most important facts of digital life.”

—Nicholas Negroponte, Being Digital (1995)

Welcome to the update for the third edition of Experiencing Music Technology! If you are familiar with the earlier versions of this textbook, we hope you will appreciate the changes herein and find this version as useful as the last. If you are a new reader, we hope you will enjoy this introduction to music technology and its role in the contemporary music scene.

Writing about this field is exciting. Many times since the last edition, we have stopped the process of reviewing and testing new software and hardware, remarking to each other how truly amazing the field’s achievements have been since our last edition. In 1993, when we first decided to create this textbook, we were motivated in large part by the power of music technology to enhance the experience of musicians of all ages and experience levels. As researchers, educators, and musicians, we saw the role of music technology as a major force in teaching the technical aspects of music and, perhaps most importantly, encouraging the creative experience of music composition, improvisation, performance, and music listening. More than 14 years later as we conclude this edition, we believe this more than ever before.

Of course, updating such a book presents us with one obvious challenge: the persistence of change. Developments in hardware, software, and even the very culture of music technology itself seem to escalate exponentially. Since 1999, we have seen: (1) major operating-system changes in both PC and Macintosh computers, (2) a tripling of the power of personal computers accompanied by major drops in cost, (3) literally hundreds of new music-software titles in every major category produced by companies in the United States and abroad, (4) new hardware devices for a variety of music needs at all price points, and (5) major shifts in the way music is acquired and enjoyed by us all. Just a few of the new technologies we have seen emerge include mobile computing, wireless, DVD and surround sound, soft synths and effects, and the prevailing dominance of digital audio, with a bias toward software rather than hardware solutions. All of this has an obvious effect on our ability to do a credible job of accounting for the field, for those both inside and outside academe.

The task is made a little easier because of the approach we have taken since the start. In each edition, we concentrate less on the specifics of each software
In the first version of the third edition, we incorporated many changes and these continue in the current updated edition. For example, we continue our emphasis on music and people. We have retained the structure that begins with overall issues of operating systems and Internet use, followed by several sections on digital audio and MIDI. We move to notation and then end with computer-aided instruction. Throughout the book, we try to reflect the most leading-edge topics in music software, hardware, and data structures.

This upgrade includes several new features. The majority of screen shots have been completely redone to reflect the inevitable changes in software and hardware.
development in the last three years. We have included new software titles and deleted others, based on our understanding of the changing scenes in music production and in music instruction software. When appropriate, we have reflected the changes in major operating systems, including the development of Microsoft’s Vista OS for PC computers and the new Leopard version of OS X for Macintosh. All of the hardware and key concepts have been reviewed, updated where needed, and new technologies and products replaced or added to reflect the current computer and computer music scene.

Perhaps the biggest change has been our decision to move the project tutorials for software from a bundled DVD to online sources. After discussions with many users of the book—both instructors and students—and after considering changes in bookstore procedures and the obvious flexibility of online distribution, we are happy to provide a set of the most used tutorials in their current version as an online resource. Throughout the text, we include links to the projects in the same way we have always done. For information on access to these step-by-step project tutorials on important music software, consult our book website at http://www.emtbook.net.

Book Content and Goals

Experiencing Music Technology, 3rd Edition, covers the essential topics a musician should consider when exploring the use of computers and technology in the many aspects of the music experience: listening, performing, composing, teaching, and managing. The book is designed as an introductory resource for a wide audience both inside and outside the academic setting. Although it is introductory in scope, it still provides considerable depth of coverage on critical music-technology topics.

Modular in design, the book’s resources can be used in many ways. Although intended as the text for a complete undergraduate or graduate course of study devoted to music technology, it can also serve as a supplemental resource for other courses in the curriculum: general musicianship, piano pedagogy, theory and aural skills, arranging and orchestration, music composition and improvisation, instructional design, and other contemporary topics.

In addition, the book can be easily read and used for self-study by people who are simply curious about and intrigued by the use of computers for music making. Professional musicians, parents, children, computer aficionados, and lay musicians of all kinds may find the book helpful in increasing their understanding of music technology.

Experiencing Music Technology is designed to meet the following goals:

- Provide a conceptual overview of music and technology with essential study and reference material
- Give a broad perspective of the many ways people can use technology in music applications
- Offer modular organization of the material to provide flexibility for the reader and the instructor
- Note historic milestones in music computing and technology
- Promote a systems approach to computer understanding, planning, and implementation by stressing five components: people, procedures, data, software, and hardware
• Emphasize hardware and software unique to music applications
• Focus on the conceptual and cross-application features that define current commercial hardware and software
• Avoid featuring industry-specific products for their own sake, instead emphasizing features in common or contrast with other products to illustrate their general application to music experiences.

Experiencing Music Technology Online Projects and Support Website

Online Web-based Projects are available to provide supportive tutorials to parallel the book material. While the textbook illustrates concepts of music technology with a broad range of software examples, The Online Projects provide hands-on activities focused on specific commercial software to parallel the major topics in the book. All of the materials can be easily viewed through a web browser.

Each software activity is a tutorial that features step-by-step directions for using a specific software application. A generous number of screen shots are provided to illustrate the steps in the tutorials. Links are included to related materials, including worksheets that students can use to track their progress and teachers can use to evaluate work completed. These worksheets can be viewed and printed right from a web browser. The Online Projects are available as ZIP files for download at www.emtbook.net, on file for each project activity.

Icons in the Margin of the Book

To help you as you progress through each chapter, we have created several icons that will alert you to different levels of help. Watch for these icons:

• LINKS to helpful information related to this topic elsewhere in the book

• TIPS that are especially helpful to those just starting to use computers and music technology

• ASIDES that are interesting notes for reading enjoyment and mind expansion

• Online Project materials: training online at www.emtbook.net that accompanies this textbook and provides hands-on experience with software noted in the textbook
Definitions

In addition to the term viewport, a few other terms are critical in this book. We need to be sure that you understand what terms like musician, music experience, computer, and technology mean for us.

Musician

The term musician refers to anyone, at any level of sophistication, engaged in music experiences. This definition of musician includes the parent, child, student, teacher, administrator, performer, and composer. We realize that the usual use of this term refers to individuals with advanced skills in music, particularly in performance. However, in the interest of promoting a view of music computing accessible to the widest-possible audience, we have chosen this more-relaxed definition.

Music Experience

Music experience refers to the fundamental ways people interact with music cognitively, emotionally, and aesthetically. Included in this are the processes of listening to, performing, and composing music, which are the hallmarks of music as art. Throughout this book, we are interested in ways that technology can enhance these fundamental aspects of experiencing music. In addition, we are concerned with how technology can help with teaching and studying music and managing music activities. Although these activities are not primary music experiences, they are vital to music as practiced in our society.

Computer

The term computer, as used in this book, refers to small computer systems commonly known as personal computers. In creating our illustrations, we have chosen to focus on the two primary icon-based computing environments used today by musicians: (1) IBM PCs and their compatibles, commonly referred to as either “Windows” or “PC” machines, and (2) Macintosh, sometimes called “Mac,” computers. Throughout the book, we refer to these as either “Macintosh” or “PC” machines, or “Macintosh” or “Windows” operating systems, regardless of whether the versions are OS 9, OS X, Windows 2000, Windows NT, Windows XP, Vista or any future versions of these. By icon-based, we mean operating systems that use graphic images or icons for common operations with the computer.

Technology

The term technology refers to computers and all of the music and nonmusic peripherals needed to perform music tasks with computers. These peripheral devices include such hardware as electronic-music keyboards, MIDI controllers, printers, scanners, CD players, and so on.
Acknowledgments

First, we’d like to renew our thanks to everyone recognized in the two previous editions for their generous help, insights, and guidance in bringing this book project to fruition. For this third edition and its update, we extend our sincere thanks to James Frankel (Teachers College, Columbia University), Sara Hagen (Valley City State University), Evelyn K. Orman (Louisiana State University), several anonymous reviewers who offered insightful critiques of the second edition, and a number of colleagues across the country who have read portions of the new edition and offered comment, factual accuracy, and revised wording. These include a select group of people who provided technical reviews of our written materials: Frank Clark (Georgia Institute of Technology), Don Byrd (Indiana University), Chris Douglas (Edirol), Scott Genung (Illinois State University), Ken Johnson (M-Audio), Virgil Moorefield (University of Michigan) Scott Lipscomb (University of Minnesota), and Ken Pohlmann (University of Miami). Then there were those who came through with critical information and support materials at just the right time: James Bohn; John Dunn (Indiana University); Ben Flin, Peter Maund, and Bobbie Thornton (Sibelius); Greg Smith (Hal Leonard); Bill Hanson (Apple Computer); Billee Kraut (AABACA); Tom Lykins (Sound Marketing); Tom Johnson (MakeMusic!); Henry Panson (University of Alabama-Birmingham); Sam Reese (University of Illinois); Perry Roland (University of Virginia); Eleanor Selfridge-Field (Center for Computer Assisted Research in the Humanities), Tom White (MIDI Manufacturers Association); Lee and Laura Whitmore (Sibelius); and Larry Worster (The Metropolitan State College of Denver); and numerous industry contacts who came through with photos and information for us. These professionals have added enormously to the reliability and validity of the material herein. Of course, any errors remain solely our responsibility.

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David Brian Williams, Bloomington, Illinois
Peter Richard Webster, Winnetka, Illinois
About the Authors

David Brian Williams and Peter Richard Webster have partnered for more than 18 years to provide leadership to the music profession in technology applications; workshops on the application of technology to music and music education; and presentations for state, national, and international conferences, including MENC, CMS, ATMI, and NASM.

David Brian Williams is Emeritus Professor of Music and Arts Technology at Illinois State University. Dr. Williams founded one of the first nationally recognized integrated arts technology programs and served a four-year appointment as Associate Vice President for Information Technology on his campus. He is currently a freelance consultant on computers and music technology (www.coach4technology.net). In the late 1970s, he cofounded Micro Music, Inc., and developed numerous music-education titles for the Apple II and the MMI DAC sound card. He has written extensively in the areas of music education, music psychology, music and arts technology, and instructional development. He has served on the boards of MENC, CMS, Illinois Music Educators Association, and ATMI. He chaired the MENC task force for developing Opportunity-to-Learn Standards for Music Technology and, in 2001, received the Illinois Music Educators Association Distinguished Service Award for his work in music technology.

Peter Richard Webster is the John Beattie Professor of Music Education and Technology at Northwestern University’s School of Music, where he also serves as the Associate Dean for Faculty Affairs, directs doctoral research in music education, and serves on the music technology, cognition, and music-education faculties. He is the author of Measures of Creative Thinking in Music, an assessment tool designed for children aged 6–10. He has published in numerous professional publications, such as Music Educators Journal, Journal of Research in Music Education, CRME Bulletin, Contributions to Music Education, Arts Education and Policy Review, Research Studies in Music Education, Music Education Research, and Psychomusicology. He has authored chapters in several books, including chapters on creative thinking in music and music technology research in the first and second editions of the Handbook of Research on Music Teaching and Learning. He has served on the board of CMS and is a past president of ATMI.
EXPERIENCING MUSIC TECHNOLOGY