

Transition Guide

Experiencing Music Technology, 4th Edition

David Brian Williams and Peter Richard Webster

EMT 4th eBook Edition		EMT 3rd Edition Updated Comparison		
Viewport I Musicians and Their Use of Technology I		Viewport I Musicians and Their Use of Technology		
Overview	p. 1		Overview	1
	Overviews throughout the 4th edition feature all new Music Technology in Practice interviews of active musicians and educators in the field as well as an introduction to the content of the Viewport's Modules and a short listing of the suggested project activities and selected readings for the Viewport.			
Module 1	People and Music: Technology's Importance in Changing Times p. 4		Module 2	People Using Technology 12
	<ul style="list-style-type: none"> • Module 1 —as all Modules in the 4th Edition—begins with a new "Why Study This Module?" section. Setting the stage philosophically, this initial module seeks for a deeper understanding of technology as tools for human creation and enjoyment of music, changing patterns in music study in general and in higher education music curricula in particular, and a model for understanding change in the adoption of technology innovations. • All Modules in the ebook contain hotlinks to various references and links and conclude with a special "Webport" section customized to each module with links for tutorials and resources on the Web and the authors' website, https://teachMusicTech.com 			
Module 2	People Making Technology: The Dance of Music and Technology p. 8		Module 1	People Making Technology
	A brief glance at the history of computers and music technology is enhanced with new images and more recent music technology advances and applications.			

Module 3	People Competencies for Music Technology p. 19			
	A new module for the 4th edition introduces a key new thread throughout the book: a set of 10 core music technology competencies developed through the authors' research over the past several years.			
Module 4	People Getting Help p. 24		Module 4	People Helping with Technology 21
	Similar in focus to past book editions, but updated with new resources			
Module 5	Finding Your Experience Level p. 26			
	A new module introducing the three mastery levels of technology skills--novice, competent, and expert--in reference to the organization of material in the 4th edition.		Module 3	People Questioning Technology 17 <i>Module omitted from 4th Edition</i>
	Project Details for Viewport I p. 30			
	New to the 4th Edition are a set of suggested projects for individual or class activities to put the concepts and skills in the viewport into practice. These are introduced in the Overviews with extensive descriptions of each activity concluding each Viewport.			
Viewport II		Viewport II		
Platforms, Operating Systems, and Internet Concepts for Musicians		Computer and Internet Concepts for Musicians		
Overview	p. 33		Overview	25
Module 6	Operating Systems, Digital Work Habits, and Internet Use p. 36		Module 5	Computer Operating Systems and Internet Software 27
	New material related to: <ul style="list-style-type: none"> • Operating systems and their purposes • Digital work habits including naming conventions, viruses, malware and security • Complexities of copyright • Internet-based software for personal and professional development 			

Module 7	Concepts of Computers, Networking, and the Internet p. 49		Module 6	Computer and Networking Concepts 46
	<p>New material related to:</p> <ul style="list-style-type: none"> • Streaming protocols for music and video • Updated of file formats including audio, graphics, and video, e.g., FLAC and OGG, HEIC and HEVC, etc. 			
Module 8	EMT Workstation Designs: Internals and Connectivity p. 59		Module 7	The Mechanics of Computers and Networking 57
	<p>This topic is expanded into two modules: one on the internals of computers and the other, Module 9, on external mechanics.</p> <p>Completely new EMT workstations diagrams are presented throughout the book.</p> <p>New material related to:</p> <ul style="list-style-type: none"> • Modular devices (smartphones & tablets), Chromebooks, in addition to desktops & laptops • Miniaturization of SoC chips embedded in technology (audio codecs as example) • SATA and PCIe internal computer bus interfaces • USB-C, USB 3.0 and 4.0, and Thunderbolt replacing Firewire connectivity • Migration from CD and DVD storage to SSD and flash memory • More extensive tables illustrating expansion of connectivity speeds and bandwidth through computer buses, storage, and Wi-Fi and cellular networking 			
Module 9	EMT Workstation Designs: Input and Connectivity p. 75			
	<p>New Module 9 focusing on external connectivity</p> <p>New material related to:</p> <ul style="list-style-type: none"> • EMT Workstation diagrams for desktop (including laptop and Chromebook) and for mobile devices (smartphones and tablets) • Input devices including touchpads and screens, pencils, and styluses • Virtual assistants and artificial intelligence (AI) techniques • Output devices including external SSD and flash memory • Updated audio and video output connectivity • Wrap up section for Modules 8 and 9 on desktop and mobile workstations 			
	Project Details for Viewport II p. 85			

<p style="text-align: center;">Viewport III</p> <p style="text-align: center;">Analog and Digital Audio Basics</p>		<p style="text-align: center;">Viewport III</p> <p style="text-align: center;">Digital Audio Basics</p>	
Overview	p. 91		Overview 75
Module 10	Concepts of Acoustics, Audiology, and Digital Audio p. 93		Module 8 Acoustics, Digital Audio, and Music Synthesis 81
	<ul style="list-style-type: none"> • New section on audiology and the human ear • Revised presentation of sampling width and quantization 		
Module 11	Building a Basic Analog and Digital Music Studio p. 113		Module 10 Building a No-Frills Digital Audio Workstation 127
	<p>EMT workstation diagrams (Music Studio Models) completely revised and updated with both desktop and mobile designs.</p> <p>Expanded presentation offering both an analog solution and a digital solution for building a basic music workstation for mobile and desktop</p> <p>New material related to:</p> <ul style="list-style-type: none"> • Web Audio and Web MIDI • Microphone choices offering guidance for studio and live performance • Six audio interfaces suitable for mobile devices • Four digital audio interfaces and expanded audio channels • Sound drivers and latency • Mobile and Chromebook considerations • Storage devices for audio work including flash memory and SD cards, cloud-based storage 		

Module 12	Wave Editing and Basic-Level DAW Software p. 138		Module 9	Software for Capturing, Editing, and Storing Digital Audio 103
	<p>New preliminary section that includes:</p> <ul style="list-style-type: none"> • Differences between mono, stereo, channel, and track • Wave editors vs. basic-level digital audio workstations (DAWs) • Installation, space use, and plug-ins • Importing preexisting audio • Recording live audio and auditing playback • Choosing the right platform <p>New section featuring exemplar software for wave editors considered in depth: <i>Audacity</i>, <i>WavePad</i>, <i>TwistedWave</i></p> <ul style="list-style-type: none"> • Introduction to audio effects processing including their role and family organization <p>New section featuring exemplar software for basic-level DAWs considered in depth (focus on digital audio): <i>GarageBand</i>, <i>Mixcraft Recording Studio</i>, <i>Soundation Chrome Studio</i>, <i>Audio Evolution Mobile</i></p>			
Module 13	Concepts of Modular Analog Synthesis and Synthesizers p. 174			
	<p>New module focusing on the renaissance of modular analog synthesis both virtual and hardware.</p> <p>Unique material related to:</p> <ul style="list-style-type: none"> • Analog synthesis history • Components of analog synthesizers • Examples of programming virtual synths (Minimoog and ARP 2600) and matched to their hardware complements • Examples of commercial hardware and virtual analog modular synths • Eurorack and VCV Rack 			
	Project Details for Viewport III p. 188			

Viewport IV Adding MIDI to the Mix		Viewport V Music Sequencing and MIDI Basics	
Overview	p. 193		Overview 213
Module 14	How MIDI Works p. 198		Module 14 How MIDI Works 216
	<p>New material related to:</p> <ul style="list-style-type: none"> • defining channels for MIDI networks with multiple devices connected through merge boxes and patchbays • wired and virtual wireless solutions for desktop and mobile MIDI applications • MIDI 2.0 and Web MIDI • Inter-app solutions: IAC, AU, VST and mobile alternatives IAA, AU, AudioBus • Open Sound Control (OSC) as alternative to MIDI • SMPTE, MTC, ADAT, and World Clock moved to this Module 		
Module 15	MIDI Editing and Basic-Level DAW Software p. 219		Module 15 Software Techniques for MIDI Sequencing 229
	<p>New preliminary section that includes:</p> <ul style="list-style-type: none"> • MIDI versus Digital Audio • MIDI channels/Timbre numbers <p>New section featuring exemplar software for basic-level DAWs considered in depth (focus on MIDI): <i>GarageBand, Mixcraft Recording Studio, Studio One Artist, Audio Evolution Mobile, Soundtrap, GarageBand (iPadOS)</i></p> <p>New section on specialized software for mobile platforms considered in depth: <i>Korg Gadget 2, NanoStudio2, AudioKit Synth One, DM1-The Drum Machine</i></p> <p>New section featuring Workflow Utilities: <i>Audiobus</i> and <i>AUM-Audio Mixer</i></p> <p>New section on mixing and mastering with Basic-Level DAWs including a section on hints for mixing and mastering</p>		
Module 16	MIDI Hardware: Interfaces and a Cornucopia of Controllers p. 265		Modules 16 & 18 MIDI Hardware: Interfaces, Keyboards, and Sound Modules 250

	<p>Merging of content from the previous edition into Module 16.</p> <p>New material related to:</p> <ul style="list-style-type: none"> • Updated EMT music-studio-with-MIDI diagrams for desktop/laptop and mobile solutions with new industry examples • Expanded MIDI patchbay material including smart patchbays • MIDI Polyphonic Expression (MPE) <p>MIDI controller section updates:</p> <ul style="list-style-type: none"> • Condensed keyboard controller • MIDI pad controllers • Enhanced guitar and wind controllers <p>New section on mixer control surfaces, hardware, and software-based mixing:</p> <ul style="list-style-type: none"> • Mackie HUI and MCU protocols as well as MIDI • Tablets and smartphones as mixer control surfaces for DAWs • DAW, DIY, and multiple-user mobile mixer control apps <p>Refreshed section on creating new modes of MIDI expression</p> <p>Hardware tools for the DIY controller experimenter</p>			Extending MIDI: Controllers, SoundFonts, and Timing 311
	Project Details for Viewport IV p. 291			
Viewport V		Viewport IV		
More Advanced Digital Audio Workstations		Doing More with Digital Audio		
Overview	p. 391		Overview	143
Module 17	Multichannel Audio Hardware and Concepts p. 298		Modules 12 & 11	Hardware for Multichannel Digital Audio 197

	<p>Module selectively merges the previous material from the 3rd Edition Modules 11 & 12 into one. The focus is on mixer hardware and related concepts and skills in mixing. Topics include:</p> <ul style="list-style-type: none"> • Audio mixer concepts and design: • Routing and channels • Summing, buses, and mixes • Processing effects including time-based/modulation effects, amplitude/dynamic effects, spectral/sound quality effects, and pitch effect processors • Aux and insert buses • Group and matrix buses <ul style="list-style-type: none"> • Multichannel audio workstation designs with EMT music production/performance studio EMT diagrams. Each design provides illustrative commercial examples with hands-on tutorials to aid in learning mixer techniques and skills. <ul style="list-style-type: none"> • The three designs: analog mixer, digital mixers, Virtual or In-the-Box Mixers <p>New section on mixers for unique recording needs to include portable, podcasting, small mixers for small jobs, and DJ mixers</p> <ul style="list-style-type: none"> • Portable sound section (moved to this module) <ul style="list-style-type: none"> • Standalone recorder/players • Surround sound 			Sonic Realism: MPEG, Surround Sound, and Discs 147
Module 18	Software for Advanced DAWs p. 329		Module 13	Software for Multiple Tracks and Channels 167
	<p>New preliminary section that includes:</p> <ul style="list-style-type: none"> • Advanced DAW landscape • Eleven advanced DAWs profiled for overall characteristics • Which advanced DAW is best considering personal preference and style of music? <p>Exemplar Software considered in depth—<i>Logic Pro, Auria Pro, Live</i></p> <p>New section on advanced DAWs and Hardware</p>			
	Project Details for Viewport V p. 385			

		Viewport VI: Doing More with MIDI and Beyond		
		<i>Omitted in 4th Edition</i>	Module 17	Adventures in Sound Shaping and Synthesis 272
Viewport VI Music Notation Production		Viewport VII Music Notation		
Overview	p. 391		Overview	331
Module 19	Representing Music on the Printed or Digital Page p. 393		Module 19	Coding Systems for Music Notation and Performance 335
	<ul style="list-style-type: none"> • Expanded material on MusicXML • New section on file formats for notation applications, score writers, OMR and AMR, and digital music reader applications • New section on import/export formats for notation with examples from Sibelius, Finale, and SmartScore • Standard Music Font Layout (SMuFL) and a discussion of universal music fonts across scorewriters 			
Module 20	Entry Techniques for Scorewriters p. 413		Module 21	Notation Hardware: Input Devices, Scanners, and OMR 397
	<p>A new Module combining input device hardware with entry system alternatives from scorewriters like <i>Dorico</i>, <i>Finale</i>, <i>MuseScore</i>, <i>Noteflight</i>, <i>Notation</i>, and <i>Sibelius</i> to include:</p> <ul style="list-style-type: none"> • Keyboard entry with keypads, mouse, palettes, and ribbons • Step-time with MIDI keyboard • Virtual piano, guitar, and drums • Real-time MIDI record with pulse or tap and foot pedal • Live or recorded audio • Handwritten • Scanning notation 			

Module 21	Software for Scorewriting, Scanning, and Digital Music Readers p. 429		Module 20	Software for Music Notation 357
	<p>Completely redesigned module given mobile options, scanning, and digital reader developments</p> <p>New nomenclature: “Music Notation Production” software with subcategories of “Scorewriter,” “Scanning,” “Digital Music Readers”</p> <ul style="list-style-type: none"> • New section on six scorewriting exemplars for desktops considered in depth: <i>Dorico, Finale, MuseScore, Noteflight, Notion, Sibelius Ultimate</i> (exemplars considered in terms of basic setup and operation, followed by specialized features) • New section on scorewriters for mobile devices: <i>Sibelius, Dorico, and Notion</i> mobile options; <i>StaffPad</i> and other options • New section on optical and audio music scanning exemplars: <i>SmartScore X2, Music-to-XML, Audio Score Ultimate. ScanScore, PlayScore 2 Professional</i> • New section on: Digital Music Reader Applications: <i>forScore, Newzik, TomPlay</i> 			
Module 22	Hardware for Music Printing, Scanning, and Mobile Music Reading p. 479		Module 21	Notation Hardware: Input Devices, Scanners, and OMR 397
	<p>New material includes:</p> <ul style="list-style-type: none"> • Expanded content on music printing and scanning with details of print size, paper types, scanning limitations, and more with guidance for producing make-do and near-professional quality scores scorewriter, scanner, paper, and printer • Accessories for digital music readers from page turners, mounts, pencils or styluses 			
	Project Details for VPVI p. 493			
Viewport VII		Viewport VIII		
Resources for Music Teaching and Learning (new name)		Computer-Aided Instruction in Music		
Overview	p. 499		Overview	403
Module 23	Software and Resources for Music Teaching and Learning p. 502		Modules 22 & 23	Music Software for Knowledge and Skill Development 406

	<p>Completely redesigned module given changes in landscape of music pedagogy</p> <p>New preliminary sections on:</p> <ul style="list-style-type: none"> • underlying themes of educational change • pedagogical skill, professional standards, people competencies <p>Resources Dedicated to Music Teaching and Learning Listening:</p> <ul style="list-style-type: none"> • Listening/Conceptual Study • Performance • Composition <p>Over 50 exemplars described for both younger and more advanced learners</p> <p><i>Note: More detail devoted to these exemplars in the ebook</i></p>			<p>New Directions in Music-Instruction Software 426</p>
<p>Module 24 (New module ebook only)</p>	<p>Further Technology Resources for Teaching and Learning p. 513 PAGE NUMBERS IN MODULE 24 IN THE EBOOK ARE SET TO page "513" TABLE OF CONTENTS IN EBOOK HAS ACCURATE LINKS TO MODULE 24 CONTENT</p>			
	<p>Completely new module that focuses on important more general resources for music teaching and learning</p> <p>Categories include</p> <ul style="list-style-type: none"> • Interdisciplinary resources • Podcasts • Portals for music teaching resources • Portals for audio/printed music • Music teaching blogs <p>Distance learning</p> <ul style="list-style-type: none"> • Learning management systems • Portfolio management • Video applications • Assessment aids <p>Over 30 exemplars described</p> <p>Social media and building a personal learning network (PLN) considered</p> <p>Section on music production software in earlier viewports described in service of music teaching and learning as a way of summarizing the book in the context of music teaching</p>		<p>+</p>	

	Project Details for VPVII p. 514			
Postlude	519	Putting it All Together	445	
Appendix A EMT Workstation Equipment Guide and Codes p. 520		Appendix B	EMT Workstation Equipment Guide and Codes	
Appendix B Selected Readings p. 522		Appendix A	Selected Readings by Viewport	
Appendix C Experiencing Music Technology's Ten Competencies Checklist p. 52				
Trademarks p. 529				
Subject Index p. 531		Index	455	
Names Index p. 540				
Hardware Index p. 542				
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Note: all indices created by the authors				