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Review of The Norton CD-ROM MasterWorks: Interactive Music Guides for History, Analysis, and Appreciation, Vol. 1. By Daniel Jacobson and Timothy Koozin

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Reviews

Daniel Jacobson and Timothy Koozin. *The Norton CD-ROM MasterWorks: Interactive Music Guides for History, Analysis, and Appreciation*, Vol. 1. New York: W.W. Norton, 1996.

Reviewed by Gary Wittlich

The Norton CD-ROM MasterWorks is a recent addition to the growing collection of CD-ROM publications for music study. According to the description of the *MasterWorks* on the box in which it is published, this software "is the first multimedia resource that enhances the entire music curriculum in appreciation, history, and theory. Designed for individual study or class presentation, each volume provides a dozen works specially chosen to display styles and genres from all eras of Western music."

Contents

MasterWorks comes with a booklet that briefly describes the contents, hardware requirements, installation instructions, and the basic operation of the software. The application is written in HyperCard and requires a Macintosh computer with at least 4 MB of RAM and System 6.07. However, it is recommended that System 7.x and 5 or more MB of RAM be available for best operation. I tested *MasterWorks* on two different Macintosh computers, a Quadra 840 and a PowerMac 8500, both running System 7.5 and with greater than the required RAM. I used two different AV monitors, one 15" and the other 17". As might be expected, viewing is better on the larger monitor.

Figure 1 shows the *MasterWorks* main menu. In typical HyperCard fashion, clicking on a title on the menu takes the user to that module. Each module opens with an introduction that activates an audio recording of the work and displays the work's title, the author of the module (either Jacobson or Koozin), and one or more scanned images pertinent to the work. Clicking on the graphic brings

up a reference to its original source. The Introduction, which can be bypassed from the *MasterWorks* Menu page by clicking the checkbox at the upper right, moves directly to the contents screen.

Figure 2 shows the contents screen of the Rodgers module, which features a 1952 Chet Baker trumpet solo in a performance of "My Funny Valentine" by the Gerry Mulligan Quartet, with additional improvisations by vibraphonist Gary Burton and guitarist Jerry Garcia.

Figure 1. *MasterWorks* Menu

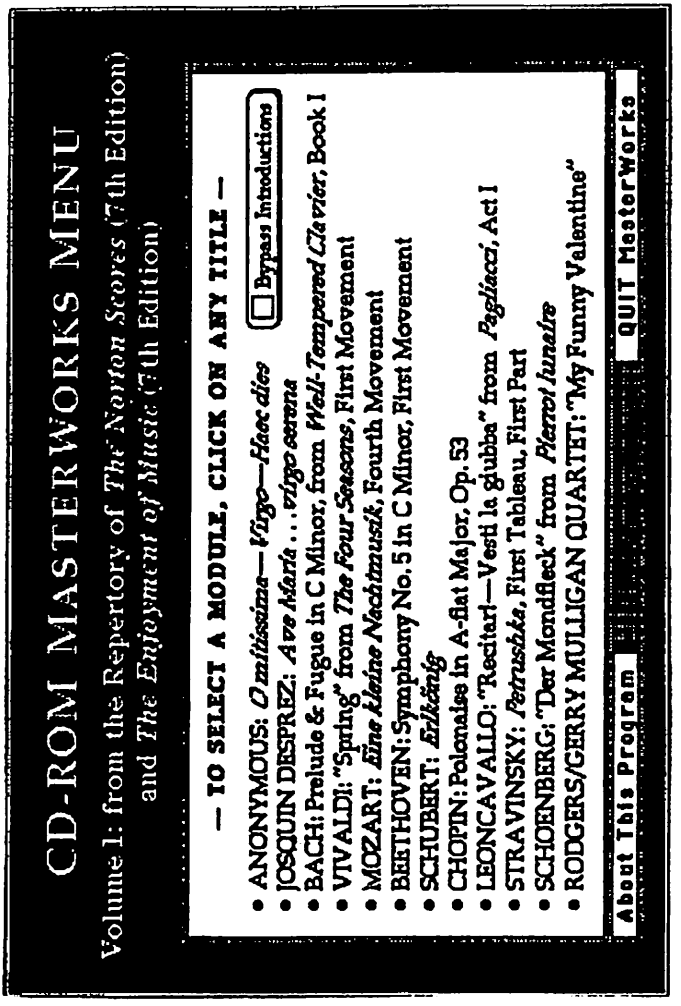
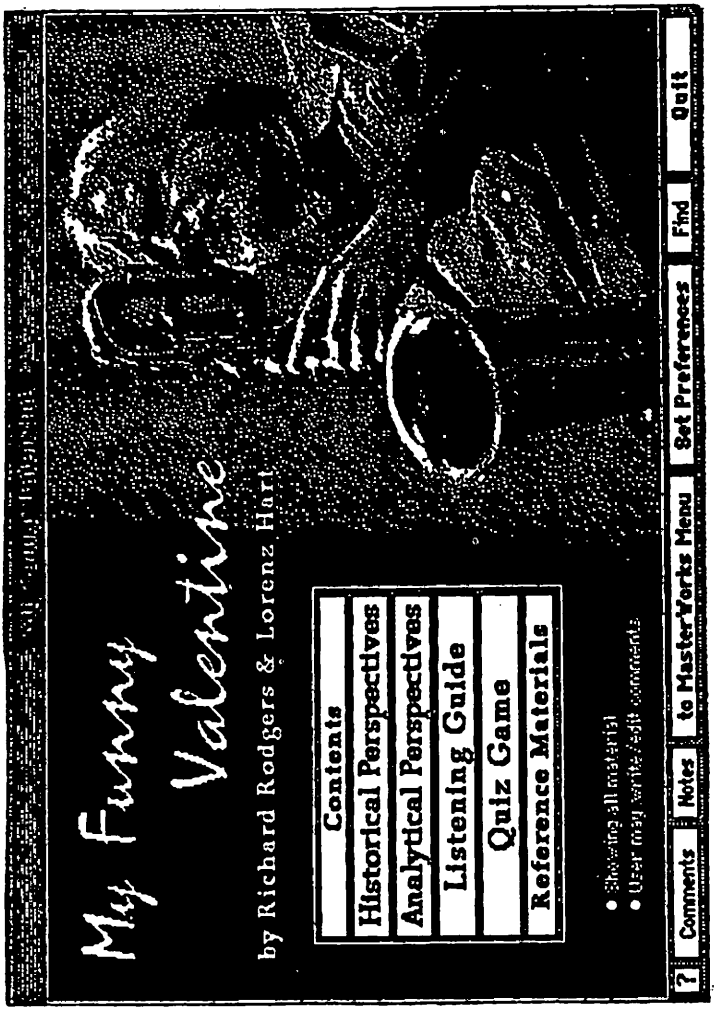


Figure 2. Rodgers module: Contents

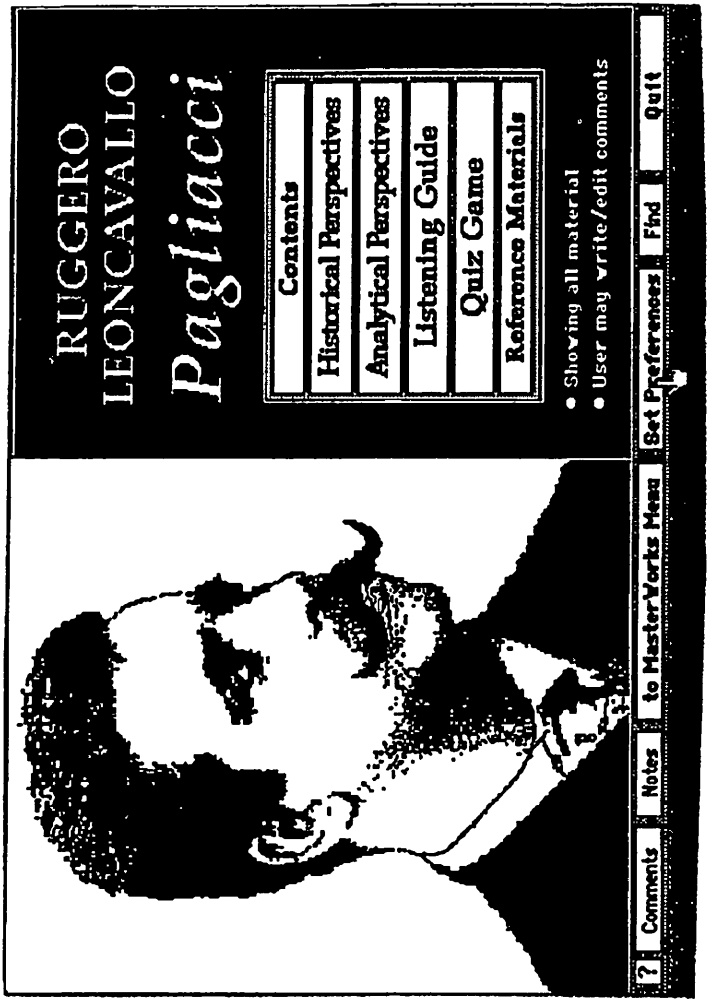


Each module of *MasterWorks* contains the same basic components: Historical Perspectives, Analytical Perspectives, Listening Guide, Quiz Game, and Reference Materials. With the Set Preferences option at the bottom of each module's contents screen, the user can configure the presentation as shown in Figure 3. Presentation of information is structured into two levels. The user can call

for only level 1 information to simplify the presentation, but level 2 information is always available via a mouse click. From the Set Preferences option, the user can also choose whether to show title bars within the modules, to enable writing of comments, or to clear the content of previously written comments.

Also available from the menu bar at the bottom of the screen are buttons enabling help, comments, notes (files for user entry of text),

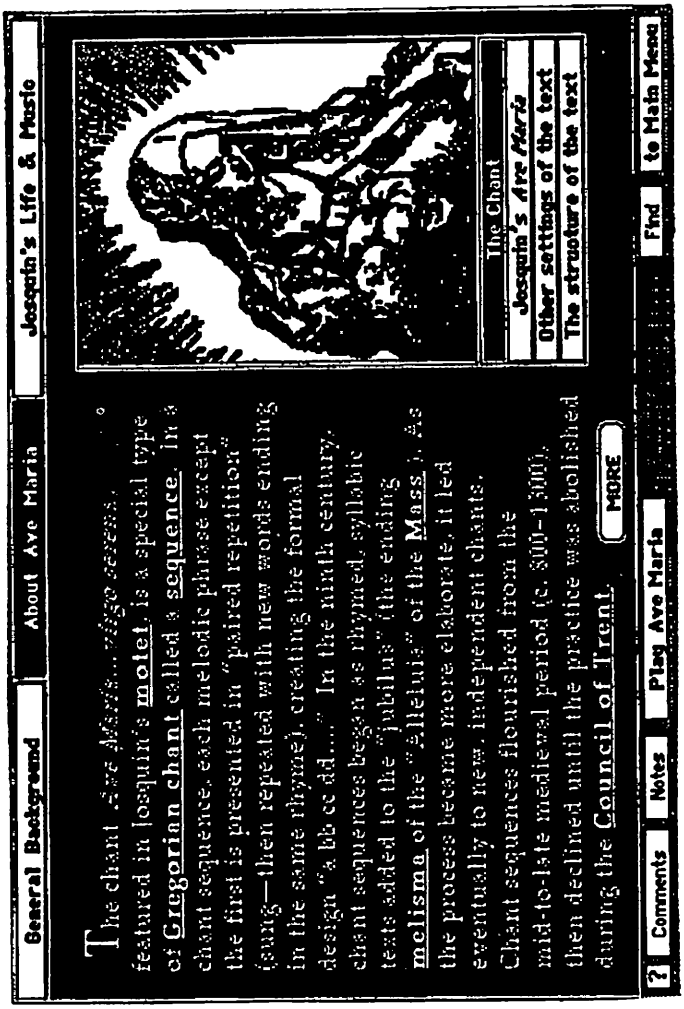
Figure 3. Leoncavallo module: Set Preferences option



a find option for locating words in the glossary, and a quit button. The notes button also keeps a history of references (bookmarks) to sections of the *MasterWorks* the user has entered, with an option for clearing those points. The help, glossary, comments, and notes options all appear as pop-up windows.

Figure 4 shows a page from the About Ave Maria portion of the Historical Preferences component in the Josquin module. Gener-

Figure 4. Josquin module: About Ave Maria portion of Historical Preferences component

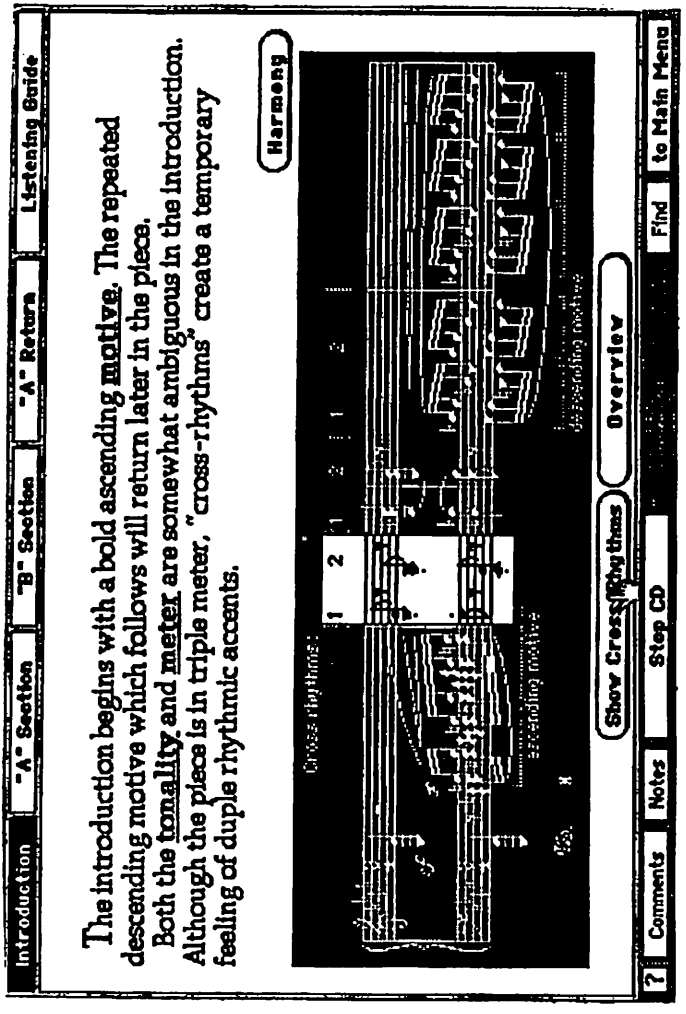


ally, the authors provide one screen of text for each heading within a module component or subcomponent, though in some cases additional information is available via a button. From any of these screens, the work can be played and additional information is available via clearly marked buttons. Underlined words appearing throughout the modules are linked to the glossary, which provides brief definitions, many containing links to other definitions.

An example of an Analytical Perspectives section from the Chopin module is shown in Figure 5. The figure shows the result of clicking on the Show Cross-Rhythms button, which activates an audio excerpt of the passage shown. Throughout the modules, segments of graphic illustrations are coordinated with the sound and highlighted to orient the user. Clicking on the other buttons brings up information about the harmonic contents of the passage, including illustrations in music notation.

The Listening Guide portion of each module takes the user through the work with a variety of graphic aids, starting with a form view of the complete composition or excerpt at the top of the screen. All graphics are synchronized with the form graph and with the CD audio. Shown in Figure 6 is a screen from the Beethoven module's Analytical Perspectives section in which a linear (Schenkerian) graph complements the form graph. Clicking the mouse button at any point on the graph calls up the audio and invokes a moving cursor above the form graphic to orient the user to the portion of the movement that the linear graph represents. An important feature of the linear graph is that it is laid out proportionally in terms of the time spanned, and each point along the horizontal axis of the graph is linked to the performance as well as to the cursor on the form graph (more on this later). In addition, the linear graphs include a Graph Info button giving access to information about what the graphs say about the music. Hidden beneath the Graph Info button is a Show Score button, which appears when the Hide Graph button is clicked. Scores, some of which appear in reductions depending on the size of the ensemble, scroll in synchrony with the audio. For modules that involve text, the text lines are generally coordinated with the form graph, highlighting the lines as the music unfolds. In the case of the Schoenberg *Pierrot* module,

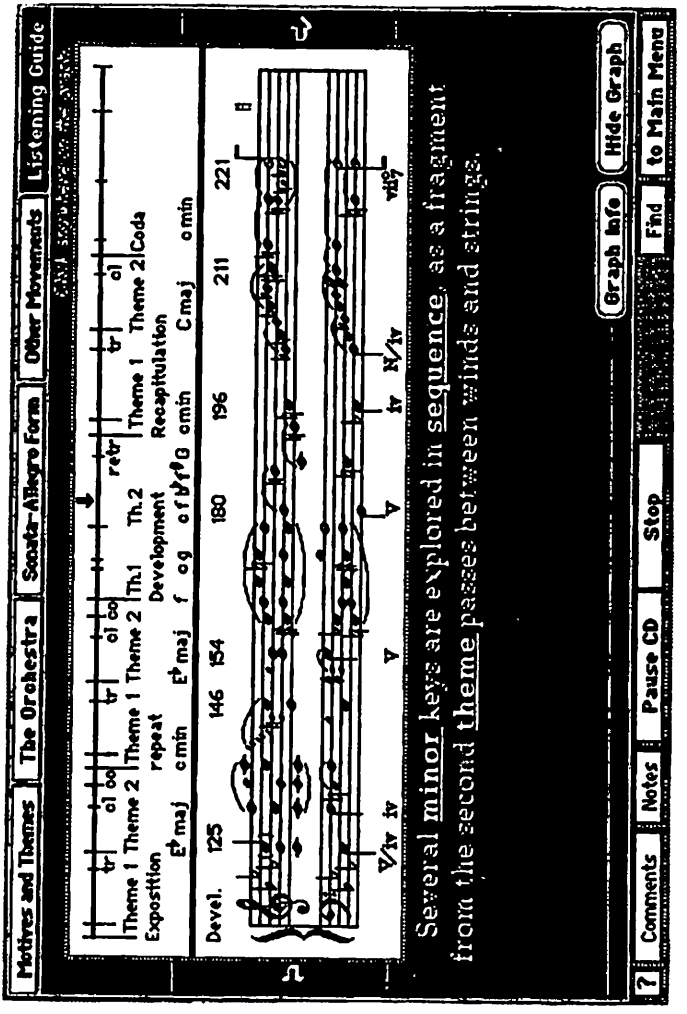
Figure 5. Chopin module: Analytical Perspectives



both German and English texts appear side by side, with simultaneous text highlighting in synchrony with the music.

As is typical of most software intended for instructional use, there is a quiz component, in this case in the form of a game for one or two players with 10 or 20 questions to be answered for varying points and with appropriate sound effects for correct and incorrect

Figure 6. Beethoven module: Analytical Perspectives with linear graph option chosen



answers and for completion of the game. Quiz items range from multiple choice to those in which the listener has to arrange icons containing excerpts from the module's work to represent the order in which they occur in the composition. This latter exercise is similar to approaches taken in applications developed by David Will-

iams (*Toney Music Games*)[1] and Richard Ashley (*Big Ears*).[2] When the user completes the quiz or elects to quit (which is possible at any point within the game), he or she is able to get a review of the items missed and to print the results of the review. Figure 7 shows an example of the quiz game from the Stravinsky module. (Igor and Sergei are names I entered for the players.)

The remaining component of each module is the Reference Materials, which varies from module to module but which in general cites the particular performance used in the module, published writings about the composer and the work, the source of the score used in the presentation (which in some cases is adapted for the presentation by the authors), and, in some modules, other score editions.

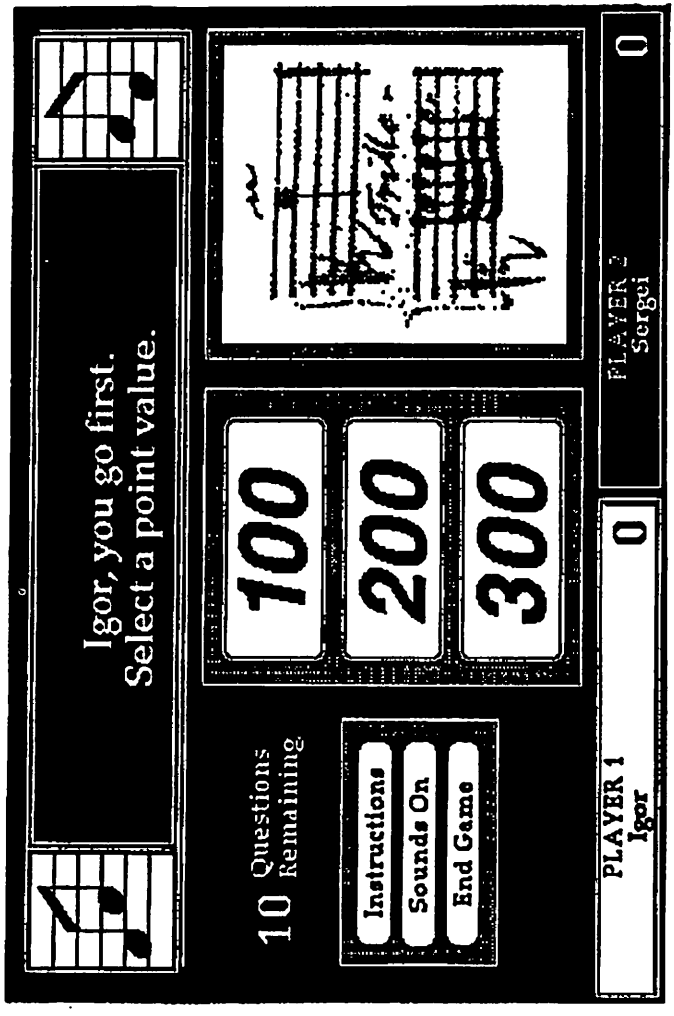
Evaluation

MasterWorks has much to recommend it. The coverage is good and appropriate for undergraduate music study. The inclusion of a jazz module is appealing and reflects a growing awareness on the part of music theory and literature teachers that we have excluded a vital part of our twentieth-century musical heritage from core curricula in many schools for far too long. The information presented by way of background on the works and in support of various analyses appears to be accurate and is concise and clearly written. Graphics are both appealing and well chosen, and the glossary is easy to use and is comprehensive. In general, the software operates without fatal flaws, and the clear and consistent user interface design permits easy navigation within and among modules. Given the variety of approaches within the modules, ranging from simple time

[1]The games are a series of HyperCard stacks that let children practice music discrimination, order and form, and music conservation. They are available from the Office of Research in Arts Technology, Illinois State University, Normal, Il 61790-5600. Screen prints and a discussion appear on p. 95 of David Williams and Peter Webster, *Experiencing Music Technology* (New York: Schirmer Books, 1996).

[2]Richard Ashley, "A Computer System for Learning Analytic Listening," in *Proceedings of the Computer Music Conference*, ed. David Butler (San Francisco: Computer Music Association, 1989), 5-8

Figure 7. Stravinsky module: Quiz Game



lines to more complex analytic graphs, the software should serve the curriculum enhancement purpose for which it is intended.

With any complex software application, however, there are inevitably some operational problems. I encountered three of these, two of them minor, one major. One of the minor problems took place within a quiz game when I attempted to reset the quiz to take it again. In this instance the screen reviewing answers from the previ-

ous game showed up beneath the dialogue box asking for the number of players. This problem did not recur in my trials. The second minor problem, one that did recur, is that clicking on the reset test button on the quiz game screen appears always to generate an error message saying that there is no background number 0 and to contact the author or the publisher of the stack for assistance. The error, however, is not fatal, for the message can be canceled and the game resumed or quit. The serious problem occurred when I clicked several times on the note icons at top of the quiz game screen (see Fig. 7). I received the error message mentioned above, but when I canceled the error message box, a blank screen containing a question and blank answer fields appeared. Clicking on the reset test button on the screen again called up the same error message and locked up the software. I tried restarting the lesson by selecting one of the module icons in the Norton *MasterWorks* folder, but when I tried to activate the quiz in the module, I was told there was a quiz in progress and asked whether I wanted to end that quiz or cancel the request. I tried to end the quiz but wound up unable to launch another one. I then rebooted the computer and relaunched the *MasterWorks* software. However, the error apparently corrupted the software so that my only recourse was to reinstall *MasterWorks*. Fortunately, the installation procedure is simple, so the error was not completely fatal. While one might question why someone would click on the notes at the top of the game screen, this is precisely the kind of thing an inexperienced user might do, especially since the note icons might be taken to represent buttons. Happily, I could not replicate this error in subsequent trials.

Pedagogy

We've come a relatively long way in some twenty years of computer-based instruction development in terms of the quality of software intended to serve the learning needs of students and the presentation needs of teachers. The capabilities of today's desktop and laptop computers surpass those of mainframes in the 1970s and 1980s, and we can now develop multimedia applications with many different kinds of authoring tools, from relatively simple tools, such as HyperCard and Multimedia ToolBook, to more complex and

powerful development tools, such as Macromedia Director and Authorware. Given the limitations of HyperCard—lack of color, lack of high-resolution graphics, and limitation to a single platform—the authors of *MasterWorks* have done a masterful job.[3]

There is, however, a missing component that I think warrants inclusion, namely, a set of guidelines about how *MasterWorks* might be used by students and instructors, especially those unfamiliar with CD-ROM hypertext applications. Given the relatively straightforward operation of *MasterWorks*, perhaps the developers and the publisher assumed its use is self-evident: one simply launches the application, explores the contents through the many paths possible, and thereby learns about the included music literature and its structure. Yet those of us who have worked with hypertext applications with students know that learning in a hypertext context is not quite so simple. One of the strengths of such contexts is that they offer a rich database navigable in different ways by different users. But this strength can also be a weakness, particularly for young learners, for exploration does not necessarily equate with learning. Diana Laurillard, pro-vice-chancellor of technology development of the British Open University, points out that hypertext, while useful as an encyclopedic resource, does not provide much help when trying to make sense of things. "When students are trying to understand a difficult conceptual idea [musical structure being a case in point], they need a narrative line."[4] Users will likely need some guidance

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[3]In a communication from Timothy Koozin, I learned that Volume 2 of *MasterWorks* is being developed for cross-platform use, and that it will include color and high-resolution graphics. The composers tentatively selected for inclusion are Dufay, Palestrina, Purcell, Corelli, Bach, Haydn, Beethoven, Berlioz, Wagner, Webern, Copland, and Messiaen. Koozin also mentioned that the present volume is available at a reduced price ($25 instead of $49.95) with any Norton music book and with certain other publications, such as *The Norton Scores*. Persons interested should contact the publisher.

[4]See "Learning, Teaching, Technology: Putting First Things First," an interview with Diana Laurillard by Russ Edgerton in the *AAHE Bulletin* 49.1 (September, 1996): 3-6. See also the discussion of problems of learning in hypertext contexts in Thomas Duffy and Randy Knuth, "Hypermedia and Instruction: Where is the Match?" in *Hypertext: A Psychological Perspective*, ed. D. Jonassen and H. Mandl (London: Ellis Norwood Publishing, 1993).

by an experienced teacher who provides effective assignments on the basis of which students can discover musical relationships and build musical understanding.

Guidance in the use of the various analytic graphs, in particular, would be helpful, for such graphs are most valuable to those who understand how they are constructed and what they can—and cannot—illustrate about musical structure. One important, but not obvious, feature of the linear graphs in *MasterWorks* is that their layout is proportional, which makes them somewhat richer than a typical Schenkerian graph on which they are modeled. Timothy Koozin offers some valuable comments on the value of multimedia graphics in general, proportional graphs in particular, in an article "Graphic Approaches to Music Analysis in a Multimedia Environment," written during the early development stages of *MasterWorks*.[5]

Koozin discusses two models for graphics representing the real time of a music performance, *static* and *dynamic*. A static model is represented by the sonata-allegro form chart of the Beethoven module shown in Figure 8. Here the listener follows the music as it unfolds with each highlighted region on the diagram representing a fixed time span. In Koozin's words:

> A static real-time model can be very effective in encouraging aural comparison of one audio segment to another, as the user deconstructs the piece into component parts for any number of varied rehearings. Objectifying the aural fabric into modular chunks in this way can provide a useful tool for developing awareness of large-scale musical processes, as the user samples themes and key areas normally projected across long time spans. While this function is effective as an informational model linking specified time spans to graphic representations, it is less useful in representing change or ambiguity. A single highlight routine cues the start of events, but cannot show movement through a segmentation. In directing attention to starts only, a series of such routines might actually encourage the user to shut down perceptually between cues while waiting for the next burst of visual information.[6]

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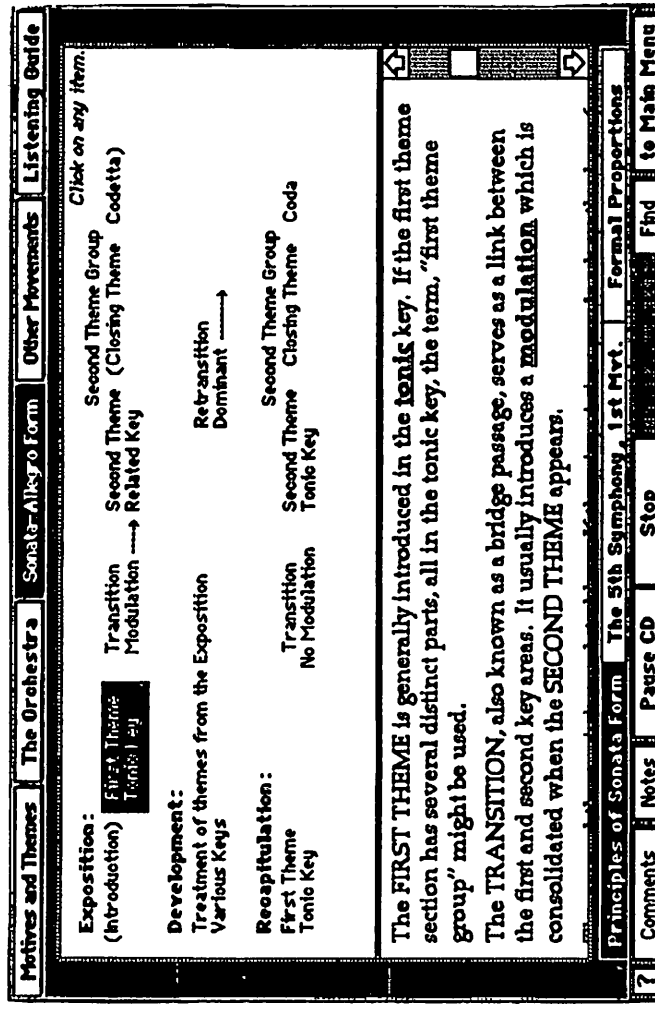
[5]Timothy Koozin, "Graphic Approaches to Musical Analysis in a Multimedia Environment," *Computers in Music Research V* (Spring 1995): 103-117.

[6]Ibid, 106.

Figure 8. Beethoven module: Sonata-Allegro Form chart



On the other hand, information gained from dynamic real-time proportional linear graphs

> changes incrementally over time and varies qualitatively in response to user input. . . . [E]very point on the horizontal axis of the screen is proportionally linked to the CD performance (to a fine degree of accuracy limited by screen resolution, computer speed and the programming routine). Rather than showing fixed predetermined segmentation, a continuously moving arrow [see the cursor above the form graph in Fig. 6 as an example] shows motions toward and away from events depicted in the graphs. The user explores his/her own segmentations by choosing click points along the horizontal axis of the screen.[7]

Koozin believes that the dynamic model is more kinesthetic and engaging than the static model, and that it requires more decision making on the part of the student in the sense that the student controls the selection of entry points on the graph. He believes further that the fine control of temporal details, coupled with the analytic information embedded in the graph, invites study of musical detail that makes the user "an analytical partner, constructing the aural/temporal components of the analysis in real time."[8] I suspect, however, that the intended use of proportional graphs in this application might be missed by most users without some introduction to the thought behind the graphs and their structure and without some guidance either on-line (the logical place for it) or in print. In volume 2 of *MasterWorks*, I urge the developers to add such information and guidance on-line.

For the Future

MasterWorks is an engaging software application, one that represents the augmentation stage of technology use that University of Colorado psychologist Thomas Landauer writes about as the second of three stages in the development of computing as it affects human productivity.[9] At the same time, despite its apparent value,

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[7]Ibid, 109.

[8]Ibid, 114.

[9]Thomas Landauer, *The Trouble with Computers* (Cambridge, MA: The MIT Press, 1995). The first stage is automation, and the third is user-centered design, development, and deployment.

MasterWorks lacks one ingredient that I believe must be built into software before computer technology can provide for the transformation of education that many educational technologists write about,[10] namely, what Harvard's Leonard Rosen calls "high interactivity." Rosen views the kind of multimedia published by companies such as Voyager (in the case of music, think of the various contributions by Robert Winter, for example) as "low interactivity." For all that such software improves on textbooks and lectures, it is still a product of that instructional paradigm. In Rosen's words,

> Whether a lecture is situated in a classroom or on a computer screen, the vision of education is the same: Experts have knowledge, and students should listen and receive it. Ironically, the navigational structure of the software attempts to give users control over information and implicitly says, "You are empowered." But all the while, the on-screen experts send the opposite message—that knowledge is theirs to dispense.[11]

High interactive music software would enable students to compose pieces in the style of those included in multimedia literature study. It would allow students to orchestrate their compositions for playback as MIDI sound. It would enable them to be analysts themselves rather than simply learning about the author's analyses. It would enable overlaying authored graphics with student-created graphics by means of simple drawing tools for the purpose of comparison. It would provide a link to a World Wide Web browser to enable searches for alternative sources of information to supplement that found in the application, much as the commercial product *Lotus Notes* provides seamless linking with the Web. It would also provide for conferencing and for collaborative work among students and between students and teachers in the search for solutions to musical problems. In short, it would provide a completely integrated learning environment in which the student is immersed and is enticed to participate actively.

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[10]See, for example, Michael G. Dolence and Donald M. Norris, *Transforming Higher Education: A Vision for Learning in the 21st Century* (Ann Arbor, MI: Society for College and University Planning, 1995).

[11]Leonard Rosen, "Point of View," *The Chronicle of Higher Education* (June 5, 1995): A48.

To create such comprehensive learning tools will likely require the collaborative efforts of content experts, instructional designers, programmers, and publishers, all of which take time and financial support, both at present in short supply.[12] Publishers are reluctant to commit financial and other resources to untested approaches to learning, and the culture of scholarly communities does not presently support a reward structure sufficient to engage those who have the ideas and desire to create the kind of software that will involve students in high interactive contexts. Nevertheless, there is growing evidence of the need to change the culture of the academy,[13] which in time will hopefully bring about improved environments for learning that take advantage of technology.

High interactive software is becoming commonplace in the sciences, especially in chemistry, physics, and mathematics in the form of interactive simulations and visualization. It is less common in the humanities, though we are beginning to find some models. Rosen describes software developed by the Laboratory for Advanced Technology in the Humanities at MIT for the study of the French language. In this application students interact with a narrative about a journalist who has been evicted from an apartment in Paris. The students listen to and leave messages on a virtual answering machine, keep notes on prospective apartments, use maps, and guide the journalist to one of seven possible outcomes. They thus participate actively in the solution of a problem from real life but within another culture and language.[14] Another French language application is called *Nouvelles Dimensions* and is the conception of University of North Carolina professor James Noblitt, who is also head of the humanities division of the Institute for Academic Technology, an institute sponsored by the University. The software offers contextualized training using video clips of native French students engaged in everyday conversation. Via interaction with the clips,

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[12]One might also add to this list researchers, who would provide some evidence of the viability of one type of pedagogical approach over another.

[13]See for example John Seeley Brown and Paul Duguid, "The University's Digital Future", *Change 28.4* (July/August, 1996) and Robert B. Barr and John Tagg, "From Teaching to Learning: A New Paradigm for Undergraduate Education," *Change* 27.6 (November/December, 1995): 12-25.

[14]Rosen, "Point of View," A48.

users gradually gain insight into the pacing, inflection, and body language of French speakers, which helps them to develop sensitivity to the language, its syntax, and its semantics. An associated interactive dictionary, called *Système D*, allows students to construct French sentences and get feedback on their choice and use of the language. Databases of word families, guides to usage, and detailed assistance with verb forms help the student to write meaningfully at the elementary level of instruction.[15] And a third application is described by Laurillard as a product developed by the Open University for art history study. In this application the students look at some twenty paintings on the computer screen and then experiment with grouping and classifying them. The program then compares what the user has done with how experts have classified the paintings in order to help users to understand alternative ways of analyzing paintings. "If you have the opportunity to take something like *Mona Lisa* and resize the head or remove the hands, you begin to get an idea of what compositional elements have gone into making that painting a classic."[16]

Though there do not yet appear to be any music equivalents of high-interactive software, nevertheless *MasterWorks* is a step in the right direction and is better than other multimedia music software that I have seen. Along with its successor volume, *MasterWorks* should provide an excellent starting point for future multimedia music learning development. The authors—and the publisher—are to be commended for their contribution.

[15]The software is published on CD-ROM by Heinle and Heinle, Boston.
[16]Laurillard, "Learning, Teaching, Technology," 6.