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CART: Music Appreciation Meets Computer Technology

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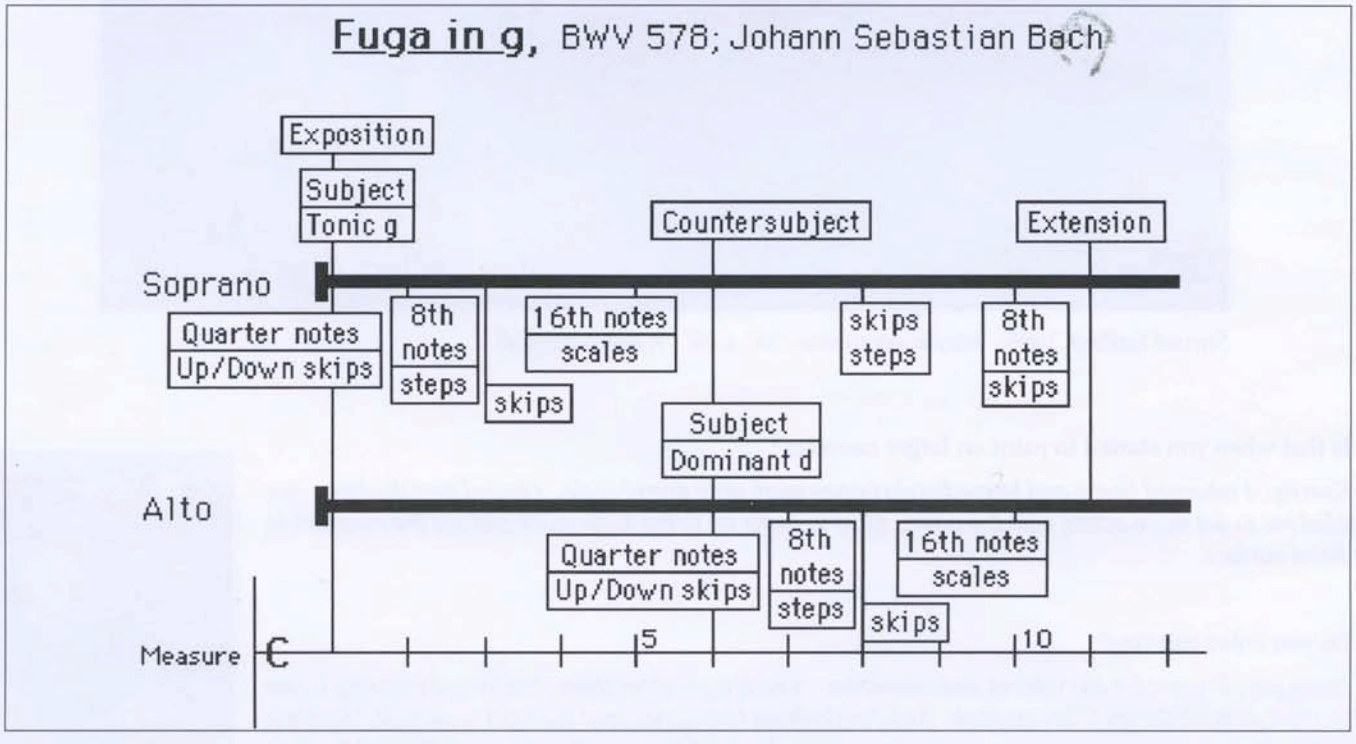
MUSIC APPRECIATION MEETS COMPUTER TECHNOLOGY

Computer technology has created exciting possibilities for music teachers and their students. Utilizing CART hardware and software, Professor Michael Dilthey has designed horizontal graph analyses of several classic musical compositions which illuminate fundamentals of the pieces and promote informed listening. The graph analyses make it possible to present musical concepts such as form and thematic material, melody, harmony, rhythm and other basic parameters in an attention-getting and easily accessible format.

Multimedia allows Professor Dilthey to combine graphs, which represent the music in visual form, and recorded performances in a single program. The graphs are created on Superpaint, a Macintosh paint program, and transferred into Quick Time on the Director Program, a multimedia program, then aligned with the corresponding recording. Thus, while students are listening to Johann Sebastian Bach's *Fugue in G,* for example, they watch a graph analysis of the score scroll across the computer screen. CART at the Moakley Center is an ideal environment for this type of research, since the powerful computers and software make it possible to experiment with various multimedia applications.

Professor Dilthey's multimedia experiments developed out of frustration with traditional methods of teaching Music Appreciation. Text-based listening guides, he found, were too limiting in their design; reading of the text could not be precisely coordinated with the audio performance, forcing the instructor to talk rudely over the performance in order to explain important points. In contrast, the coordination of audio and visual information in multimedia is an exact teaching tool that does not disrupt the audio performance. A great deal of information can be made available on the screen, giving the instructor some freedom to select what he or she wants. In a sense, the graphs re-create the experience of following a printed score while listening to a recording at the same time. However, the graph permits a student who cannot read music to follow what is going on, while the reader of a conventional score must be familiar with musical notation.

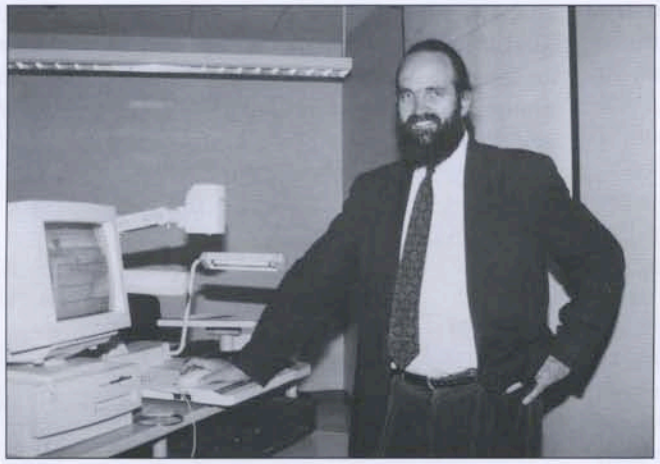
Computerized graph analysis allows instructors to draw attention to specific elements of a musical composition by highlighting them. In the Bach *Fugue in G*, for example, the instructor may want to show where and how each of the four voices of the fugue comes in. As each voice



Professor Dilthey's horizonal graph of the beginning of Johann Sebastian Bach's *Fugue in G*

enters, descriptive boxes appear above or below the voice line (see illustration # 1). Fundamental information about form and harmony appears above each voice line, while information more closely associated with in-depth analysis of rhythm and melody appears below each voice line. Thus, as the *Fugue in G* begins, the boxes containing the words "Exposition" and "Subject/tonic G" are highlighted above the heavy line which represents the soprano voice, informing the viewer that this is the first section and that the subject or basic melody of the composition is in the key of G (as one would expect from the title), the tonic or central key of that composition. The highlighted box below the soprano line conveys more technical information: we are now hearing "quarter notes" with melodic "up/down skips"; by the second measure the highlighted box shows that these have been replaced by "eighth notes" with melodic "steps." In the sixth measure of the fugue, the alto voice enters in the key of D, which is the "Dominant" or fifth note of the G major scale. By highlighting selectively, the instructor can call attention to whatever elements he or she wants the students to notice, without the unaesthetic disruption of calling out such instructions as "Listen for the entrance of the alto voice here." As the piece unfolds, the student can observe how these details contribute to higher level formal divisions in the music under study. In the Bach *Fugue,* for example, he or she may notice that harmonic key changes are aligned with entrances of the subject or that sixteenth note passages are intricately associated with the countersubject. Students can move freely forward and backward through the horizontal graph for the purpose of comparative analysis. They discover fundamental information about form and structure by learning how the various elements fit into the overall flow of the piece and improve their ability to hear a composition by understanding the integration of the musical elements.

Professor Dilthey designs different kinds of graphs to fit different musical genres. For orchestral works, the graphs include tone color and dynamic information which doesn't apply to a keyboard work like the *Fugue in G* . Discussion of formal elements is also adapted to illuminate the form being presented. For an orchestral work such as the "Overture" to Felix Mendelssohn's *A Midsummer Night's Dream*, the upper portions of the graph include basic information about such matters as pitch, texture, dynamics and timbre, information obtained in the first or second hearing of the work. As the student works down through the graph, more detailed information about thematic material, form, harmony and phrasing is presented.



Professor Michael Dilthey

Professor Dilthey is currently adding videos of live performances to his scrolling graphs. He sees this as an important next step, since a good performer communicates aesthetic and character information about a piece and provides a concrete source of the sounds, an integral component in the enjoyment of music. At CART's new office in the Moakley Center he recently demonstrated a graph which combines a Quick Time video of a performance of the Strauss song "All mein Gedanken" by Bridgewater Music Professor Leslie Goldberg, a translation of the text and an analysis of the score. One of his current projects is to combine a scene from opera with explanatory graphic information. He hopes eventually to establish a library of these works on CD-ROM for independent study in the computer laboratory.

Computer technology is the most recent of the technological advances which have transformed the teaching of Music Appreciation in this century. Fifty years ago, the course was taught using a piano. The instructor played pieces written for ensembles such as orchestra or string quartet on the piano, and then tried to describe how those pieces would sound on the instruments for which they were intended. When long-playing records, tapes and, most recently, compact disks became available, the students could hear the music in its correct format. Now, with multimedia permitting the instructor to coordinate audio and visual information, students can become even more involved in the musical experience.

Listening to a piece of music while simultaneously watching a graph analysis which reveals the technical details of its composition is highly illuminating. Immersed in information, the listener/viewer becomes powerfully aware of the care and purposefulness with which serious music is written.