Title: Review of CUBASE

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It is with pleasure that we inaugurate the reprint of the entire seven volumes of The Quarterly Journal of Music Teaching and Learning. *The journal began in 1990 as* The Quarterly. *In 1992, with volume 3, the name changed to* The Quarterly Journal of Music Teaching and Learning *and continued until 1997. The journal contained articles on issues that were timely when they appeared and are now important for their historical relevance. For many authors, it was their first major publication.* Visions of Research in Music Education *will publish facsimiles of each issue as it originally appeared. Each article will be a separate pdf file. Jason D. Vodicka has accepted my invitation to serve as guest editor for the reprint project and will compose a new editorial to introduce each volume. Chad Keilman is the production manager. I express deepest thanks to Richard Colwell for granting VRME permission to re-publish* The Quarterly *in online format. He has graciously prepared an introduction to the reprint series.*

Review of CUBASE

By Terry Griffey

Grove School of Music

In the early days of electronic music—30 years ago—synthesizers were designed to produce one sound only. A researcher would spend months on the equipment to get just the right sound; then the sound would be tape recorded and spliced in order to articulate the music. Stockhausen's famous *Studie II* was created this way. Of course, it was possible to connect an organ keyboard to the synthesizer, but that simply made an electronic organ. In 1965, Bob Moog created a breakthrough when he brought out his portable transistorized synthesizers. By restricting the keyboard to one note at a time, Moog's synthesizers allowed greater attention to be paid to the quality of each individual note. From the beginning, the objective of researchers working with electronic music was to gain greater control of various aspects of sound than traditional musical instruments offered.

Another approach to the synthesizer was invented by Californian Don Buchla. He thought the tape-splicing procedure was too tedious and the keyboard too traditional; so he invented a device he called a sequencer. This could be programed to play a sequence of sounds on a modular transistorized synthesizer, and the originals played up to eight sounds in a programed order. These sounds could differ among themselves in more ways than pitch alone, and thus Buchla synthesizers achieved the goal of controlling many aspects of the sounds. The Buchla Model 123 sequencer could control three different parameters of a sound simultaneously. (Sound parameters include frequency, loudness envelope, spectrum, resonance, reverberation, and other factors.)

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For performers, however, the familiar keyboard was preferred; so it quickly became standard on lower-priced synthesizers. For composers of electronic music, the sequencer became an essential tool. Synthis of London brought out a 256-note, three-voice sequencer, actually a digital computer, that became the heart of its famous Synthi 100 synthesizer. Since that time, all sequencers have been computers or computer programs.

Sequencers are now of two types. There are the "stand-alone" dedicated hardware sequencers that are actually small, special-purpose digital computers; then there are software sequencers, computer programs designed to run on desktop computers. Both types are connected through the use of Musical Instrument Digital Interface (MIDI) connections. In other words, the computer "plays" the synthesizer through the MIDI cable.

When choosing a sequencing program for the college classroom, many decisions must be made. Because several sequencing packages are available for each computer, a teacher can easily become confused by the advertising hype and quick demonstrations given by traveling salesmen. At the Grove School of Music, many different sequencing packages are being tried. Our investigations and purchase decisions have been based upon computer availability, student learning curves, practicality, software features, and customer support.

This article describes CUBASE, a new package now used at Grove. This sequencer, which uses the relatively low-priced Atari ST or the Atari Omega series of computers,

was created by Steinberg and is distributed by Ross-Jones Marketing in Los Angeles.

Like many other programs, CUBASE uses the features found on a typical, modern personal computer including a mouse, pop-up dialog boxes, files, cutting and pasting, windows, clicking, and dragging. It also uses a number of specialized features found only in music programs, such as tracks, parts, groups, arrangements, and songs, which are the structural levels of CUBASE. It also employs MIDI features such as filtering, data compression and expansion, MIDI timecode, auto-channeling, and Society of Motion Picture and Television Engineers (SMPTE) timecode, a technique used to synchronize music and sound to motion pictures and television.

CUBASE offers a distinct advantage to college composition students, who quickly learn that electronic composition techniques are directly related to both available electronic sequencing capabilities and to orchestration techniques. The typical graduate student often does not have the time to figure out how to use the software, yet misuse of software can result in some very unmusical compositions. The electronic sequencer must be flexible enough to allow the student composer to manipulate the data to attain the desired musical effect. In composing electronically, the orchestration of the music is the primary concern; yet student composers must continue to use paper and pencil to sketch the design of the composition, for this remains the most critical factor of any composition. After the outcome of the composition is formulated, CUBASE allows the composer to input data and to manipulate those data in a creative way to orchestrate the number. Orchestration is "getting the spots off the paper" and transformed into music.

The Sequencer Design

The unique structure of the CUBASE sequencer makes this software program a powerful sequencing and compositional tool. The hierarchy from the smallest to the largest unit of the program is as follows:

The part consists of a group of measures which may constitute a drum pattern, a bass pattern, a countermelody, or a verse of a composition. The MIDI information is stored on the MIDI channel, but this information need not be output on that channel because of the auto-channeled functions built into the program. This feature allows any part to be stored as a separate entity and used anywhere within the composition. Since good compositions consist of the development of a skillfully manipulated motive, this function is a very strong feature.

After a part is recorded, it appears in a window showing its length, start, and end times. This block of information can be moved to another track or to a different location simply by dragging it. It can be copied and pasted by using graphic manipulation. This flexibility allows the composer to try different ideas and motives anywhere in the composition. As conservation of music materials is one of the most difficult hurdles for the student composer, this feature is important.

The part can be easily transposed, lengthened, or shortened. Pop-up dialog boxes, in which the user answers questions and provides information, are available and the data within a part easily can be globally changed. Filtering on most data bytes, as well as data compression and expansion, can be done within these boxes.

When a part is copied and pasted, it can be designated as a real or a ghost copy. A real copy is a stand-alone copy of the original. A ghost copy is one which does not contain data but simply instructs the computer to play the original part at the ghost position. This means that if the original is changed, so is the ghost. This provides the student with flexibility when editing a passage.

A part may be divided into smaller parts. An eight-measure phrase might be split into two four-measure passages. The first or second four-measure passage can then be copied and used in another location. By a click of the mouse, the two parts may be rejoined. CUBASE's creative editing features, like this one, promote good compositional techniques.

A track consists of a group of parts all playing on a designated MIDI channel. A track can also consist of parts which contain

more than one MIDI channel. CUBASE allows the student to play a track on its original or recorded MIDI channel or to rechannel the data. Changing channels is easy with the use of the mouse. Whenever the mouse indicator is over a numerical field, such as a MIDI channel deployed on the screen, pushing the left mouse button decrements the field; the right mouse button increments the field. All of the numerical fields in the program, such as the location counter, the punch-in and -out counters, and the SMPTE counter work the same way. This consistency is good programing design.

Tracks may be copied and pasted as well as cleared and deleted. A track which contains multiple MIDI channels can be split into two separate tracks by selecting a single function from one of the menus; this feature is helpful when one is working with files that have been dumped from another sequencer or device. Thus, a file which has been saved as a single track, multiple-channel MIDI file can be split into two separate tracks for editing. When students sequence at home and wish to edit and orchestrate their compositions in the lab or studio environment, this feature eliminates confusion. Tracks can be easily named through the use of dialog boxes. There is also a file for each track which allows the instrument name to be entered. Naming is useful when orchestrating different types of sounds to create a new texture.

The group is a collection of parts from various tracks. A group may consist of one or many parts called from one or many tracks. Groups allow the composer to combine recorded parts. A special window is used for constructing parts. A group track may be created, allowing the composer to try various tracks and parts together before deciding on how various elements in the composition are to be put together. A group track can accompany the original parts and tracks if desired. Groups can be moved into any location within the composition by simply holding the mouse down and dragging the part into the desired location.

The arrangement consists of one or more groups appearing in the default window and including all of the tracks, or the sum of all the tracks and groups. More than one arrangement can be open at a time. This feature allows for copying and pasting groups, parts, and tracks from one arrangement to another. The student may compose various orchestrations for comparison purposes. CUBASE's ability to allow the student to make a wide variety of comparisons is a valuable attribute.

The song is defined as all of the arrangements created while using the program at one time. The song includes drum maps and input maps. These maps are helpful when orchestrating drum machines and synthesizers. CUBASE does not require the student to transpose every drum MIDI note number when changing drum machines. The song is the largest entity of the program, and it is saved only when the composition is complete.

Other Features

Other features found in the program may give the reader an idea of the power of CUBASE.

Quantization is a process which eliminates the random variation in human performance and "rounds off" all numbers representing sound to specified small values. Any part may be quantized in this program without going to a separate window or dialog box. A simple click to select a part allows the user to go to a menu and select different types of quantization.

The *over-quantize* is the most natural type of quantization. This program analyzes the overall performance and then quantizes the part by keeping the input data in the same order, but changes the tightness of the part. *Note one* quantizes on the note-on status bytes and is the stiff type of exact quantization found in most programs. The *iterive* quantizes (subdivides) by strength and intensity, as do most high-end sequencer programs. One can also design his or her own quantization.

When using the function, a dialog box will appear and allow the user to select where the grid points are to subdivide. This feature allows the user to select one measure. If this feature could be extended to a two-measure phrase, it would be useful in creating interesting drum and bass "grooves", because most drum and bass patterns are two-measure phrases. The

user can, however, create a special kind of feel to a composition. "Straight eights" can be quantized into a swing feel. As nice as this feature is, it's still impossible to make any electronic band swing as hard as Basie!

A nice type of quantization feature allows a track to be quantized into the same grid as another track. This subdivision is accomplished by dragging a track onto the top of another track and then quantizing. This feature is used in locking up bass and drum tracks while retaining a natural feel, allowing the composer to be consistent once a good feel of a track has been found.

The sync program will synchronize to standard MIDI clock or SMPTE timecode. The resolution of the sequencer, when used by itself with internal sync, is 192 clocks per quarter. When in external sync, its resolution doubles to 384 clocks per quarter, which is sufficient for most film and video applications.

The user is advised to purchase the SMPTE adapter, available from Steinberg, when using SMPTE. The adapter is software configured from within the program and is easy to use. A SMPTE counter is provided on the main arrange window; so the user can determine the current tape position.

Tempo maps may be created within the program. A master tempo track is provided for use as a "fit-time" feature when syncing to film or to video. Although clumsy, it is workable. New tempos can be inserted anywhere within an arrangement, and time signatures can be changed.

Keyboard mapping is a way to control the sequencer by using specific keys on the controller. This feature allows for fast input and editing. A great number of the features of the program can be controlled from the controller without touching the computer. When time is of the essence, this feature is handy.

The multi-tasking feature allows the Atari to run more than one program at a time; in other words, the sequencer can be playing or recording, and the user can be simultaneously downloading synthesizer patches from another program. A MIDI mixing program could be running at the same time as the sequencer.

Tweaking patches in real time is very useful to proper orchestration, but memory restrictions are a factor. At least two megabytes of memory are needed to make this useful. Being able to download a sound in real time as the sequencer plays is advantageous to the orchestration process. Other types of programs, such as word processors and databases, can be running at the same time as the sequencer. Checking databases for locations of samples and sounds is very easy and helpful when they can be used at the click of the mouse.

CUBASE's editing feature is the most extensive found in any program. Editing can be done by note graphs or even lists. One remarkable feature of the program is that the program shows each part in music notation. The student can input the data and see if the part is what was scored. Notes can be deleted, moved, elongated, shortened, or transposed in any of the editing windows. Step-time recording can also be done within the editing windows. These editing features are some of the most flexible and intuitive parts of CUBASE.

This description has not reviewed every feature of CUBASE, but does give an overview of this software program. Customer support for the product appears to be good. ❑