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MUSIC

by the

NUMBERS

A complete audio studio on your desktop? It's possible with today's music hardware and software. Here's a look at the products to get you started and suggestions for the system just right for your pocketbook.

Joey Latimer

The paths of the computer and music industries keep crossing. Musical instruments have become more computerized, and computers, more musical. If you have a personal computer, you already have half of a sophisticated sound- and music-production studio on your desktop. With an amazingly small investment, you can add the music software and hardware to put your studio in action.

Terms such as *MIDI*, *digital sampling*, and *sequencing* are some of the most common buzzwords you'll hear in computer-music circles these days. MIDI, an acronym for Musical Instrument Digital Interface, is the interface standard that makes it possible for computers to interact with synthesizers, drum machines, and other electronic music devices. Digital sampling is a process that lets you record

samples, or "snapshots," of sounds and store them digitally so you can then use your computer or a MIDI instrument to play them back. Sequencing is the recording or inputting of notes into a computer for storage and playback. The combination of computers, MIDI, digital sampling, and sequencing has created a hybrid technology that can bring wonderful new music into your life.

The current range of products in the computer-music field is wide and getting wider every day. Competition has forced prices down to the point where you can get a MIDI interface

and software, or an inexpensive digital sampler, for under \$200. A MIDI keyboard or drum machine with digitally sampled sounds can be found for less than \$400. It's possible to equip your computer with more expensive hardware and add-ons, of course, but that's not the point of this article. We'll focus on something simple—showing you what you need to make music with your computer at a price you can afford.

The six computer audio products we've chosen are examples of the affordable, high-quality software and hardware that you can find for MS-DOS, Commodore 64/128, Apple II, Amiga, Macintosh, and Atari ST computers. Ranging in price from \$79 to \$199, each can help get your audio studio out of the realm of fantasy and onto your desk.

Illustration by John Pack



Half of an audio studio is already on
your desktop: your personal computer.
Completing your music setup isn't hard
and doesn't cost a lot of money.

IBM PC and Compatibles

MIDI Starter System

The people at Music Quest have introduced a package, the MIDI Starter System, which includes a MIDI interface card, two long MIDI cables, a composition package, an eight-track recording program, and sound editor/librarian programs for the popular Yamaha DX and Casio CZ synthesizers. You supply the computer and MIDI instruments, and Music Quest supplies the rest—all for \$199.

The brains of this starter system is a MIDI coprocessor interface card that slips into any free slot in your PC. On the back of the card are two connectors. One is the metronome output, which can be connected to an amplifier or mixing board using an RCA-style connecting cable. The other connects to a MIDI in/out adapter cable that comes with the package. Hooking it all up and getting it running takes 15–30 minutes.

The software, which features pull-down menus and optional mouse operation, is easy to learn and a pleasure to use. The *Easy-8 Sequencer* lets you record, overdub, and edit up to eight tracks. Quantizing (automatically correcting timing problems), key transposing, MIDI filtering, and copy and paste are all standard features of *Easy-8*. *MelodEase*, the package's composition program, uses a piano-roll metaphor, but it does more than just let you make playable rolls. It's also a powerful note sequencer in its own right and works great for editing drum patterns. The sound editor/librarian programs let you load, edit, save, and transfer banks of sounds to and from Yamaha DX- and Casio CZ-series synthesizers.

Commodore 64/128

Dr. T's Keyboard Controlled Sequencer

Dr. T's Keyboard Controlled Sequencer has been a mainstay for Commodore 64 MIDI users since it was introduced in 1984. Even though other 64 sequencers have been introduced, the Keyboard Controlled Sequencer (KCS) has continued to sell well, mainly because of its extensive MIDI editing features and overall flexibility.

To use KCS, you need a MIDI interface and a MIDI instrument. Sequences of notes are entered by playing the MIDI instrument. KCS can have up to 35 independent sequences stored in memory at one time. Each sequence is assigned to a letter or number on the keyboard. To play a sequence, you simply press the assigned key. The sequencer will hold as many as 3550 MIDI events.

Recording can be done in real-time or by using step-entry. Realtime means that KCS records your performance as you play along with a metronome. Step-entry lets you enter notes and durations one note (step) at a time.

Other features supported by KCS include playing, transposing, overdubbing, autocorrecting, copying, and merging sequences.

The editor included with KCS lets you edit each MIDI event, either individually or globally. With this powerful feature, you can change the MIDI channel for each note individually, alter the durations of notes, fix incorrect notes, change note velocities, and more. Some musicians use the editor to add "feel" to the music, since computer music can sound a little stiff.

Apple II

Sonus Personal Musician

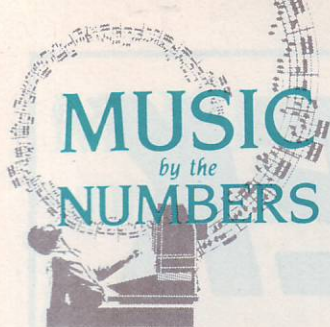
Sonus Personal Musician, a hardware and software package for Apple II+, IIe, or IIGS computers, makes it both easy and inexpensive to jump into the world of MIDI.

Inside the Sonus package, you'll find a MIDI interface card with one MIDI input and two MIDI outputs, two MIDI connecting cables, and a program for recording, overdubbing, and playing back music.

The interface card fits in slot 2 of your computer, and the MIDI cables must be routed out of the computer to a MIDI instrument, such as a keyboard. If you have a II+ or IIe, this is simply a matter of lifting the lid, plugging in the card, and carefully running the MIDI cables through an available slot opening in the back of the computer. In the case of a IIGS, however, there's no convenient place for the wires to exit the computer case. I had to run the wires out from under the top of the IIGS's case, making it bulge a bit.

The MIDI recording program that comes with the package supports recording and overdubbing on as many as four tracks at a time. This means that you could, depending on the availability of MIDI instruments, record drums on track 1, synthesizer bass on track 2, electric piano on 3, synthesized horns on 4, and then play them all back at the same time. In addition, the program lets you store as many as eight recorded sequences.

The program, which operates much the same way that a standard tape recorder does, also includes several other useful functions. There is a metronome clock to help you play in time, but if your timing is a little shaky, you can use the autocorrect fea-



Macintosh MacRecorder Sound System

The MacRecorder Sound System, from Farallon Computing, is a must-have for Macintosh owners.

MacRecorder includes a sound-input device called the MacRecorder Sound Digitizer, plus an audio cable and two useful programs—*HyperSound* and *SoundEdit*. You can use the MacRecorder Sound System to digitally sample and edit any kind of sound, whether it's from voice, recorded media, or even live broadcasts. Once you've recorded sounds, you can play them back, edit them, mix them, and store them in *SoundEdit*, *HyperCard*, *Studio/Jam Session*, *VideoWorks*, and other file formats.

The MacRecorder digitizer is a small plastic box with a built-in microphone, a level control, and connectors labeled Mic-In and Line-In. When recording, you can use the built-in microphone or plug in your own. To let you record from another audio source, such as a CD player, Farallon furnishes a long audio connecting cable. The MacRecorder system supports stereo recording, but you need two

MacRecorder digitizers if you want to record both channels at the same time.

The *SoundEdit* program is a sound editor that makes it easy to visually display recorded sounds on the screen while you hear them through the Macintosh's speaker (or an external speaker). Once you have a sound in the *SoundEdit* window, you can enhance it by adding special effects. These include smoothing, looping, filtering, mixing, and more. *SoundEdit* will run on any Macintosh with at least 512K of memory, though it performs better if your Mac has at least one megabyte of memory and two 800K drives.

HyperSound is a *HyperCard* stack that lets you record and play monaural sound, copy sounds from *HyperSound* to other *HyperCard* stacks, and create a Home button for *HyperSound* in your Home card. Unfortunately, *HyperSound* must be run from a hard disk, and it requires that *HyperCard* be installed on the hard disk, too. While this eliminates many users, those running *HyperCard* on a hard disk drive will find *HyperSound* and MacRecorder welcome additions to stack construction tools.

The sampling rates available within *SoundEdit* and *HyperSound* are

22,000, 11,000, 7300, or 5500 samples per second. The higher the rate, the better the quality of the sampled sound, and the faster the computer's memory is used. At 22,000 samples per second, for instance, the frequency range recorded is 0 kHz–10 kHz, which generates good-sounding music and high-quality speech. At this speed, you can record only 45 seconds on a one-megabyte Macintosh. Changing the sampling rate to 5500 samples per second lets you record up to three minutes of voice on that same Macintosh, although with much less impressive quality.

Atari ST Navarone ST Sound Digitizer

The Navarone ST Sound Digitizer is a low-cost yet high-quality digital sampler/software combination for Atari ST personal computers. Enclosed in a plastic box resembling side-by-side game cartridges, the ST Sound Digitizer plugs into the cartridge port on the computer. Two jacks (line in and line out) and accompanying level

Music Speak A Short Glossary

If many of us muddle our way through music, it may be because of the terminology. We may know dozens of esoteric computer terms, but the jargon associated with music—electronic or computerized music especially—can be daunting to the uninitiated. Here are enough explanations to make you conversant in MIDI-speak.

Digital sampling. A process that lets you record samples, or "snapshots," of sounds and store them digitally. Sampled sounds can be edited, stored on disks, and played back using a computer and/or a MIDI-equipped instrument. A hardware/software system for digital sampling is sometimes referred to as a *digitizer*.

Drum machine. An electronic device for emulating real drums. The drums are "played" by pressing buttons or pads, each representing a different drum. A MIDI-equipped drum machine can be con-

nected to other MIDI-equipped devices, including computers.

Frequency response. The audio range or limitations of a piece of hardware. Humans can hear frequencies at a maximum of about 18,000 Hz (cycles per second). Hardware with a good frequency response will cover most of the range of human hearing. Poor frequency response results in dull sounds.

MIDI. An acronym for *Music Instrument Digital Interface*. An international standard established so that instruments, computers, and other MIDI-equipped devices can communicate with each other.

MIDI interface. A hardware device that lets computers, synthesizers, drum machines, and other hardware receive and transmit MIDI data. This data represents musical information such as which notes were played, when, and how hard. The MIDI interfaces on different devices are connected using special MIDI cables.

Overdubbing. The process of listening to previously recorded music and recording

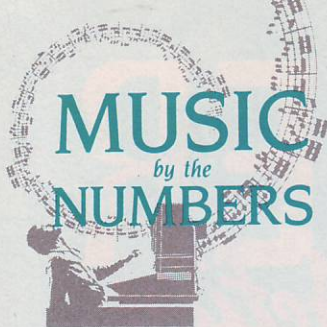
new parts without erasing the old. Commonly used in recording to "build" musical arrangements instrument by instrument.

Sampling rate. Usually measured in samples per second, the sampling rate of a digital sampler lets you know how good the quality of the sampled sounds will be when the sounds are played back. The faster the sampling rate, the better the sound quality.

Sequencer. A software program for composing, recording, editing, storing, and playing back musical compositions. Music can be entered into a sequencer by playing in realtime, or notes can be entered one at a time, in step time.

Sequencing. Using a sequencer to record or input the musical notes making up musical arrangements and compositions.

Synthesizer. An electronic musical instrument capable of mimicking the sounds of other instruments or generating new and unique sounds. Synthesizers are usually activated by playing a piano-type keyboard; most come MIDI-equipped.



controls are found on the side of the box. A microphone is not included, but the manual lists several acceptable Radio Shack models along with their part numbers.

The Navarone lets you vary the sampling rate from 1000 to 64,000 samples per second, resulting in a very acceptable frequency response of 10 Hz–20,000 Hz. As with any other sampler, however, the better the quality of the sample, the more memory used. If you plan to save a lot of high-quality samples, it's best to have a hard drive or a lot of 3½-inch disks

handy.

When you first boot up the mouse-driven ST Sound Digitizer software, the screen looks and responds like an oscilloscope connected to the digitizer's input. This screen lets you check and adjust the input level to avoid clipping. Another screen, the Command Screen, lets you control the digitizer and sound-editor functions, which include sound editing, reversing sounds, mixing, squeezing, and many other functions.

One feature that makes the ST Sound Digitizer stand out is its ability

to let you play the sounds you digitize using a MIDI instrument. By clicking MIDI on the Command screen and then playing middle C on a MIDI keyboard, you can play a middle C of the sound currently in memory.

It's really strange, being able to play my Casio CZ-101 and hear a hiccup come out. □

Joey Latimer is a freelance writer, musician, and recording engineer. Formerly a technical editor with *Family Computing*, he now operates a MIDI recording studio and testing lab in the mountains of California.

Music by the Dollars

Alesis HR-16 Digital MIDI Drum Machine

\$449
Alesis Post
3630 Holdridge Ave.
Los Angeles, CA 90016
(213) 467-8000

Casio MT-540 MIDI Keyboard

\$249.50
Casio
570 Mt. Pleasant Ave.
Dover, NJ 07801
(201) 361-5400

Deluxe Music Construction Set

\$99.95
Amiga
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171

Dr. T's Keyboard Controlled Sequencer

\$149
Commodore 64
Dr. T's Music Software
220 Boylston St., Suite 206
Chestnut Hill, MA 02167
(617) 244-6954

E-mu SP-1200 Digital Sampling Percussion System

\$2,995
E-mu Systems
1600 Green Hills Rd.
Scotts Valley, CA 95066
(408) 438-1921

Ensoniq Mirage-DSK Digital Sampling MIDI Synthesizer

\$1,295
Ensoniq
155 Great Valley Pkwy.
Malvern, PA 19355
(215) 647-3930

Finale

\$1,000
Macintosh
Coda Music Software
1401 E. 79th St.
Bloomington, MN 55420
(612) 854-1288

Kurzweil 250 Digital Keyboard

Price varies depending on configuration
Kurzweil Music Systems
411 Waverley Oaks Rd.
Waltham, MA 02154
(617) 893-5900

MacRecorder Sound System

\$199
Macintosh
Farallon Computing
2150 Kittredge St.
Berkeley, CA 94704
(415) 849-2331

Music Quest MIDI Starter System

\$199
IBM PC and compatibles
Music Quest
1700 Alma, Suite 260
Plano, TX 75075
(214) 881-7408

Navarone ST Sound Digitizer

\$99.95
Atari ST
Navarone Industries
454 Kenneth Ave.
Campbell, CA 95008
(408) 378-8177

Passport Designs MIDI Interface with Tape Sync

\$199.95
Commodore 64
Passport Designs
625 Miramontes St.
Half Moon Bay, CA 94019
(415) 726-0280

Passport Designs MIDI Transport—MIDI/SMPTE Interface

\$459
Macintosh
Passport Designs
625 Miramontes St.
Half Moon Bay, CA 94019
(415) 726-0280

Personal Composer System-2

\$495
IBM PS/2; IBM PC AT and compatibles
Personal Composer
P.O. Box 648
Honaunau, HI 96726
(808) 328-9518

Sonus Personal Musician

\$129
Apple II
Sonus
21430 Strathern St., Suite H
Canoga Park, CA 91304
(818) 702-0992

Voyetra OP-4000 MIDI Interface

\$179
IBM PC and compatibles
Voyetra Technologies
333 5th Ave.
Pelham, NY 10803
(914) 738-4500