MTC Express Multi-touch Controller (review)

Randall Jones

The MIT
Press

➡ For additional information about this article

Figure 1. MTC Express Multi-touch
Controller with Max Patch.

future world in which humanity has been completely suppressed by technology. Even the human voice is lost in the mix. By the fourth section the vocal text no longer has the character of an individual; at this point the text consists mainly of quotations from other people. By the end, the voice itself is stolen by the taped samples. This piece is an excellent example of the synthesis of acoustic and electronic music.

While all the music on this recording is well crafted, the disc's strength comes from the multimedia accompaniments on the "enhanced" section of the CD. GEMS uses multimedia to enhance traditional liner notes. Mr. Picton's notes include linked sound files for the sampled instruments. Mr. Harley adds details on the software used and a multimedia photo display to accompany the music. Mr. Budón provides tables of frequencies and ratios used in the composition as well a video of the recording process. Mr. Ferguson uses a video of the recording process along with the text of the piece. Each set of notes also includes a picture of the composer, a biographical sketch, and a sample from the beginning of their work.

Anyone who is interested in the world of electroacoustic music should listen to this recording. Each composition takes a different approach, making the disc an excellent sampler of the processes being used in electronic composition today. The enhanced portion of the CD requires a PowerPC with a 4X CD-ROM and 24 MB RAM or a Windows PC with a 4X CD-ROM and 16 MB RAM.

Products

MTC Express Multi-touch Controller

Tactex Controls, Inc., #3 203 Harbour Road, Victoria, British Columbia V9A 3S2, Canada; telephone (250) 480-1132; fax (250) 480-1142; electronic mail sales@tactex.com; World Wide Web www.tactex.com

Reviewed by Randall Jones
Seattle, Washington, USA

The MTC Express (see Figure 1), from Canadian manufacturer Tactex Controls, is a touch pad controller with a unique multi-touch capability. Though it has other uses in a variety of applications including graphics, the device is definitely being marketed with computer music in mind.
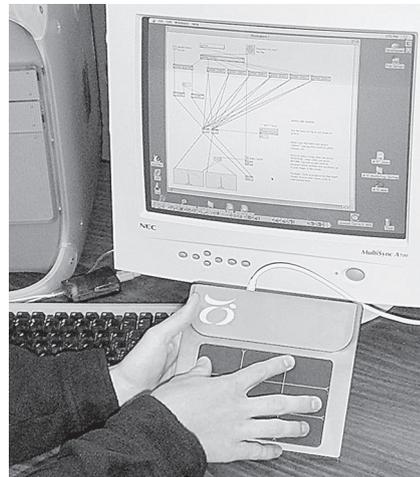
Specifications
Using an internal web of fiber-optic strain gauges (produced under license from the Canadian Space Agency), the MTC Express senses multiple points of pressure applied to its surface simultaneously. Each contact point sensed by the pad provides its data, consisting of x, y, and pressure values, at a sampling rate of 200 Hz.

Software support is provided for both Macintosh and Windows computers in the form of libraries, example C code, and a demo application. For the Macintosh, an external for Cycling '74's Max is also provided with an associated .help patch.

The pad generates its multi-touch data starting from a 6×12 grid of deformation measurements gathered by the fiber optic sensors. This data is reduced within the pad to produce a list of contact points. The raw val-

ues on the grid are available through the device's Application Programming Interface (API) as well.

The unit is housed in red milled aluminum, into which the Tactex logo is etched. The active sensing area is 14.5×9.5 cm (5.75×3.75 in). This area has a black polycarbonate surface which is printed with a 3×3 grid in white. The entire unit is only a little over one centimeter thick. A single cable permanently attached to the rear of the pad forks off into both a nine pin serial interface and a "wall-wart" power adapter. A DB9-to-Mac serial cable is included for Macintosh use.

Impressions

The multi-touch capability of the MTC Express does indeed make it unique. There are other touch pad controllers on the market, some with built-in effects, and pen tablets have been around for years, providing multiple axes of control on a two-dimensional surface. But the ability to play using multiple simultaneous gestures on a single, portable, affordable control surface is entirely new and promises a wealth of performance uses.

I have been beta-testing the Macintosh version of the MTC Express for several months. Along the way, I wrote several Max/MSP patches and made an alternate Max external to communicate with the pad. The process of compiling the external was easy thanks to the detailed documentation and example code that is provided. The documentation is provided in Adobe Acrobat format as a combined owner's and developer's guide. The information is comprehensive, and treats Windows and Macintosh users with equal courtesy. Happily, no installation of drivers is required to use the system—it uses the native serial drivers on each platform. So, although no information is given specifically for Linux developers, it seems likely that a savvy programmer could get it up and running on that operating system without too much trouble.

The setup process for Max/MSP consists of installing the Tactex Max external and normalizing the pad. Normalizing is a slightly tweaky process designed by Tactex to allow for variations in sensitivity between different pads. It can also be seen as a way to work out the trade-off between sensitivity and noise in the data. To begin, you run the Tactex demo application or invoke the normalization mode in the Max external. Then you run a finger over the pad, traveling over the entire surface with an even touch. The demo program assists with a display showing the area covered. The pressure values generated are saved in a file to which the Tactex object refers on each startup. After a few tries you get the hang of it, and can then vary the pressure you apply in order to affect the pad's sensitivity.

I imagine that for consumer applications of their technology, Tactex will have to come up with a way of normalizing each pad during the manufacturing process. Probably they already have. But the MTC Express is not yet a consumer product: its audience is limited for the moment to Max users and C programmers, so it makes sense to let these picky early users experiment with the normalizing process for themselves.

The touch sensing works extremely well, with positional accuracy of about one millimeter. Multiple simultaneous touches spread widely apart on the pad are equally accurate, but when moved closer to one another they exhibit a proximity effect which pulls the results together. It's possible that this could be corrected by software in the future. This merging limits the number of usable simultaneous touches to about four.

The dynamic range of the touch sensitivity is surprisingly large. The pad will recognize a light touch, yet still produce sensibly changing data when you bear down as hard as possible with a finger. When this much pressure is applied, the pad takes a few seconds to return to a zero reading after the pressure is removed while the flexible backing of the sensor returns to its rest state; but at moderate amounts of finger pressure, this delay effect does not appear at all.

The polycarbonate surface is pleasant to the touch, not too rough on the fingers, and it seems fairly durable. In the time that I've been working with the pad, a grid of small round indentations has become worn into the surface, seemingly corresponding with the structure of the internal sensors. These can easily be felt, but don't seem to affect the pad's sensitive response. The solid aluminum enclosure is pleasantly rugged in this time of cheaply available but cheaply built plastic peripherals. I wouldn't hesitate to kick it around some if I had a mind to! Unfortunately, though, the cable which provides both power and data connections is permanently attached to the rear of the device. This makes packing a bit more difficult and warrants treating the device with care.

My only serious gripe about the MTC Express is with its connectivity. I imagine many performers currently using PowerBooks will be interested in this device. Unfortunately, recent generations of Apple computers lack native serial ports. To attach the MTC Express to a PowerBook, the only solution I have found is to use a serial-to-USB converter. And all such converters I've tried so far introduce signal latency on the order of 20–30 msec. So, unfortunately, I can't recommend the pad for the "finger drumming" I had hoped to do, or other such musical applications where a stable response of less than 10 msec is needed.

If conducting or mixing is more your style of performance, or you are not after real time musical control, the extended latency should not be a problem. And, if you have a computer with native serial hardware, you can experience the 5-msec latency which the pad offers. The problem is not strictly with the pad, but with the lack of any good connection option for current computers. The Magma PCI expander for PowerBooks combined with a PCI serial card might offer another possible solution, but I haven't been able to test this.

Overall, I have found the MTC Express to be an exciting and usable controller. I think the few compromises made in its design are reasonable ones. Its multi-touch capability, ruggedness, and portability all give it useful potential for any computer musician. If you are a laptop rocker looking to add more "live" to your live show, this func-

Figure 2. Digigram VXpocket PC card digital audio interface.

tional unit could be an especially pleasant option, and quite affordable at US$ 495.

More information on the MTC Express and the Max/MSP demos are available on the company's Web site (www.tactex.com).

Digigram VXpocket PC Card Digital Audio Interface

Digigram, S.A., Parc de Pré Millier, 38330 Montbonnot, France; telephone (+33) 4-7652-4747; fax (+33) 4-7652-1844; electronic mail info@digigram.com; World Wide Web www.digigram.com

Reviewed by James Harley
Moorhead, Minnesota, USA

As components have shrunk and processing power has increased, it is becoming increasingly popular to do digital audio—recording, editing, processing, performing—using a notebook computer. The convenience of being able to travel with much less gear is an obvious advantage. Interactive performances can be more engaging as well, as musicians need not be quite so hidden behind desktop computer components and full-sized monitors. One thing that has been lacking, however, is a compact, high-quality interface for importing, converting, and exporting audio. Digigram has filled that gap admirably with its VXpocket audio interface. At a list price of US$ 729, this 24-bit unit easily turns your portable computer into a two channel audio workstation.

The VXpocket is a sleek, credit card–sized PC card (see Figure 2) that pops into the built-in Type II slot that comes with most newer notebook computers, both Macintosh and Windows models. A

single cable that attaches to the card splits into balanced XLR analog connectors (two channels each of input and output) and S/PDIF coaxial digital RCA connectors for digital input/output (see Figure 3). I found that the length of cable provided with the VXpocket is a bit short to allow one to plug into the back of a DAT recorder or CD player without having to re-position the computer or audio devices. The entire cable set is approximately three feet in length, with the break-out portion, containing the individual connectors, being no more than six inches. Of course, this is easily solved by connecting your own cables, but that does start to add to the bulk of your necessities.

Installation is very simple. Digigram has provided ASIO drivers for both Macintosh and Windows (95, 98, NT), and additional ones for Macintosh Sound Manager and Windows Wave (PC users must also have a free IRQ). Version 2.20b and higher ASIO drivers provide 24-bit support, and allow selection of internal or external clock synchronization. An announced upgrade adds SMPTE (LTC) time-code input, which will require purchase of an additional cable. I tested the VXpocket on a Macintosh G3 PowerBook (OS 9.0.4, 400 MHz, 192 MB RAM). When installed, you need to verify that the ASIO driver is placed in the VX folder. Otherwise, the required extensions are added automatically and the con-

trols for the card added to the Sound Manager interface, accessed either through the Control Panels folder or the Extensions Strip. Digigram has also provided its own control panel, an interface that allows the user to select Sampling Frequency (up to 48 kHz), Input level (line or mic), Monitoring, and whether the input and output levels are fixed (0 dB). If the analog gain of the output is not fixed, there is also a slider for adjusting the levels.

One minor problem you might run into is that if you want to monitor your audio at the same time as sending it out of the card to a recorder or some other device, you will have to plug your headphones into the external unit as there is no monitor output on the card. If you are recording onto your hard disk, though, and don't need to send the signal back out to another device, then you can choose to send the audio out of the Macintosh interface and just plug your headphones into the Audio Out on the back of your computer.

The VXpocket works remarkably well. I tested it in several ways, and encountered no problems. I did find, I should admit, that it takes some adjustment to get the input levels set right when plugging a microphone directly into the soundcard. It is necessary to change the settings, and to make sure the input levels are not fixed so that you can adjust the levels. There is no phantom power element built in, so condenser mics cannot be used without their own power source. I found it easier to adjust the levels by plugging the mic into a mixer before sending it into the computer, and this option, while adding to the bulk of your luggage, also enables a wider range of situations to be accommodated (such as mixing a number of sources).

Otherwise, this unit works like a charm. I transferred soundfiles from

Products **99**