tech

New Ways to Jam

BY BEAN

OVER THE PAST SEVERAL YEARS, a new breed of instruments has surfaced that is changing the nature of music and performance art. Sleek, affordable MIDI controllers that respond to muscle tension and hyperinstruments, which respond to gestural movements, can be used to trigger and manipulate lighting, sound, and graphics. The various ways in which these twisted masses of wires and sensors are engaged depends on the user's technique, concentration, and dramatic flair.

These performance machines are clearly an emerging technology; we shouldn't

The BodySynth translates gestures and other movements into sonic textures.

judge these tools or the people who play them by the same standards that we apply to more familiar instruments. Making the process of creation and the resulting music compelling enough to bring out of the studio and onto the stage is certainly a challenge. Even more difficult is communicating to an audience the causal relationship between subtle physical movements and sound so that people can comprehend the performance.

The BodySynth. To say that Pamela Z presents a uniquely personal manifestation of multimedia music would be indisputable—to experience it is quite another matter. Drifting in the abyss between the analog and digital worlds, Z performs with the BodySynth to trigger an array of sonic textures that would intrigue any musician. In performance, Z dons the BodySynth's 4-channel unit, which comes with four wireless sensors able to detect electrical impulses from her muscle movements. The BodySynth's processor uses a variety of algorithms to translate electromyogram (EMG) signals into music via MIDI messages. Up to four different MIDI channels can be programmed to interpret the continuous gestural motion of Z's muscles; the more effort involved in the movement, the greater the velocity, and the higher the pitch or the deeper the pitch bend.

With her playful approach to sound design, Z wields a sonic palette that is as delightful as it is disturbing. Armed with electrodes and using Opcode *MAX* software as the object-oriented musical programming environment, Z is able to execute a few simple moves to create intricate rhythmic patterns, lush harmonic pads, or washes of precalculated noise. She strategically locates sensors on different body parts so that a quick flick of the wrist might trigger samples of street noise, a shimmy to the left could unleash a barrage of nonsensical or cryptic utterances, and a shoulder roll could

PHOTO BY DONNA COMPTON

be the ticket for a cascade of operatic vocalizations. Certainly one of the most intriguing aspects of Z's show is the frenetic fusion of live vocals with samples of vocalizations triggered in response to her own movements. The natural integration and orchestration of digital delays, vocal processing, and MIDI devices into Z's art is truly provocative, though it may not be to everyone's taste.

SensorBand's ESP. Coordinating body movement and translating it into a composition of sound patterns and controlled noise is quite a challenge for one person. Imagine an ensemble of artists taking the plunge together. That's exactly what the SensorBand is all about. Hailing from Holland, Japan, and France, these three musicians collectively embrace all the challenges of the human-machine interface. An array of spatial control instruments integrating ultrasound, infrared, and electrical impulses are employed by the members of Sensor-Band to create improvisational sound collages. When the cybernauts are unable to collaborate in person because of geographical distance, they experiment with streaming audio and video connections in real-time via the Internet using ISDN lines. Stylistically, the SensorBand's improvisational pieces range from strenuous concentration to rhythmic conversations passed back and forth between band members.

Getting into gear with BioControl System's BioMuse MIDI controller and *MAX* software, SensorBand's "guitarist," Atau Tanaka, plays air guitar as a serious virtual instrument. With each arm swathed in a band of sensors to trigger guitar sounds via gestural movement, Atau's clenched body parts pulsate with a ceremonial building of intensity. Like the BodySynth, the Biomuse deciphers EMG data and uses signal-processing algorithms to control digital devices in real time. Although the BioMuse controller can send up to eight channels of MIDI, Atau uses four EMG channels. The compositions which emerge are based entirely on interaction with the musicians on the far side of the stage or the globe, where Atau's bandmates are enveloped in their own forms of sonic articulation.

Edwin Van Der Heide fulfills his function as "vocalist" using a MIDI Conductor which was developed at STEIM (Studio for Electro Instrumental Music) in Amsterdam to manipulate vocal samples with a handheld controller and ultrasound. Van Der Heide also writes the code for his own blend of digital signal-processing performance software, which runs on an Ariel Motorola DSP96000 DSP card. Van Der Heide's time-stretching software expands and contracts the samples' amplitude and diffuses the range of sound when he moves the MIDI Conductor in three-dimensional space.

Slicing and dicing the air with drumfire, Zbigniew Karkowski is SensorBand's "percussionist." He inhabits a virtual enclosure of infrared beams that he developed in conjunction with Ulf Bilting and Vladimir Grafov. Karkowski uses custom hardware and software together with *MAX* and Digidesign's SampleCell II in such a way that every time he breaks a beam with an exaggerated movement, a corresponding drum sound emanates from his intangible drum set.

Soundnet. Taking the empowering musical capabilities of interactive technology a step further, the members of SensorBand built a stunning architectural fantasy: a MIDI-triggering instrument called the Soundnet. Inspired by a spider web installation/composition created by STEIM composer Michel Waisvisz, the group constructed a massive network of ropes strung together with custom sensors that respond to movement as people climb on the rigging. This grand pseudoweb morphs from what appears to be a rope climber's dream into a monumental musical device.

As Soundnet is in its infancy, it requires a new cultivation of musculature and musicality. Eleven cylindrical sensors designed by Bert Bongers of Philips' Institute for Perception Research are embedded in the Soundnet. Each sensor hosts a modified Soundcraft fader in a large spring capable of sustaining 500 kg of force. Clambering all over the web, the members of SensorBand shake the ropes to trigger the sensors. Each artist/climber's movements literally stretch the sensors, which in turn send signals to an Infusion Systems I-Cube Interface, which outputs MIDI messages to a Macintosh running performance software created with *MAX*.

The limitations of these controllers make improvising engaging, real-time compositions a challenge. As more artists gain access to uninhibited cybertools, this genre of electronic music will continue to evolve. Intellectually, this zone of exploration can be extremely satisfying, but as for the resulting melodic experience, you'll have to judge for yourself. ◆