"This thing isn't working right."

"I swear, somebody's been goofing with my stuff!"

"I don't know what's going on, but it sure as hell ain't my fault!"

Yeah. Right. I've heard it all before. In live electronic percussion performance, blaming technical problems on little gremlins simply won't cut it. If your rig has a serious glitch at a gig, you can be stopped dead in your tracks. You can't fault anyone but yourself if things don't work right. After all, gremlins don't exist, right?

The University of Arizona's electronic percussion ensemble, CrossTalk, provides an interesting laboratory for both human and technical error: ten electronic percussion controllers, two MIDI patch bays, 12 sound modules, a P.A. system, a monitor system, and a headphone system. Add to all this gear nine group members who go in and out of the rehearsal room, practicing their parts, experimenting with sounds, and doing a good deal of individual creative exploration. It's a petri dish of potential problems.

With tons of trial and error, we've done a good job of solving most of the troubles that have come our way, and we've gotten very fast at solving any new problems that might show up. This article intends to offer some pointers to help solve problems that you might have and provide a good set of suggestions to keep trouble at bay.

SYSTEM COMPONENTS. Electronic percussion systems can be very complex. Whenever there are problems, the first step is to break the system down into its component parts and see if you can quickly diagnose the sub-system that is causing the problem.

Electrical System: Without electricity, nothing works! Your electrical system carries power to every device in your rig. This sounds simple, but failure to get power to your equipment is a very common problem.

Triggers: These are the devices that read your strokes and send the electrical spikes to the system's brain. Triggers can be attached to acoustic drums, placed inside electronic drum pads, or integrated into larger controller systems like the DrumKat, MalletKat, and the HandSonic.

MIDI Systems: MIDI systems generate the actual MIDI messages and serve as the middleman between the trigger that reads the stroke and the sound module that fires the sounds. MIDI systems can be included inside a controller (TrapKat), an electronic kit (DTXtreme), a sound mod-

Illustration Kim Weinberg

Plugged In

ule (DMPro), or a freestanding dedicated unit (DTS70). The MIDI component would also include any MIDI patch bays or computer systems that are integrated into your rig.

Sound Modules: Sound modules create the sounds that will eventually come out the speakers. Exactly how the module will react depends on both the programming of the module and the programming of the MIDI system.

Audio Systems: An audio system could include sub-mixers, main mixers, outboard effects units, power amplifiers, house speakers, monitor speakers, and headphone systems.

WHAT TO DO? When something goes wrong, you can't just run around in a panic. You've got to solve the problem, figure out the cause, and act to prevent the same thing from ever happening again. It's been our experience that 99 percent of the problems are user error. Today's electronic percussion instruments are pretty solid. While they will crash once in a while, it's much more common that someone in the group has overlooked a minor detail that results in major problems. Once that error is discovered, it's a simple matter to fix it and keep going.

We've designed a pretty good system for finding problems based primarily on what the most common mistakes have been in the past. The plan that we use is to start at the origin of the system and follow it through to the end.

DEALING WITH ELECTRICAL POWER. As you might expect, if a machine doesn't have electrical power, it's just not going to operate. If you flip the power switch and nothing happens, your next step is to follow the power from the device all the way back to the wall receptacle. Here's the process:

- *Is the device turned on?*
- *Are you using the correct cable or power adapter?*
- *Is the power cable plugged into the device?*
- *Is the device cable plugged into the power strip?*

- *Is the power strip turned on?*
- *Does the breaker on the power strip need to be flipped?*
- *Is the power strip plugged into the receptacle (or extension cord)?*
- *Is there power at the receptacle?*

If at any point in your investigation, you find that power isn't available, then you've solved the problem. If you've checked all these connections and your machine still won't turn on, you should check to see if the unit might have a blown fuse.

DEALING WITH CONTROLLERS AND MIDI SYSTEMS. If these devices have power but still don't seem to be reacting properly, it's time to troubleshoot this part of your system. Again, the best way to approach troubleshooting is to follow the signal from the origin to the destination:

- *Are the triggers or pads properly cabled into the brain?*
- *Is the MIDI cable leaving the controller from the "OUT" port?*
- *Are all the pedals and switches plugged in correctly?*
- *Is the controller set to the proper patch? You might try exiting and returning to your patch.*
- *Is the controller sending on the proper MIDI channel?*
- *Is the patch calling up the correct program change message on the sound module?*
- *Are the messages of pan position and volume as they should be?*
- *Are the triggers' programming values correct (such as sensitivity, velocity curves, mask time, etc.)?*
- *If you're using a MIDI patch bay, is it routed correctly?*

If all of these items have been checked, you might try turning off the controller, waiting about 15 seconds, and rebooting the machine. Electronic musical instruments are computer- and software-based, and they have been known to crash once in a while.

DEALING WITH SOUND MODULES. Sound modules read MIDI signals and create sound. For this reason, you have to troubleshoot both the MIDI and the audio sides of the device.

Plugged In

- Is the MIDI cable connected to the device's "IN" port?
- Is the master volume turned up?
- Is the module set on the correct patch?
- Is the module set to receive to the proper MIDI channel?
- Is the module set to the proper receive mode (mono, poly, multi, etc.)?
- Are the channel volume and pan position values correct?
- Is the sound routed to the correct out puts (main, aux, discrete channels, etc.)
- Are the audio cables connected to the correct audio outputs?
- If necessary, you can try rebooting your sound module by turning it off and back on again.

DEALING WITH AUDIO SYSTEMS.

Since each audio system is highly unique, it is more difficult to give a set of common problems. But there are some basic concepts that you can check to make sure that your audio system is working properly.

- Are the cables routed to the correct inputs?
- Are the mixer's trim settings correct?
- Are the channel faders turned up?
- Are the master channel faders turned up?
- Are the channels muted or soloed?
- Check any outboard gear's operation for problems.

One important tool when troubleshooting an audio system is a pair of headphones. Check to see if there is a headphone signal coming from the sound module. If so, then you know your controller is operating properly and the problem must be somewhere else. If you've got a good headphone signal out of the mixer, then you know the problem is somewhere in the mixer's outputs or perhaps the power amps or speakers.

PREVENTATIVE MEASURES

Tech Checks. Everyone knows that you need ample time before a gig to have a thorough sound check. How about tak-

ing the time for a technical check? A technical check is similar to a sound check, but this is the time to check all cables, pedals, and patches to make sure everything is operating properly on a technical level.

Bring Replacement Gear. Everyone carries some extra gear to gigs. Most drummers keep spare heads, snare cord, washers, felts, and even pedals nearby in case of an emergency. On the electronic side, you should always have a few additional MIDI cables (long ones), and audio cables (also long) on hand. Here are a few other items you may want to keep in a small bag in case of trouble.

- Extra footswitches - both sustain and patch change.
- Fuses for each machine that uses them.
- Extension cords, power cords, and power strips.
- Duct tape (a.k.a. gray tape, gaffer's tape, rock and roll tape, etc.).
- Audio adapters of various types.
- Basic tool box including screwdrivers, pliers, and solder gun.
- Extra cable ties.
- Operating manuals for all your gear.
- Extra media for re-loading data (floppy disks, CD-ROMS, etc.).

Label Everything. This may seem incredibly stupid, but a large number of technical problems have something to do with cabling mistakes. We use a system in which each end of the cable is labeled with a different color. We use yellow for the MIDI outputs and white for MIDI inputs. For example, the cable with a yellow tag that reads "DrumKat 2 Out" plugs into the MIDI Out of the DrumKat. The other end of the cable has a white label that reads "DrumKat 2 In," and plugs into the MIDI patch bay. We do the same thing with audio cables — yellow tags for the sound module's output and white for the ends that plug into the mixers.

It's a good idea to label all of your power cords with the name of the device at both ends. In addition, get in the habit of plugging cables into the same spot in the power strip. If you really want to get detailed about this, you can label your power strip. This may seem

like overkill, but it makes life easier when you're troubleshooting. One quick glance at your power strip, and you'll know if all your gear is plugged in or not. You'll also appreciate this extra detail if you want to borrow a single piece of gear out of your rig and move it to another location. You won't have to guess which power cable belongs to which piece of gear.

If you've got a few of those wall-wart power converters, it's vitally important that you clearly mark which converter goes to which instrument. There are many different configurations of these things, and if you use the wrong one, you'll have problems. At best, the machine just won't power up. At worst, you'll cause serious damage and it will need to be repaired. In CrossTalk, we had an experience where we used the wrong wall-wart power supply. Luckily, it didn't fry the machine, but it did scramble all the preset memory. It was a hard lesson to learn!

Back Up Your Data. Yeah, I know, this is like reminding you to back up your computer, or wear your mittens and stuff. To quote a good friend: "Anyone who has been into computers as long as we have, has had a major crash without an adequate backup. Been there, done that, got the gray hairs to prove it!" But programming a complex electronic part is *very* time consuming, and having to reprogram is a pain in the butt. In addition, if you experience a problem, you'll rarely lose the programming of a single song, preset, or sequence. It's much more likely that you're going to lose all the memory in the entire machine!

Backing up is actually pretty easy. All of the electronic instruments today have a method of performing a "data dump," which can be saved to an external device of some sort. In CrossTalk, we use the Yamaha MDF-3 (MIDI Data Filer). This is a small floppy-disk drive that can save tons of data dumps on a single disk. We have disks for each machine, and any time a student programs new material or even edits or adjusts

the programming they've already done, we pull out the Data Filer and save it on disk. Taking one more step, we even make backup copies of the floppy disks so that if something should happen to one of the disks, we've got a backup of the backup. Hey, that's what they do at NASA on the shuttles. Should our performances have any less of a failsafe system? If you don't want to work with a dedicated MIDI data filer, you can use a software sequencer to record and play back the System Exclusive MIDI messages that make up a data dump. This way, your computer serves as the primary backup medium and your computer backups are your redundant files.

Learn a Little Maintenance. While you might not be able to fix everything that

had the sampler up and running again in five minutes.

Practice Your Setup. Since you practice your performances, you might want to think about practicing your setups. Get in the habit of setting your rig up the same way each time. Create a Tech Check that will test your system in a thorough yet time efficient manner.

Don't Do Stupid Stuff. Every once in a while, you'll be tempted to do something that is just plain stupid. Avoid this temptation. I'm a little embarrassed to share this story with you, but perhaps you'll learn from our mistakes. During a recent performance, we taped down some cables that stretched from the back of the house to the stage for our headphone system. After

The Ins and Outs of MIDI

Many problems can be traced to incorrect cable routing. Be sure that your MIDI cables are routed correctly and life will be good.

MIDI IN: Use this port when you want the device to receive messages from a different device.

MIDI OUT: Use this port when you want the device to send messages to a different device.

MIDI THRU: Use this port only when you want to route messages from the IN port through this device to a different device. In other words, the messages that emerge from the THRU port are a copy of the messages at the MIDI IN port.

could go wrong with your machines, it's a good idea to become familiar with what's on the inside. CrossTalk had a little problem with one of our samplers. Once we flew from Tucson to Columbus, Ohio. On arrival the sampler booted up with zero RAM installed. This is bad thing for a sampler! Without any RAM, the machine can't make any sound. The problem was fixed when we opened the box and noticed that the daughterboard (which holds the RAM) had vibrated loose from the motherboard. The solution was simply to press down on the daughterboard to re-seat it. Once that was done, the machine operated perfectly.

After another trip, another one of the samplers booted just fine, but none of the buttons on the front panel worked. No matter what button you pressed, nothing happened. This was pretty easy to figure out. Since every single button was non-functional, we guessed that a cable connecting the front panel to the motherboard was disconnected. We opened up the machine, and sure enough, one of the ribbon cables shook loose. We

the cables were taped to the floor, it was necessary to change the stage set up. Don't roll a nine-foot concert grand piano over your cables. Turns out that they are really heavy! Instead of pulling up the tape and cables, moving the piano and re-taping the cables, we decided to save time. The weight of the wheels going over the cable sliced the cable in two. However, the outside sheath of the cable looked fine. The inside of the cable was ruined, we didn't know it, and we didn't have any monitors for the concert.

I hope that these tips and suggestions will help you in your quest for a glitch-free performance. One last suggestion: Each piece of gear has it's own set of idiomatic quirks. The more you learn about your equipment — playing, programming, editing, reading the manual — the better you'll understand how everything operates. And remember, 99.9 percent of all problems are human errors.

The other one percent really is caused by gremlins. 🖐