
Supplementing MIDI with Digital Audio

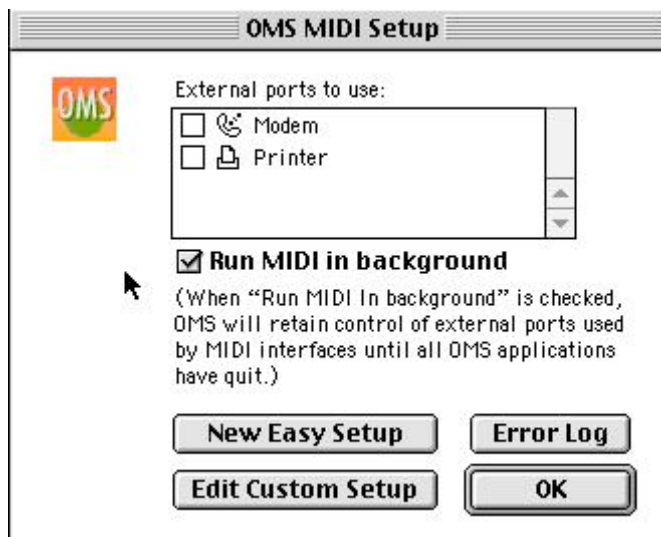
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Last month I showed how to use subsequences to put together a popular-style song.

<http://ti-me.org/members/november2003/repp1.html>

Unfortunately, even the best composer can be disappointed with using MIDI alone to produce a song. The good news is that by adding a few parts of recorded digital audio to the sequence, the final result will sound more natural. Since most of us do not have an elaborate recording setup, we are forced to record our instruments one at a time. Luckily, with today's technology, we can use low-cost sound cards to produce music that is almost as good as a professional recording.

This project requires a computer with a sound card that has at least two audio inputs, software for MIDI, and some kind of recording software. I am using Digital Performer for both the MIDI and digital audio parts of the project. You may use two different software packages, but make user your MIDI software will run in the background, that is it will keep playing while you are working with the recording software.



Also, if you are planning to record instruments with a microphone, then you will need a device to amplify the

microphone to the level used by your audio card. Some audio cards have inputs for microphones, but a preamplifier may be necessary. Mixing boards have preamplifiers built into them, and some tape decks (particularly older ones) can take a microphone input.

Overview:

1. Start with a MIDI file of the song.
2. Record in a scratch vocal or lead part.
3. Add a bass line.
4. Record in other parts as needed.
5. Keep multiple takes.
6. Record MIDI lines in one at a time.
7. What about drums?
8. Layer and mix.
9. Record the final vocal track or lead instrument.

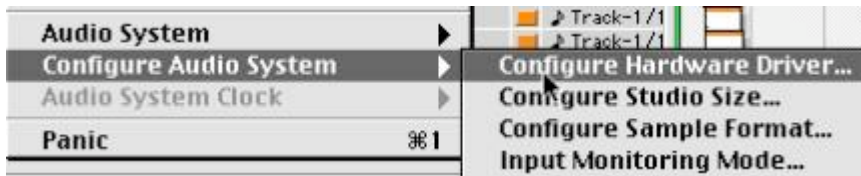
1. Start with a MIDI file of the song.

When the big boys record a song, they will often begin by recording basic tracks. The whole band gets together in a large studio and records a basic version of the song as a reference. This process is fine if you have an elaborate system, but this article assumes that Abbey Road Studios is not available. Without MIDI we would be forced to start with a click track (metronome) as a reference point and then build up the mix one instrument at a time. A MIDI file not only serves the primary purpose of keeping a steady tempo throughout (essential when we get to the editing stage), but also gives the performer an idea of what the composer has in mind for the final project.

If you worked through my article last month, then you already have a MIDI file ready to go. If you are using separate MIDI and audio software, you will probably want to record your MIDI track into your recording software so that you do not have to keep juggling between the two of them.

Here is how I tell Digital Performer how to record my MIDI. I have the output of my keyboard running through a small mixer and then into the inputs of my sound card. (The mixer is not necessary, but it helps me get the right level for recording.)

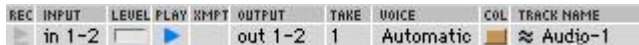
First I go to the Basics menu choose Configure Audio System>Configure Hardware Driver



Then I need to tell Performer to listen to its line input rather than the built in microphone or CD drive. For Input Source choose Line In.



Then I create a stereo audio track and set its inputs and outputs.



Record enable the new track and press play. The MIDI data comes out of the computer and makes the keyboard play. Then the audio from the keyboard enters the sound card, controlled by the audio software. The software will have some way of telling you if your signal is too loud or too soft. In Performer, the indicator is called the Audio Monitor. Generally, the signal should be as loud as possible without going over the limit, or clipping. Too loud is worse than too soft. If the signal is too loud, then the sound will be distorted and unusable. If the signal is too soft, then the sound may be a little noisy, but still usable.



After you are satisfied with the record level, press record and wait for the file to play through completely.

You could record MIDI with no keyboard at all if you can route your audio through the computer directly into your recording software. On a Macintosh with Performer the direct connection is an input called Sound Manager.



After you have made your recordings mute the MIDI tracks. Do not delete them yet because you may want them later.

2. Record in a scratch vocal or lead part.

Traditionally the vocal part is recorded last so that the vocalist can be inspired by all the other instruments. In popular music the vocalist is the main focus and deserves special attention.

However, instrumentalists like to key off of the melody line to add fills and interpretation, so a vocal part is necessary from the very beginning. As a compromise, the vocalist records in a temporary, or scratch, track to serve as a guide to the other musicians. If your song does not have a vocal part, there is probably still a line you would consider the focus of the piece.

The scratch track is not necessarily intended as the final product. However, do take care to make a good recording, because the first take may be the best one. After the death of a famous artist, many songs have been released that would have been considered incomplete if the artist were still alive.

3. Add a bass line.

Why start with the bass? Everything to this point has been a temporary recording to set the mood. Even though the bass is far from the focus of the song, the heart hears what the brain ignores. Without a strong bass and percussion lines, a popular song will die on the vine no matter how talented the lead musicians are.

4. Record in other parts as needed.

Some instruments will sound fine in MIDI and some will not sound natural. As a guitar player, it is difficult for me to listen to synthesized guitar parts no matter how good the samples are.

In general, if you can find someone to play in an instrument live, the results are usually better than MIDI (assuming the player has some chops).

5. Keep multiple takes.

In the old days when recording to analog tape, once a recording was erased it was gone forever. With hard disk recording there is no need to worry about recording over a take that may or may not have been the best one. Just keep a number of the good takes and decide later which ones to use. You can also use multiple takes to make your band seem bigger, or for interesting doubling effects in the mixing stage.

Disadvantages to multiple takes include limitations of hard drive space and added chaos. Make sure to keep good records so you will not forget which were the best recordings.

6. Record MIDI lines in you want to keep one at a time.

Remember I said to keep those MIDI tracks? Well here we are going to use them. In Step 1 we recorded in a scratch track of the original MIDI file. With all of the other instruments we have added, the mix is probably beginning to sound a bit thick. Delete the scratch music track now.

Some MIDI tracks sound good in a mix. Lines such as string pads disappear nicely into a mix without sounding too mechanical. Live strings are difficult to record even if you can find all of the players. Depending on your tastes, some of the instruments you recorded live might sound fine doubled with MIDI Instruments.

Mute all of the tracks except for the one you want to record. You will probably need to turn up your keyboard to get a good strong signal in. Record the tracks in one at a time. This process is time consuming, but worth the effort when we start to mix.

7. What About the Drums?

OK, so the drums and bass are the heart of the song. Unfortunately, drums (like drummers) can be problematic. If you take our two microphones and put them in front of a drum set, no matter how well you place them or how expensive the microphones are, the result will never quite sound like Phil

Collins. A more complicated method, but still within the parameters of our two-channel interface, would include using a sub-mixer for the drums. If a small, say 8-channel, mixer is available and you have a big pile of microphones sitting around, then mix the drums down to two tracks. Put a microphone on every drum and two overhead to get a good sound. (Microphone placement is an art, and many resources exist on what microphones to use and how to place them.) Route the microphones into the sub-mixer, get a good balance, and then record the drum set into your computer as a stereo track. Phil Collins still will not be impressed, but at least you are getting closer.

A more workable method would be to use your MIDI drums. In certain styles of music, electronic drums are acceptable or even preferred. Record the parts in one drum at a time rather than as a whole set. Record the snare on its own line, the high hat on another, etc.

Having the drums on separate lines leads to a number of advantages. We can mix the drums as we see fit, adding effects and equalization to each part. We can also replace individual drum sounds with samples of more appropriate drums. If the drums are recorded separately, we can even quantize the drum parts to clean up bad rhythms.

8. Layer and mix.

Now it is time to take the individual recordings and mix them down into something that will inspire the vocalist. Mixing includes balancing and panning instruments, adding effects, and editing. Stay tuned for my article next month in which I will describe the mixing process in detail.

9. Record final vocal track or lead instrument.

Now that the real work has been done, it is time to bring back in the vocalist so he or she can produce the final masterpiece. Singers are the most susceptible to environmental or emotional distraction, so treat them like an artist. Make sure all the technical details are worked out before hand, and set a creative mood. Give the singer some reverb in the headphones even if you do not plan to keep it in the mix. A dry voice through headphones can ruin a singer's confidence. Keep several takes

of the voice part so that you can cut them up later to produce a perfect recording.

After supplementing your MIDI with digital audio recordings, the music will sound more like you envisioned when you wrote the song. But, like most perfectionists, you still may not be totally happy with the results. Next month I will talk about the mixing process, or how to take all of your recordings and combine them to sound like the pros.



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