MIDI vs Paper Music

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The Question:

Al Good sent me a note via the COAA Members Yahoo Group. He said, in part:

> When we attended the (2013 COAA) rally in GA, some of the MIDI organs sounded great, and some others left a little to be desired in the arrangement of their music. Earlier this year we ordered a 31/83 MIDI organ from Rob Barker in England, and after attending the rally, I am wondering if we did the right thing?

The Answer:

Relax, Al, the question of whether music sounds good or bad to you has nothing to do with MIDI versus paper. It is primarily a question of:

- Has the arranger done a skillful job?
- Can the tune really fit the organ's scale
- Does the tune fit the location? An audience at an old-folks home will listen to stuff which will not stop traffic at Knoebels Amusement Park.
- Do you like the tune and style?

I have heard poor "paper music" on books and rolls and on organ CDs. Although much of "the MIDI problem" involves amateur arrangements, sometimes you may even hear a bad professional arrangement because the organ owner insisted on having an arrangement made of a tune which can not properly fit the organ. This may be because the tune has too many sharps and flats, has no real melody, or relies on words for our enjoyment. On band organs, most of us expect a fairly strong but simple beat from the percussion section. We do not have the ability to warp notes or control volume. Whether we like heavy metal and rap music or not, it does not map properly onto carousel organs.

Figure 1. All the music on the left can easily fit into a SD card on the right (plus hundreds more).

One major "problem" with MIDI is that unskilled novice arrangers can make a tune "play" with much less knowledge and effort than is required to produce a roll. Some tunes you may hear at rallies are "early works" of arrangers teaching themselves (but *everybody has to start someplace*. My most recent arrangements for our OSI MIDI organ makes me like my early John Smith rolls much less).

Why Use MIDI?

From an operational standpoint, there are definitely some very important strengths to using MIDI on our organs. Even on small instruments a MIDI organ offers many potential advantages over a paper roll or book organ. These include:

- You can quickly switch between tunes
- You never have to stop to rewind
- You don't need a wagon to haul your music (**Figure 1**).
- You can back up files easily
- You can set up special chips or disks for individual events
- You don't have to worry about water or insect damage to your files
- You can easily share files with your friends (although you may be violating the copyright law in doing so)
- Your arranger can supply you with files much more quickly than with paper
- You can adapt tunes to different scales, easily playing 20 note tunes directly on a 26 or 31 note organ and sometimes the reverse
- You can link several organs together into an orchestra
- In some instances a MIDI system may have a faster response than a mechanical or pneumatic one, allowing shorter notes and a more complex arrangement
- A MIDI organ scale may be expanded relatively easily. A "128 key" crank organ is not an impossible goal to achieve!

Why Use Paper?

- Every MIDI organ requires electric power. That is not a problem for an organ run with a large motor, but a MIDI crank organ has a heavy battery which must be regularly recharged and periodically replaced.

- In general, it is considerably more difficult to change tempo on a MIDI organ, and thus almost impossible to play duets unless the organ are linked by wires or a radio system.
- With a MIDI organ you can have so many tunes on hand that you can not find the one you want if you do not do a good job of file management! In comparison, it may be easier to search through a suitcase full of rolls than to locate a particular tune on a chip containing several hundred tunes and a scrolling 20 character display.
- Paper rolls can provide visual activity which adds interest for most audiences. In my opinion, both paper and MIDI organs benefit from an attractive facade with some sort of animation.

Larger organs share many of the advantages. Dave Wasson is now running a MIDI interface on Trudy as well as his amazing paper roll changing system. He is mostly playing "the same old music," but it is much more convenient to manage it. He now plays individual tunes by request at rallies. In addition, it is allowing him to play arrangements which he has not had time to run through his punch.

For large organs, almost every tune should be customized for the individual organ, not just the scale on the keyframe or tracker bar. MIDI technology facilitates this.

On all mechanical instruments there is some lag time between when the edge of a hole or a MIDI solenoid starts to generate a signal and when the note begins to sound. With MIDI and most instruments using airflow through holes in paper this lag is very short, and a bit longer with finger "key" systems. The lag time for percussion notes is significantly greater because the beater must be accelerated and travel some distance before it hits. Percussion marking on a book or roll is frequently offset to account for the lag in the pneumatics. On some organs a few holes in the tracker bar may be offset for the same purpose. With MIDI and electrically driven valves the offset may need to be different, but with MIDI if the (skilled) arranger has access to the organ in question, the offset can easily and quickly be adjusted to fit properly. That is almost impossible with a book or roll unless it is re-punched.

Scanning of rolls or books to create MIDI files often creates problems. If a good arrangement for an individual organ is scanned from paper and played back with MIDI there may be no problem, but if the arrangement is transferred to an organ which is not identical in construction the timing offsets may not be correct. That is not a new problem, however. "Cut rate" and/or amateur book copies have been playing for years and sometimes result in offset problems. I can hear the result on several CDs I have.

If a keyless roll or book with chain perforations is scanned and then played on MIDI then every hole may be sounded as a start and stop (being flawlessly reproduced) rather than a continuous note. It is also possible that note lengths that are too short for the organ to respond to are programmed into the MIDI file, but not heard. Most MIDI editing software has a "piano roll" view, and while the work may be tedious, adjustments are easy to make.

Of course adaptions which do not account for differences in voices and percussion sounds can also result in poor sounds. Arranging for a calliope is far different from arranging for a modern dance organ or German fair organ even if all instruments have the same drum set and overall range of notes.

Even on small 20-note organs, we will find that arrangements do not sound exactly the same on a Smith Busker, a Raffin 20/31, a Hofbauer 20, a Vienna Woods, a small Alan Pell, and an OSI. This is not MIDI v. paper, it is organ differences. Part of this is differences in the shape of the pipes within a voice, and part in the number of voices (stops) available, but note offsets, action speed, and note length differences apply as well.

When MIDI files made for other uses such as player pianos or orchestrions are played on band organs, many of the notes are too long. This is particularly true for percussion voices, such as piano and glockenspiel, where the note dies away after the strike, but a pipe keeps on sounding.

Tom Meijer noted in "Music Arranging and the Computer", ***Carousel Organ*** #6, January, 2001:

> The computer is a great help for the present-day arranger of music for mechanical instruments. … With the computer the arranger can do the same things as he did before with paper and pencil, but quicker and easier-especially concerning the always occurring repetitions in the music. It is also easier to make tempo adjustments in a tune. … he can listen to what he has arranged, while with the old method he only could hear in mind the final results of his work" and "one can easily transpose a finished arrangement from one scale to another.

As I noted in "Scanning Sheet Music to Produce MIDI Files," ***Carousel Organ*** #50, January, 2012, it is now even possible to use a PC and a scanner to actually "read" sheet music directly into MIDI files. As a result, an arranger does not have to enter each note individually on a computer, to "keyboard" music into a MIDI file, or to draw each note on a piece of paper.

The organ owner who benefits most from MIDI is the one who does some of his or her own arranging.

Even if you own a punch, MIDI speeds up the processes and allows full testing of an arrangement before committing to paper. A MIDI system will allow you to try arranging and to see if you have the required talent and dedication needed to achieve decent results.

Mike Knudsen has been using a MIDI interface on his Raffin 31/84 to play his own arrangements and compositions for over ten years. As he noted in "Build a MIDI Interface for the Raffin Crank Organ," ***Carousel Organ*** #19, April, 2004, "I still get to crank the wind and change stop registers." He also still plays paper on the organ. By the way, the only thing "out of date" in Mike's 2004 articles is that j-omega now only sells a significantly improved MIDI interface board.

If you choose a MIDI organ "because there are lots of MIDI files on the Internet which we can download for free" you are making a major mistake. While there may be millions of MIDI files available for free download, few are "carousel organ" files. For crank organs the total is probably only one or two hundred. For Wurlitzer 125 and 150 scales perhaps about a hundred of each. For the Wurlitzer 165 scale, probably fewer than ten. Even if you find a good 20-note file which you like, it may require transposition to fit your organ's scale.

A number of arrangers offer MIDI arrangements for small organs through a website. They allow you to hear a portion of the arrangement, typically as an .MP3 file, before making a purchase. The file may then be purchased on a disk, a chip, or as a download (or even as a paper roll). International payments may be made through PayPal. I think the going rate for a good MIDI arrangement for a crank organ is about $20. Remember that it takes an arranger just as much time and effort to produce a MIDI file for direct play as to produce one for roll punching. The saving is only on the actual punching and shipping.

Remember that every MIDI file is covered by a valid legal copyright, even though the copyright on the original composition may have expired. If you play a stolen file in public, the arranger may find you on YouTube.

In our on-line discussion Roger Wiegand said,

> Many of the best arrangers refuse to release or authorize midi versions of their work—perhaps contributing to the MIDI-poor music perception. …. Mostly though, the problem is that MIDI makes the process easy so that pieces that would (and should) get a lot more thought and editing if one had to undertake the time and expense of cutting a roll or book are slapped onto the storage device and played in public.

Amen, Roger. "Bad music" is heard at rallies because the organ owners choose to play it, for whatever reason. And that includes some paper music, as well as MIDI arrangements.

References

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Wally Venable loves crank organs whether played by a cardboard book, a paper roll, or a MIDI system. He enjoys arranging, primarily in the 20 and 31-note scales and 20-note MIDI scale with added percussion. He has lead COAA arranging seminars at several rallies.