Seer Systems's Patent:
Creating, Streaming, and Playing Files that Combine Different Types of Musical Data

U.S. Patent No. 5,886,274

Latest Date That Material Can Qualify for Prior Art: **July 11, 1997**

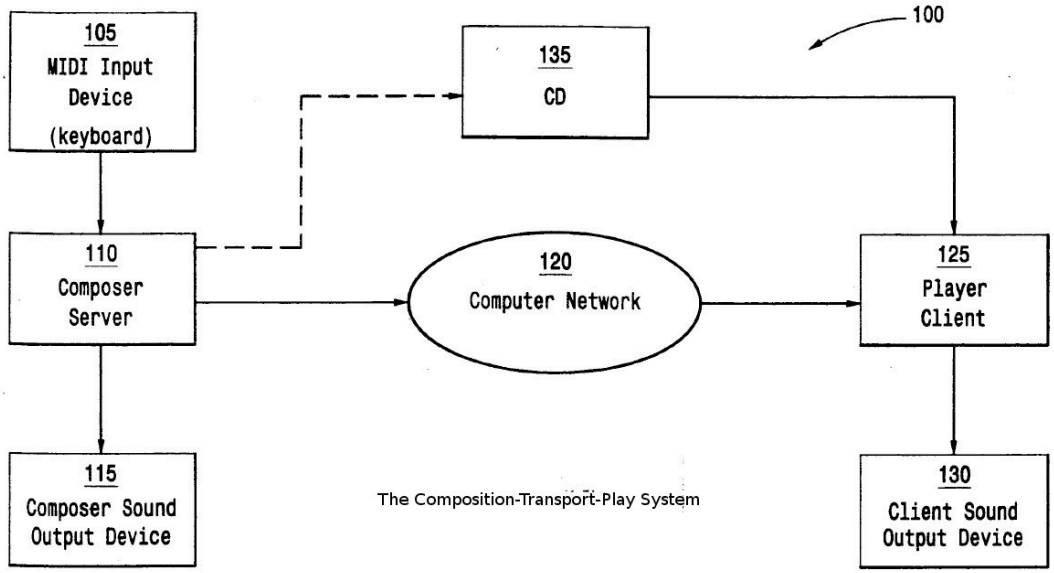
I. Description of the Invention

A MIDI file is like sheet music. Sheet music tells a performer what notes to play and how to play them, but it doesn't contain the actual sounds. In order for a listener to hear the musical work, musicians must play the piece on their instruments.

Similarly, a MIDI file includes the instructions for playing a piece of music—the musical notes, volume signals, and so on—but it relies on the listener's synthesizer to create the actual sounds. The quality of the music depends on the quality of the synthesizer, and a MIDI file played on a poor-quality synthesizer may sound nothing like the composer intended. The piano might sound tinny; the violins may sound fake. However, if the composer could send the sound files along with the musical score, the music would sound the same regardless of which synthesizer is used to play it.

The systems and methods described in this patent allow just that. The patent essentially describes a system that takes a set of signals for controlling a musical piece (such as a MIDI file), adds sound files to it, and can play the resulting song or transfer it to other systems to play. It also claims a number of additions to and variations on this system, as we will describe below. While the MIDI technology is the primary example discussed in the patent, the patent is not limited to MIDI technology. Any system capable of performing musical works in the manner described is implicated.

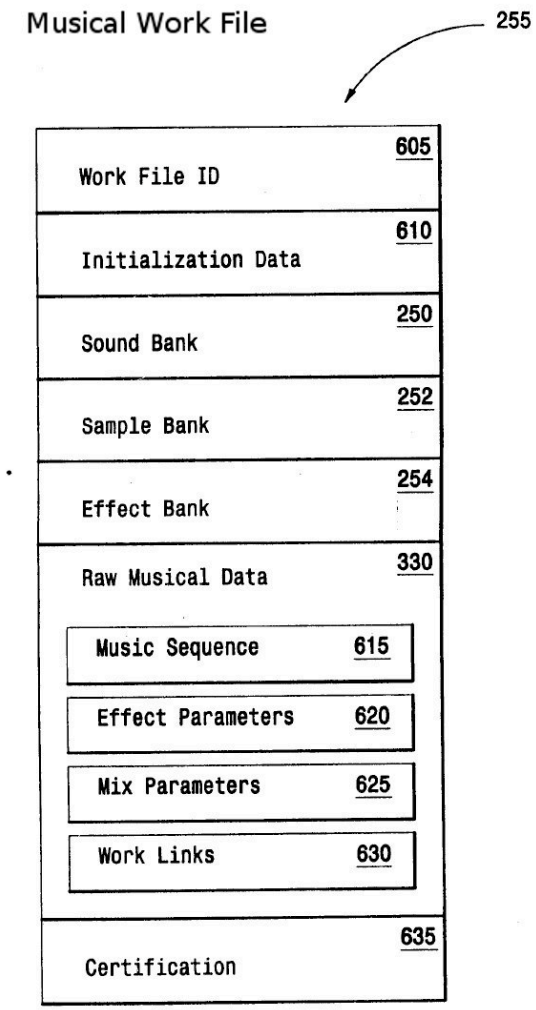
A glossary of frequently-used terms from the patent is included at the end of this description.



Patent Figure 1

This patent deals with "musical work files"—that is, files containing musical data. Here, these musical work files include "music control signals" (such as a MIDI sequence), a set of instrument sounds (a "sound bank"), and an optional set of sound effects (an "effects bank"). A musical work file may also include references to other pieces of musical data (such as MIDI sequences, instrument sounds, or sound effects) that are stored on a CD-ROM or remotely on an Internet server. The patent refers to these references as "work links," and they operate much like hyperlinks on a web page, pointing the user to a file stored in some other location.

The invention's claims deal with creating a musical work file (putting all the musical data into a single file), distributing the musical work file (sending and receiving it, over the Internet or otherwise), and playing the musical work (which may include following the "work links" and downloading the musical data that they point to). The patent specifies that the work files can be received and played in real time, essentially streaming the music.



Patent Figure 6

II. Claims at Issue

This patent's claims fall into two categories: claims relating to the creation of the musical work file; and claims relating to the transmission and playing of the musical work file. For each of these two functions, the patent lays out a number of claims: three broad claims[1], one more-detailed claim, and several variations on these claims. The most important claims for us to eliminate are the "independent" claims; many of the

1 These broad claims include a "method" claim, a "system" claim, and a claim for a computer program that implements the method.

A method claim describes the steps to accomplish a task, much as a recipe describes the steps to create a meal. A system claim is more detailed than a method claim. A system is like the machinery that is used to accomplish a method, or the set of appliances used to follow a recipe.

variations (or "dependent" claims) will fall without the independent claims to support them. Below, we summarize the patent's major claims.

Creating the musical work file:

The patent lays out a three-step method for creating musical work files, described in **Claim 16**: 1) receive music control signals; 2) receive a sound bank; and 3) store the control signals and sound bank together as a single file. This claim does not specify what actually carries out these steps; all that matters is that they are performed. **Claim 26** and **Claim 27** describe computer software that performs each of the above steps. **Claim 1** goes into more detail in describing a system to create a musical work file. This system uses a sound bank, an input device, a sequencer, and a "work manager" (which generates the musical work file).

Playing the musical work file:

Claim 36 describes a method for playing a musical work file. The method covers the steps of: 1) receiving the musical work file (which contains "downloadable-in-real-time" data); 2) processing the music sequence data; and 3) converting the processed music sequence data into sound. **Claim 44** and **Claim 45** describe computer software that performs each of the above steps. **Claim 28** describes a more detailed system that receives and plays the musical work file. It has an input terminal that receives the musical work file (which contains "downloadable-in-real-time" data), a synthesizer that processes the file, and a speaker system for playing the music.

Variations:

The patent defines many variations on these claims. The most important of these variations is the addition of "work links" to the musical work file (**Claims 24 and 42**). These links point to musical data stored elsewhere (such as on a CD-ROM or on the Internet); the player device attempts to download these files as it plays the musical piece.

III. Description of Prior Art Needed to Bust This Patent

The Seer Systems patent was filed on *July 11, 1997*. We need to find prior art that was publicly available before that date. Prior art can be in the form of a published patent, a printed publication (such as a web page, newsgroup post, public presentation, magazine article, or technical paper), a product manual, or literature related to a product or its sale. Publicly available software that was distributed before the filing date and that demonstrated the functionalities described in the patent may also be used as prior art.

To bust this patent completely, we need one or more pieces of prior art that disclose each of the elements in the various claims. But even busting one or two of the claims will help narrow the patent's reach.

The absolute best prior art will describe all of the required elements of each claim put together in the way described by the patent (here, combining a sequence of musical

notes and sound files into a new file type and playing that file, preferably by streaming it over the Internet). But even prior art that only partially covers a claim is useful if we can combine it with other pieces of prior art to fully cover the claim. For example, prior art that describes playing something like a "musical work file" could be combined with prior art that describes downloading media files in real time over the Internet.

We are especially interested in prior art relating to downloading and playing parts of "musical work files" in real time. A great piece of prior art would describe a system for streaming media files by taking the file one chunk at a time and downloading the necessary sound files and musical data for that chunk before playing that part and moving on to another chunk. But we are not limited to this type of prior art. Anything that can be mapped to the elements of a claim will be useful.

Below is a description of the prior art we are seeking for each key claim:

Creating the Musical Work File

A. Claims 16, 26, and 27

Claim 16 describes a method of creating a musical work file. Prior art to bust this claim must include or describe each of the following steps (if the prior art also involves using software to implement this method, we may also be able to bust Claims 26 and 27):

[a] receiving *music control signals*;

This would ideally involve receiving MIDI signals, though other kinds of music control signals would also work.

AND

[b] receiving a *sound bank* (or a portion of a sound bank) containing at least one instrument sound;

The prior art must receive sounds along with the music control signals. A "sound bank" is generally understood to be a set of instrument sounds that can be loaded into a synthesizer.

AND

[c] storing the control signals and the sound bank together as a single file.

The whole idea of this part of the claim is storing the two parts together so that they can be transferred over a network and played as a single file. A file type intended for network streaming would be ideal, but is not necessary. It would also be helpful if the system storing this file did any or all of the following: assigns header data to the musical work file; computes initialization data; reformats, imports and exports raw musical data; and certifies the musical work file.

B. Claim 1

Claim 1 is a more detailed description of a system that performs the three steps above. Where the above claims could use any means of creating the musical work file, this claim specifies devices to perform each step. Prior art to bust Claim 1 must contain:

> **[a] a sound bank containing at least one instrument sound;**

AND

> **[b] an input device for receiving music control signals;**

AND

> **[c] a *sequencer* coupled to the input device for storing the music control signals;**

A "sequencer," in the patent and as it is generally understood, is a device that stores music control signals and the related timing information.

AND

> **[d] a *work manager* coupled to the sound bank and to the sequencer for generating a musical work file containing the music control signals and at least a portion of the sound bank.**

The "work manager," in this patent is software for managing the musical work. It converts the raw musical data (control data, sound banks, effects) into a single file (the musical work file), and it can also perform other maintenance tasks on the musical work files, such as adding/updating header data, certifying the file, and so on.

Transferring and Playing the Musical Work File

C. Claims 36, 44, and Claim 45

Claim 36 describes a method of transferring and playing a musical work file. As with the claims above, we can also bust Claims 44 and 45 if the prior art implements this method using computer software. Prior art to bust these claims must involve the following steps:

> **[a] receiving a musical work file containing data that is *downloadable in real time*;**

Ideally, this prior art would be able to receive a work file streamed over a network, but

the claim is not limited to this means. A CD-ROM will also work, as should other means of transmitting the work file, so long as the system does not need to load all the data into memory before playing the musical piece (that is, the system can load the necessary data "in real time").

AND

[b] *processing* the music sequence data based on the topology information and the sound bank;

This step prepares the musical work file to be played by the synthesizer. It involves readying the musical data and initial settings, retrieving the necessary instrument sounds from the sound bank or work links, and ensuring that all necessary sounds are available.

AND

[c] *converting* the processed music sequence data into sound.

This step uses a synthesizer driver to convert the processed data into sound, which is then output to a speaker system.

D. Claim 28

Claim 28 is a more detailed description of a system that performs the three steps above. Where the above claims could use any means of playing the musical work file, this claim specifies devices to perform each step. Prior art to bust Claim 28 must contain:

[a] an *input terminal* for receiving a musical work file containing data that is downloadable in real-time;

AND

[b] a *synthesizer* for processing the music sequence data (the synthesizer is attached to the input terminal and is capable of adding downloadable-in-real-time sounds);

The prior art needs to have some kind of sound synthesizer engine that can load sounds (from the work file or from a network) on the fly.

AND

[c] a *speaker system* connected to the synthesizer for converting the processed music sequence data into sound.

E. Claims 24 and 42

These claims extend the "musical work file" to include "work links"—links to musical data stored in some other location. Claim 24 deals with the creation of work files with links, and Claim 42 deals with the transmission and playing of work files with links.

This element is not necessary to bust the patent's major claims, but ideally we would like to find prior art that covers these claims as well.

IV. Where to Send Prior Art

If you are aware of prior art which you believe could be used to invalidate any claim(s) of this patent, please send that information to: priorart@eff.org or go to the web form located at http://w2.eff.org/patent/wanted/contribute.php?p=seer.

GLOSSARY

Term	Definition	Example
Certifying	Verifying the integrity of data being exchanged between two parties and guaranteeing authorized use of this data	
Downloadable-in-real-time	Streaming, wherein the player begins playing audio and/or video from one location in the file while it is receiving later parts of the file from the server	Streaming a work file over a network, e.g., streaming audio, whereby the file need not be fully "loaded" before the file begins playing
Input device	A hardware or software device for receiving music control signals	A composer server that receives, for example, a MIDI sequence
Input terminal	A device for receiving data	
Instrument sounds	A sound source(s)	The sound from, e.g., a piano, drums, or guitar
Mix changes and effect changes	Alterations of the parameters controlling the processing of signals	Changes in parameters such as pitch, note duration, tempo, rhythm
Music control signals	Signals for controlling a musical work	A MIDI sequence
Musical work file	File containing musical data	
Network communications	A device that sends data to	

Term	Definition	Example
interface	and/or receives data from a network	
Sample bank	A collection of one or more digital recordings	
Sequencer	A device that stores music control signals and the related timing information	
Serial number	A number used to identify	Any identification number
Sound bank	A collection of one or more sounds sources	
Topology information	A description of the configuration of processors	
Work certifier	Work certifier, which is software	
Work link	Reference to musical data	Links to musical data stored on, for example, a CD-ROM or an internet server
Work link data	Musical data	
Work manager	Software for managing a musical work	Any software that, for example, performs maintenance tasks such as adding/updating header data, certifying the file, etc.