

determined sampling frequency; and generating the musical sound based on the actual digital waveform according to the provided performance information.

[0007] Furthermore, the invention relates to a machine readable media containing instructions for causing said machine to perform a method of creating a digital waveform to generate a musical sound according to performance information. The method performed comprises the steps of: providing performance information; preparing a computerized waveform generator operable based on a given algorithm at a variable operation speed to create a digital waveform by successively computing sample values of the digital waveform; provisionally operating the computerized waveform generator to carry out trial creation of a model digital waveform while measuring the operation speed at which the trial creation is carried out; optimally determining a sampling frequency comparable to the measured operation speed; actually operating the computerized waveform generator to enable the same to successively compute sample values of an actual digital waveform at the determined sampling frequency; and generating the musical sound based on the actual digital waveform according to the provided performance information.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Figure 1 is a schematic block diagram illustrating a first embodiment of the inventive musical sound generator.

Figure 2 is a schematic block diagram illustrating a variation of the embodiment shown in Figure 1.

Figure 3 is a schematic block diagram illustrating another variation of the embodiment shown in Figure 1.

Figure 4A is a schematic block diagram illustrating an arrangement in which a sound source device and its peripheral devices are integrated with each other.

Figure 4B is a schematic block diagram illustrating an arrangement in which a DSP and its peripheral devices are integrated with each other.

Figure 5 illustrates operating modes in the first embodiment according to the present invention.

Figure 6 is a memory map of a RAM provided in the first embodiment.

Figure 7 is a flowchart illustrating an overall process executed in the first embodiment.

Figure 8 is a flowchart illustrating a waveform synthesizing program executed in the first embodiment.

Figure 9 is a flowchart illustrating the waveform synthesizing program executed in the first embodiment.

Figure 10 is a flowchart illustrating the waveform synthesizing program executed in the first embodi-

ment.

Figure 11 is a flowchart illustrating the waveform synthesizing program executed in the first embodiment.

Figure 12 is a flowchart illustrating the waveform sample value loading process executed in the waveform synthesizing program.

Figure 13 is a flowchart illustrating the waveform sample value computation process executed in the waveform synthesizing program.

Figure 14 is a flowchart illustrating the waveform sample value computation executed by CPU in the waveform synthesizing program.

Figure 15 is a flowchart illustrating the synthesizing process by a selected hardware in the waveform synthesizing program.

Figure 16 is a flowchart illustrating the synthesizing process by the selected hardware in the waveform synthesizing program.

Figure 17 is a flowchart illustrating a timer process in the waveform synthesizing program.

Figure 18 is a flowchart illustrating a synthesizing process by a selected hardware in a second embodiment.

Figure 19 is a flowchart illustrating a synthesizing process by a selected hardware in a third embodiment.

Figure 20 is a flowchart illustrating a synthesizing process by a selected hardware in a fourth embodiment.

Figure 21 is a schematic block diagram illustrating a variation to which the present invention is applied.

Figure 22 is a schematic block diagram illustrating another variation to which the present invention is applied.

Figure 23 is a schematic block diagram illustrating a further variation to which the present invention is applied.

Figure 24 is a schematic block diagram illustrating a still further variation to which the present invention is applied.

Figure 25 is a schematic block diagram showing an additional embodiment of the inventive musical sound generating apparatus.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Details of embodiments of the present invention will be described hereunder with reference to the drawings. Figure 1 is a schematic block diagram showing a first embodiment of a musical sound generator according to the present invention. In Figure 1, numeral 10 denotes a CPU, which controls various units composing a computer system via a data bus 12, according to a basic program stored in a ROM 11. Numeral 13 denotes a RAM temporarily storing various registers, flags and data. Numeral 14 denotes an I/O port of the multi type which receives and transmits MIDI informa-