

General MIDI System Level 1

PLEASE SEE MMA PUBLICATION "General MIDI System Level 1 Developer Guidelines" (1996) FOR ADDITIONAL RECOMMENDATIONS AND CLARIFICATIONS RELATED TO THIS SPECIFICATION.

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GM System - Overview

This Specification outlines a minimum MIDI configuration of a "General MIDI System" which defines a certain class of MIDI controlled sound generators. The General MIDI (or GM) System provides a high degree of compatibility between MIDI synthesizers, and adds the ability to play songs (in the form of MIDI data) created for any given MIDI synthesizer module that follows this Specification.

This class of products are intended for broad applications in the music, consumer, and entertainment markets, due to increased compatibility and unprecedented ease-of-use.

Background

Without this specification, when an end user tries to play back MIDI data on a given set of MIDI synthesizers the results can vary widely depending on what MIDI synthesizers are involved and what their capabilities are. The MIDI data has to be specially prepared for those particular synthesizers and drum machines in order to sound exactly as originally intended.

For example, the sound that plays on MIDI note messages sent over channel one/program number one is determined by the individual synthesizer manufacturer. However, there usually is little similarity between program numbers and expected timbres on today's popular synthesizers. Other examples are the variability of pitch bend range, octave registration, or the drum note mapping.

This variety is wonderful for professional users, but can be troublesome for consumers and music authors. Therefore, it has in the past been virtually impossible to produce MIDI data that will play on all of the popular MIDI synthesizers. The data had to be made manufacturer and device specific. This has limited the availability of MIDI data titles to individual instruments or at best to those of a particular manufacturer.

The main barrier to resolving this problem is that the original MIDI specification does not specify a "minimum MIDI configuration" or set of capabilities that one could rely on being in a given synthesizer. A particular MIDI device has no idea what MIDI device is connected to the other end of its MIDI cable, and until now there was no industry-standard minimum configuration that manufacturers or authors could use as a reference.

The Solution

This General MIDI System is the solution to that problem. It describes a minimum number of voices, sound locations, drum note mapping, octave registration, pitch bend range, and controller usage, thereby defining a given set of capabilities to expect in a given synthesizer module. This mode will be identified by a logo on the instrument such as the "Compact Disc" logo shown on all devices supporting the CD standard.

General MIDI is a mode that synthesizers can be switched in and out of to provide a common "base case." Higher end products will likely support additional modes of operation and should not be limited by General MIDI. The General MIDI Specification is also left open to further extensions (or "levels") for advanced applications and continued improvements.

GM System - Level 1 Performance Requirements

General MIDI Sound Generator Requirements

Synthesis/Playback Technology (Sound Source Type):

- Up to the manufacturer.

Number of Voices:

- A minimum of:
 - 1) 24 fully dynamically allocated voices available simultaneously for both melodic and percussive sounds; or
 - 2) 16 dynamically allocated voices for melody plus 8 for percussion.

MIDI Channels Supported:

- All 16 MIDI channels.
- Each channel can play a variable number of voices (polyphony).
- Each channel can play a different instrument (timbre).
- Key-based Percussion is always on channel 10.

Instruments:

- A minimum of 128 presets for Instruments (MIDI program numbers), conforming to the "GM Sound Set" (see Table 2)
- A minimum of 47 preset percussion sounds conforming to the "GM Percussion Map" (see Table 3)

General MIDI Sound Generator Recommended Hardware

- Master Volume control.
- MIDI In connector (Out and Thru connectors are optional).
- Audio Out (2 – left & right) plus Headphones connectors.

Level 1 Performance Requirements

General MIDI Protocol Implementation Requirements

Note on/Note off:

- Octave Registration: Middle C = MIDI Key 60 (3CH)
- All voices, including percussion, respond to velocity
- Voices dynamically allocated (notes/drums can re-attack using free voices)

Controller Changes:

<u>Controller #</u>	<u>Description</u>
1	Modulation
7	Volume
10	Pan
11	Expression
64	Sustain
121	Reset All Controllers
123	All Notes Off

<u>Registered Parameter #</u>	<u>Description</u>
0	Pitch Bend Sensitivity
1	Fine Tuning
2	Coarse Tuning

Channel Messages:

- Channel Pressure (Aftertouch)
- Pitch Bend (default range = ± 2 semitones)

Default Settings:

- Bend="0", Volume="100" (0-127), Controllers "normal"

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