MIDI-CI Profile for Default Drum Note Map

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PREFACE

MIDI Association Document M2-125-UM
MIDI-CI Profile for Default Drum Note Map

The MIDI-CI specification and the Common Rules for MIDI-CI Profiles define how Devices with similar applications or of a similar Device type can negotiate to use a common set of MIDI messages, called a MIDI-CI Profile, or simply a Profile.

Devices which implement a Profile have a high level of interoperability with each other. Profiles are a beneficial component in enabling intelligent auto-configuration.

A Profile is a defined set of rules for how a MIDI receiver Device implementing the Profile shall respond to a chosen set of MIDI messages, to achieve a particular purpose or to suit a particular application. In addition to defining response to MIDI messages, a Profile may optionally also define other Device functionality requirements. This definition also then implies MIDI implementation of a sender or in some cases may require a defined MIDI implementation of a sender.

This specification defines a MIDI-CI Profile for a default mapping of drum sounds to Note Numbers. The mapping is based on the commonly shared mapping in many MIDI products since the 1980s. This same mapping was adopted in the 1990s into General MIDI specifications.

For details of MIDI-CI Profile Negotiation mechanisms which are necessary to implement these Profile specifications, please read the MIDI-CI and Common Rules for MIDI-CI Profiles specifications.

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Version History

Table 1 Version History

Publication Date	Version	Changes
2025-01-31	1.0	Initial release

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1 References

1.1.1 Normative References

[MA01] ***Complete MIDI 1.0 Detailed Specification***, Document Version 96.1, Third Edition, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA02] ***M2-100-U MIDI 2.0 Specification Overview***, Version 1.1, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA03] ***M2-101-UM MIDI Capability Inquiry (MIDI-CI)***, Version 1.2, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA04] ***M2-102-U Common Rules for MIDI-CI Profiles***, Version 1.1, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA05] ***M2-103-UM Common Rules for Property Exchange***, Version 1.1, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA06] ***M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol***, Version 1.1, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA07] ***M2-118-UM MIDI-CI Profile for General MIDI 2***, Version 1.0.0, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

[MA08] ***M2-115-U MIDI 2.0 Bit Scaling and Resolution***, Version 1.0.1, Association of Musical Electronics Industry, https://www.amei.or.jp/, and The MIDI Association, https://www.midi.org/

1.2 Terminology

1.2.1 Definitions

AMEI: Association of Musical Electronics Industry. Authority for MIDI Specifications in Japan.

Controller Message: Any MIDI Message from the following list:

MIDI 1.0 and MIDI 2.0 Protocol:

- Control Change
- Channel Pressure (Aftertouch)
- Poly Pressure (Key Aftertouch)
- Registered Controller (RPN)
- Assignable Controller (NRPN)
- Pitch Bend

MIDI 2.0 Protocol only:

- Registered Per-note Controller (including Relative versions)
- Assignable Per Note Controller (including Relative versions)
- Per Note Pitch Bend

Destination: A Receiver to which the Sender intends to send MIDI messages.

Device: An entity, whether hardware or software, which can send and/or receive MIDI messages.

Device ID: A one-byte field in Universal System Exclusive messages, as defined in the MIDI 1.0 Specification ***[MA01],*** to indicate which device in the system is supposed to respond. The more specific application of Device ID in MIDI-CI messages is defined in the MIDI Capability Inquiry specification ***[MA03]***. The use of "Device" in this context is not the same as a Device as defined above.

Drum Note Map Profile: The MIDI-CI Profile for Default Drum Note Map specification.

Initiator: One of two MIDI-CI Devices with a bidirectional communication between them. Initiator has the management role of setting and negotiating parameters for interoperability between the two Devices. The primary goal of Initiator is usually (but not strictly required to be) configuring two Devices for subsequent communication from Initiator as MIDI transmitter to Responder as MIDI receiver. The role of Initiator and Responder may alternate between the two MIDI-CI Devices. Either MIDI-CI Device may initiate a MIDI Transaction (act as Initiator) at any time. Also see Responder.

Inquiry: A message sent by an Initiator to begin a Transaction.

MA: MIDI Association. Authority for MIDI specifications worldwide except Japan. See also MMA.

MIDI 1.0 Protocol: Version 1.0 of the MIDI Protocol as originally specified in ***[MA01]*** and extended by MA and AMEI with numerous additional MIDI message definitions and Recommended Practices. The native format for the MIDI 1.0 Protocol is a byte stream, but it has been adapted for many different transports. MIDI 1.0 messages can be carried in UMP packets. The UMP format for the MIDI 1.0 Protocol is defined in the M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification ***[MA06]***.

MIDI 1.0 Specification: Complete MIDI 1.0 Detailed Specification, Document Version 96.1, Third Edition ***[MA01]***.

MIDI 2.0: The MIDI environment that encompasses all of MIDI 1.0, MIDI-CI, Universal MIDI Packet (UMP), MIDI 2.0 Protocol, MIDI 2.0 messages, and other extensions to MIDI as described in AMEI and MA specifications. See the MIDI 2.0 Specification Overview ***[MA02]***.

MIDI 2.0 Protocol: Version 2.0 of the MIDI Protocol. The native format for MIDI 2.0 Protocol messages is UMP as defined in M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification ***[MA06]***.

MIDI-CI: MIDI Capability Inquiry ***[MA03]***, a specification published by The MIDI Association and AMEI.

MIDI-CI Device: A Device that has the ability to act as a Responder that replies to inquiries received from an Initiator. The ability to act as an Initiator is recommended but optional.

MIDI-CI Transaction: A Transaction using a set of MIDI-CI messages that includes an Inquiry sent by an Initiator and a reply to the Inquiry returned by the Responder. The Responder's reply to an Inquiry might be a single message that satisfies the Inquiry, a set of multiple messages that satisfy the Inquiry, or an error message. See also Transaction.

MIDI Endpoint: A Device which is an original source of MIDI messages or final consumer of MIDI messages.

MIDI In: A hardware or software MIDI connection used by a MIDI Device to receive MIDI messages from a MIDI Transport.

MIDI Manufacturers Association: A California nonprofit 501(c)6 trade organization, and the legal entity name of the MIDI Association.

MIDI Out: A hardware or software MIDI connection used by a MIDI Device to transmit MIDI messages to a MIDI Transport.

MIDI Thru: A hardware or software MIDI connection used by a MIDI Device to retransmit MIDI messages the device has received from a MIDI In.

MIDI Transport: A hardware or software MIDI connection used by a Device to transmit and/or receive MIDI messages to and/or from another Device.

MMA: See MIDI Manufacturers Association.

MUID (MIDI Unique Identifier): A 28-bit random number generated by a Device used to uniquely identify the Device in MIDI-CI messages sent to or from that Device.

Note Data Messages: MIDI messages which include a Note Number field. These include Note On/off, Poly Pressure, Per-Note Pitchbend, Registered Per-Note Controllers, Assignable Per-Note Controllers, and Per-Note Management Message**.**

NRPN: Non-Registered Parameter Number, a type of controller message defined in the MIDI 1.0 Protocol. NRPNs have equivalent messages in the MIDI 2.0 Protocol, called Assignable Controllers (see ***[MA06]***).

Profile: An MA/AMEI specification that includes a set of MIDI messages and defined responses to those messages. A Profile is controlled by MIDI-CI Profile Negotiation Transactions. A Profile may have a defined minimum set of mandatory messages and features, along with some optional or recommended messages and features. See the MIDI-CI specification ***[MA03]*** and the Common Rules for MIDI-CI Profiles ***[MA04]***.

Protocol: There are two defined MIDI Protocols: the MIDI 1.0 Protocol and the MIDI 2.0 Protocol, each with a data structure that defines the semantics for MIDI messages. See the M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification ***[MA06]***.

Receiver: A MIDI Device which has a MIDI Transport connected to its MIDI In.

Responder: One of two MIDI-CI Devices with a bidirectional communication between them. The Responder is the Device that receives an Inquiry message from an Initiator Device as part of a MIDI-CI Transaction and acts based on negotiation messages managed by the Initiator Device. Also see Initiator.

RPN: Registered Parameter Number, a type of controller message defined in the MIDI 1.0 Protocol**.** RPNs have equivalent messages in the MIDI 2.0 Protocol, called Registered Controllers (see ***[MA06]***).

Sender: A MIDI Device which transmits MIDI messages to a MIDI Transport which is connected to its MIDI Out or to its MIDI Thru port.

Source: A Source is a Sender which originates or generates MIDI messages. A Source does not include a Sender which is retransmitting messages which originated in another MIDI Device.

Transaction: An exchange of MIDI messages between two MIDI Devices with a bidirectional connection. All the MIDI messages in a single Transaction are associated and work together to accomplish one function. The simplest Transaction generally consists of an inquiry sent by one MIDI Device and an associated reply returned by a

second MIDI Device. A Transaction may also consist of an inquiry from one MIDI Device and several associated replies from a second MIDI Device. A Transaction may be a more complex set of message exchanges, started by an initial inquiry from one MIDI Device and multiple, associated replies exchanged between the first MIDI Device and a second MIDI Device.

UMP: Universal MIDI Packet.

UMP Endpoint: A MIDI Endpoint which uses the UMP Format.

UMP Format: Data format for fields and messages in the Universal MIDI Packet, see ***[MA06]***.

UMP MIDI 1.0 Device: any Device that sends or receives MIDI 1.0 Protocol messages using the UMP Format, see ***[MA06]***. Such Devices may use UMP Message Types that extend the functionality beyond Non-UMP MIDI 1.0 Systems.

Universal MIDI Packet (UMP): The Universal MIDI Packet is a data container which defines the data format for all MIDI 1.0 Protocol messages and all MIDI 2.0 Protocol messages. UMP is intended to be universally applicable, i.e., technically suitable for use in any transport where MA/AMEI elects to officially support UMP. For detailed definition see M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification ***[MA06]***.

1.2.2 Reserved Words and Specification Conformance

In this document, the following words are used solely to distinguish what is required to conform to this specification, what is recommended but not required for conformance, and what is permitted but not required for conformance:

Table 2 Words Relating to Specification Conformance

Word	Reserved For	Relation to Specification Conformance
shall	Statements of requirement	**Mandatory** A conformant implementation conforms to all 'shall' statements.
should	Statements of recommendation	**Recommended but not mandatory** An implementation that does not conform to some or all 'should' statements is still conformant, providing all 'shall' statements are conformed to.
may	Statements of permission	**Optional** An implementation that does not conform to some or all 'may' statements is still conformant, providing that all 'shall' statements are conformed to.

By contrast, in this document, the following words are never used for specification conformance statements; they are used solely for descriptive and explanatory purposes:

Table 3 Words Not Relating to Specification Conformance

Word	Reserved For	Relation to Specification Conformance
must	Statements of unavoidability	Describes an action to be taken that, while not required (or at least not directly required) by this specification, is unavoidable. Not used for statements of conformance requirement (see 'shall' above).
will	Statements of fact	Describes a condition that as a question of fact is necessarily going to be true, or an action that as a question of fact is necessarily going to occur, but not as a requirement (or at least not as a direct requirement) of this specification. Not used for statements of conformance requirements (see 'shall' above).
can	Statements of capability	Describes a condition or action that a system element is capable of possessing or taking. Not used for statements of conformance permission (see 'may' above).
might	Statements of possibility	Describes a condition or action that a system element is capable of electing to possess or take. Not used for statements of conformance permission (see 'may' above).

1.3 Protocol and Data Format Conventions

1.3.1 MIDI 1.0 Protocol and MIDI 2.0 Protocol

This document describes the use of messages in the MIDI 2.0 Protocol. However, Devices which conform to the Profile in this specification may implement either the MIDI 2.0 Protocol or the MIDI 1.0 Protocol. For a comparison of the Protocols and for mechanisms to select a Protocol see the M2-104-UM Universal MIDI Packet (UMP) Format and MIDI 2.0 Protocol specification ***[MA06]***.

> *Note: Section* **6.2** *is an exception, presenting MIDI 1.0 data format and values because it defines the use of a System Exclusive mechanism which is included specifically for Devices which use MIDI 1.0.*

1.3.2 Registered Controllers (RCs) and Registered Parameter Numbers (RPNs)

This document describes the use of RC messages in the MIDI 2.0 Protocol. These translate directly to RPN messages in the MIDI 1.0 Protocol. Devices which conform to the Profiles in this specification may implement the MIDI 2.0 Protocol with RC messages or the MIDI 1.0 Protocol with RPN messages. Scaling of values between RCs and RPNs is addressed in Section 1.3.3.

1.3.3 Resolution and Bit Scaling

In this document, values are expressed according to the ranges and resolutions defined in fields of the MIDI 2.0 Protocol. Any MIDI 1.0 Protocol Device or system that is using this Profile must scale the values to suit the Device or system. For example, a 32-bit value of a Registered Controller might be scaled to a 14-bit value or a 7-bit value in the corresponding Registered Parameter Number.

Scaling methods are defined in the M2-115-UM MIDI 2.0 Bit Scaling and Resolution specification ***[MA08]***.

2 Introduction

2.1 Executive Summary

This specification is intended to promote compatibility between a wide range of products which generate drum sounds.

> *For example, a drum pattern which is programmed on a drum machine or portable keyboard can also send MIDI Note messages to play the pattern on a software based drum application and remain musically useful.*

This specification defines a MIDI-CI Profile for a default mapping of specific drums to specific Note Numbers. The note map used in this Profile was established by many products in the 1980s as a commonly used set of note assignments for drum sounds and that was later standardized in General MIDI.

Many drum machines, grooveboxes, keyboard workstations, portable keyboards, digital pianos, and software synthesizers (many of which do NOT support the full GM specification) have drum kits that utilize this drum kit mapping because of the vast quantity of MIDI data available that will play properly with these drum maps.

> *For example, a Kick Drum is always played on Note Number 0x24, and a Snare Drum is always played on Note Number 0x26. As a result, a pattern programmed for a hihat sound on one device which conforms to the Profile will play a hihat sound on any other device which conforms to the Profile. This Profile also supports some other key features like mutually exclusive sounds. For example, a closed hihat and an open hihat cannot sound simultaneously.*

This Profile has far broader applications than a more rigidly defined GM Drum map because it allows sound designers the freedom to map any sound to the Default Note assigned to Bass Drum or Snare and experiment with matching existing MIDI sequence data to new sonic possibilities.

2.2 Background

This Profile specification relies on mechanisms defined by the MIDI-CI (Capabilities Inquiry) specification. MIDI-CI allows devices to communicate their capabilities to each other. Devices can use that capabilities information to self-configure their MIDI connections and related settings. Profiles are a beneficial component in enabling intelligent auto-configuration between 2 devices.

Profiles define specific implementations of a set of MIDI messages chosen to suit a particular instrument, device type, or to accomplish a particular task. Two devices that conform to the same Profile will generally have greater interoperability between them than devices using MIDI without Profiles. Profiles increase interoperability and ease of use while lowering the need for manual configuration of devices by users.

Further information required for implementing this device Profile is found in the Common Rules for MIDI-CI Profiles specification.

3 MIDI-CI Functions

This section defines functions which operate on the Channel of the Drum Note Map Profile.

3.1 MIDI-CI Profile Configuration

This section defines the response to Profile Configuration messages including the Drum Note Map Profile Identification.

MIDI-CI Profile Configuration Messages identify and control each Profile uniquely using several fields in MIDI-CI Profile Configuration messages. The Profile identifiers for this Drum Note Map Profile are as follows:

Table 4 Five Bytes Profile ID

Profile ID Byte 1	0x7E (Standard Defined Profile)
Profile ID Byte 2	0x20 (Drum Note Map Profile Number MSB)
Profile ID Byte 3	0x03 (Drum Note Map Profile Number LSB)
Profile ID Byte 4	0x01 (Drum Note Map Profile Version)
Profile ID Byte 5	0xXX (Drum Note Map Profile Level)

Drum Note Map Profile Level:

- 0x00 Some implementation but does not comply with minimum requirements
- 0x01 Meets the minimum requirements
- 0x02-0x7E Reserved
- 0x7F Highest level of Profile support (Same as 0x01 in this Profile)

4 Drum Note Map Profile

This MIDI-CI Profile for Default Drum Note Map specification defines, as a minimum requirement, that a conforming Device shall use the Note Number mapping defined in ***Table 5***.

This Profile specification also defines the optional use of certain Control Change messages and MIDI 2.0 Per-Note Controllers.

4.1 Mapping Drum Sounds to Note Numbers

All Devices which support this MIDI-CI Profile for Default Drum Note Map shall assign sounds which it can play to match the mapping defined in ***Table 5***.

A Device is not required to be able to play all of the listed sounds and may include only a subset of the total list of sounds in the Drum Note Map.

A Device may include extra sounds assigned to Note Numbers 0 through 26 and 89 through 127.

Table 5 Drum Note Map

Note # Decimal	Note # Hex	Name	Mutually Exclusive Set	Recommended Pan Position (optional)	Profile Details Discovery Bitmap	
					Byte	Bit
27	0x1B	High Q		Left 23%	2	0
28	0x1C	Slap		Left 23%	2	1
29	0x1D	Scratch Push	MES 7	Left 16%	2	2
30	0x1E	Scratch Pull	MES 7	Left 16%	2	3
31	0x1F	Sticks		Center	2	4
32	0x20	Square Click		Left 16%	2	5
33	0x21	Metronome Click		Center	2	6
34	0x22	Metronome Bell		Center	3	0
35	0x23	Acoustic Bass Drum		Center	3	1
36	0x24	Bass Drum 1		Center	3	2
37	0x25	Side Stick		Center	3	3
38	0x26	Acoustic Snare		Center	3	4
39	0x27	Hand Clap		Left 16%	3	5
40	0x28	Electric Snare		Center	3	6
41	0x29	Low Floor Tom		Left 47%	4	0
42	0x2A	Closed Hi-hat	MES 1	Right 32%	4	1
43	0x2B	High Floor Tom		Left 28%	4	2
44	0x2C	Pedal Hi-hat	MES 1	Right 32%	4	3

Note # Decimal	Note # Hex	Name	Mutually Exclusive Set	Recommended Pan Position (optional)	Profile Details Discovery Bitmap	
					Byte	Bit
45	0x2D	Low Tom		Left 9%	4	4
46	0x2E	Open Hi-hat	MES 1	Right 32%	4	5
47	0x2F	Low-Mid Tom		Right 10%	4	6
48	0x30	High Mid Tom		Right 29%	5	0
49	0x31	Crash Cymbal 1		Right 32%	5	1
50	0x32	High Tom		Right 48%	5	2
51	0x33	Ride Cymbal 1		Left 31%	5	3
52	0x34	Chinese Cymbal		Left 31%	5	4
53	0x35	Ride Bell		Left 31%	5	5
54	0x36	Tambourine		Right 16%	5	6
55	0x37	Splash Cymbal		Left 16%	6	0
56	0x38	Cowbell		Right 32%	6	1
57	0x39	Crash Cymbal 2		Left 31%	6	2
58	0x3A	Vibra-slap		Left 55%	6	3
59	0x3B	Ride Cymbal 2		Left 31%	6	4
60	0x3C	High Bongo		Right 56%	6	5
61	0x3D	Low Bongo		Right 56%	6	6
62	0x3E	Mute High Conga		Left 39%	7	0
63	0x3F	Open High Conga		Left 39%	7	1
64	0x40	Low Conga		Left 39%	7	2
65	0x41	High Timbale		Right 32%	7	3
66	0x42	Low Timbale		Right 32%	7	4
67	0x43	High Agogo		Left 55%	7	5
68	0x44	Low Agogo		Left 55%	7	6
69	0x45	Cabasa		Left 55%	8	0
70	0x46	Maracas		Left 63%	8	1
71	0x47	Short Whistle	MES 2	Right 56%	8	2

Note # Decimal	Note # Hex	Name	Mutually Exclusive Set	Recommended Pan Position (optional)	Profile Details Discovery Bitmap	
					Byte	Bit
72	0x48	Long Whistle	MES 2	Right 56%	8	3
73	0x49	Short Guiro	MES 3	Right 48%	8	4
74	0x4A	Long Guiro	MES 3	Right 48%	8	5
75	0x4B	Claves		Right 32%	8	6
76	0x4C	High Wood Block		Right 56%	9	0
77	0x4D	Low Wood Block		Right 56%	9	1
78	0x4E	Mute Cuica	MES 4	Left 31%	9	2
79	0x4F	Open Cuica	MES 4	Left 31%	9	3
80	0x50	Mute Triangle	MES 5	Left 63%	9	4
81	0x51	Open Triangle	MES 5	Left 63%	9	5
82	0x52	Shaker		Right 48%	9	6
83	0x53	Jingle Bell		Right 56%	10	0
84	0x54	Bell Tree		Right 60%	10	1
85	0x55	Castanets		Left 47%	10	2
86	0x56	Mute Surdo	MES 6	Left 31%	10	3
87	0x57	Open Surdo	MES 6	Left 31%	10	4
88	0x58	Applause		Center	10	5

Sound Names: Undefined Tonal Quality

The tonal qualities or properties of each sound is not defined. Each sound is defined in name only, although that name implies at least a musical role. A sound designer and/or device designer may freely decide what sound they will provide to best suit each of the named sounds.

A Device may substitute a sound which is not identical to the name of the sound, if that sound is intended in context to fill a similar role to the named sound.

> *For example: A Device may have an electronic kick drum sound as the bass drum sound on Note Number 0x24 and a longer or deeper version of the electronic kick drum on Note Number 0x23, even though Note Number 0x23 is named "Acoustic Bass Drum".*

Mutually Exclusive Sets (MES)

Some sounds require a mutually exclusive Note On/Off assignment. For example, when a Note On message for Note number 42 (Closed Hi Hat) is received while Note number 46 (Open Hi Hat) is sounding, Note number 46 is promptly muted and Note number 42 sounds.

The following combinations of timbres use mutually exclusive assignments. When any sound which belongs to any of the following Mutually Exclusive Sets (MES) starts to play, all other sounds in the same Mutually Exclusive Set shall be muted.

- MES 1: Closed HH (42) / Pedal HH (44) / Open HH (46)
- MES 2: Short Whistle (71) / Long Whistle (72)
- MES 3: Short Guiro (73) / Long Guiro (74)
- MES 4: Mute Cuica (78) / Open Cuica (79)
- MES 5: Mute Triangle (80) / Open Triangle (81)
- MES 6: Mute Surdo (86) / Open Surdo (87)
- MES 7: Scratch Push (29) / Scratch Pull (30)

Pan Position

If sounds are mixed in a main audio output which is in stereo, then each sound may be placed according to the recommended Pan Position. The Pan Position for each sound may be set by a Registered Per-Note Controller (see Section ***6.1.2***).

4.2 Note On / Note Off

Each sound is triggered by a Note On message. Every Note On message shall be followed by a matching Note Off message.

The timing of the Note Off message may be determined by the Sender. For example, a Sender which is a drum pad might typically send a Note Off shortly after the Note On but a Sender which is a keyboard might typically send a Note Off whenever the player releases the key.

In many Devices the Note Off message has no impact on the sound output for drum sounds. For most sounds, the Receiver should play the whole life cycle of the sound regardless of the timing of a Note Off message.

5 Response to Control Change Messages

A Device which conforms to the Drum Note Map Profile should respond to Control Change messages to set the properties on the specified MIDI Channel as defined below.

5.1 Volume – CC#7

A controller which is set by a main volume knob (or similar control mechanism) applied to all sounds. Regarding the curve of volume change messages, the square of the value is proportional to the volume.

Table 6 Response to CC#7 Volume

CC#7	Amplitude
0xFFFFFFFF	0 dB
0xC1041041	-4.9 dB
0x80000000	-11.9 dB
0x40000000	-23.9 dB
0x20000000	-36.0 dB
0x00000000	-infinity

The formula used is:

$$\text{gain in dB} = 40 * \log_{10}(\text{CC\#7}/\text{0xFFFFFFFF})$$

Default = 0xC8000000

Also see Section ***6.1.1*** for information about Per-Note Volume Control.

5.2 Reverb Send Level – CC#91 (Effects 1 Depth)

Sets the reverb send level for the Channel. The curve responding to the value shall be linear with respect to amplitude. Send level is 100% at value 0xFFFFFFFF.

Also see Section ***6.1.8*** for information about Per-Note Reverb Control.

5.3 Channel Mode Messages

The following sections define the response to Mode messages.

5.3.1 All Sound Off – CC#120

Value: 0x00000000

When this message is received, all the Notes sounding shall be immediately released, and the sound is muted as quickly as possible without producing a click or other audible noise.

5.3.2 Reset All Controllers – CC#121

Default Value: 0x00000000

When value is 0x00000000, this message shall reset the status of Control Change messages (except as noted in the following paragraph) to default values, Channel pressure to 0x00000000, and Pitch Bend to 0x80000000(center) on the specified Channel.

Program Change, Bank Select (0/32), Channel Volume (7), Pan (10), and Expression (11) shall not be reset.

5.3.3 All Notes Off – CC#123

This message shall turn off all Notes sounding on the Receiver.

5.3.4 Other Mode Messages – CC#124-127

Response to the following Mode messages is optional and device implementation specific:

- Omni Mode Off (CC#124)
- Omni Mode On (CC#125)
- Mono Mode On (CC#126)
- Poly Mode On (CC#127)

6 Response to Registered Per-Note Controller Messages

The Default Drum Note Map Profile defines 2 optional mechanisms to set properties on a specified Note Number

1. Per-Note Controller messages as defined in Section ***6.1***.
2. Key-Based Instrument Controllers Universal System Exclusive messages as defined in Section ***6.2***.

6.1 Response to Registered Per-Note Controller Messages

A Device which conforms to the Drum Note Map Profile and the MIDI 2.0 Protocol may implement Registered Per-Note Controllers to set the properties on the specified Note Number as defined in Sections ***6.1.1*** through ***6.1.8***.

A Receiver which responds to these Registered Per-Note Controllers shall treat these Registered Per-Note Controllers as persistent for all future Notes. The Per Note Management message may be used to reset these to default values and/or detach all Registered Per-Note Controllers from a currently sounding Note (see ***[MA06]***). For any Registered Per-Note Controller which does not have a defined default value, the Receiver may determine its preferred default value.

6.1.1 Volume – RPNC#7

A Registered Per-Note Controller which sets the volume of the sound on each Note Number. Regarding the curve of volume change messages, the square of the value is proportional to the volume.

Table 7 Response to RPNC#7 Volume

RPNC#7	Amplitude
0xFFFFFFFF	0 dB
0xC1041041	-4.9 dB
0x80000000	-11.9 dB
0x40000000	-23.9 dB
0x20000000	-36.0 dB
0x00000000	-infinity

The formula used is:

$$\text{gain in dB} = 40 * \log_{10}(\text{RPNC\#7}/0\text{xFFFFFFFF})$$

Default = 0xC8000000

The Volume level set by this RPNC for the specified Note Number is relative to any value set by the Control Change #7 (see Section *Error! Reference source not found.*).

> For example: If a CC#7 sets Volume for the whole Channel to -3 dB and a subsequent PNCC#7 sets the Volume for Note Number 64 to -2 dB, then the sound assigned to Note Number #64 should sound at a Volume of -5 dB, while the sounds on other Note Numbers continue to sound a Volume of -3 dB.

6.1.2 Pan – RPNC#10

A Registered Per-Note Controller which sets the left to right pan position of the sound on each Note Number.

This message will pan a sound anywhere in the stereo field from left 100% to right 100%.

The recommended (optional) default pan value for each sound is shown in ***Table 5***.

0x00000000 = Left 100%

0x80000000 = Center (Left 0%, Right 0%)

0xFFFFFFFF = Right 100%

6.1.3 Timbre/Harmonic Intensity (Sound Controller 2) – RPNC#71

Default Value: 0x80000000 (no change)

Sets the strength of the resonance effect for filter(s) for the specified Note Number. Exact behavior is left to the manufacturer's discretion.

Modifies the resonance parameter value that is preset in the timbre. The timbre shall recognize it as a relative change, where the center (null point) is 0x80000000. When the value is less than 0x80000000, the resonance becomes weaker. When the value is greater than 0x80000000, the resonance becomes stronger.

6.1.4 Release Time (Sound Controller 3) – RPNC#72

Default Value: 0x80000000 (no change)

Controls the release time of the envelope for the specified Note Number. This is a relative parameter whose center (null point) is 0x80000000. When the value is less than 0x80000000, the time becomes shorter. When the value is greater than 0x80000000, the time becomes longer. Exact behavior is left to the manufacturer's discretion.

6.1.5 Attack Time (Sound Controller 4) – RPNC#73

Default Value: 0x80000000 (no change)

Controls the attack time of the envelope for the specified Note Number. This is a relative parameter whose center (null point) is 0x80000000. When the value is less than 0x80000000, the time becomes shorter. When the value is greater than 0x80000000, the time becomes longer. Exact behavior is left to the manufacturer's discretion.

6.1.6 Brightness (Sound Controller 5) – RPNC#74

Default Value: 0x80000000 (no change)

Controls the cut-off frequency of filter(s) for the specified Note Number.

Controls the preset cut-off frequency of the filter. This is a relative parameter whose center (null point) is 0x80000000. When the value is less than 0x80000000, the frequency becomes lower. When the value is greater than 0x80000000, the cutoff frequency becomes higher. Exact behavior is left to the manufacturer's discretion.

6.1.7 Decay Time (Sound Controller 6) – RPNC#75

Default Value: 0x80000000 (no change)

Controls the decay time of the envelope for the specified Note Number. This is a relative parameter whose center (null point) is 0x80000000. When the value is less than 0x80000000, the time becomes shorter. When the value is greater than 0x80000000, the time becomes longer. Exact behavior is left to the manufacturer's discretion.

6.1.8 Reverb Send Level (Effects 1 Depth) – RPNC#91

Sets the reverb send level for the specified Note Number. The curve responding to the value shall be linear with respect to amplitude. Send level is 100% at value 0xFFFFFFFF.

The Reverb level set by this RPNC overrides for the specified Note Number any value set by the CC#91 (see Section *Error! Reference source not found.*).

> For example: If a CC#91 sets Reverb Send level for the whole Channel to 0x40000000 and a subsequent PNCC#91 sets the Reverb Send for Note Number 64 to 0x00000000, then the sound assigned to Note Number #64 should sound without Reverb, while the sounds on other Note Numbers continue to sound with Reverb Send Level of 0x40000000.

6.2 Universal System Exclusive: Key-Based Instrument Controllers

A Device which conforms to the Default Drum Note Map Profile and the MIDI 1.0 Protocol may implement the Key-Based Instrument Controller messages to set the properties on the specified Note Number as defined in this Section.

Key-Based Instrument Controllers are Universal System Exclusive messages defined in MIDI 1.0 to mimic the functions of the Channel-based Controllers for sounds which are assigned separately to individual Note Numbers.

MIDI 1.0 Byte Stream Format

```
F0 7F <device ID> 0A 01 0n kk [nn vv] .. F7

          F0 7F      Universal Real Time SysEx header
          <device ID>   ID of responding device
          0A         sub-ID#1 = Key-Based Instrument Control
          01         sub-ID#2 = Controller
          0n         MIDI Channel Number
          kk         Key number
          [nn,vv]    Controller Number and Value
          :
          F7         EOX
```

nn Controller Number

The Control Change numbers applicable to this Profile:

Table 8 Key-Based Instrument Controllers List

nn Controller Number	Name	Equivalent RPNC
7	Volume	See Section ***6.1.1***
10	Pan	See Section ***6.1.2***
71	Timbre/Harmonic Intensity (Sound Controller 2)	See Section ***6.1.3***
72	Release Time (Sound Controller 3)	See Section ***6.1.4***
73	Attack Time (Sound Controller 4)	See Section ***6.1.5***
74	Brightness (Sound Controller 5)	See Section ***6.1.6***
75	Decay Time (Sound Controller 6)	See Section ***6.1.7***
91	Reverb Send Level (Effects 1 Depth)	See Section ***6.1.8***

vv Value

The values used are 7-bit scaled values of the 32-bit values defined for the equivalent Registered Per-Note Controllers. See Sections ***6.1.1*** through to ***6.1.8.***

7 Discovering Sounds Included and Optional Features Supported: Profile Details Inquiry

The MIDI-CI Profile Details Inquiry mechanism may be used to discover implementation details of a Receiver. The following implementation details are discoverable:

- Which Per-Note control mechanisms are supported.
- Which Note Numbers have active sounds available.

A Device may also use the Reply to Profile Details Inquiry message to report changes to its configuration.

7.1.1 Optional Features Profile Details Inquiry Message

An Initiator may send this to discover details of the Profile implementation of a Responder.

Table 9 Profile Details Inquiry Message

Value	Parameter
F0	System Exclusive Start
7E	Universal System Exclusive
1 byte	Destination 00–0F: To/from MIDI Channels 1-16
0D	Universal System Exclusive Sub-ID#1: MIDI-CI
28	Universal System Exclusive Sub-ID#2: Profile Details Inquiry
1 byte	MIDI-CI Message Version/Format
4 bytes	Source MUID (LSB first)
4 bytes	Destination MUID (LSB first)
5 bytes	Default Drum Map Profile Id (0x7E 0x20 0x03 0x01 0x01)
01	Inquiry Target: Profile Optional Features Supported
F7	End Universal System Exclusive

7.1.2 Reply to Profile Details Inquiry Message

When a Responder receives the Profile Details Inquiry message it shall respond by sending a Reply to Profile Details Inquiry message.

A Device should also send this message as a Notification message when the data has changed, without needing a prior receipt of a Profile Details Inquiry message. For example, if a change of program on a Device results in a different set of Note Numbers having sounds available, the Device should send the message to declare the new data set.

Table 10 Reply to Profile Details Inquiry Message

Value	Parameter
F0	System Exclusive Start
7E	Universal System Exclusive

1 byte	Destination 00–0F: To/from MIDI Channels 1-16
0D	Universal System Exclusive Sub-ID#1: MIDI-CI
29	Universal System Exclusive Sub-ID#2: Reply to Profile Details Inquiry
02	MIDI-CI Message Version/Format
4 bytes	Source MUID (LSB first)
4 bytes	Destination MUID (LSB first)
5 bytes	Default Drum Note Map Profile Id (0x7E 0x20 0x03 0x01 0x01)
01	Inquiry Target: Profile Optional Features Supported
14 00	Inquiry Target Data Length (dl) (LSB first)
11 bytes	Inquiry Target Data – Features Supported
F7	End Universal System Exclusive

7.1.3 Inquiry Target Data – Features Supported

The Inquiry Target Data field declares features supported as follows:

Table 11 Profile Features Supported

Bytes	**Features Supported**
Byte 1 (bitmap*)	D0: Supports MIDI 2.0 Per-Note Controllers D1: Supports MIDI 1.0 Key-Based Instrument Controllers (Universal SysEx) D2-D6: Reserved
Byte 2 (bitmap*)	D0: Default Sound on Note Number 27 D1: Default Sound on Note Number 28 D2: Default Sound on Note Number 29 D3: Default Sound on Note Number 30 D4: Default Sound on Note Number 31 D5: Default Sound on Note Number 32 D6: Default Sound on Note Number 33
Byte 3 (bitmap*)	D0: Default Sound on Note Number 34 D1: Default Sound on Note Number 35 D2: Default Sound on Note Number 36 D3: Default Sound on Note Number 37 D4: Default Sound on Note Number 38 D5: Default Sound on Note Number 39 D6: Default Sound on Note Number 40

Byte 4 (bitmap*)	D0: Default Sound on Note Number 41 D1: Default Sound on Note Number 42 D2: Default Sound on Note Number 43 D3: Default Sound on Note Number 44 D4: Default Sound on Note Number 45 D5: Default Sound on Note Number 46 D6: Default Sound on Note Number 47
Byte 5 (bitmap*)	D0: Default Sound on Note Number 48 D1: Default Sound on Note Number 49 D2: Default Sound on Note Number 50 D3: Default Sound on Note Number 51 D4: Default Sound on Note Number 52 D5: Default Sound on Note Number 53 D6: Default Sound on Note Number 54
Byte 6 (bitmap*)	D0: Default Sound on Note Number 55 D1: Default Sound on Note Number 56 D2: Default Sound on Note Number 57 D3: Default Sound on Note Number 58 D4: Default Sound on Note Number 59 D5: Default Sound on Note Number 60 D6: Default Sound on Note Number 61
Byte 7 (bitmap*)	D0: Default Sound on Note Number 62 D1: Default Sound on Note Number 63 D2: Default Sound on Note Number 64 D3: Default Sound on Note Number 65 D4: Default Sound on Note Number 66 D5: Default Sound on Note Number 67 D6: Default Sound on Note Number 68
Byte 8 (bitmap*)	D0: Default Sound on Note Number 69 D1: Default Sound on Note Number 70 D2: Default Sound on Note Number 71 D3: Default Sound on Note Number 72 D4: Default Sound on Note Number 73 D5: Default Sound on Note Number 74 D6: Default Sound on Note Number 75
Byte 9 (bitmap*)	D0: Default Sound on Note Number 76 D1: Default Sound on Note Number 77 D2: Default Sound on Note Number 78 D3: Default Sound on Note Number 79 D4: Default Sound on Note Number 80

	D5: Default Sound on Note Number 81 D6: Default Sound on Note Number 82
Byte 10 (bitmap*)	D0: Default Sound on Note Number 83 D1: Default Sound on Note Number 84 D2: Default Sound on Note Number 85 D3: Default Sound on Note Number 86 D4: Default Sound on Note Number 87 D5: Default Sound on Note Number 88 D6: Reserved

If the Device has a default sound currently available to be played on a Note Number, then set the bit to one. If there is no sound currently available on the Note Number, then set the bit to zero.

**Bitmap fields in MIDI-CI messages are presented as follows:*

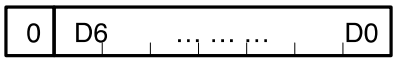

Figure 1 Bitmap Format Per Byte

https://www.amei.or.jp

https://www.midi.org