**Eddie‘s MIDI Tutorials**

[**What is hexadecimal?**](https://www.2writers.com/eddie/TutHex.htm)[**Roland System Exclusive Messages**](https://www.2writers.com/eddie/TutSysEx.htm)[**Selecting Roland Capital Tones and Variations**](https://www.2writers.com/eddie/TutCapitalTones.htm) **(Patch Change, Controllers 0 and 32)**[**Registered and Non-Registered Parameter Numbers**](https://www.2writers.com/eddie/TutNrpn.htm) **(RPN NRPN, controllers 6, 38, 98, 99, 100 101)**[**Creating user drumsets on the Roland Sound Canvas**](https://www.2writers.com/eddie/TutUserDrumSet.htm) **(Patch Change, Controllers 0 and 32)**

[**Glossary**](https://www.2writers.com/eddie/MidiGlossary.htm)

# [What is hexadecimal?](https://www.2writers.com/eddie/TutHex.htm) / Hexadecimal Tutorial

The simplest explanation of hexadecimal is this:

In "**decimal**" we have ten digits, 0 through 9. In "**hexadecimal**" we have sixteen digits, 0 through F. That is literally all there is to it. Everything else works exactly the same!

A point of clarification before the example. To differentiate between decimal and hexadecimal numbers, an "h" is appended to hexadecimal numbers. Hexadecimal is quite a jaw-breaker to repeat, so it is often simply called "hex".

Another point of interest is that hex numbers are usually presented as two digits, since one "byte" can have a hex value between 00h and FFh (0 through 255 decimal).

When counting in decimal, once we run out of digits we start combining them by putting a 1 to the left and starting at 0 on the right; thus 10 follows 9. In the same way, in hex once we run out of digits we do the same, thus 10h follows Fh.

**Decimal : 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 etc.**

**Hex: 0h 1h 2h 3h 4h 5h 6h 7h 8h 9h Ah Bh Ch Dh Eh Fh 10h 11h etc.**

Note that 10h is not said aloud as "ten" because it is not ten, it is sixteen! Generally hex numbers are said as the individual digits; thus 10h is "one zero hex".

To convert between decimal and hex is quite simple with the following chart:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **0h** | **1h** | **2h** | **3h** | **4h** | **5h** | **6h** | **7h** | **8h** | **9h** | **Ah** | **Bh** | **Ch** | **Dh** | **Eh** | **Fh** |
| **0h** | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 |
| **1h** | 1 | 17 | 33 | 49 | 65 | 81 | 97 | 113 | 129 | 145 | 161 | 177 | 193 | 209 | 225 | 241 |
| **2h** | 2 | 18 | 34 | 50 | 66 | 82 | 98 | 114 | 130 | 146 | 162 | 178 | 194 | 210 | 226 | 242 |
| **3h** | 3 | 19 | 35 | 51 | 67 | 83 | 99 | 115 | 131 | 147 | 163 | 179 | 195 | 211 | 227 | 243 |
| **4h** | 4 | 20 | 36 | 52 | 68 | 84 | 100 | 116 | 132 | 148 | 164 | 180 | 196 | 212 | 228 | 244 |
| **5h** | 5 | 21 | 37 | 53 | 69 | 85 | 101 | 117 | 133 | 149 | 165 | 181 | 197 | 213 | 229 | 245 |
| **6h** | 6 | 22 | 38 | 54 | 70 | 86 | 102 | 118 | 134 | 150 | 166 | 182 | 198 | 214 | 230 | 246 |
| **7h** | 7 | 23 | 39 | 55 | 71 | 87 | 103 | 119 | 135 | 151 | 167 | 183 | 199 | 215 | 231 | 247 |
| **8h** | 8 | 24 | 40 | 56 | 72 | 88 | 104 | 120 | 136 | 152 | 168 | 184 | 200 | 216 | 232 | 248 |
| **9h** | 9 | 25 | 41 | 57 | 73 | 89 | 105 | 121 | 137 | 153 | 169 | 185 | 201 | 217 | 233 | 249 |
| **Ah** | 10 | 26 | 42 | 58 | 74 | 90 | 106 | 122 | 138 | 154 | 170 | 186 | 202 | 218 | 234 | 250 |
| **Bh** | 11 | 27 | 43 | 59 | 75 | 91 | 107 | 123 | 139 | 155 | 171 | 187 | 203 | 219 | 235 | 251 |
| **Ch** | 12 | 28 | 44 | 60 | 76 | 92 | 108 | 124 | 140 | 156 | 172 | 188 | 204 | 220 | 236 | 252 |
| **Dh** | 13 | 29 | 45 | 61 | 77 | 93 | 109 | 125 | 141 | 157 | 173 | 189 | 205 | 221 | 237 | 253 |
| **Eh** | 14 | 30 | 46 | 62 | 78 | 94 | 110 | 126 | 142 | 158 | 174 | 190 | 206 | 222 | 238 | 254 |
| **Fh** | 15 | 31 | 47 | 63 | 79 | 95 | 111 | 127 | 143 | 159 | 175 | 191 | 207 | 223 | 239 | 255 |

Find the decimal number you want to convert and look at the top hex digit first then at the left hex digit and you have the hex equivalent!

Do the reverse to convert from hex to decimal, find the left hex digit on the top position and find the right hex digit along the left side; where the two meet is the decimal equivalent!

The more you work with hex the easier it will become.

# [Roland System Exclusive Messages](https://www.2writers.com/eddie/TutSysEx.htm) / MIDI SysEx Tutorial

In an effort to bring System Exclusive (SysEx) messages to the masses, I embarked on a mission to produce this tutorial which will help people plumb the depths of this wonderful and powerful area of MIDI.

To understand SysEx messages you will need to have an understanding of [hexadecimal](https://www.2writers.com/eddie/TutHex.htm).

The first part deals with the actual contents of the SysEx message and their function in the scheme of things.

The second part deals with the infamous Roland checksum.

By the end of this you may be disappointed that it is all quite easy after all!

## System Exclusive (SysEx) Tutorial

### Part 1 : The Anatomy of a SysEx Message (or Do this please!)

This discussion on SysEx is aimed at people using Roland equipment, but will put you in good stead to apply the knowledge to other makes of MIDI equipment.

The idea of SysEx is to change settings in a synth that cannot be accessed by any other means. Usually, anything that can be changed in a synth can be done via SysEx, but because of its unwieldy structure and length, the more common parameters can be accessed via [controllers](https://www.2writers.com/eddie/MidiGlossary.htm#controller) (like [volume](https://www.2writers.com/eddie/MidiGlossary.htm#level) et al) and special events (like [patch change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange), [pitch bend](https://www.2writers.com/eddie/MidiGlossary.htm#PitchBend) et al). SysEx is the only means of retrieving data from a synth.

The Roland SysEx message is made up of nine parts. All notation is in hex, but without the trailing "h" for simplicity's sake.

[1] [2] [3] [4] [5] [6] [7] [8] [9]

F0 41 10 42 12 40007F 00 41 F7

I will discuss each part briefly before going into detail on the usage of SysEx messages.

Parts **[1]**, **[2]** and **[9]** are part of the MIDI specification and are required by all SysEx messages. What is in between is specific to the manufacturer, identified by part **[2]**, which is 41h in Roland's case.

Part **[3]** is known as the [Device ID](https://www.2writers.com/eddie/MidiGlossary.htm#DeviceId). Most Roland MIDI devices use the default of 10h, but is provided for us to change as we see fit. The idea behind the Device ID is that if you have more than one MIDI device of the same type in a [daisy chain](https://www.2writers.com/eddie/MidiGlossary.htm#DaisyChain) (connected to one another) you can change the Device ID on each of them so that you can send SysEx messages that will be accepted by only one of them, not all.

Part **[4]** is the Model ID. GS synths will all respond to SysEx with a Model ID of 42h, however they generally have their own Model ID as well.

Part **[5]** specifies whether we are sending (12h) or requesting (11h) information. If a synth receives a SysEx message it recognizes, it will look this part to determine whether it needs to change an internal setting or reply (with its own SysEx message) with the value of a setting.

Part **[6]** is the start address on which the SysEx intends to act. It is at this address that you may wish to put a value (or values) or retrieve the current value(s). It always contains three bytes. Most synth manuals will provide you with a long "**address map**" table which explains what lives at each address. Although daunting on a first perusal, once you understand its function it becomes a wonderful resource.

Part **[7]** has two functions. If part **[5]** is 12h (sending data) then part **[7]** contains the *data* we are sending and can be one byte or many bytes in length. If it is 11h (requesting data) then it is the *number* of bytes we want the synth to send us. I will expand on this later with examples.

Part **[8]** is the infamous Roland checksum which gets a whole section to itself in this tutorial.

That, in a nutshell, is what a SysEx message is made up of. If you're still a little hazy then don't be concerned. By way of examples you will see SysEx in action and will soon realize that there is no mystery to SysEx after all.

**Example 1 : The GS reset. (or Sending a single byte.)**

[1] [2] [3] [4] [5] [6] [7] [8] [9]

F0 41 10 42 12 40007F 00 41 F7

Open your text books...er...manuals to the address map for your synth. If it is a GS synth, run your finger down the left most column (which usually contains the address location) and find 40 00 7F. Different manuals describe it differently (how consistent!) but in essence it is the famous GS Reset. (The SC-88 manual describes it as "MODE SET 00=GS Reset")

What this message is telling the synth is "put the value 00h at address 40007F". What the synth does in this particular instance is perform an initialization.

**Example 2 : Patch Change. (or Sending more than one byte.)**

[1] [2] [3] [4] [5] [6] [7] [8] [9]

F0 41 10 42 12 401100 0801 26 F7

We can send more than one byte of data in a single SysEx message. This is very useful when we want to set the value of several settings that follow each other in the address map. By sending more than one byte in part **[7]**, which is the data part, the first byte will be put in the address specified and the following bytes in each successive address location. Each address location can only hold one byte of data.

In the example above we are putting the value 08h into address 401100h and the value 01h into address 401101h. Think about it this way, if we send more than one byte to an address then each successive byte will be put in the address below the previous one in the map in the manual.

For the above example, the SC-88 manual has the following in the address map:

Address(H) Size (H) Data (H) Parameter Description

---------- -------- -------- ----------- -----------------

40 1**x** 00 00 00 02 00 - 7F Tone Number **CC#00** Value 0-127

40 1x 01**#** 00 - 7F **P.C.** Value 1-128

A quick time out here to explain the manual notation:

1. **x** in the address represents the synth part number, 1 though F.

Thus x=1 for part 1,

hence 40 11 00 is the start address for part 1.

2. **#** in the address means that we cannot send data to this address, we

must send multiple bytes to a previous address that does not have a #.

3. **CC#00** is the GS [variation](https://www.2writers.com/eddie/MidiGlossary.htm#variation) number.

4. **P.C.** is the regular [patch change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange).

Now you can see how 08h goes to the address specified in the SysEx message, and 01h goes to the *next* address.

For those with an external Sound Canvas with a display, if you successfully send this example to your synth you will see the patch name "Piano 2w"!

If there is anything you do not understand, please e-mail me and try as best possible to explain what confuses you and what part (if not all) you still don't understand. I have discovered that the way things are explained can make perfect sense to one person, and absolute nonsense to another. It's all to do with the words used and the order of the explanation. (Thank goodness Yoda gave self-defense lessons and not English lessons!)

**Example 3 : Receiving data. (or What are you thinking?)**

**[1] [2] [3] [4] [5] [6] [7] [8] [9]**

**F0 41 10 42 11 401100 000002 2D F7**

To find out what value(s) your synth has in an address (or range of addresses) we use the 11h value in part **[5]**.

Part **[6]** identifies the start address that we're interested in.

Part **[7]** is now an indication of the number of bytes we want back, as opposed to being the data we sent to the synth when using 12h in part **[5]**. This part must always contain three bytes (six hex digits).

That's it. The synth will respond with a SysEx message containing the value(s) we asked for.

This example is the converse of example 2. Instead of setting the Varaition/Patch Change, we are asking the synth to tell us what the current setting is. The synth's response is in the format of a SysEx message. The message will be exactly what could have put those values in those addresses in the first place!  
In other words, if you successfully send "example 2" to the synth and then send "example 3" to the synth, then the contents of the synth's response will be the bytes that make up "example 2"!!

There should be more examples in your manual which you can now try. Try and predict the result before you send the example. If the result confirms your prediction then your SysEx world has just become a universe!

### Part 2 : The Roland Checksum (or Did I get it right?)

The idea behind the checksum is simple. When we send a SysEx message to a synth, we want it to do only what we ask and nothing else. Consider the real world where messages don't always reach their destination in their original form. The results could be disasterous.

If a SysEx message gets corrupted during transmission to the synth, it is entirely possible that it could become a totally different (but valid) message! So a reverb change could conceivably become a GS Reset!!  
To avoid this, Roland uses a checksum that is calculated using the **address** *and* **data** parts of the SysEx message, thus ensuring that if the address or data is corrupted somehow, they will no longer match the checksum and the SysEx message will be discarded.  
(For the cynics out there: Yes it is conceivable that the address/data *and* the checksum could be corrupted in such a way that a different, valid message is formed. However, the likelyhood is *far* smaller than with no checksum present.)

Calculating the checksum follows a simple formula which is easily learned and applied. Following this formula will gaurantee correct checksums:

1. Convert the hex values to decimal.  
2. Add the values together, but if the answer to any sum exceeds 127 then subtract 128.  
3. Subtract the final answer from 128.  
4. Convert the resulting value back to hex and use as the checksum.

Here is a practical example:

**[1] [2] [3] [4] [5] [6] [7] [8] [9]**

**F0 41 10 42 12 401100 4163 0B F7**

Remember the checksum is only calculated from the address **[6]** and the data **[7]**, thus we need only look at 40 11 00 41 63 in this example.

1. Convert hex to decimal:

40h = **64**

11h = **17**

00h = **0**

41h = **65**

63h = **99**

2. Add values, keeping result under 128:

**64** + **17** = 81

81 + **0** = 81

81 + **65** = 146 ( 146 - 128 = 18 )

18 + **99** = 117

3. Subtract answer from 128

128 - 117 = 11

4. Covert to hex:

11 = 0Bh

It's that simple! Part **[8]** is the checksum and is indeed 0Bh in this instance.

The manual shows a different method which involves slightly more complicated arithmatic. If you prefer this method then by all means use it.

In essence it involves adding all the values together, dividing by 128 and subtracting the *remainder* from 128, if the remainder is greater than 0. Thus:

1. Convert hex to decimal:

40h = 64

11h = 17

00h = 0

41h = 65

63h = 99

2. Add values:

64 + 17 + 0 + 65 + 99 = 245

3. Divide by 128

245 / 128 = 1 remainder 117

4. Subtract remainder from 128, if remainder is not 0\*

128 - 117 = 11

5. Covert to hex:

11 = 0Bh

\*If the remainder is 0 then the checksum is 0.

# Selecting Roland Capital Tones and Variations (Patch Change, Controllers 0 and 32)

**Modulation ( Controller 1 )  
Portamento ( Controllers 5, 65 and 84 )  
Volume and Expression ( Controllers 7 and 11 )  
Pan ( Controller 10 )  
Hold ( Controller 64 )  
Sostenuto ( Controller 66 )  
Soft ( Controller 67 )  
Reverb ( Controller 91 )  
Chorus ( Controller 93 )  
Delay ( Controller 94 )**

Simply using a [patch change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange) to change instruments on a Roland Sound Canvas is no longer guaranteed to get the [patch](https://www.2writers.com/eddie/MidiGlossary.htm#patch) you intended. There are two other areas to take into consideration now.

Firstly you need to consider which [bank](https://www.2writers.com/eddie/MidiGlossary.htm#bank) (or [variation](https://www.2writers.com/eddie/MidiGlossary.htm#variation)) you want to use. Each instrument can have a maximum of one hundred and twenty seven variations! However, not all banks are currently used. Some instruments have no variations while some have as many as thirteen!   
To specify which bank you want, use [Control Change](https://www.2writers.com/eddie/MidiGlossary.htm#ControlChange) **zero** (0) with a value between zero and one hundred twenty seven. Bank zero is known as the [Capital Tone](https://www.2writers.com/eddie/MidiGlossary.htm#ControlChange), while the remainder are variations.

Secondly you need to consider which [map](https://www.2writers.com/eddie/MidiGlossary.htm#map) you want to use. This map idea was introduced with the Roland SC-88, but earlier Sound Canvas owners need to know about it so that they can ensure their [sequences](https://www.2writers.com/eddie/MidiGlossary.htm#sequence) play correctly when played on later Sound Canvases.   
To specify which map you want, use **Control Change** **thirty two** (32) with a value indicating the desired map. Map zero will use the map selected by the button on the front of your Sound Canvas. Map one is the SC-55 map. Map two is the SC-88 map. Map three is the SC-88Pro map. Map four is the SC-8850 map. You can be sure there will be more to come!   
As a side note, since the CM-64/32L synths are older synths, prior to the establishing of the Sound Canvas standard, these maps are embedded as variations within the SC-55 map. So to access these two maps, select "bank one hundred twenty six, map SC-55, patch zero through sixty three" or "bank one hundred twenty seven, map SC-55, patch zero through one hundred twenty seven".

To activate the bank and map change, you *must* send a [Patch Change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange) message. Changing the bank or map *will not do anything* until a patch change is sent. From now on, any patch changes you send will remain within the current bank and map. If you try and change to an instrument that does not exist in the current bank and map combination, the instrument will not be changed. The Sound Canvases after the SC-55 range do not "fall back" to the next lowest existing variation.

So to ensure you get the instrument you want, be sure to always specify the **bank**, the **map** and then the **patch**.

# [Registered and Non-Registered Parameter Numbers](https://www.2writers.com/eddie/TutNrpn.htm) (RPN and NRPN, controllers 6, 38, 98, 99, 100 and 101) / RPN and NRPN Tutorial

[RPN](https://www.2writers.com/eddie/MidiGlossary.htm#rpn) stands for "**Registered Parameter Number**", while [NRPN](https://www.2writers.com/eddie/MidiGlossary.htm#nrpn) stands for "**Non Registered Parameter Number**". They work exactly the same, but act on different areas of the synthesizer.

RPN is defined by the Standard MIDI Specification (hence "registered") and works the same on all synthesizer that conform to the MIDI Specification. NRPN is specific to a particular synthesizer (hence "non registered") and is unlikely to work the same on synthesizers from different manufacturers.

The idea of parameter numbers, as opposed to [System Exclusive messages](https://www.2writers.com/eddie/MidiGlossary.htm#sysex), is that they are easier to use and faster to transmit. It is for these reasons that the most often used parameters are encompased in either RPN or NRPN.

The MIDI Specification currently defines only four parameters (RPN):

1. Pitch Bend Sensitivity (0,0)
2. Master Fine Tuning (0,1)
3. Master Coarse Tuning (0,2)
4. RPN null (127,127)

The only confusing part of using parameter numbers, initially, is that there are **two parts** to using them. First you need to tell the synthesizer **what parameter** you want to change, then you need to tell it **how to change** the parameter.

For example, if you want to change the "pitch bend sensitivity" you would send the following [control change](https://www.2writers.com/eddie/MidiGlossary.htm#ControlChange) messages:

101 0

100 0

6 2

38 0

The **101** *and* **100** messages indicate what **parameter** is to be changed. The **0** after each one comes from the parameter list above. Changing only the **0** next to control change **100** to **1** would select "master fine tuning" as indicated in the parameter list above.

Then comes the **6** and **38** messages, which indicate **what** to do with the parameter pointed to by the 101 and 100 messages. In this example we are changing the "pitch bend sensitivity", we are setting it to **2** (which is actually the default value). Note that if the value next to control change 38 is 0, then you can safely omit the message - however I would recommend always including it for completeness.

Pitch bend sensitivity is how much the currently sounding note(s), in the current MIDI channel, is/are affected by pitch bend. The default value of 2 means that the maximum pitch bend will result in a pitch change of two semitones. (Above and below the sounding note, meaning a total of four semitones from lowest to hightest pitch bend positions.)

The maximum sensitivity is twenty-four semitones (two octaves above and two below).

As a demonstration, the first of the following MIDI files plays a single note and bends the pitch from the lowest to the highest range available to the pitch bend controller. This is followed by two MIDI files, each setting the pitch bend sensitivity to a different value using RPN. Click on one of the sensitivity settings, then play the note. Click on the other sensitivity setting and then play the same note!

|  |  |  |
| --- | --- | --- |
| [Sustained note with pitch bend](https://www.2writers.com/eddie/notebend.mid) | [Pitch bend setting of 2 semitones](https://www.2writers.com/eddie/2stones.mid) | [Pitch bend setting of 24 semitones](https://www.2writers.com/eddie/24stones.mid) |

NRPN is different from one manufacturer to another, but the concept is exactly the same as RPN, so if you know how to use one, then you know how to use the other! It is just a matter of looking in the manual to find out **what parameters** can be changed and in **what way**.

As an example: the Roland GS standard defines a parameter called "vibrato rate". This is the speed at which a sustained note will "waver". The parameter value is (**1**,**8**) and has a value range of **0** through **127**.

Since 101 and 100 are defined as RPN, NRPN uses **99** and **98**.

To maximize a note's vibrato, send the following control changes:

99 1

98 8

6 127

38 0

Now any sustained notes in the same channel will have a very violent vibrato!!

Be aware that some NRPN are "relative" while others are "absolute". This means that sending a **relative** change of 10 **three times** will result in a change of **30**. An absolute change results in exactly the number specified, regardless of how often it is sent.

Something to bear in mind is that the data controllers (6 and 38) always change the **most recent** parameter specified with parameter controllers in the same channel. The Roland manual recommends sending the "RPN null" immediately after sending the data controllers, so that stray data controllers don't alter a parameter unexpectedly. The perfectionist in me says this is unnecessary. If there are errant data control messages out there I want to hear them make something go wrong, so I can find them and remove them!

# Glossary

|  |  |
| --- | --- |
| **A** | |
| **Accordian** |  |
| **Active Sensing** | Active Sensing is a process by which MIDI devices can monitor an active connection with other MIDI devices. This message is sent regularly at specific intervals. |
| **Address** | An address is literally a "location". For electronic devices, an address is a location in memory. Values can be read from addresses in Read Only Memory (ROM), while values can be read from and written to addresses in Random Access Memory (RAM). |
| **Aftertouch** | Aftertouch is a message which indicates how much pressure is applied to the keyboard *after* the note has/notes have been played. There are two types of aftertouch, **Channel Aftertouch** which is a single value for the entire [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel), and **Key Aftertouch** which are separate messages for each key pressed. These values can be used to control an effect, for example [vibrato](https://www.2writers.com/eddie/MidiGlossary.htm#vibrato). On the Roland Sound Canvas, a [SysEx](https://www.2writers.com/eddie/MidiGlossary.htm#sysex) message is required to specify what happens when aftertouch messages are received. By default, these messages do nothing. Aftertouch messages are [Channel Messages](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). These messages are also known as **Channel Pressure**, **Channel Key Pressure** and **Polyphonic Key Pressure** |
| **All Notes Off (CC 123)** | This message will stop all currently playing notes in a [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) unless [hold](https://www.2writers.com/eddie/MidiGlossary.htm#hold) or [sostenuto](https://www.2writers.com/eddie/MidiGlossary.htm#sostenuto) are on, in which case it is ignored. This is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **All Sounds Off (CC 120)** | This message will unconditionally stop all currently playing notes in a [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel). This is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Attack** | See [envelope](https://www.2writers.com/eddie/MidiGlossary.htm#envelope). |

|  |  |
| --- | --- |
| **B** | |
| **Bassoon** |  |
| **Bank (CC 0)** | In Roland terms, a bank is the same as a [variation](https://www.2writers.com/eddie/MidiGlossary.htm#variation) and is used interchangeably in the manual. The Bank message is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Bulk Dump** | Use bulk dump to retrieve the values from a large block of [addresses](https://www.2writers.com/eddie/MidiGlossary.htm#address) with a single [SysEx](https://www.2writers.com/eddie/MidiGlossary.htm#SysEx) request message. The MIDI device manual should identify what bulk dump options are available and what the request message is to obtain them. |

|  |  |
| --- | --- |
| **C** | |
| **Celesta** |  |
| **Capital Tone** | This is simply the first instrument in each [bank](https://www.2writers.com/eddie/MidiGlossary.htm" \l "map) , where the [variation](https://www.2writers.com/eddie/MidiGlossary.htm#variation) number is zero. There are one hundred and twenty-eight capital tones. |
| **Channel** | MIDI messages are transmitted via a single cable. To be able to play notes on different instruments, the idea of a channel is used. MIDI messages intended for a specific channel have the channel number encoded in the message itself. Because of the size of the MIDI message, there is a maximum of 16 MIDI channels. To overcome this limitation, [ports](https://www.2writers.com/eddie/MidiGlossary.htm#port) are used to address *groups* of 16 channels. |
| **Channel Aftertouch** | See [Aftertouch](https://www.2writers.com/eddie/MidiGlossary.htm#aftertouch) |
| **Channel Message** | A "Channel Message" is a MIDI message that is intended for a specific [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel). A Channel Message is made up of three parts. The first part identifies the type of MIDI message and what channel the message is intended for. The next two parts have different functions depending on the type of MIDI message. Most MIDI messages fall into this category. [SysEx](https://www.2writers.com/eddie/MidiGlossary.htm#sysex) messages are independent of channel and are of variable length. |
| **Channel Pressure** | See [Aftertouch](https://www.2writers.com/eddie/MidiGlossary.htm#aftertouch) |
| **Chorus** | Chorus is an [effect](https://www.2writers.com/eddie/MidiGlossary.htm#effect) which makes a sound "fatter" by making it appear that the sound is coming from more than one source, hence "chorus". |
| **Coarse Tuning** | Coarse tuning is the process of changing the tuning of an instrument in semitones (half-steps). Master Coarse Tuning (controlled with [RPN](https://www.2writers.com/eddie/MidiGlossary.htm#rpn)) is used to change the tuning of an entire channel, as opposed to [scale tuning](https://www.2writers.com/eddie/MidiGlossary.htm#ScaleTuning) which adjusts individual notes. See also [Fine Tuning](https://www.2writers.com/eddie/MidiGlossary.htm#FineTune) |
| **Continuous Controller** | See [controller](https://www.2writers.com/eddie/MidiGlossary.htm#controller). |
| **Control Change (CC)** | Control change is a [MIDI message](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) that changes the state of a [controller](https://www.2writers.com/eddie/MidiGlossary.htm#controller). There is room for 128 types of control change messages, however not all are assigned by the standard MIDI specification and furthermore, not all synthesizers support all controllers. Control change messages are often referred to by the letters CC and the number of the controller, e.g. volume is "CC 7". Control change messages are [channel messages](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Controller** | A controller is something that controls a function in a MIDI device. The most obvious example is [volume](https://www.2writers.com/eddie/MidiGlossary.htm#level), however there are many others. Some controllers have a physical control on the MIDI device, like pedals, knobs, levers and sliders. Changing the position of the control sends [control change](https://www.2writers.com/eddie/MidiGlossary.htm#ControlChange) messages on a specific MIDI [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel). |
| **Cutoff Frequency** | The cutoff frequency is used to alter the way we hear a sound. A [low pass filter](https://www.2writers.com/eddie/MidiGlossary.htm#lpf) is used to specify the point at which frequencies are cutoff, allowing only lower frequencies to be heard. A high cutoff frequency, will make a sound seem brighter. A low cutoff frequency will make a sound seem dark or dampened. |

|  |  |
| --- | --- |
| **D** | |
| **Dulcimer** |  |
| **Daisy Chain** | A daisy chain is the term used when connecting multiple MIDI devices together. The [MIDI Out](https://www.2writers.com/eddie/MidiGlossary.htm" \l "MidiOut) connector of the first device is connected to the [MIDI In](https://www.2writers.com/eddie/MidiGlossary.htm#MidiIn) connector of the second device. The [MIDI Thru](https://www.2writers.com/eddie/MidiGlossary.htm#MidiThru) connector of the second device is connected to the MIDI In connector of the third device and so on. Using a daisy chain allows you to control multiple MIDI devices from a single source, whether it be a [sequencer](https://www.2writers.com/eddie/MidiGlossary.htm#sequencer) or a keyboard. Since most devices will respond to MIDI data on all sixteen [channels](https://www.2writers.com/eddie/MidiGlossary.htm#channel), it would be necessary to mute certain channels on each device so that only one device responds to specific channels, unless you want to use [layering](https://www.2writers.com/eddie/MidiGlossary.htm#layering). |
| **Data Entry (CC 6 and CC 38)** | The Data Entry [controllers](https://www.2writers.com/eddie/MidiGlossary.htm" \l "controller) are used in conjunction with [RPN](https://www.2writers.com/eddie/MidiGlossary.htm#rpn) and [NRPN](https://www.2writers.com/eddie/MidiGlossary.htm#nrpn) messages. Once an RPN or NRPN [parameter](https://www.2writers.com/eddie/MidiGlossary.htm#parameter) is selected, these controllers are used to modify that parameter. For examples, see the [RPN and NRPN](https://www.2writers.com/eddie/TutNrpn.htm) tutorial. |
| **Decay** | See [envelope](https://www.2writers.com/eddie/MidiGlossary.htm#envelope). |
| **Delay** | Delay is an [effect](https://www.2writers.com/eddie/MidiGlossary.htm#effect) which creates an echo or echoes, depending on the setting. |
| **Device ID** | The Device ID of a synthesizer is only useful when you have more than one of the same synth in a [daisy chain](https://www.2writers.com/eddie/MidiGlossary.htm). To be able to send [system exclusive messages](https://www.2writers.com/eddie/MidiGlossary.htm#SysEx) to specific synthesizers of the same type in a daisy chain you would first have to change each of their Device IDs. Only the synthesizer with the matching Device ID would respond to the system exclusive message. |
| **Drum Part** | Each [part](https://www.2writers.com/eddie/MidiGlossary.htm#part) in a Sound Canvas can either be a "normal part" or a "drum part". A normal part plays different notes on a single instrument. A drum part plays a different rhythm (percussion) instrument on different notes. Some Sound Canvases can have more than one drum part. |
| **Drum Set** | A drum set is a collection of specific rhythm (percussion) instruments used on the [drum part](https://www.2writers.com/eddie/MidiGlossary.htm#DrumPart). There are a limited number of percussion instruments available in a drum set, thus different drum sets allow access to different percussion instruments. Use a [patch change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange) message on the drum part to change the drum set. |

|  |  |
| --- | --- |
| **E** | |
| **English Horn** |  |
| **Effect** | This is exactly what the name implies. It is a process that is applied to a sound to create an effect. The most common effects found in synthesizers are [chorus](https://www.2writers.com/eddie/MidiGlossary.htm" \l "chorus) and [reverb](https://www.2writers.com/eddie/MidiGlossary.htm#reverb), however there are many others. |
| **Envelope** | The envelope of a sound is the shape a sound makes when represented visually. An envelope has four parts: **attack**, **decay**, **sustain** and **release**. The envelope of different sounds varies considerably. The **attack** part is the first audible part of a sound when a note is played on an instrument. It goes from silence to the maximum volume of the note. The **decay** part is when the sound loses some volume after the attack. The **sustain** part is heard for as long as the note continues to play. Some instruments can sustain a note indefinitely (like an organ) while others fade to inaudibility. The **release** part occurs when the note is release and the sound fades to silence. |
| **Expression (CC 11)** | Expression is used in conjunction with [level (CC7)](https://www.2writers.com/eddie/MidiGlossary.htm#level) to control the volume. Level is used to set the maximum volume for the channel, while expression is used to vary the volume up to the limit set by the level. Expression is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |

|  |  |
| --- | --- |
| **F** | |
| **Fretless Bass** |  |
| **Fine Tuning** | This is used to adjust the pitch of an instrument in small steps. You can use a different tuning for each [part](https://www.2writers.com/eddie/MidiGlossary.htm#part). Master Fine Tune (controlled with [RPN](https://www.2writers.com/eddie/MidiGlossary.htm#rpn)) is used to adjust the pitch of the entire channel, as opposed to [Scale Tuning](https://www.2writers.com/eddie/MidiGlossary.htm#ScaleTuning) which changes individual notes. See also [Coarse Tuning](https://www.2writers.com/eddie/MidiGlossary.htm#CoarseTune). |

|  |  |
| --- | --- |
| **G** | |
| **Gamelan Gong** |  |
| **General Midi (GM)** | Before the GM standard was introduced, different synthesizers seldom had the same instrument on the same [Patch Change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange) (PC) number. When a MIDI file [sequenced](https://www.2writers.com/eddie/MidiGlossary.htm#sequence) for a particular synthesizer was played back on a different synthesizer most, if not all the instruments would be wrong. While PC 1 on one synthesizer could be "Piano", on another it could be "Violin" and on yet another it could be a sound effect! GM is, in essence, a standard that specifies what instrument corresponds to each of the one hundred and twenty-eight PC numbers. It also specifies that the percussion [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) is channel 10 and which notes on the percussion channel correspond to which percussion instrument. In theory, a GM sequence should sound the same on any GM compliant synthesizer. For full details on the GM specification, have a look at the [MIDI Manufacturers Association](http://www.midi.org/) web site. |
| **General Standard (GS)** | GS is Roland's standardized specification, which is a superset of [GM](https://www.2writers.com/eddie/MidiGlossary.htm#gm). This means it is GM compliant, but goes further than GM in its specification of how MIDI messages are processed by a MIDI device. In theory, a GS [sequence](https://www.2writers.com/eddie/MidiGlossary.htm#sequence) should sound the same on any GS compliant synthesizer. Because of the popularity of GS, more of its features have been incorporated into GM. |

|  |  |
| --- | --- |
| **H** | |
| **Harp** |  |
| **Hexadecimal** | Decimal is a numbering system that uses ten digits, 0 through 9. Binary is a numbering system that uses two digits, 0 and 1. Hexadecimal is a numbering system that uses sixteen digits, 0 through F. Hexadecimal is a convenient numbering system when working with data used by electronic devices such as computers and synthesizers. To understand [System Exclusive Messages](https://www.2writers.com/eddie/MidiGlossary.htm#SysEx) you will need to understand hexadecimal, so have a look at the [Hexadecimal Tutorial](https://www.2writers.com/eddie/TutHex.htm). |
| **Hold (CC 64)** | The "Hold" [Control Change](https://www.2writers.com/eddie/MidiGlossary.htm#ControlChange) message is the MIDI equivalent of a piano's sustain pedal. This message switches the sustain *on* or *off* depending on its value. Hold is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |

|  |  |
| --- | --- |
| **I** | |
| **Ice Rain** | If you can find a musical application for this Roland Sound Canvas instrument, I would like to hear it! |
| **Instrument** | In MIDI terms, an instrument is anything that produces a sound. Apart from the expected musical instruments you will often find a whole selection of sound effects like animal and machine sounds. Different synthesizers use different methods to produce the sounds. Some synthesizers can produce acoustic sounds much better than others. Each MIDI [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) can play only one instrument at a time. The [patch change (PC)](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange) message and [variation (CC 0)](https://www.2writers.com/eddie/MidiGlossary.htm#variation) are used to select the desired instrument within a [map](https://www.2writers.com/eddie/MidiGlossary.htm#map). |

|  |  |
| --- | --- |
| **J** | |
| **Jew's Harp** |  |

|  |  |
| --- | --- |
| **K** | |
| **Kanoon** |  |
| **Key Pressure** | See [Aftertouch](https://www.2writers.com/eddie/MidiGlossary.htm#AfterTouch) |
| **Key Shift** | Key shift allows you to transpose a [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) in steps of semitones (half-steps) up to a maximum of two octaves above or below normal. This is a quick and easy way of transposing a [sequence](https://www.2writers.com/eddie/MidiGlossary.htm#sequence) without changing every note. There is a master key shift and a key shift for each channel. |

|  |  |
| --- | --- |
| **L** | |
| **Lequint Guitar** |  |
| **Layering** | Playing the same notes on multiple [instruments](https://www.2writers.com/eddie/MidiGlossary.htm#instrument) simultaneously is called "layering". This effect can be achieved by copying one [track](https://www.2writers.com/eddie/MidiGlossary.htm#track) in a [sequence](https://www.2writers.com/eddie/MidiGlossary.htm#sequence) and pasting it into another track to be played on another [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) using a different instrument. The Roland Sound Canvas can achieve layering much more easily by assigning the same MIDI channel to multiple [parts](https://www.2writers.com/eddie/MidiGlossary.htm#part). |
| **Level (CC 7)** | In MIDI terms, when referring to level, one is usually referring to the **volume** level. There are two types of level: **Master Level** and **Channel Level** (CC 7). Master Level is used to adjust the total output volume of the synthesizer, while Channel Level is used in conjunction with [Expression](https://www.2writers.com/eddie/MidiGlossary.htm#expression) (CC 11) to adjust the volume of individual channels, and is therefor a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Local Control (CC 122)** | Local Control can be turned on or off. When it is on, a MIDI device can be controlled with its built-in keyboard. When it is off, the MIDI device will only respond to [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm" \l "MidiMessage>) received through [MIDI In](https://www.2writers.com/eddie/MidiGlossary.htm#MidiIn), locally played notes are ignored. |
| **Low Frequency Oscillator (LFO)** | A low frequency oscillator is used to cyclically change something, for example pitch, creating [vibrato](https://www.2writers.com/eddie/MidiGlossary.htm#vibrato). The frequency (speed) and the depth (amount) of the oscillation can be changed. LFO is often used with [TVF](https://www.2writers.com/eddie/MidiGlossary.htm#tvf) and [TVA](https://www.2writers.com/eddie/MidiGlossary.htm#tva) to create effects. |
| **Low Pass Filter (LPF)** | A low pass filter is used to filter out higher frequencies in a sound so that only the lower frequencies can be heard. The point above which the frequencies are filtered out is known as the [cutoff frequency](https://www.2writers.com/eddie/MidiGlossary.htm#CutoffFreq). |

|  |  |
| --- | --- |
| **M** | |
| **Mandolin** |  |
| **Map (CC 32)** | In Roland terms, a map is a set of all instruments that belong to a synthesizer. For example, the SC-88 Map has more instruments than the SC-55 Map. It is important to be specific about which map you're selecting an instrument from, as is indicated in the tutorial [Selecting Roland Capital Tones and Variations](https://www.2writers.com/eddie/TutCapitalTones.htm) Map is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Master Coarse Tune** | See [Coarse Tuning](https://www.2writers.com/eddie/MidiGlossary.htm#CoarseTune). |
| **Master Fine Tune** | See [Fine Tuning](https://www.2writers.com/eddie/MidiGlossary.htm#FineTune). |
| **MIDI** | MIDI stands for Musical Instrument Digital Interface. It is a standard for connecting instruments together and for exchanging [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage). |
| **MIDI Implementation Chart** | A MIDI implementation chart is a chart specifying what [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) a MIDI device can send (transmit) and which it can receive (recognize). |
| **MIDI In** | MIDI In is the physical connection where a MIDI device receives [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage). MIDI In is connected to another MIDI device's [MIDI Out](https://www.2writers.com/eddie/MidiGlossary.htm#MidiOut) or [MIDI Thru](https://www.2writers.com/eddie/MidiGlossary.htm#MidiThru). |
| **MIDI Message** | MIDI messages are used to exchange data with MIDI devices. There are many of types of messages ranging from control messages to note messages. |
| **MIDI Out** | MIDI Out is the physical connection through which a MIDI device sends [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage). MIDI Out is connected to another MIDI device's [MIDI In](https://www.2writers.com/eddie/MidiGlossary.htm#MidiIn). |
| **MIDI Thru** | MIDI Thru is the physical connection through which a MIDI device sends all [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) that it receives through [MIDI In](https://www.2writers.com/eddie/MidiGlossary.htm#MidiIn). This is used to [daisy chain](https://www.2writers.com/eddie/MidiGlossary.htm) multiple MIDI devices. |
| **MIDI Time Code (MTC)** | MIDI Time Code is part of the standard MIDI specification. It is a means by which connected MIDI devices can synchronize with one another. |
| **Mode** | There are four Modes in MIDI: Mode 1: [Omni On](https://www.2writers.com/eddie/MidiGlossary.htm#OmniOn), [Poly](https://www.2writers.com/eddie/MidiGlossary.htm#poly) Mode 2: Omni On, [Mono](https://www.2writers.com/eddie/MidiGlossary.htm#mono) Mode 3: [Omni Off](https://www.2writers.com/eddie/MidiGlossary.htm#OmniOff), Poly Mode 4: Omni Off, Mono |
| **Modulation (CC 1)** | Most MIDI keyboards have a modulation wheel or control. By default, the response to this [controller](https://www.2writers.com/eddie/MidiGlossary.htm#controller) is to add [vibrato](https://www.2writers.com/eddie/MidiGlossary.htm#vibrato) to the playing notes, however it can be re-assigned to control other [effects](https://www.2writers.com/eddie/MidiGlossary.htm#effect). Modulation is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Mono (CC 126)** | If the Mono [MIDI message](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) is sent to a [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel), only one note can be played at a time on that channel. This is useful for instruments that cannot play chords. Mono is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). See also [Poly (CC 127)](https://www.2writers.com/eddie/MidiGlossary.htm#poly). |
| **Multitimbral** | Multitimbral is the term used for a MIDI device that can simultaneously play more than one [timbre](https://www.2writers.com/eddie/MidiGlossary.htm#timbre). |
| **Mute** | Mute means "silent" or "to silence". It is used when you want to silence some [channels](https://www.2writers.com/eddie/MidiGlossary.htm#channel) while listening to others. |

|  |  |
| --- | --- |
| **N** | |
| **Nylon String Guitar** |  |
| **Non-registered Parameter Number (NRPN) (CC 98 and CC 99)** | NRPNs are messages that can be used to modify sound parameters in a synthesizer. For example, [vibrato](https://www.2writers.com/eddie/MidiGlossary.htm#vibrato) can be adjusted using NRPN on the Roland Sound Canvas. NRPN messages are used to select the desired parameter and then [data entry](https://www.2writers.com/eddie/MidiGlossary.htm#DataEntry) messages are used to change the selected parameter. Unlike [RPN](https://www.2writers.com/eddie/MidiGlossary.htm#rpn), NRPN is not part of the standard MIDI specification and therefor is not necessarily consistent across synthesizers. NRPN messages are [Channel Messages](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). For examples, see the [RPN and NRPN](https://www.2writers.com/eddie/TutNrpn.htm) tutorial. |
| **Note** | A note is a sound you can hear. In MIDI terms a note is switched on and off to produce sound. The Note On [Midi message](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) has [pitch](https://www.2writers.com/eddie/MidiGlossary.htm#pitch) and [velocity](https://www.2writers.com/eddie/MidiGlossary.htm). A Note On message with a velocity of zero is the same as a Note Off message. Note On and Note Off are [channel messages](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |

|  |  |
| --- | --- |
| **O** | |
| **Oud** |  |
| **Omni Off (CC 124)** | When Omni is switched off a MIDI device will only receive [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm" \l "MidiMessage) on one [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel). |
| **Omni On (CC 125)** | When Omni is switched on a MIDI device will receive [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm" \l "MidiMessage) on all [channels](https://www.2writers.com/eddie/MidiGlossary.htm#channel). |

|  |  |
| --- | --- |
| **P** | |
| **Pungi** |  |
| **Pan (CC 10)** | Use Pan (CC 10) to place an instrument in the stereo field. Lower values will be closer to one speaker, while higher values will be closer to the opposite speaker. Each [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) can only be at one pan position at a time, however you can change that position as often as you like. Pan is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Parameter** | A parameter is simply a value. Most [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) have one or two parameters, for example [Note On](https://www.2writers.com/eddie/MidiGlossary.htm#note) has two parameters: [pitch](https://www.2writers.com/eddie/MidiGlossary.htm#pitch) and [velocity](https://www.2writers.com/eddie/MidiGlossary.htm#velocity). |
| **Part** | The Roland Sound Canvas is a [multitimbral](https://www.2writers.com/eddie/MidiGlossary.htm#MultiTimbral) MIDI device. This means it is capable of simultaneously producing the sounds of multiple [instruments](https://www.2writers.com/eddie/MidiGlossary.htm#instrument). To do this it uses Parts to encapsulate each instrument. Each Part is similar to a MIDI [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) in that it can play only one instrument at a time. It can also be set up with individual [effects](https://www.2writers.com/eddie/MidiGlossary.htm#effect) settings. Where a Part differs from a Channel is that the Channel Number assigned to a Part can be changed. If more than one Part is assigned the *same* Channel Number, then *all* those parts will respond to [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm) received on that Channel. Since each Part can play a separate instrument, the effect is multiple instruments playing the same notes. This is called [layering](https://www.2writers.com/eddie/MidiGlossary.htm#layering). |
| **Patch** | To play different "[instruments](https://www.2writers.com/eddie/MidiGlossary.htm#instrument)" on the original synthesizers, one had to physical connect different parts of the synthesizer with patch cables. Thus changing instrument became known as changing the Patch. In Roland terms, a patch includes not only the instrument setting but the [effects](https://www.2writers.com/eddie/MidiGlossary.htm#effect) settings too. |
| **Pitch** | Each note in a scale has a specific pitch. Playing the same note of the same scale on different instruments will produce the same pitch. |
| **Patch Change (PC)** | The Patch Change message is used to select one of one hundred and twenty-eight [instruments](https://www.2writers.com/eddie/MidiGlossary.htm#instrument) in the current [bank](https://www.2writers.com/eddie/MidiGlossary.htm#bank) of the current [map](https://www.2writers.com/eddie/MidiGlossary.htm#map). Patch Change is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Pitch Bend** | Pitch Bend [messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) smoothly change the [pitch](https://www.2writers.com/eddie/MidiGlossary.htm#pitch) of all playing notes in a [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel). Many MIDI devices employ a lever or wheel to control the transmission of these messages. Pitch Bend is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Poly (CC 127)** | If the Poly [MIDI message](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) is sent to a [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel), multiple, simultaneous notes can be played on that channel. This is useful for instruments that can play chords. Poly is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). See also [Mono (CC 126)](https://www.2writers.com/eddie/MidiGlossary.htm#mono). |
| **Polyphonic Key Pressure** | See [aftertouch](https://www.2writers.com/eddie/MidiGlossary.htm#aftertouch). |
| **Polyphony** | The polyphony of a synthesizer is the maximum number of voices (or sounds) that can be played simultaneously. Some synthesizers employ more than one voice to produce a single note for some [instruments](https://www.2writers.com/eddie/MidiGlossary.htm#instrument). These instruments reduce the number of notes that can be played simultaneously. |
| **Port** | Ports are used to overcome the sixteen [channel](https://www.2writers.com/eddie/MidiGlossary.htm#channel) limit imposed by MIDI. Each port can address sixteen channels. |
| **Portamento (CC 5, CC 65, CC 84)** | Portamento creates a sliding effect by smoothly changing pitch from the last note played to the pitch of the currently playing note. Use [control change](https://www.2writers.com/eddie/MidiGlossary.htm#ControlChange) (CC) 65 to switch portamento on or off. Use CC 5 to control how quickly the pitch transition takes place. Use CC 84 to specify a starting note without actually playing the note. Portamento is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Program Change** | See [Patch Change](https://www.2writers.com/eddie/MidiGlossary.htm#PatchChange). |

|  |  |
| --- | --- |
| **Q** | |
| **Quijada** |  |

|  |  |
| --- | --- |
| **R** | |
| **Rabab** |  |
| **Registered Parameter Number (RPN) (CC 64 and CC 65)** | RPN messages are used to modify three parameters: [pitch bend](https://www.2writers.com/eddie/MidiGlossary.htm#PitchBend) sensitivity, [master fine tuning](https://www.2writers.com/eddie/MidiGlossary.htm#MasterFineTune) and [master coarse tuning](https://www.2writers.com/eddie/MidiGlossary.htm#MasterCoarseTune). The RPN messages are used to select the desired parameter and then the [data entry](https://www.2writers.com/eddie/MidiGlossary.htm#DataEntry) messages are used to change the parameter. RPN messages are defined in the standard MIDI specification and are consistent across synthesizers. RPN messages are [Channel Messages](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). For examples, see the [RPN and NRPN](https://www.2writers.com/eddie/TutNrpn.htm) tutorial. |
| **Release** | See [envelope](https://www.2writers.com/eddie/MidiGlossary.htm#envelope). |
| **Reset All Controllers (CC 121)** | The Reset All Controllers [message](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage) will return all [controller](https://www.2writers.com/eddie/MidiGlossary.htm#controller) values to their default values. The Reset All Controllers message is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Resonance** | By adjusting the Resonance value, frequencies or overtones in the area of the [cutoff frequency](https://www.2writers.com/eddie/MidiGlossary.htm#CutoffFreq) can be emphasized or de-emphasized. Resonance can be altered with [NRPN](https://www.2writers.com/eddie/MidiGlossary.htm#nrpn). |
| **Reverb** | Reverb is an [effect](https://www.2writers.com/eddie/MidiGlossary.htm#effect) that emulates what would happen to a sound with different surroundings. A sound reverberates much more in a large hall than in a small room. |

|  |  |
| --- | --- |
| **S** | |
| **Shanai** |  |
| **Scale Tuning** | Scale tuning allows small adjustments to the pitch of each note in the octave. All octaves are affected equally. Scale tuning can be used to create different musical scales. |
| **Sequence** | A Sequence is simply a collection of MIDI messages that can be sent to a MIDI device to produce music. A sequence is usually created and modified in a [sequencer](https://www.2writers.com/eddie/MidiGlossary.htm#sequencer) and can be saved to file like a document. These files are themselves often referred to as sequences. Most sequencers have a proprietary file format, but the most common format you will encounter is the [Standard MIDI File](https://www.2writers.com/eddie/MidiGlossary.htm#smf) format. A sequence is usually divided into multiple tracks. Each track contains events, which are usually [MIDI messages](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage). A track can be assigned a [port](https://www.2writers.com/eddie/MidiGlossary.htm#port) which is set to a specific MIDI device. The track is also assigned one of the sixteen MIDI channels on that device. The absolute start time of each event is represented either as **Bar**(Measure)**:Beat:Tick** or as [SMPTE](https://www.2writers.com/eddie/MidiGlossary.htm) time code. |
| **Sequencer** | A Sequencer is software that is used to read, edit, save and play MIDI [sequences](https://www.2writers.com/eddie/MidiGlossary.htm#sequence). A sequencer can be used on a computer or a dedicated hardware device connected to a MIDI device. Some MIDI devices have built-in sequencers. |
| **SMF** | See [Standard MIDI File](https://www.2writers.com/eddie/MidiGlossary.htm#smf). |
| **SMPTE** | SMPTE stands for Society of Motion Picture and Television Engineers, and is pronounced "sempty". It is a time code developed by engineers for synchronizing audio and video. SMPTE time code is represented as **hh:mm:ss:ff**, which is hours:minutes:seconds:frames. |
| **Soft (CC 67)** | The Soft [controller](https://www.2writers.com/eddie/MidiGlossary.htm#controller) message emulates the soft pedal of a piano by lowering the [cutoff frequency](https://www.2writers.com/eddie/MidiGlossary.htm#CutoffFreq) thus dampening the sound. Soft is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Sostenuto (CC 66)** | The Sostenuto [controller](https://www.2writers.com/eddie/MidiGlossary.htm#controller) message emulates the sostenuto pedal on a piano. The result is to sustain only notes already playing. Sostenuto is a [channel message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). |
| **Standard MIDI File (SMF)** | The Standard MIDI File format is a specification developed by the International MIDI Association. It is an internationally recognized method of saving a MIDI [sequence](https://www.2writers.com/eddie/MidiGlossary.htm#sequence) to a file on disk. |
| **Sustain** | See [envelope](https://www.2writers.com/eddie/MidiGlossary.htm#envelope). |
| **System Exclusive Message (SysEx)** | A method of two way communication between MIDI devices. It is called "exclusive" because the message is coded to address a specific MIDI device. If MIDI devices are connected in a [daisy chain](https://www.2writers.com/eddie/MidiGlossary.htm#DaisyChain), only those devices which recognize a specific SysEx message will respond to it. However, if you have more than one of the *same* MIDI device in the chain you would need to change the [device ID](https://www.2writers.com/eddie/MidiGlossary.htm#DeviceId) to make them act like different devices. To learn how to use SysEx messages, see the [SysEx Tutorial](https://www.2writers.com/eddie/TutSysEx.htm). |

|  |  |
| --- | --- |
| **T** | |
| **Tamboura** |  |
| **Timbre** | Timbre is another word for sound. It is sometimes used interchangeably with [patch](https://www.2writers.com/eddie/MidiGlossary.htm#patch) and [instrument](https://www.2writers.com/eddie/MidiGlossary.htm#instrument). Multitimbral is the term used for MIDI devices capable of playing many sounds simultaneously. |
| **Time Variant Amplitude (TVA)** | "Amplitude" in this instance means "volume". "Time variant" means "changing with time". Synthesizers use [LFO](https://www.2writers.com/eddie/MidiGlossary.htm#lfo)s to cyclically change a sound. In this instance, it is the amplitude that is being varied to create a tremolo effect. |
| **Track** | A track is part of a [sequence](https://www.2writers.com/eddie/MidiGlossary.htm#sequence). It stems from the days when multitrack tape recorders were used to record early synthesizers that could only play one [patch](https://www.2writers.com/eddie/MidiGlossary.htm#patch) at a time. Once one track was recorded, the synth would be repatched and while the previous tracks were played back, the new track would be recorded with the new patch. |
| **Time Variant Filter (TVF)** | A Time Variant Filter is simply a changing of the [cutoff frequency](https://www.2writers.com/eddie/MidiGlossary.htm#CutoffFreq) over a period of time. A [Low Frequency Oscillator](https://www.2writers.com/eddie/MidiGlossary.htm#lfo) is used to cyclically vary the cutoff frequency. The rate (speed) and depth (amount) of the variation can be controlled. |

|  |  |
| --- | --- |
| **U** | |
| **Ukelele** |  |

|  |  |
| --- | --- |
| **V** | |
| **Vibraphone** |  |
| **Variation (CC 0)** | The Roland Sound Canvas range of synthesizers have 128 [capital tones](https://www.2writers.com/eddie/MidiGlossary.htm#CapitalTone), each of which have a maximum of 127 variations. Variations are *usually* the same kind of instrument, but of a different type. For example "Old Upright" is a variation of the "Honky-tonk" capital tone. Not all variations are actually used. Different [maps](https://www.2writers.com/eddie/MidiGlossary.htm#map) have a different number of variations. In the SC-88 Map, some capital tones have no variations, while others have as many as thirteen. The variation message is a [Channel Message](https://www.2writers.com/eddie/MidiGlossary.htm#ChannelMessage). In Roland terminology, a variation is the same as a [bank](https://www.2writers.com/eddie/MidiGlossary.htm#bank). For more details have a look at [Selecting Roland Capital Tones and Variations](https://www.2writers.com/eddie/TutCapitalTones.htm). |
| **Velocity** | The term "velocity" in MIDI terms is misleading. Basically it is a value representing how hard a note is played on a MIDI device such as a keyboard. "Hard" implies pressure, so to avoid confusion with [aftertouch](https://www.2writers.com/eddie/MidiGlossary.htm#aftertouch), which deals with pressure, it was decided to use "velocity" which implies speed. Thus the faster (harder) a note is played, the louder it will sound. |
| **Velocity Sensitive** | Some MIDI devices, such as a keyboard, can sense how fast (hard) you play notes. This value, known as the [velocity](https://www.2writers.com/eddie/MidiGlossary.htm#velocity), is embedded in the [Note On](https://www.2writers.com/eddie/MidiGlossary.htm#note) [message](https://www.2writers.com/eddie/MidiGlossary.htm#MidiMessage). Such devices are known as "velocity sensitive" devices. The sensitivity can usually be adjusted to your playing style so that notes don't sound wildly different in volume. |
| **Vibrato** | Varying the pitch of a playing note very slightly, less than a trill, is known as "vibrato". It is used to make a sustained note sound more interesting. The Roland Sound Canvas can alter the characteristics of vibrato with [NRPN](https://www.2writers.com/eddie/MidiGlossary.htm#nrpn) messages. |
| **Voice** | In synthesizer terms, a voice is usually a single, discreet sound. Synthesizers are limited in the number of voices they can play simultaneously. The maximum number of simultaneous voices a synth can play is known as its [polyphony](https://www.2writers.com/eddie/MidiGlossary.htm#polyphony). |
| **Volume** | See [level](https://www.2writers.com/eddie/MidiGlossary.htm#level). |

|  |  |
| --- | --- |
| **W** | |
| **Wadaiko** |  |

|  |  |
| --- | --- |
| **X** | |
| **Xylophone** |  |

|  |  |
| --- | --- |
| **Y** | |
| **?** |  |

|  |  |
| --- | --- |
| **Z** | |
| **Zither** |  |