

# MIDI in REAPER (Learning Resources)

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In your next lab you will need to create a piece using MIDI tracks and virtual instruments. For this reason, in this document I provide a little bit of contextualisation on MIDI, especially on how to work with MIDI in REAPER.

**MIDI IS THE “ESPERANTO” ACROSS ALL SORTS OF DIFFERENT MUSIC INSTRUMENT MANUFACTURERS, HARDWARE AND SOFTWARE, COMMERCIAL AND NON-COMMERCIAL. THAT COMES WITH SOME GENERALISATIONS (WE COULD SAY, LIMITATIONS)**

We could think of it as the mixture of the two major paradigms in music making and music production: The Piano Keyboard, and the Mixing Console.



Introduction to MIDI

WHAT IS MIDI

A History of MIDI

- Acronym for **Musical Instrument Digital Interface**
  - Communication protocol to be implemented/understood by all hardware and software manufacturers.
  - General MIDI expands the protocol with instrument specification and polyphony.

## Timeline

1981 - *Universal Synthesiser* paper by Dave Smith and Chet Wood

1983 - [MIDI 1.0]

1991 - General MIDI

1996 - MIDI 1.0 Detailed Specification (including GM

2020 - MIDI 2.0 Specification

## Midi Data

- 7-bit resolution of most parameters (128 values, ranging from 0 to 127)
- Based on industry needs (implements a conservative instrumental model (eg... Moog vs. Buchla!):
  - Pitch
    - Velocity (dynamics / intensity)
    - Events are a combination of pitch + velocity pairs
    - Duration is not explicit
      - Time lapse between note on and note off messages
      - Note off typically specified as a *note on with velocity 0*
  - Control messages ([list](#), see General MIDI for most common interpretations)
    - includes regular "mixing" controls (volume, panning), effects and instrumental expression
  - Program changes (see General MIDI for standard instrument assignment)
    - "the Orchestra of MIDI"
  - Pitch-bend (7 + 7 bit = 16384 steps)
  - System exclusive messages (reserved to manufacturers)
- MIDI ports (16 channels each):
  - Each MIDI channel:
    - 24 voices polyphony (according to General MIDI)
    - 128 pitches
    - 128 velocity steps
    - 128 control parameters
      - 128 values per control parameter
    - 128 program changes (instruments)

Table of MIDI note numbers and musical notes

Octave	Note Numbers											
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
-1	0	1	2	3	4	5	6	7	8	9	10	11
0	12	13	14	15	16	17	18	19	20	21	22	23
1	24	25	26	27	28	29	30	31	32	33	34	35
2	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59
4	60	61	62	63	64	65	66	67	68	69	70	71
5	72	73	74	75	76	77	78	79	80	81	82	83
6	84	85	86	87	88	89	90	91	92	93	94	95
7	96	97	98	99	100	101	102	103	104	105	106	107
8	108	109	110	111	112	113	114	115	116	117	118	119
9	120	121	122	123	124	125	126	127				

## MIDI in REAPER

The [REAPER 6 MIDI introduction](#) shows the basics of recording midi in realtime, by using an external controller (but you could also use the internal REAPER virtual keyboard) to record a keyboard and a drum track. Additionally, some basic notions of how to assign samples to midi notes are provided.

- [MIDI Track Recording Modes \(Overdub/Replace\) in REAPER - YouTube](#)
  - Default: Creates new takes when recording over
  - Overdub: writes on same item as before non destructively.
  - Replace: writes on same item replacing what was there.
  - Replace-touch (refer to automation modes above)
  - Replace-latch (refer to automation modes above)
- [The MIDI Modes \(Editors\) in REAPER - YouTube](#)
  - Piano Roll
  - note names
  - Event list
  - Score
- [Midi Editor Preferences in REAPER - YouTube](#)
  - Items
  - tracks
  - Projects
- [Quantising MIDI in REAPER - YouTube](#)

## **If you want to know more...**

If you're patient and interested, the following series guides you through the process of creating a complete song entirely from MIDI in REAPER with free virtual instruments (total runtime ~1h 50 min).

First MIDI Song in REAPER 1/8 - Melody and chords (~18 min)

First MIDI Song in REAPER 2/8 - Drums (~16 min.)

First MIDI Song in REAPER 3/8 - Bass synth (~16 min.)

First MIDI Song in REAPER 4/8 - Arranging (~16 min.)

First MIDI Song in REAPER 5/8 - Verse Synth (~15 min.)

First MIDI Song in REAPER 6/8 - Transitions (~14 min.)

First MIDI Song in REAPER 7/8 - Adding last sounds with media explorer (~7 min.)

First MIDI Song in REAPER 8/8 - Mixdown (~6 min.)

Otherwise, the following documents could expand your knowledge in specific areas of working with MIDI in REAPER, especially if you're into electronic popular music:

- [Creating 808 Bases in REAPER \(~10 min.\)](#)
- [Creating a MIDI Arpeggiator in REAPER \(~10 min.\)](#)
- [Create Simple EDM Chords in REAPER \(~17 min.\)](#) and [Creating MIDI Rhythmic Patterns in REAPER \(~10 min.\)](#)
- [Creating MIDI Chords \(Painting\) in REAPER \(~14 min.\)](#)

## **Advanced**

- [Humanize MIDI by randomising parameters \(~10 min.\)](#)
- [Multi Track MIDI Looper \(~10 min.\)](#)
- [ReaControlMIDI Plugin to add more control to virtual instruments~16 min.\)](#)