MIDI Output in Dplug

State of the feature?
How it works?
TL;DR New kinds of effects now possible in Dplug v12.4.1+

- Plug-ins that output MIDI from nothing (eg: arpeggiators)
- Plug-ins that filter MIDI messages (eg: note filter)
- Synthesizers/effects that can also output MIDI, either from UI or from audio thread.

CAUTION: This is a work in progress!
The features

- Send MIDI from UI or DSP

- MIDI 1.0 **Note On** and **Note Off** are the only messages supported for every format (no CC in AAX).

- AUv2 not done yet, macOS not tested yet, multiple channels not tested yet.

*More details in Dplug Issue #577.*
1. Send a MIDI message from `processAudio`

   ```
   void sendMIDIMessage(MidiMessage message);
   ```

   The message's `offset` field refers to the current sub-buffer (0 = first sample of sub-buffer).

2. Send MIDI messages from the UI (typically, on mouse events)

   ```
   void sendMIDIMessagesFromUI(const(MidiMessage)[] messages);
   ```

   - guaranteed to preserve their relative offset
   - but no guarantee of when exactly they will be sent ("ASAP")
Making the MIDI out API nice

A. Order of messages is irrelevant
   - Messages are sorted by increasing offset
     - unless their offset is the same, in which case you need to order them.

B. You can send messages arbitrarily in the future.
   - with an offset that is larger than the current buffer
   - send whole patterns

C. Works with buffer-splitting

   If you want more precise MIDI handling, you can just lower your `maxFramesInProcess()`. 
The Problem

MIDI effects aren’t super compatible across hosts.

But... what exactly is a “MIDI effect” anyway?
Making the MIDI out API compatible

A. In plugin.json “receivesMIDI” MUST be true
   - MUST call getNextMidiMessages(int frames)

B. In plugin.json “sendsMIDI” MUST be true (obviously)

C. MUST take audio input and output and bypass it.

D. (optional) can eventually produce sound to debug output MIDI.
   - Xfer Records’s Chtulhu does this, best for the user. At this points, it is almost a normal synthesizer ^^

=> Let’s just do like popular MIDI effects that actually works in hosts in the wild.
Limitation because of that compatibility work

In Live and Studio One, must use a separate track for the MIDI effect, and send to another track.

(Thankfully many video tutorials exist for other MIDI effects + hosts that don't support that).

Some hosts support MIDI effects particularly well. (Bitwig, REAPER).
Demo time!

Meet Arpejoe, a Dplug example plugin that demonstrates MIDI output.
Thank you

Questions?