MIDI Extensions

Music 253/CS 275A
Stanford University
MIDI shortcomings: Accent

- Barring
- Accent
- Beams
- Grouping
Shortcomings: Duration, articulation

Durations
- Ties (certain kinds)
- Ambiguity of articulation/instrumentation
- Matching written values to sounding values

Articulations
- Staccato
- Marcato
- Tentuto
Expressive MIDI: Code vs. Controllers
(Making MIDI more competent for notation)

Who: Cooper, Ng, Boyle

- `expEvent` (SysEx)
- Min length = 5 bytes
  - 0xF0 start of message
  - 0x7D non-commercial
  - `<data bytes [2..n]>`
  - 0xF7 end of message

Two encoding tables

- `Finale` [Adobe] font list
- “Isolated” symbols
  - Articulation signs
  - Dynamics
  - Rests
  - Stems and tails
- Bit flags for graphical placement of adjunctive objects

Linnstrument
MIDI vs notation

**Extensible symbols, with bit flags**
- 8ve
- Pedal markings
- Trills
- Crescendos
- Beams
- Slurs

**Super objects** [MuseData]
- Objects that subsume multiple more finite objects/events
  - Beams
  - Slurs
Remedies: Overview

- **System-exclusive messages**: manufacturers
- **Bit re-purposing**: Mathews, Hewlett, et al.
- **Addition of control track**: researchers (Mathews et al.)
Proposed (never adopted) extensions
NotaMIDI (Kjell Nordli)

- Employed **meta-events** for extended info
  - Time signature
    - Key signature
    - Clef-sign
    - Crescendo, diminuendo
  - Accent
  - Slur
  - Enharmonic pitch
  - Tempo name (Allegro, Adagio, et al.)
**Expressive MIDI (Ng, Boyle, et al.)**

- Based on **system-exclusive** messages

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Plus look-up table
Augmented MIDI (Mathews, Hewlett)

- Mathews’s system based on bit repurposing
- For:
  - Accents
  - Articulations
- From:
  - Bits in the Note-On command OR
  - Bits from the Velocity byte
Augmented MIDI (controller legacy)
(How to accommodate gesture in MIDI)

- **Who?: Max Mathews**
- **Method**
  - Addition of “drum track”
- **Gestural information**
  - Accents
  - Articulations (incl. slurs)
- **How?**
  - Reassign two bits from note-on command

Max Mathews’ Radio Baton
Mathews’ Music V (pre-MIDI)

[Owed a debt to Pierre Boulez’s wish for similar control for tapes]

Music V: Sound generation, pre-MIDI
Radio drum/baton file (c. 1988)

This statement defines an instrument. Here a wave-form table for the clarinet is set up. GEN2 calls an oscillator subroutine. The parameters are (1) an operation code (3 = generate function), (2) an action time, (3) an instrument number, (4) a table number, and (5–10) the relative amplitudes of harmonics 1–6.

These statements cause notes to be played. The initial parameters are (1) an operation code (1 = play note), (2) an instrument number, (3) a start-of-action time, (4) event duration, (5) an absolute amplitude for the event, and (6) event frequency (Hz). These parameters may be followed by a variable number of user-defined parameters (not shown).

Example G1: Music V representation of Bars 1 and 2 of the Clarinet part of the Mozart trio.

Beyond MIDI, Glossary
http://beyondmidi.ccarh.org/beyondmidi-600dpi.pdf
Controller legacy in Malinowski’s cranker

- Stephen Malinowski’s “cranker” for electro-acoustic performances
  - https://www.youtube.com/watch?v=EAWSonBN3Pk