SHEET MUSIC
ENGRAVING

Sam Barr
• How a composer communicates music to musicians
• Several systems worldwide; I focus on western notation
• Modern western music notation conveys:
  • Note pitches
  • Rhythms
  • Tempo
  • Dynamics (loud and soft)
  • Articulation (manner of playing the note)
• Notate all of these simultaneously
• Music engraving: process of typesetting music
HISTORY OF MUSIC
ENGRAVING
15th Century

- Printed music came about same time as printed text
- Most printed music was liturgical
- Early scores used moveable type
  - Scores printed in 2-3 stages
- More expensive than printing text
- Often times handwritten
- Moveable type had limited use into 19th century
Earliest known (dated) printed music, 1476

Earliest printed music from England, 1500

16th Century

- Musical notation becomes more complex
  - Movable type inflexible

- Began engraving music into plates of metal
  - Copper, later pewter/aluminum/zinc
  - Done by hand
  - Single page could take as long as 8 hours

- Where the term "music engraving" comes from

- Remained popular with publishers into 20th century
  - Even as late as 1990s
In Liebesarmen ruht ihr trunken,
Des Lebens Früchte winken euch;
Ein Blick nur ist auf mich gesunken,
Doch bin ich vor euch allen reich.

Andantino espressivo assai
dolcissimo
18th century

- 1796: Lithography invented
  - Draw on limestone with grease pen
  - Treat stone with chemicals
  - Ink sticks to where grease was

- Cheaper than metal engraving
  - Produces less polished scores

- Used alongside engraving
  - Cheaper alternative
  - Some publishers used both methods
20th Century

• Software for typesetting sheet music
• Became popular with the rise of the personal computer
• Eventually replaced metal engraving as industry standard
• Many types of typesetting programs
  • Text based formatting
  • Scorewriters
  • SCORE
Text Based Editors

• Similar to TeX, troff
• Describe sheet music with text file
  • Program converts text input to pdf/ps/svg
• music
  • Released in 1987 by Eric Foxley
  • Music typesetting for troff
• MusiXTeX
  • Created in 1991
  • Music typesetting for TeX
  • Comes preprocessor PMX with more intuitive syntax
• Lilypond
  • Created in 1996
  • Standalone typesetting language
Glengarry’s March

Input given in key of A major

A E7 A G
A D E7 A G A
The coding is as follows:

\begin{music}
\parindent10mm
\instrumentnumber{1} \% a single instrument
\setname{Piano} \% whose name is Piano
\setstaffs{2} \% with two staffs
\generalmeter{\meterfrac44} \% 4/4 meter chosen
\startextract \% starting real score
\Notes{ibu0f0\qb0\cge}\tbu0\qb0\g|\hl j\en
\Notes{ibu0f0\qb0\cge}\tbu0\qb0\g|\ql l\sk\ql n\en
\bar
\Notes{ibu0f0\qb0\d\g}\qlp i\en
\Notes{tbu0\qb0\g|ibb1j3\qb1j\tbl1|qb1k}\en
\Notes{ibu0f0\qb0\cge}\tbu0\qb0\g|\hl j\en
\zendextract \% terminate excerpt
\end{music}
\{ 
numericTimeSignature 
\time 4/4 
\clef treble 
\key f \major 
\relative { 
 f'8\p \<(g8 a4) f'4\>! e4~\> | 
e4 c2\>! r4 | 
d8\mf c8 bes8 a8 g4. a8 | 
f4.-- f8--. f2-- \bar "|." 
} 
\}
Scorewriters

• Similar to WYSIWYG editors like Word
  • GUI for typesetting sheet music

• Most popular type music engraving program
  • Easier/more intuitive to learn

• Used by publishers
  • Give easy access to fine-grain typesetting options

• Used by composers
  • Allow for playback and recording of music

• Several prominent scorewriters:
  • Finale (1988, Windows)
  • Sibelius (1993, Mac)
  • Musescore (2002, Cross platform, Open source)
  • Dorico (2016, Windows, Mac)
SCORE

- Released in 1987 by Leland Smith
- Written for MS-DOS in FORTRAN
- Text based input, simplified vector graphics
  - Output pdf
- Industry standard for many years
  - Produced high quality scores
  - Difficult to learn
  - Still sees usage today
- Became abandonware after Smiths death
  - Source code unavailable
  - New copies not being sold
Staff # = 1  Left End = 0  Vert. Pos = 0  Size = 1.00  Right End = 200
Spacing = 1  Left Pos = 39  Right Pos = 177  Meter = 4/4  Key Sig. = Eb
Type notes,etc>sd/b3/b/df//ri/b/b/df//ri/dn/e/c/bn/d/e/c/bn/cf/dn/ff/df/an/c/

Enter 26 rhythms ->q/e//h/w/q/e//h/w/qx8_
sans pédale

couper sec et bref
louré, presque sans péd
SHEET MUSIC
TYPESETTING
Clef
Several kinds of clefs
Vertical Position Matters
Vertical Position Depends on Clef
Time Signature
Note stems
Stem Direction
Eighth Notes
Questions?

• YouTube, YouTube, 14 Mar. 2016, www.youtube.com/watch?v=BvyoKdW-Big.