Midi Shortcomings:
Temperament, Expression

## Video synchronization via MIDI

- Score (track)
- Moving images
- Frame numbers
- Bar numbers
- Sound tracks



## Shortcomings: Tuning, Temperament

## Pitch

- Non-Western
- Non-equally tempered

- Interpretation of accidentals (inflections)

Modes vs. chromatic scale


Ionian Mode (I)
Dorian Mode (II)
Phrygian Mode (III)
Lydian Mode (IV)
Mixolydian Mode (V)
Aeolian Mode (VI)
Locrian Mode (VII)


## Mapping (or not) to the chromatic scale

- Diatonic=8 tones
- Chromatic=12 tones
- Pentatonic=5 tones



Lady playing tanpura, c1735

## Non-equal temperament

- Baroque tunings (18 ${ }^{\text {th }}$ century)
- "Just" intonation
- Meantone
- Werckmeister III

- Arbitrary 8 ve arrangements ("short octaves", split keys)




## Vicentino's enharmonic harpsichord (pitch equivalents in cents)



Music for enharmonic harpsichord (from c1550) here by Martino Pesenti (c1650)

## Electronic replicas offering unequal temperament

Three modes
Equal-tempered
Meantone
Werckmeister III
Two acoustic contexts
Room
Hall
Two "instruments"
Organ
Harpsichord
Five "stops"
Harpsichord 1-manual
Harpsichord 2-manual
Flemish
Lute
https://www.youtube.com/watch?v=zZSIHVifRps

## MIDI in use: Historical vs digital harpsichords

- Original $16^{\text {th }}$-century instrument: National Music Museum, Vermilion, SD
- https://www.youtube.com/watch?v=aq9iwiyq6u0
- Alteration of tuning, temperament
- https://www.youtube.com/watch?v=W2gOI1p 0iM [Vallotti tuning, English Renaissance music]
- Split keys, Renaissance harpsichords:
- https://www.youtube.com/watch?v=D0OveRacKHO


## Steinway Spirio (electronic recording piano)

 https://www.steinway.com/spirio

## Quantized vs unquantized MIDI files

Quantized
Unquantized

- Expression requires unquantized files
- Unquantized files messy to work with
- Quantized files preferable for transcription but hard to listen to



## Recently built analog instruments

- John Butt demonstrating a replica of a Handel organ
- https://www.youtube.com/watch?v=v-J3YkRKn7c

