

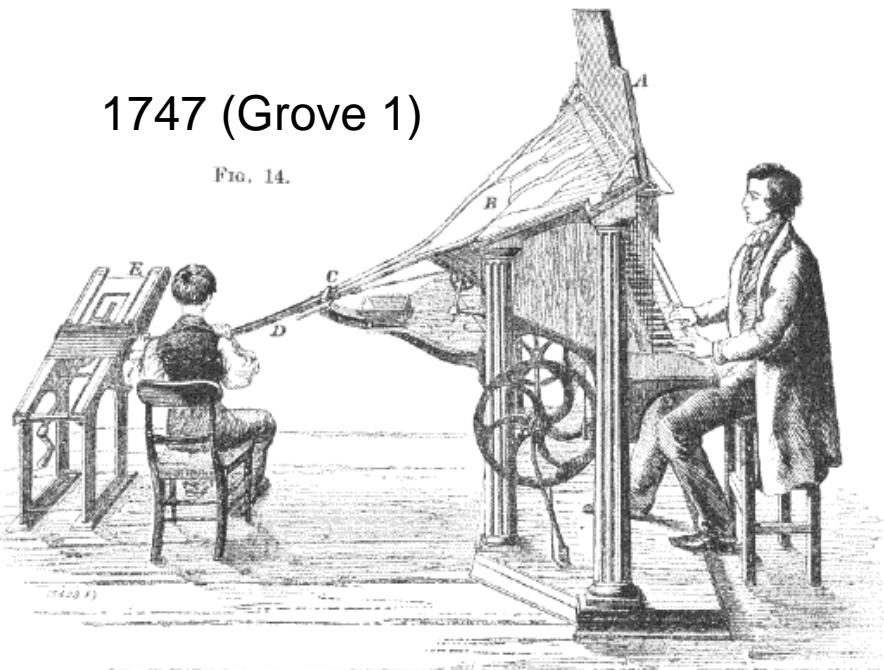
From Analogue to Digital: Sound Input through the Ages

MUSIC 253/CS 275A
STANFORD UNIVERSITY

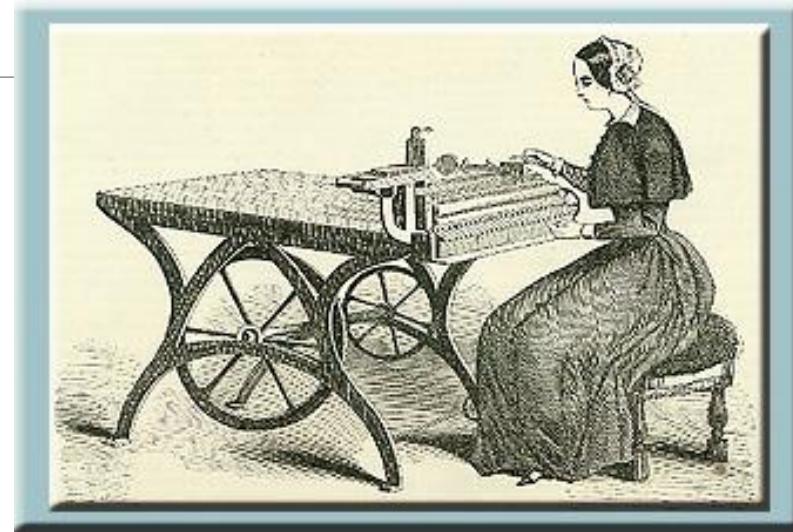
Automatic transcription

1747 (Grove 1)

Fig. 14.



Figs. 12 to 14. YOUNG'S COMPOSING MACHINE



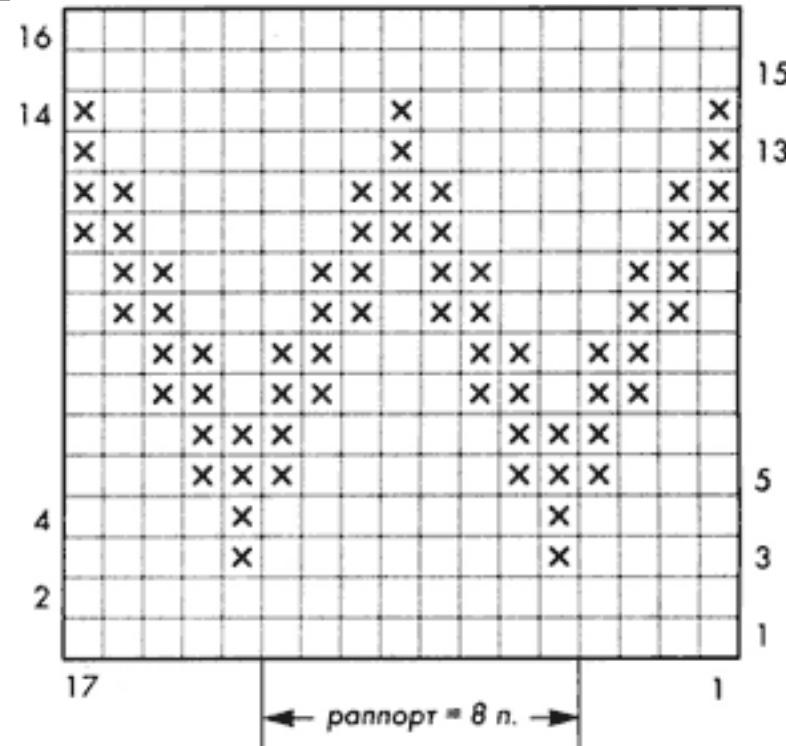
19th century
Horizontal loom

Weaving patterns

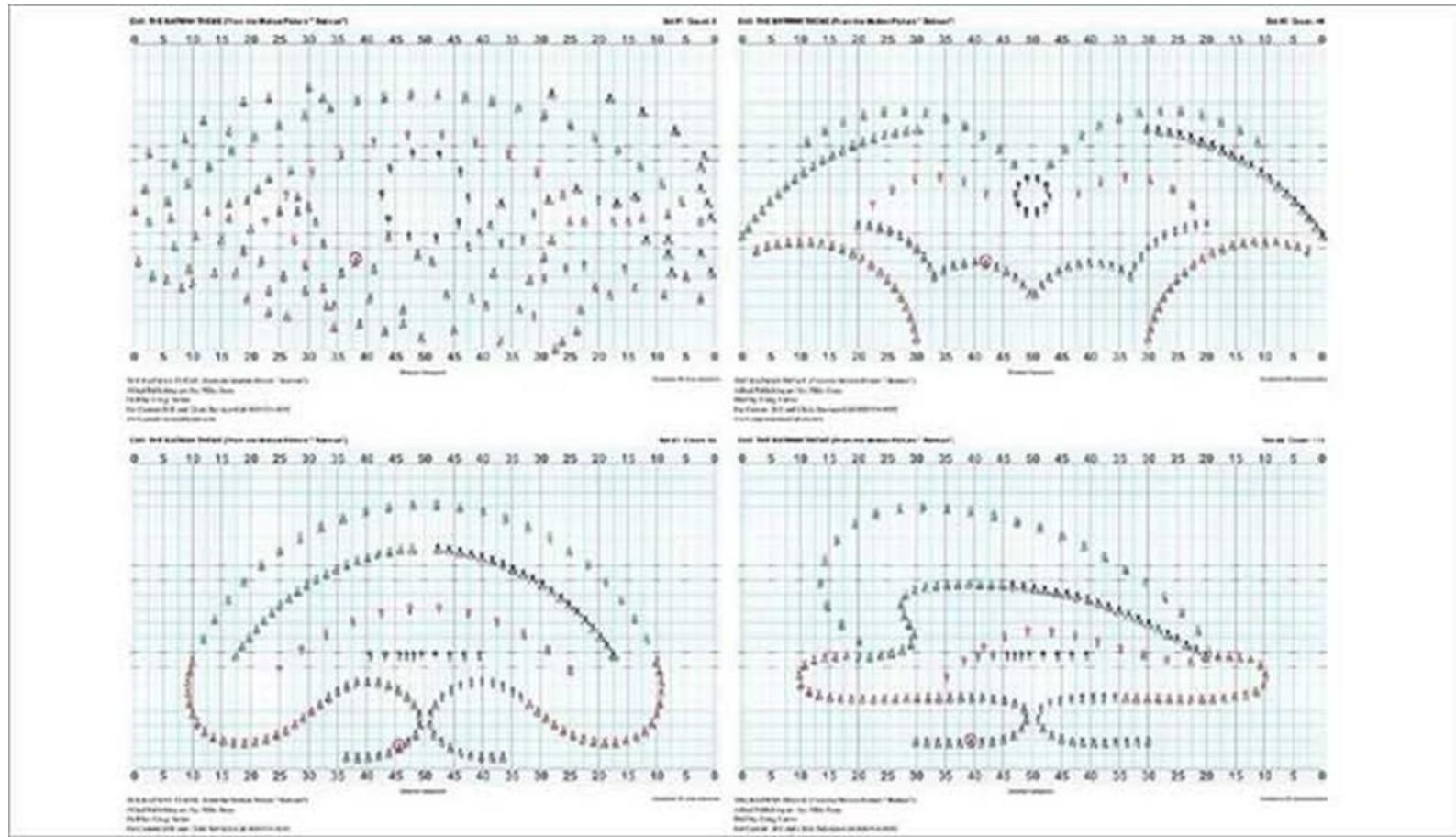


What is the basis of a Jacquard pattern?

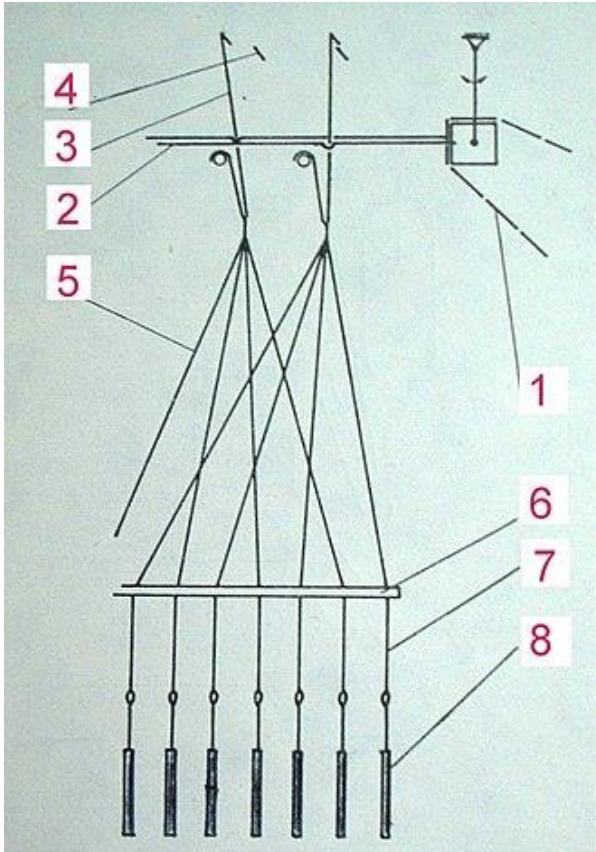
Basic grid, similar
to grids for
music-typesetting.



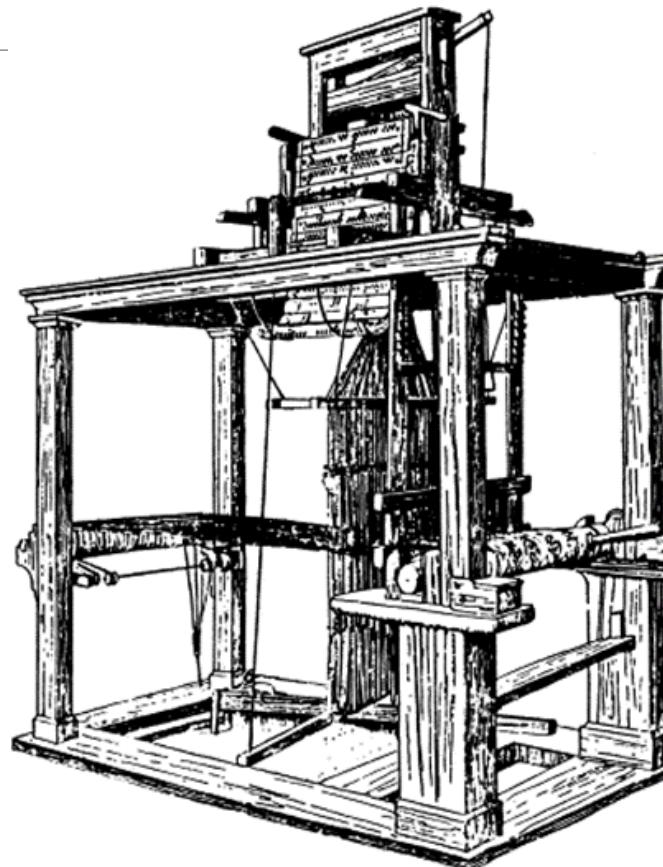
Marching-band formations



Analog methods



Threading of loom.



Vertical (Jacquard)
loom, 1855



Cards for loom.
Rotate as loom turns.

**To change pattern,
change cards.**

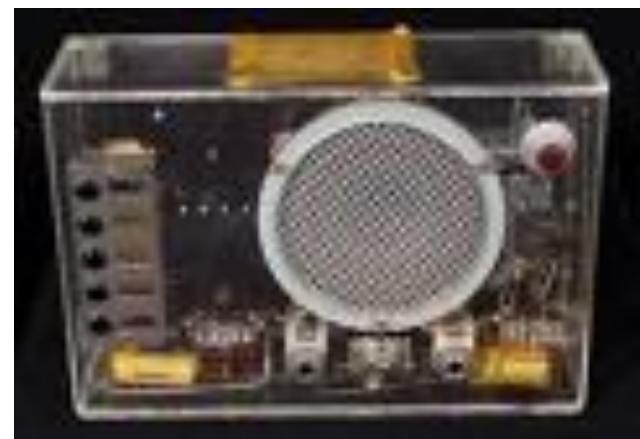
Sound generators

Machines to generate sound in order to ...

- ...**generate** music [compose or arrange] on the fly
- ...**perform** music already composed or arranged
- <https://supra.stanford.edu>
- ...**transcribe** music from performance



Organ
(orchestrion?)
roll



<https://www.youtube.com/watch?v=JTnGI6Knw5Q>

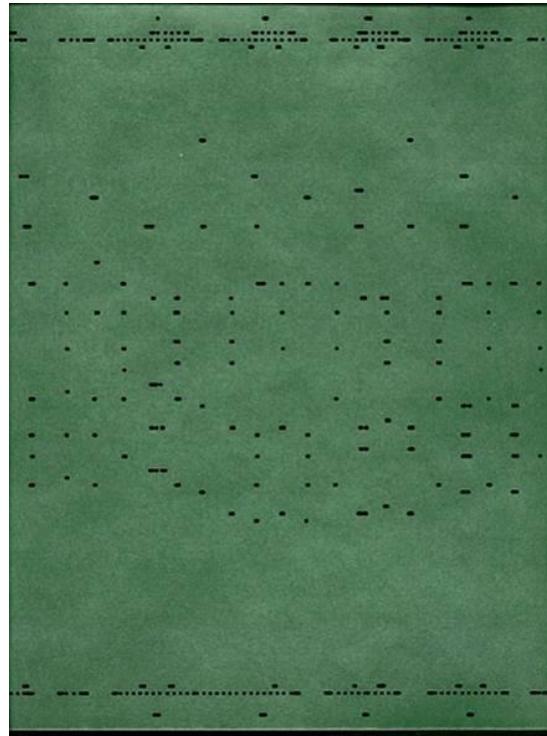
Sound generation and capture

c.1800 AD



Franklin's Glass Harmonica (1761)

c.1905



Welte-Mignon piano roll (1910)

<https://www.youtube.com/watch?v=ibUOZ3Kp7vk> (Dennis James)

<http://www.youtube.com/watch?v=XMrdhgWR9Zk>

[http://www.pianola.co.nz/public/midi/Alexander'sRagtimeBand\(1911\) Connorized88Note-1818_\(UncreditedArranger\).mid](http://www.pianola.co.nz/public/midi/Alexander'sRagtimeBand(1911) Connorized88Note-1818_(UncreditedArranger).mid) (1919)

Music Boxes and Piano Rolls



<http://www.pianola.co.nz/index.asp>

[http://www.pianola.co.nz/public/midi/Alexander'sBandIsBackInDixieland\(1919\)_QRSAutographWordRoll-884_MaxKortlander.mid](http://www.pianola.co.nz/public/midi/Alexander'sBandIsBackInDixieland(1919)_QRSAutographWordRoll-884_MaxKortlander.mid) (1911)



Victrola c. 1930

Reproducing music: Early phonography

Edison home phonograph c. 1914



Edison floor model 1921



Interfacing hardware to software

Let machines deal with
machines (robotics):



Self-playing tuba

Give users independent control
of different parts of machine:



Wurlitzer band organ

Basic properties of MIDI (1983-85)

Eight-bit architecture

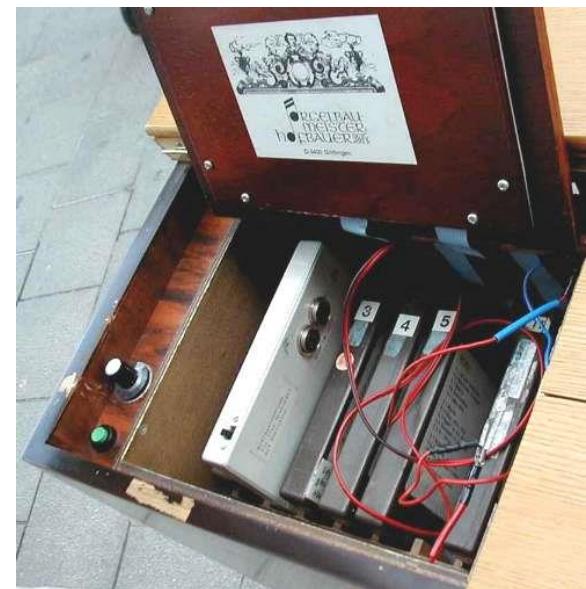
Files are binary

Highly standardized



Harmonipan

Street-organ controller



Patterns for sound “programs”: Orchestrions

Orchestrion:

https://www.youtube.com/watch?v=955mEk_q8hM

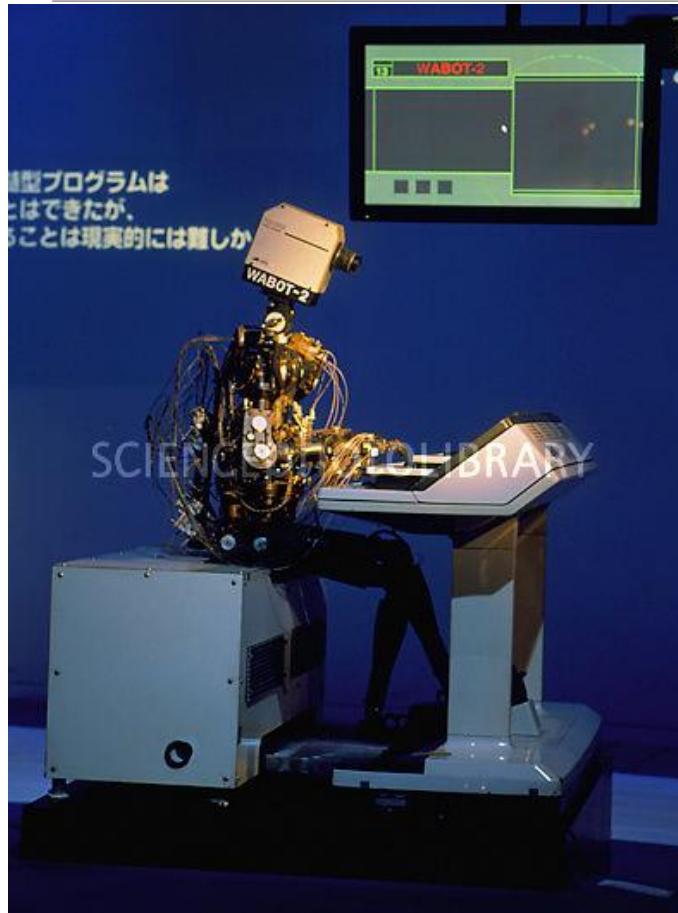
Trautonium (Oskar Sala, 1940-60s; Alfred Hitchcock films)

<https://www.youtube.com/watch?v=-tQQEChMq1A>

Paris Museum of Mus. Instruments

https://artsandculture.google.com/exhibit/TAKiqDI_Fw98kJg

Wabot from Keio University, 1984--



Video:

http://rraj.rsj-web.org/en_atcl/224