Music and Technology

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Lecture Outline

• A Brief Looks at Recording Technologies
• Electronic Instruments
• Effects
• Production Techniques
A Brief Look at Recording Technologies

• First sound recordings, late 1870s
  • Without electricity!
• First electric sound recordings: 1925
  • Microphones
• Recording to tape
  • Widely used post-WWII (in Germany from 1930s)
• Digital: mid-to-late 1970s
Electronic Instruments

- Includes all instruments made with electronic sounds: synthesizers, theremin, etc.
Theremin

- Leon Theremin, 1920s, Russia
  https://www.youtube.com/watch?v=flcsn9hzI84
- Clara Rockmore
  https://www.youtube.com/watch?v=pSzTPGIna5U

Ex: Bernard Herrmann – “The Day The Earth Stood Still” (1951)
  https://www.youtube.com/watch?v=3ULhiVqeF5U
  https://www.youtube.com/watch?v=mW0B1sipLBI
Electric Keyboard

- Uses pre-loaded samples of musical instruments and other sounds

https://www.youtube.com/watch?v=1lZ-8Vl6uTU
Moog Synthesizers

Video Ex: 50th Anniversary of the Moog Modular Synthesizer

https://www.youtube.com/watch?v=G7TJy1AyTiQ
Synthesizers

• Huge range of possible sounds
• Customizable sounds

Ex: Ohio Players
  – “Funky Worm” (1972) (:45)

Synth/Keyboard Bass

Ex: Parliament – “Flash Light” (1977)
• Bernie Worrell

Keytar

- 18th C. portable pianos
- 1980s origins
- Keyboard/Synthesizer

Ex: Herbie Hancock

- “Chameleon” (live, 2012)

https://www.youtube.com/watch?v=PK_Nz7e7ZVc
(:30, 6:00)
Electric Drum Kit

• Variety of sounds (samples)
• Volume control

**Video Ex: How Electronic Drums Sound Without Amplification**
https://www.youtube.com/watch?v=IH5mSI1LLMA

**Video Ex: How Electric Drums Work**
https://www.youtube.com/watch?v=QoWbUZChfls
Samplers

• Keyboards are a type of sampler
• A sampler is simply a different design
• https://www.youtube.com/watch?v=x91XkmI0DIs
Samplers

Multiple samples in one song:

https://www.whosampled.com/Public-Enemy/Contract-on-the-World-Love-Jam/samples/

Ex: Jurassic 5 – “Swing Set” (2000)
https://www.whosampled.com/Jurassic-5/Swing-Set/samples/
Drum Machines

https://www.youtube.com/watch?v=aoiDs41Pr_0

• “Humanization”
Loopers

• Layers of sound, live

Video Ex:

Reggie Watts Looping Machine
https://www.youtube.com/watch?time_continue=49&v=Gq3KJg-5YOM

Video Ex: Zoë Keating – Avant-Cello
https://www.youtube.com/watch?v=zcdlHt36uqw
Effects

• A sound recording is almost never the same as a live musical performance
• Mix of instruments (what is loud, what is quiet, etc.)
• Effects (natural, like the sound of a room, or added)
Reverb

• “The persistence of sound after a sound is produced”
• Sometimes called echo

Video Ex: The Wiki Drummer
https://www.youtube.com/watch?v=mY-f68J5PPo

Ex: Booker T & The MGs – “Green Onions” (1962)

• 1:14 little or no reverb, 1:30 lots of reverb
Delay

• When a sound is played back, or repeated
• Can be repeated once or multiple times

• Repeated sound can be almost instant, or a few seconds later
  • Measured in milliseconds

• Confusingly, sometimes referred to as “Echo”

• Short delay creates a unison or double-tracking effect
Delay

Slapback Echo
Ex: Elvis Presley – “Blue Moon” (1954)
Video Ex: Elvis Presley – The Story Behind Sun Studio's Famous "Slap Back" Echo
https://www.youtube.com/watch?v=FuStmPbG528

Medium Delay
Big Youth – “Screaming Target” (1973)

Longer delay
Ex: U2 – “Where The Streets Have No Name” (1987)
Distortion/Overdrive/Gain

• Originally comes from a vacuum-tube amplifier played at a very high volume
  – Sound begins to break up and gets distorted
    https://www.youtube.com/watch?v=5bJxeVgqnDo (:40)

• Effects Pedals
• Guitars, Bass, Keyboards most common

• Old blues trick, paper in strings
Wah Wah

• Simulating the sound of a mute on a trumpet or trombone
• Sweeps between the high and low frequencies in a sound
• Explain highs/lows in tone
  https://www.youtube.com/watch?v=svYoO78LyhU (1:45)

• Ex: Isaac Hayes – “Theme From Shaft” (1971)
• Ex: Jimi Hendrix Experience – “Voodoo Child” (1968)
Tremolo

- A “trembling” effect
- Bowed instruments, notes played very quickly
  [https://www.youtube.com/watch?v=4E8rMLHlpg](https://www.youtube.com/watch?v=4E8rMLHlpg)
- Sometimes called vibrato
- Effects pedals which rapidly turns the volume of a signal up and down Can be quick or slow.
- Ex: Duane Eddy – “Rebel Rouser” (1958)
- Ex: Creedence Clearwater Revival – “Born on the Bayou” (1969)
Production Techniques

• Producer as Musician
• Typical role of producer
• Hands on or hands off

• Mixing board as instrument:
  – George Martin
  – Several Dub innovators
Dub: A remix genre

- *Blackboard Jungle* (1973): One of the first Dub LPs
- Credited to The Upsetters (Lee “Scratch” Perry)
- Mixed by King Tubby

Ex: Bob Marley & The Wailers
   – “Dreamland” (1970)

Ex: The Upsetters –
“Dreamland Dub” (1973)
Prince Jammy/King Jammy

• Original vocal track

Ex: Prince Jammy – “Music Dub” (1977)
• Albums In the Light and In the Light Dub
King Tubbys Meets Rockers Uptown (1976)

- Augustus Pablo and King Tubby
- Series of King Tubbys Meets...

Ex: King Tubby and Augustus Pablo
- “King Tubby Meets Rockers Uptown” (1976)

Video Ex: Dub, King Tubby’s Style
https://www.youtube.com/watch?v=RTaZFGwg2rY
The Producer’s Overdubs

• Sometimes a producer will add something to a band’s recording

• Released version from *Let It Be* (1970)
• Orchestral and choral overdubs by Phil Spector

• From *Let It Be ... Naked* (2003)
• No overdubs
The Producer’s Overdubs

Ex: Bob Marley & The Wailers – “Concrete Jungle” (1973)
• From *Catch A Fire* (1973)
• International audience, Chris Blackwell
• Lead guitar, organ

Ex: Bob Marley & The Wailers – “Concrete Jungle” (1973)
• Unreleased Jamaican version, no overdubs
Talk Box

https://www.youtube.com/watch?v=YHnnnExSx-A

Ex: Bon Jovi – “Livin’ On a Prayer” (1986)
Ex: 2Pac feat. Dr. Dre and Roger Troutman – “California Love” (1996)

• Sound comes through tube
• Similar to wah wah effect
• Guitar. Keyboard, others
Vocoder

- Synthesized vocals
- Used for encrypting vocals during WWII
- Music in 1970s

Ex: Daft Punk feat. Pharrell Williams –
   “Get Lucky” (2013) 2:20

- A different kind of sound:

Ex: Kanye West feat. Pusha T – “Runaway” (2010) 5:30-7:00
Auto-tune

• Pitch correction – widely used invisible effect
• Studio software; effect pedal
• Relate to cut-and-paste vocals (comping)

• Purposely used as a **robotic effect:**
• First hit:

  Ex: Cher – “Believe” (1998)

Ex: Daft Punk – “One More Time” (2001) 1:00
Auto-tune

• Became overused in popular music c. 2008
• Negativity, value judgements

• Another use: creates notes where none exist

Ex: “Ain’t Nobody Got Time For That”

https://www.youtube.com/watch?v=Nh7UgAprdpM
Harmonizing

• What is harmonizing?
  – Vocals, guitars

Ex: The Beach Boys – “Unreleased Backgrounds” (1966)

Ex: The Sheepdogs – “Southern Dreaming” (2011)
Harmonizing (cont.)

Effects pedals:

Video Ex: PS-6 Harmonist
https://www.youtube.com/watch?v=Xe-Vy3HDyQ4

Video Ex: TC Helecon Harmony G XT (2:10)
https://www.youtube.com/watch?v=6RApvmAbceg