

*Please sign-in with the sign-in sheet*

TECH 101  
TECH 101  
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# TAPE MUSIC

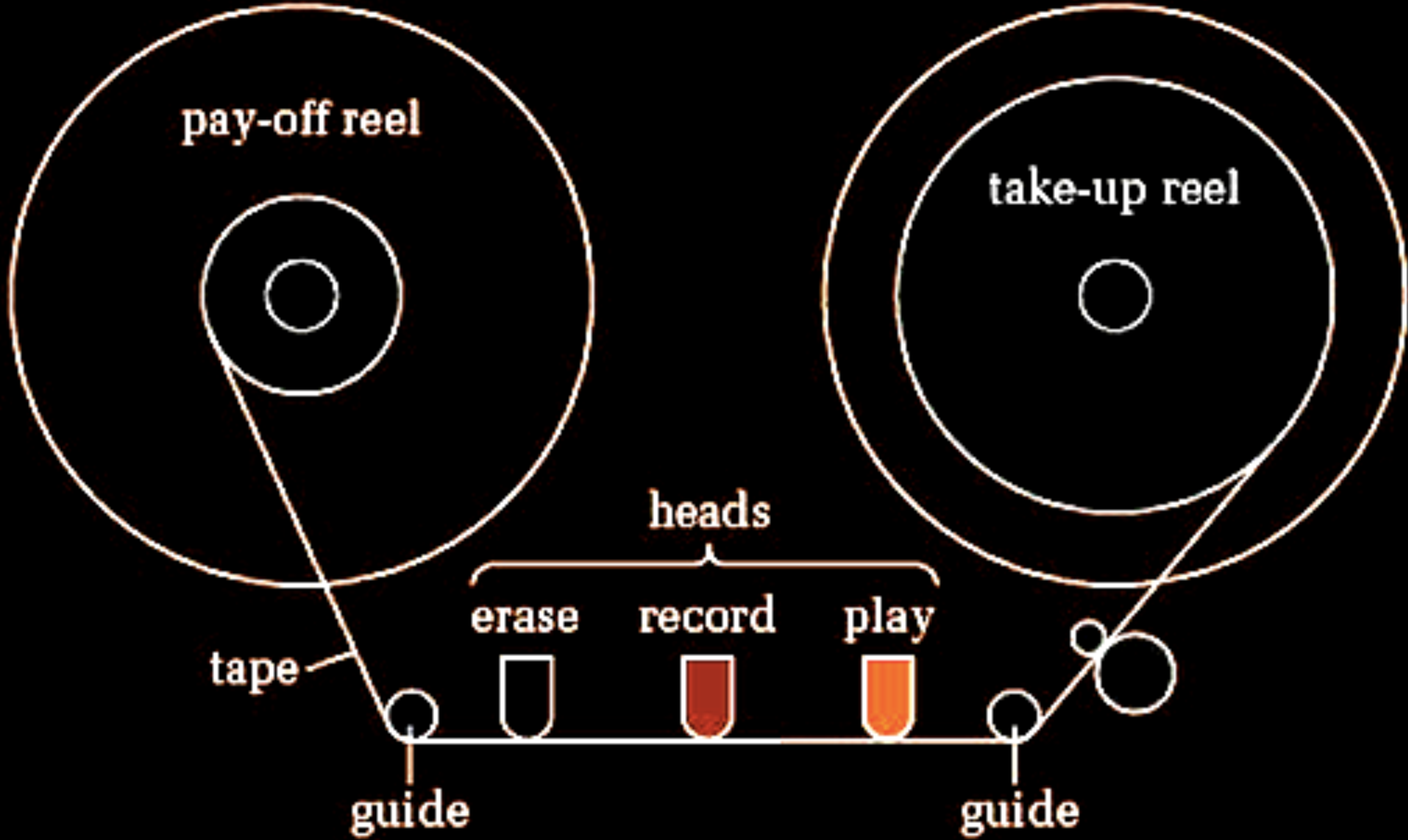


# MAGNETIC TAPE



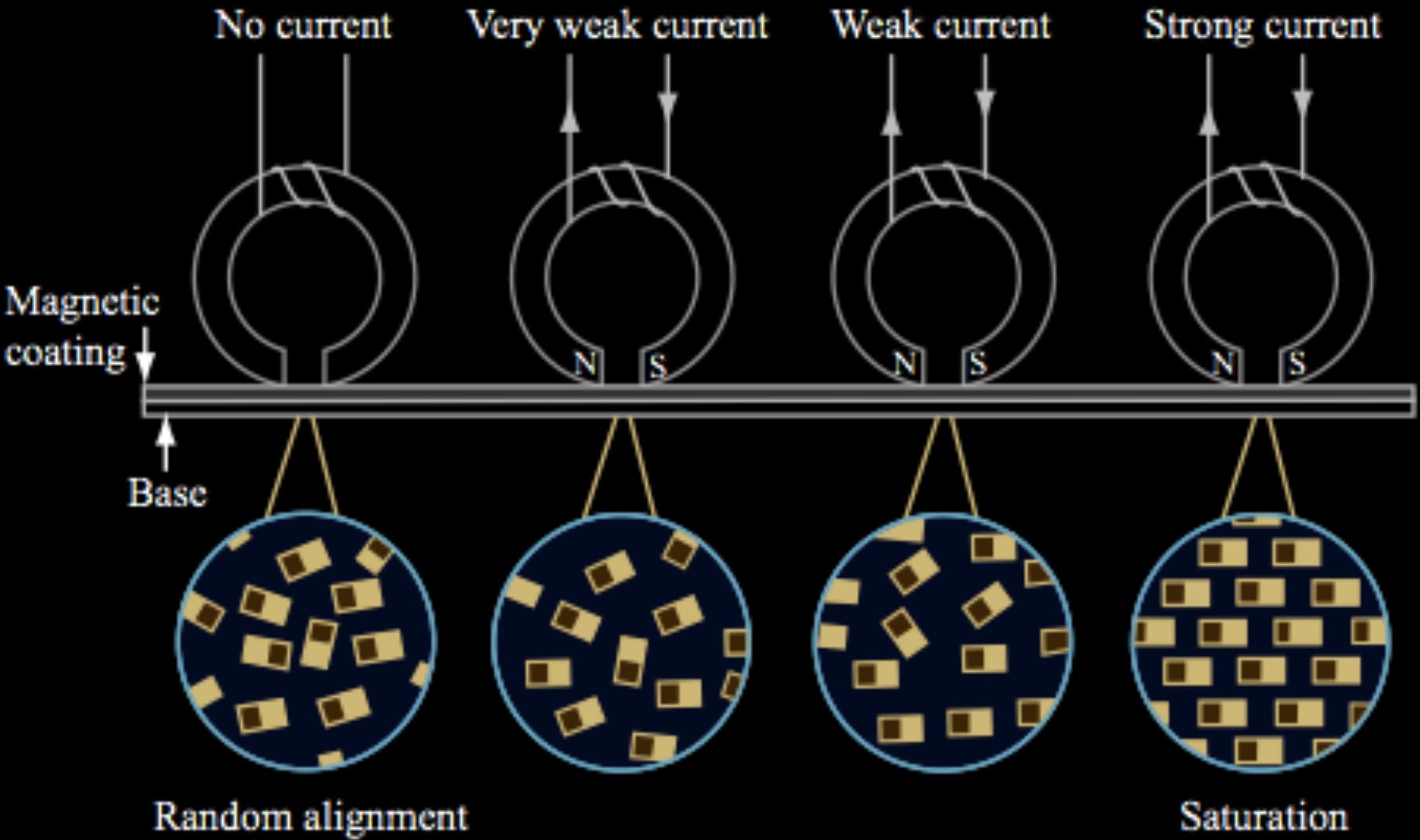
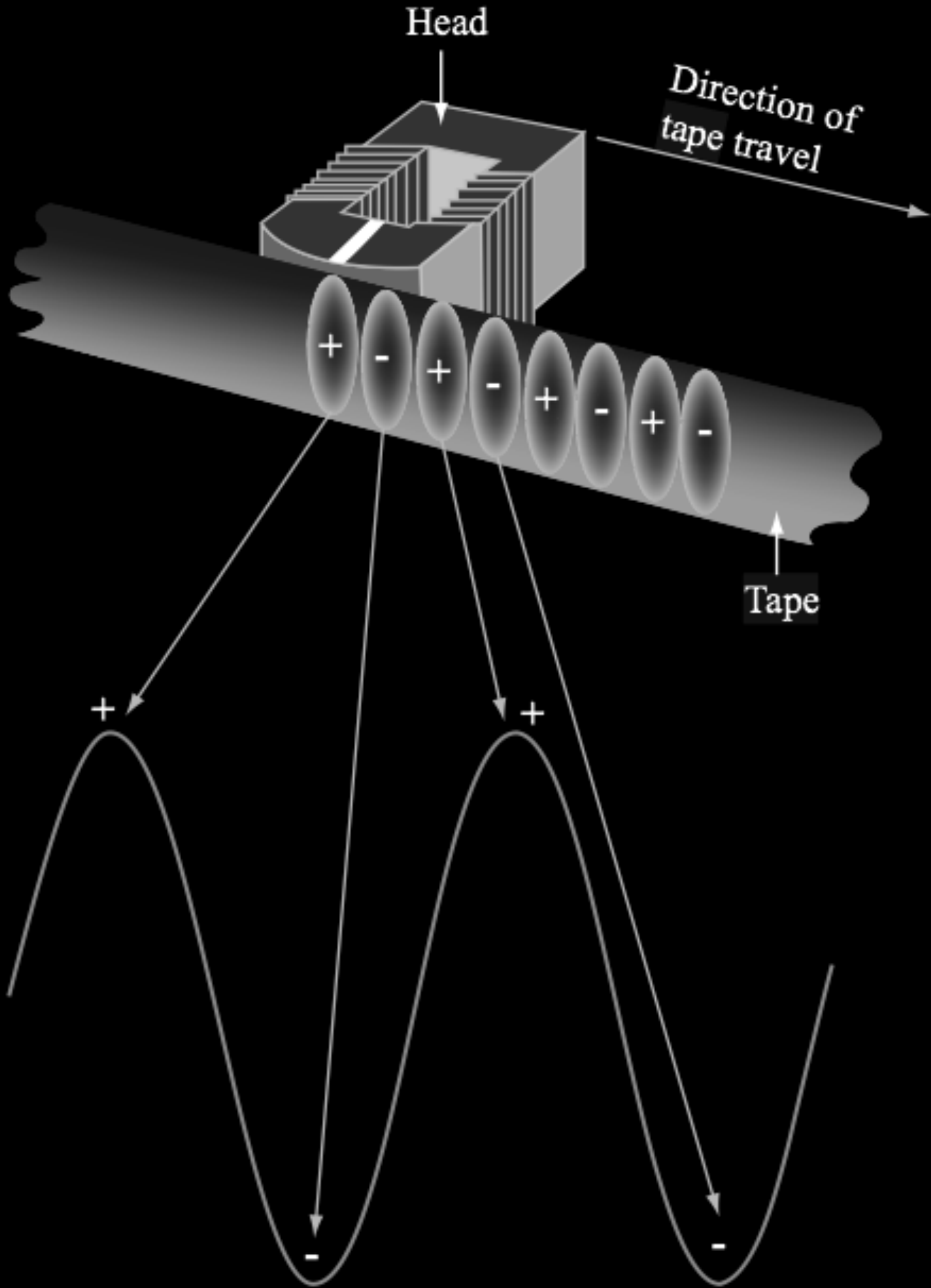


# MAGNETIC TAPE RECORDERS





# HOW IT WORKS





# SPEED & BANDWIDTH

<b>Tape Speed (inches/s)</b>	<b>Bandwidth</b>	<b>Use</b>
38 cm/s (15)	20Hz - 20kHz	studio recording
19 cm/s (7.5)	30Hz - 15kHz	home recording
9.5 cm/s (3.75)	40Hz - 13kHz	general use
4.8 cm/s (2)	50Hz - 6kHz	speech dictation



# EDITING TAPE





copyright 2014  
Bradshaw Leigh

take 6





# BASIC TAPE MANIPULATION PROCEDURES

1. Speed - transposition
2. Backwards - direction
3. Cutting - remove attacks, change envelopes
4. Splicing - editing, crossfade sounds
5. Looping - create rhythm from repetition
6. Mixing - record multiple layers of sound
7. Delay – run one tape past two machines, mix outputs







# Digital Audio Editing



Get **ocenaudio** installed on your laptop

([ocenaudio.com](http://ocenaudio.com))

And download the **ocenaudio help**

**sheet:**

[timara.net/101resources](http://timara.net/101resources)



# Mini-Lab:

Take **10-15 minutes**

Make **10 seconds** of materials (using ocenaudio)

Using *only* **2 recordings**

(Will play to class afterwards)



# WIRE RECORDER

invented 1898







## Halim El-Dabh

First known composer of tape music

The Expression Of The Zaar (1944)







# ELECTRONIC MUSIC RESEARCH CENTERS



# TO RECORD OR TO SYNTHESIZE

Music Concrete	Elektronische Musik
France	Germany
Recorded Sounds	Synthesized Sounds
Montage, Film	Art Music, Serialism
Pierre Schaeffer	Herbert Einmert





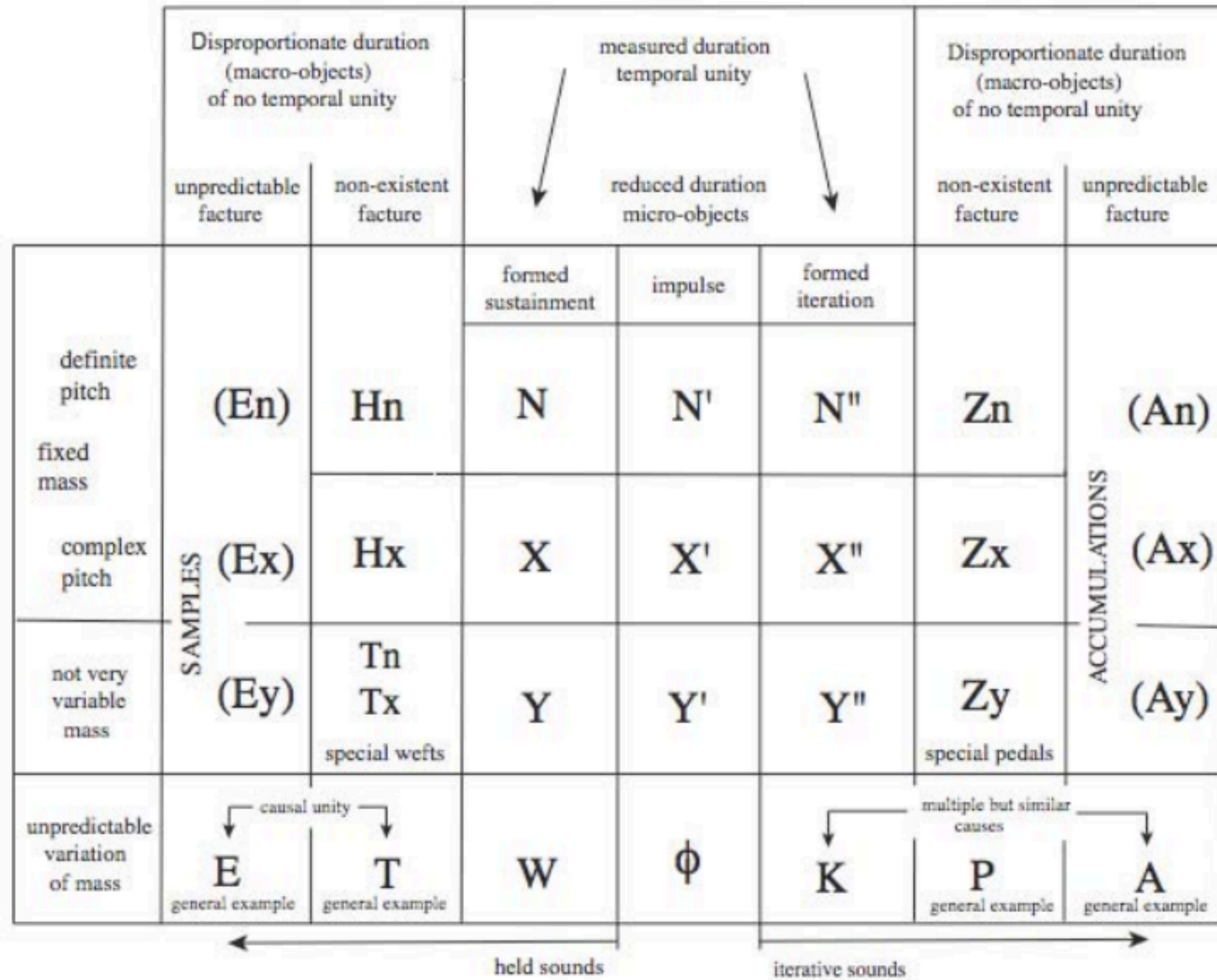
# Music Concrete & the Paris Studio

**PIERRE SCHAEFFER**

**Sound Objects (l'Objet Sonore)**

**Listen: Etude Aux Chemins de Fer (1948)**





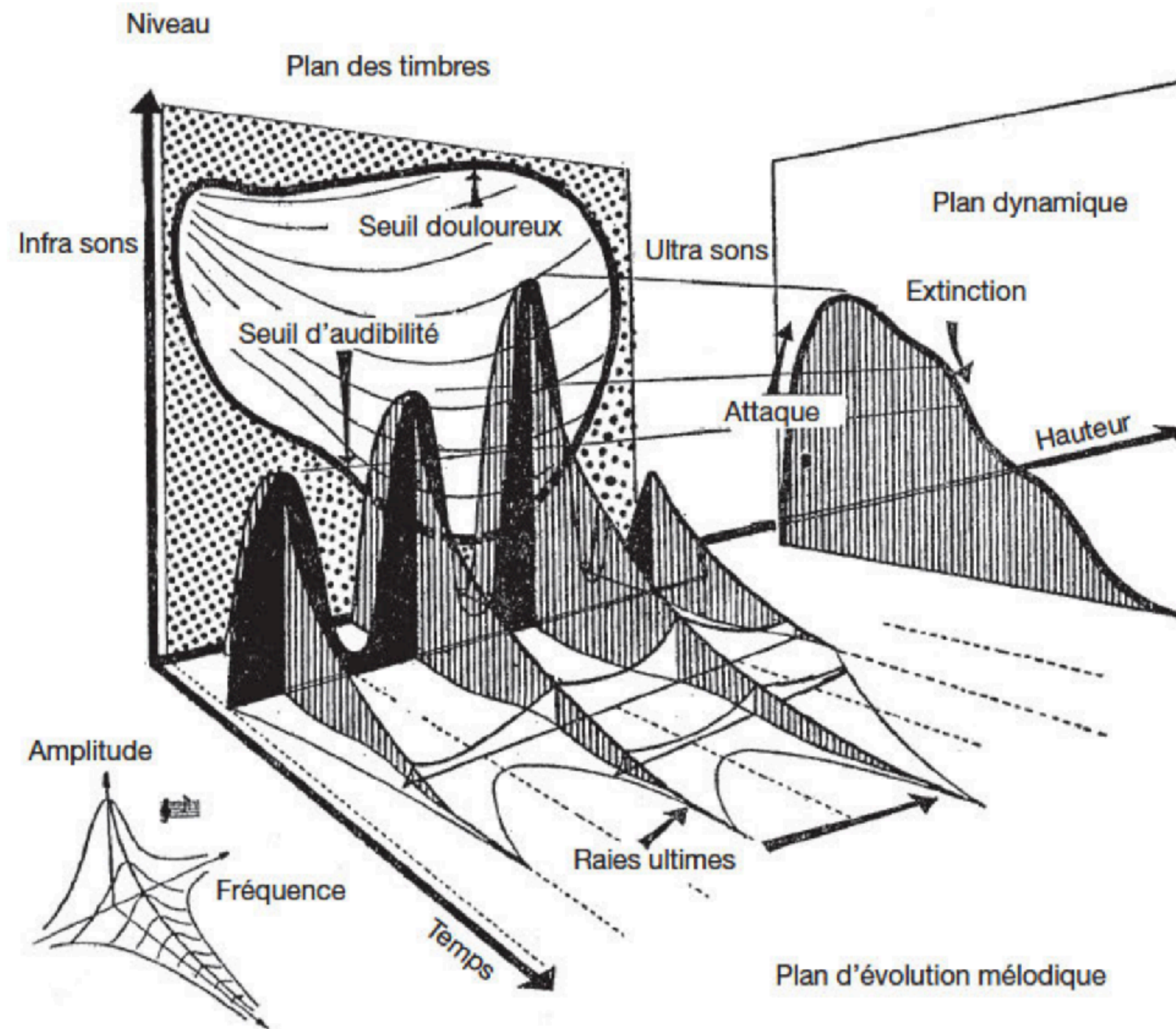
## Describing Concrete Sound: Typo-Morphology



<p>4. TO UNDERSTAND (comprendre)  - for me: signs  - in front of me: values  (meaning-language)  Emergence of a sound content and  <i>reference to, encounters with,</i>  extra-sonorous concepts.</p>	<p>1. TO LISTEN (écouter)  - for me: indicators  - in front of me: external events  (agent-instrument)  Sound <i>production</i></p>	<p>1 &amp; 4:  objective</p>
<p>3. TO HEAR (entendre)  - for me: qualified perceptions  - in front of me: qualified sound  object    <i>Selection</i> of certain  specific aspects of the sound</p>	<p>2. TO PERCEIVE AURALLY  (ouïr)  - for me: raw perceptions,  vague idea of the object  - in front of me: raw sound  object    <i>Reception</i> of the sound</p>	<p>2 &amp; 3:  subjective</p>
<p>3 &amp; 4: abstract</p>	<p>1 &amp; 2: concrete</p>	

## Listening to Concrete Sound: Modes





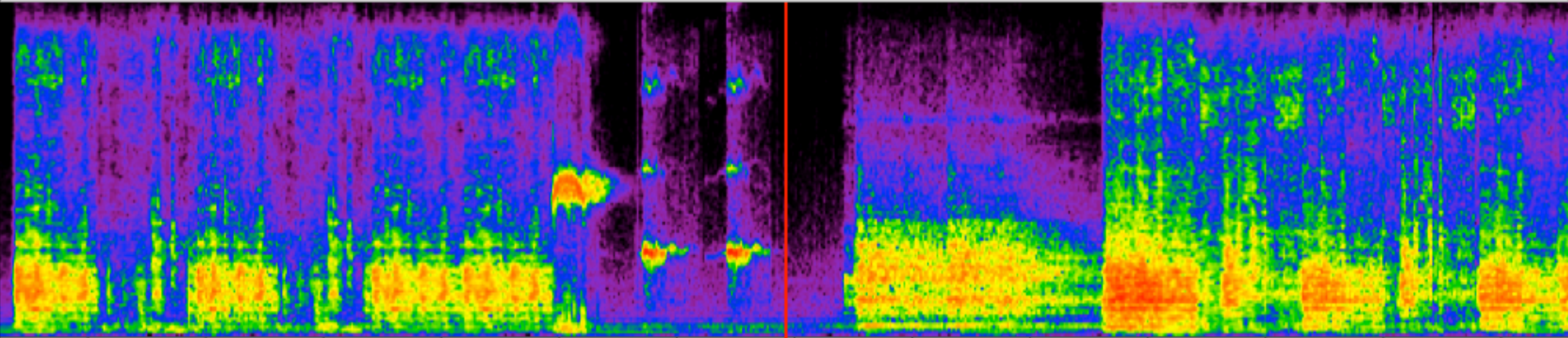
## Composing with Concrete Sound: Three Plans



Etude aux Chemins de Fer.eanalysis

Add event   Add marker   Library   Add to library   Bring to front   Send to back   Group   Ungroup   Properties

	A3	B4		
P	Y'	Y''	P	P
$(Y''1+Y'2+Y'3) \cdot 2 + Y''1 \cdot 2$	$\frac{N1 \cdot X1}{N2 \cdot X1}$	$(N1 \cdot X1 / N2 \cdot X2) \cdot 2$	$K \cdot 2$	$(W + Y''1 \cdot Y''2 \cdot Y''1) \cdot 2 + W \cdot 2$



0:00   0:30   1:00   1:30   2:00   2:30

+   -   ⏪   H   1000%   1 Etude aux Chemins d...   Volume   02:14:91   ⏩



# ELEKTRONISCHE MUSIK

& the Cologne Studio

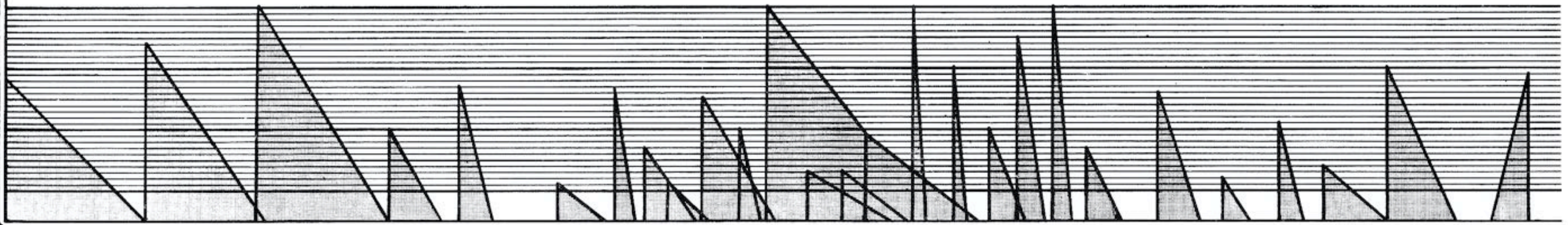
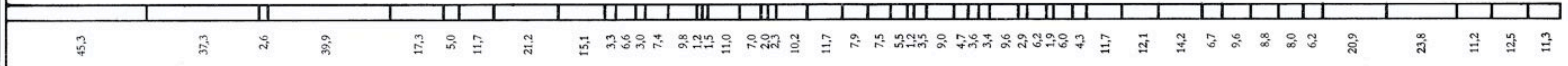
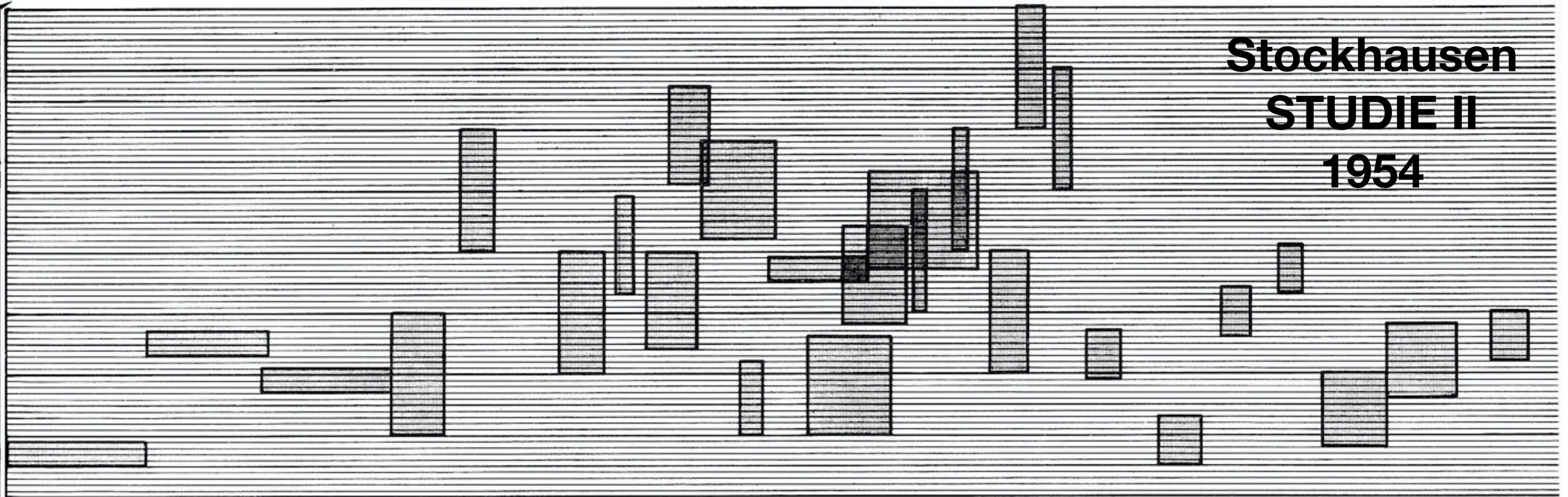
**NWDR (Northwest German Broadcasting) Studio opens in 1951**

Founded by Herbert Einmert, Robert Beyer, & Dr. Werner Meyer-Eppler

listen: Herbert Einmert's *Klangstudie II* (1952)



# Stockhausen STUDIE II 1954





# Karlheinz Stockhausen

A black and white photograph of Karlheinz Stockhausen. He is a young man with dark hair, wearing a light-colored dress shirt and a dark tie. He is looking directly at the camera with a serious expression. The background is filled with vintage recording studio equipment, including racks of modules with numerous knobs and switches, and a large panel with many vertical lines, possibly a mixing console or a tape machine. The lighting is dramatic, highlighting his face against the darker background of the studio.

Worked at both the Paris and Cologne Studios

Listen: Gesang der Jünglinge (Song of the Youths) (1955-56)



**3/15** History of Electronic Music I: Musique Concrète from 1940s to the Present, ocenaudio II: More Advanced Editing, Volume, Pitch-Shifting

HW: [Read “How Digital Audio Works” from the Max v7.3.5 Documentation](#). First half should be review (“Complex tones” is interesting!), important bit is from “Digital representation of sound” up until “Advantages of digital audio” (no need to read this).

Also check out the [How Digital Audio Works Help Sheet](#)