Sounds of Seismic Research Notes 2025
Correlated by Aug 1st 2025

The following notes need structure and organisation into the following categories;

1. Sound Synthesis
2. Synthesis Tools
3. Synthesis Music Composition
4. Sound Synthesis Musicians
5. Seismic Data
6. AI Seismology
7. AI Large Language Models

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SOS-2025-Notes.txt
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/*———————————————————— helpers ————————————————————*/

<!--This is a comment. Comments are not displayed in the browser-->

Types of Prompting SOS will use;

1. Few-Shot Prompting
2. Chain of Thought Prompting
3. Decomposition Prompting
4. Self-Criticism Prompting

See: PROMPT-TYPES.pdf

Types of Audio Synthesis

KEY FOCUS IS;

1. GRANULAR SYNTHESIS
2. WAVETABLE SYNTHESIS
3. ADDITIVE SYNTHESIS
4. FM SYNTHESIS
5. SUBTRACTIVE SYNTHESIS

Granular, Wavetable, Additive, Frequency Modulation, Subtractive

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Additive, Wavetable, FM, Granular, Subtractive, Pulsar, Phase, Vector and Subtractive Synthesis

#Additive - Delay/Feedback/Pluck Strings-Grains >> FFT
https://en.wikipedia.org/wiki/Additive_synthesis

#Wavetable
https://en.wikipedia.org/wiki/Wavetable_synthesis

#FM - Frequency Modulation
https://en.wikipedia.org/wiki/Frequency_modulation_synthesis

#Granular
https://en.wikipedia.org/wiki/Granular_synthesis

#Subtractive (original)
https://en.wikipedia.org/wiki/Subtractive_synthesis

*Pulse (Pulsar) - subset of granular
https://de.wikipedia.org/wiki/Pulsar-Synthese

*Physical Modelling
https://en.wikipedia.org/wiki/Physical_modelling_synthesis

*Phase

*Vector
https://en.wikipedia.org/wiki/Vector_synthesis

*Analogue Subtractive
https://en.wikipedia.org/wiki/Subtractive_synthesis

- Amplitude/Oscillators/Timbre

- Linear/Sequential Structures

- Amplitude Modulation (AM) and Ring Modulation (RM)

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Sound Synthesis Pioneers
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Apex Twin, Zannis Xenakis, Terry Riley, Boards of Canada, Autechre, Eno, Kraftwerk, Richard Devine, Robert Fripp, Steve Reich, CAN, Tangerine Dream, Health, Sophie, Igloohost, Dick Hyman, Wendy Carlos, Severed Heads, Fuck Buttons, John Carpenter, Ennio Morricone, Disasterpeace, Oneohtrix Point Never (OPN), Ben Prunty, Legowelt, Max Mathews, Curtis Roads, Giorgio Maroder, Jean Michael Jarre, Michael Garrison, Clark, Suzanne Ciani, Skee Mask, A.G. Cook, Caterina Barbieri, Robin Fox, Tom Hall, Kosmische Wellen >>

obscure and talented with synthesizers artists? 2025
https://www.reddit.com/r/synthesizers/comments/1lyne08/
obscure_and_talented_with_synthesizers/

Sound synthesis types >> https://en.wikipedia.org/wiki/Category:Sound_synthesis_types

+++

Realtime Stream >> MAJO (IU) Japan

Seismic Wave & Magnetic Field Correlation
-Schuman Resonances
==

Create "Interactive Globe + Earthquake Plot in Python
https://towardsdatascience.com/create-interactive-globe-earthquake-plot-in-python-b0b52b646f27/

tectonicplates/GeoJSON
https://github.com/fraxen/tectonicplates/blob/master/GeoJSON/PB2002_plates.json?short_path=879951b

https://github.com/fraxen/tectonicplates

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Best 3 AI Music Generation Models of 2025
https://www.cometapi.com/best-3-ai-music-generation-models-of-2025/

Web Audio API
https://developer.mozilla.org/en-US/docs/Web/API/Web_Audio_API

Web Audio API 1.1
https://webaudio.github.io/web-audio-api/
https://webaudio.github.io/web-audio-api/

CLAUDE
https://claude.ai

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SONIFICATION
https://en.wikipedia.org/wiki/Sonification

Audification AUDIFICATION
https://en.wikipedia.org/wiki/Audification

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LLM TOOLS

https://aistudio.google.com
https://gemini.google.com

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https://choosealicense.com/licenses/mit/

MIT Licenses Explained
https://www.wiz.io/academy/mit-licenses-explained

Archived @ https://github.com/ALLSHOOK/SOS

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♪ 🎵 🎶 ♭ ♮ ♯ 🎼 🎵 🎶 MUZAK TOOLS

CDP Unstablesound - CDP Release 8 Downloads
https://www.unstablesound.net/cdp.html

+ https://www.soundshaper.net/ (NO OSX Win$)

UNLOCK the secrets of CDP Composers Desktop Project
https://youtu.be/n-xHr61m0sY?si=ZmDmC8WYWxP7UyiR

C SOUND
https://en.wikipedia.org/wiki/Csound
https://csound.com/

Audacity
https://en.wikipedia.org/wiki/Audacity_(audio_editor)
https://www.audacityteam.org/

SuperCollider
https://supercollider.github.io/
https://en.wikipedia.org/wiki/SuperCollider

HIGH C - inspired by Iannis Xenakis (UPIC)
https://en.wikipedia.org/wiki/HighC
https://highc.org/
https://highc.org/history.html

IanniX
https://www.iannix.org/en/

The Batsh*t Software Aphex Twin Used - by Benn Jordan
https://youtu.be/5wIOBBodoic?si=5iwnZkwVzTzMF_tu

The Art Of Poison-Pilling Music Files
https://youtu.be/xMYm2d9bmEA?si=3SboutE9VHcwZhAG

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The role of artificial intelligence and IoT in prediction of earthquakes: Review
https://www.sciencedirect.com/science/article/pii/S2666544124000169

Magnetotellurics - Wikipedia
https://en.wikipedia.org/wiki/Magnetotellurics

Wave-Simulation.md · GitHub
https://gist.github.com/TheBoyRoy05/ee488fea8a51204fa0da654f26b214b4
STUDY wave simulation algo 👆

AlphaEvolve: A Gemini-powered coding agent for designing advanced algorithms - Google
DeepMind
https://deepmind.google/discover/blog/alpha

Music and artificial intelligence - Wikipedia
https://en.wikipedia.org/wiki/Music_and_artificial_intelligenceevolve-a-gemini-powered-
coding-agent-for-designing-advanced-algorithms/

Global Seismographic Network | EarthScope Consortium
https://www.earthscope.org/gsn/

Generative music - Wikipedia
https://en.wikipedia.org/wiki/Generative_music

Max Mathews - Wikipedia *created first computer music synth 1957
https://en.wikipedia.org/wiki/Max_Mathews
https://en.wikipedia.org/wiki/MUSIC-N

Steve Reich - It's Gonna Rain (1965)
https://youtu.be/Jsd50gJo5q4?si=dflKWc89YJT2LKY9

Exploring Model Graders for Reinforcement Fine-Tuning
https://cookbook.openai.com/examples/reinforcement_fine_tuning

Darren Aronofsky's Primordial Soup - Google DeepMind (AI FILM)
https://deepmind.google/models/veo/our-partnership-with-darren-aronofskys-primordial-soup/

Scientists Use Speech Recognition AI to Decode Seismic Activity | NVIDIA Blog
https://blogs.nvidia.com/blog/earth-ai/

CA Early Earthquake Warning
https://earthquake.ca.gov/

Global Seismographic Network
https://www.earthscope.org/gsn/

javascript (typescript) waveform visualizer
https://github.com/chrisweb/waveform-visualizer

Robust data driven discovery of a seismic wave equation | Oxford Academic
https://academic.oup.com/gji/article-abstract/236/1/537/7424129

Wave equation - Wikipedia
https://en.wikipedia.org/wiki/Wave_equation

The Algorithm M8 - Russian Earthquake Forecasting
https://www.itpz-ran.ru/en/predictions/the-stabilised-predictions/the-algorithm-m8/

File:Spherical wave2.gif - Wikimedia Commons - with MATLAB source code ***
https://commons.wikimedia.org/wiki/File:Spherical_wave2.gif#mw-jump-to-license

Matlab to JavaScript Converter
https://www.codeconvert.ai/matlab-to-javascript-converter

Solar Flares
Space Observing System (Tomsk, Russia): https://sosrff.tsu.ru/?page_id=554

Schumann Resonance AMPLIFICATION
https://www.youtube.com/live/EkShHXfOCJA?si=zXyrd-KTEK580uSx

Schumann resonances - Wikipedia
https://en.wikipedia.org/wiki/Schumann_resonances

Sound Design Theory: 8 Types of Audio Synthesis

https://youtu.be/F1RsE4J9k9w?si=4EtPWTxHMcvx8RHg

Electronic Artists Using Granular Synthesis (Google Search)
https://is.gd/C6kHIN

Granular synthesis - Wikipedia
https://en.wikipedia.org/wiki/Granular_synthesis

Granular Synthesis News
https://granularsynthesis.com/news.php#news8

Iannis Xenakis is widely credited as the inventor of granular synthesis.

Sound synthesis types >>
https://en.wikipedia.org/wiki/Category:Sound_synthesis_types

Pulsar Synthesis | Nathan Ho
https://nathan.ho.name/posts/pulsar-synthesis/

Sound In A Nutshell: Granular Synthesis
https://www.granularsynthesis.com/hthesis/contents.html

Who Invented Granular Synthesis >> Composer Iannis Xenakis (Google Search)
https://is.gd/QcqNEz

Music and artificial intelligence - Wikipedia
https://en.wikipedia.org/wiki/Music_and_artificial_intelligence

(PDF) Artificial intelligence in music: recent trends and challenges
https://www.researchgate.net/publication/
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https://www.researchgate.net/publication/
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Music AI Sandbox, now with new features and broader access - Google DeepMind
https://deepmind.google/discover/blog/music-ai-sandbox-now-with-new-features-and-
broader-access/

Chrome Music Lab
https://musiclab.chromeexperiments.com/About

The Rise of AI-Generated Music:
https://flourishprosper.net/music-resources/the-rise-of-ai-generated-music-what-it-means-
for-artists/

Wav2Vec-2.0 - Kīlauea volcano Hawaii
Automatic speech recognition predicts contemporaneous earthquake fault displacement
https://www.nature.com/articles/s41467-025-55994-9
**Hawaii

Additive, Wavetable, FM, Granular, Subtractive, Pulsar, Phase, Vector and Subtractive
Synthesis
Audio-Synthesis https://is.gd/i7UQmX (google Search)

Are there any new kinds of sound synthesis in development beyond the standards
(Subtractive, FM, ...)?

https://www.reddit.com/r/synthesizers/comments/1dppcad/
are_there_any_new_kinds_of_sound_synthesis_in

Pulsar Synthesis Basics
https://youtu.be/gp6b8a1Bz6o?si=Uq_w-4OhXZ_DTgd8

How AI Sound Synthesis Works
https://psychosynth.com/sound-synthesis/software/artificial-intelligence/

How Software Sound Synthesis Works
https://psychosynth.com/sound-synthesis/software/

AI-Enabled Text-to-Music Generation: A Comprehensive Review of Methods, Frameworks,
and Future Directions (PAPER) >> https://www.mdpi.com/2079-9292/14/6/1197

Sound Designer-Generative AI Interactions: Towards Designing Creative Support Tools for
Professional Sound Designers - (Extensive Paper) https://dl.acm.org/doi/fullHtml/
10.1145/3613904.3642040

Concatenative Synthesis - https://deepgram.com/ai-glossary/concatenative-synthesis

AI in Creative Fields: The Next Frontier for Art, Music, and Writing
https://cloudxlab.com/blog/ai-in-creative-fields-the-next-frontier-for-art-music-and-writing/

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https://en.wikipedia.org/wiki/EarthScope_Consortium

AWS re:Invent 2024 - Harnessing AWS for natural disaster early warning at scale
https://youtu.be/OlfhSn2Hhro?si=_ubstLxyb-U4AajM

https://www.earthscope.org/ >> IRIS?
https://www.iris.edu/app/seismic-monitor/map
Chad Trabant - Data Management Center
https://www.iris.edu/hq/staff/employee/trabant
Email: chad.trabant@earthscope.org

Creating music and art with seismic waves!
https://www.iris.edu/hq/programs/epo/life_of_a_seismologist/seismic_impact/
creating_music_and_art_with_seismic_waves

Data Services Products: SeisSound: Data: Repository
https://ds.iris.edu/ds/products/seissound/data/repository/

Digital Materials (SOS)

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TuD20110.pdf

Chris Hayward Papers
https://www.researchgate.net/profile/Chris-Hayward-4
79. Listening To The EarthSing - Chris Hayward
https://soundcloud.com/seismicsounds/listening-to-the-earth-sing

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https://www.researchgate.net/publication/242638653_Listening_to_the_Earth_sing
+ListeningtotheEarthSing.pdf
+ListeningtotheEarthSing-AIStudio/pdf

Bullen, K. E., and Bruce A. Bolt. An Introduction to the Theory of
Seismology, 4th ed. Cambridge: Press Syndicate of the University of
Cambridge, 1985.

Stanford Scientists Create an Algorithm That Is the "Shazam" For Earthquakes
https://www.smithsonianmag.com/innovation/stanford-scientists-create-an-algorithm-that-is-shazam-for-earthquakes-180957510/

'Shazam for earthquakes' | Stanford Doerr School of Sustainability
https://sustainability.stanford.edu/news/shazam-earthquakes

Understanding Seismic Design through a Musical Analogy
https://www.structuremag.org/article/understanding-seismic-design-through-a-musical-analogy/

AI-Driven Innovations in Earthquake Risk Mitigation: A Future-Focused Perspective
https://www.mdpi.com/2076-3263/14/9/244

Synthesizing Digital Seismic Waveforms for Earthquake Early Warning System
ERJSH_Volume 54_Issue 1_Pages 48-53.pdf

Volcanic Tremor Extraction and
Earthquake Detection Using Music
Information Retrieval Algorithms.pdf
srl-2021016.1.pdf
https://www.uni-potsdam.de/fileadmin/projects/soundscapelab/PapersMusic/2021/srl-2021016.1.pdf

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WAVE EQUATION VISUAL MODEL (WORKS)
v3-Source-Color-Wave-Equation-CGPT-o4.html

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Claude Shannon - Wikipedia
https://en.wikipedia.org/wiki/Claude_Shannon

Pulse-code modulation - Wikipedia
https://en.wikipedia.org/wiki/Pulse-code_modulation

OpenAI codex - not used!!

Introduction to dev containers
https://docs.github.com/en/codespaces/setting-up-your-project-for-codespaces/adding-a-dev-container-configuration/introduction-to-dev-containers

The Creative Act: A Way of Being
Book by Rick Rubin
https://ia600503.us.archive.org/33/items/the-creative-act-by-rick-rubin/The%20Creative%20Act%20By%20Rick%20Rubin.pdf

Algorithmic composition - Wikipedia

https://en.wikipedia.org/wiki/Algorithmic_composition

Re-Thinking Boundaries: The Evolution and Impact of AI in Music and Soundscapes (PDF)
https://www.researchgate.net/publication/385697636_Re-Thinking_Boundaries_The_Evolution_and_Impact_of_AI_in_Music_and_Soundscapes

Unfiltered Audio
https://www.plugin-alliance.com/en/brand/unfiltered_audio.html

SuperCollider Code - ENO - ONE Music Of Airports Code
https://sccode.org/infinitedigits

How Brian Eno Created "Ambient 1: Music For Airports"
https://reverbmachine.com/blog/deconstructing-brian-eno-music-for-airports/

THX theme in SuperCollider
https://infinitedigits.co/tinker/thx/
https://cdm.link/thx-deep-note-creator-remade-iconic-sound/

SuperCollider Ambient Scripts *****
https://sccode.org/tag/category/ambient

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Composition Techniques

Karplus–Strong string synthesis
https://en.wikipedia.org/wiki/Karplus%E2%80%93Strong_string_synthesis

The Karplus-Strong Algorithm
https://crypto.stanford.edu/~blynn/sound/karplusstrong.html

Sound and Music - Sound and music
https://crypto.stanford.edu/~blynn/sound/

MOOG Synthesizer
https://en.wikipedia.org/wiki/Moog_synthesizer

Buchla Electronic Musical Instruments
https://en.wikipedia.org/wiki/Buchla_Electronic_Musical_Instruments

Elektron Monomachine - Wikipedia (SOPHIE)
https://en.wikipedia.org/wiki/Elektron_Monomachine

Monomachine VST
https://www.reddit.com/r/Elektron/comments/1kl23uq/monomachine_vst/

How a bootleg download led SOPHIE to the instrument that would power her sonic world-building
https://crackmagazine.net/article/profiles/sophie-elektron-monomachine-book-extract-2/

Generative AI: A Self-Study Roadmap - KDnuggets
https://www.kdnuggets.com/generative-ai-a-self-study-roadmap

SOPHIE Complete Hardware & Software List
https://www.reddit.com/r/Sophie/comments/1g3mtzf/
sophie_complete_hardware_software_list/

Slipstick synthesis
https://scsynth.org/t/slipstick-synthesis/5279

Nathan Ho (SuperCollider)
https://nathan.ho.name/

SOPHIE tribute in SuperCollider (Nathan Ho)
https://youtu.be/gsAxCuUcy0o?si=emCQGAvaUy2RH6-N

Emulating a JP-8000 supersaw in SuperCollider | ZS
https://schollz.com/til/221103/

How Experimental Pop Producer SOPHIE Pushed the Envelope — Google Arts & Culture
https://artsandculture.google.com/story/how-experimental-pop-producer-sophie-pushed-
the-envelope-musikinstrumenten-museum/2wWx4L63W07OIQ?hl=en

Intelligent dance music
https://en.wikipedia.org/wiki/
Intelligent_dance_music#:~:text=Intelligent%20dance%20music%20(IDM)
%20is,rather%20than%20specific%20genre%20constraints

what genres of music Sophie
https://is.gd/l1AIMr

What Makes Sophie's Production Revolutionary (Very Good)
https://youtu.be/wOxhURdAgOM?si=fGPsGZb2c4RqW7_V

Why Iglooghost's Music Is Pure Genius
https://www.youtube.com/watch?v=UNa_-Ca7Xbc

Iglooghost, Kai Whiston, BABii - XYZ (Full Album)
https://youtu.be/fBvXgDI2s4U?si=S5oXZRJzO8DRKx38

How to make PLASTIC / LATEX / RUBBER sounds
https://youtu.be/ws8yLOIkLms?si=RYWHO_hjGFgIqyeO

obscure and talented with synthesizers? (Synthesiser Artists ****)
https://www.reddit.com/r/synthesizers/comments/1lyne08/
obscure_and_talented_with_synthesizers/

NASA Systems Engineering Handbook
https://www.nasa.gov/wp-content/uploads/2018/09/
nasa_systems_engineering_handbook_0.pdf

FM Theory & Applications: By Musicians for Musicians
Book by David Bristow and John Chowning
https://www.burnkit2600.com/manuals/fm_theory_and_applications.pdf

FM Synthesis Explained: A Musician's Guide To FM (Youtube)
https://youtu.be/wqc8rZnzTVI?si=jDRiwk_R6YFYqjPW

Frequency modulation synthesis (Wikipedia)
https://en.wikipedia.org/wiki/Frequency_modulation_synthesis

Boards of Canada Chord Theory, Part One
https://reverbmachine.com/blog/boards-of-canada-chord-theory-part-one/?v=c97b334ffd41
https://reverbmachine.com/blog/boards-of-canada-chord-theory-part-one/

Boards of Canada Chord Theory, Part Two
https://reverbmachine.com/blog/boards-of-canada-chord-theory-part-two/?v=c97b334ffd41
https://reverbmachine.com/blog/boards-of-canada-chord-theory-part-two/

Deconstructing the Boards of Canada (BoC) Sound and Music – Lars Lentz Audio™
https://larslentzaudio.wordpress.com/2025/03/03/deconstructing-the-boards-of-canada-boc-sound-and-music/

Polygon Window (Aphex Twin) – Surfing On Sine Waves. > Influenced Boards of Canada
https://youtu.be/O7kPl57pXHw?si=2YMbW5OPXSFJJHaX

Where is the 21st-century equivalent of Kraftwerk?
https://www.reddit.com/r/synthesizers/comments/myi4hn/where_is_the_21stcentury_equivalent_of_kraftwerk/

STUDY: Sorting Algorithms

How Aphex Twin Created "Selected Ambient Works 85-92"
https://reverbmachine.com/blog/aphex-twin-selected-ambient-works-85-92/

Aphex Twin - Surfing on Sine Waves 2 [FULL ALBUM]
https://youtu.be/htt1fNiKYcQ?si=e4yr4XwV8aUixYCM

Aphex Twin - Syro [FULL ALBUM]
https://youtu.be/oR4gjzXs5EE?si=HTMYqxiwGKqg2iaP

Aphex Twin - Caustic Window (1994 Full LP)
https://youtu.be/NeBuzmwOvhE?si=aLhlPOzssqsqOXWF

Synth Britannia Documentary
https://youtu.be/1lVljmH0yUw?si=Mezk6Pn5pl0B34_W

Synthesis Methods Explained: What is Granular Synthesis?
https://www.perfectcircuit.com/signal/what-is-granular-synthesis

MODULATION:
How is Beethoven able to make so many sudden shifts in key? - Music: Practice & Theory Stack Exchange
https://music.stackexchange.com/questions/79841/how-is-beethoven-able-to-make-so-many-sudden-shifts-in-key

In C - Wikipedia - Terry Riley
https://en.wikipedia.org/wiki/In_C

A Rainbow in Curved Air
https://en.wikipedia.org/wiki/A_Rainbow_in_Curved_Air

In C Remixed
https://www.youtube.com/playlist?list=PLhQNxHMcCsVpSDfJS6V6W-hmB54NI5-2G

Aphex Twin - Selected Ambient Works 85-92
Daft Punk - Discovery
Massive Attack - Mezzanine
Radiohead - In Rainbows

good grasp/ mastery of harmony?
https://www.reddit.com/r/synthesizers/comments/1644e70/

what_are_the_best_harmony_exercises_or_approaches/

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BUCHLA700

sapf: New Music Language Inspired by Supercollider, APL, and Forth (Sound as Pure Form)
https://youtu.be/FY2WYXOdXoM?si=7cLLC3qstDDSgi-B

"A tool for exploring sound as pure form." or "sound as pure form" or "sapf"
https://github.com/lfnoise/sapf

sapf: Language Basics and FM Synthesis (Sound as Pure Form)
https://youtu.be/KbTflDFqgnE?si=cc04luupMxkHqpC_
https://github.com/lfnoise/sapf

James McCartney - Creator of SuperCollider 1996
https://sourceforge.net/projects/supercollider/
https://github.com/lfnoise

Sounds As Pure Form (SAPF) - STUDY
https://github.com/lfnoise/sapf

Sound As Pure Form: Music Language Inspired by Supercollider, APL, and Forth
https://hackernews-kappa.vercel.app/top/44342731

https://github.com/lantertronics/b700ish (BUCHLA 700) - (SupeCollider)
-A rough approximation of the Buchla 700 voice architecture in the Supercollider
programming language.
-Install Supercollider and follow the instructions at the top of the b700ish.scd file. Also, you
will need to get the configuration images from Johan Boberg's Buchla 700 Archaeology page:
http://randomvoltage.com/700/

Buchla 700/ID700 Configurations & Yamaha TX81Z Algorithms Compared (also DX21, DX27,
DX100)
https://youtu.be/DWSFuAa5Oh0?si=_LjtEBMj6lYpGsVT
https://modo.sc/id700/
The Buchla 700 Emulation Project
https://bob.lopatic.de/
https://bob.lopatic.de/browser

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Digital Materials (SOS)

Seismic Data Analysis Using Digital Music Technology
TuD20110.pdf

Chris Hayward Papers
https://www.researchgate.net/profile/Chris-Hayward-4
79. Listening To The EarthSing - Chris Hayward
https://soundcloud.com/seismicsounds/listening-to-the-earth-sing
Listening to the Earth sing - Chris Hayward
https://www.researchgate.net/publication/242638653_Listening_to_the_Earth_sing
+ListeningtotheEarthSing.pdf
+ListeningtotheEarthSing-AIStudio/pdf

Bullen, K. E., and Bruce A. Bolt. An Introduction to the Theory of Seismology, 4th ed. Cambridge: Press Syndicate of the University of Cambridge, 1985.

Stanford Scientists Create an Algorithm That Is the "Shazam" For Earthquakes
https://www.smithsonianmag.com/innovation/stanford-scientists-create-an-algorithm-that-is-shazam-for-earthquakes-180957510/

'Shazam for earthquakes' | Stanford Doerr School of Sustainability
https://sustainability.stanford.edu/news/shazam-earthquakes

Understanding Seismic Design through a Musical Analogy
https://www.structuremag.org/article/understanding-seismic-design-through-a-musical-analogy/

AI-Driven Innovations in Earthquake Risk Mitigation: A Future-Focused Perspective
https://www.mdpi.com/2076-3263/14/9/244

Synthesizing Digital Seismic Waveforms for Earthquake Early Warning System
ERJSH_Volume 54_Issue 1_Pages 48-53.pdf

Volcanic Tremor Extraction and
Earthquake Detection Using Music
Information Retrieval Algorithms.pdf
srl-2021016.1.pdf
https://www.uni-potsdam.de/fileadmin/projects/soundscapelab/PapersMusic/2021/srl-2021016.1.pdf

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https://en.wikipedia.org/wiki/A_Rainbow_in_Curved_Air

It is important that this work parsing seismic miniseed waveform data NOT use any external libraries > previous work has used seisplotjs@2.1.5/dist/seisplotjs.mjs and it just generates unneccessary bloat >> this is near realtime seismic waveform audio sonification and RULES are DO NOT change data collection and parsing of miniseed current script in any way whatsoever. This is light weight efficient pure web.   Next step is focus on the sonification composition enhancing this SOUND MUSIC work >> this is a new genre that expands on Music Concrete > name yet undecided!! This current script SEISTRONICA has a similar tone and chord structure to Terry Riley's "A Rainbow in Curved Air" > REF: https://en.wikipedia.org/wiki/A_Rainbow_in_Curved_Air (18:39 length) So lets focus on expanding this. Now make suggestions how this current script can be expanded on with regard to musical sonification that is inspired by "A Rainbow in Curved Air" >> GO

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GROK - SOS {PROMPT >> IMPORTANT April 21 2025
https://grok.com/share/bGVnYWN5_d24124f9-68fc-4239-844c-490552922ece
Looking for composition solutions for Sounds of Seismic (SOS) - https://sos.allshookup.org - there is a working demo script at sos.allshookup.org/demo.html - sonification is the audio technique and it works!! Make composition suggestions for this bleeding edge new form of LLM AI Electronica - GO!!!
https://grok.com/share/bGVnYWN5_d24124f9-68fc-4239-844c-490552922ece

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MiniSEED is a data format used for archiving and exchanging seismological time series data.

It's a stripped-down version of the Standard for the Exchange of Earthquake Data (SEED), specifically designed for real-time and archived seismological data. MiniSEED primarily contains waveform data, but it lacks the detailed metadata found in the full SEED format. >> http://ui.adsabs.harvard.edu/abs/2017AGUFMIN42B..01A/abstract

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is BHZ component mseed data the vertical component (S) wave of an earthquake
https://is.gd/UNPA7x - STUDY IMPORTANT
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Significant Earthquakes - 2025
https://earthquake.usgs.gov/earthquakes/browse/significant.php#sigdef

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Convert miniSEED data to different versions, encodings, etc.
https://github.com/EarthScope/mseedconvert

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MAJO - Japan most frequency of activity on the planet
https://ds.iris.edu/mda/IU/MAJO/
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https://lifeorange.com/seismic/sonify.html

https://earthquake.usgs.gov/monitoring/operations/network.php?virtual_network=GSN

BEST SINGLE STATION
ANMO (North America, western Northern Hemisphere)

ANMO (Albuquerque, New Mexico, USA) - Best Single Station
https://earthquake.usgs.gov/monitoring/operations/stations/IU/ANMO/

BEST FIVE STATIONS for SOS

ANMO (North America, western Northern Hemisphere)
MIDW (Central Pacific, equatorial Northern Hemisphere)
CTAO (Oceania, equatorial Southern Hemisphere)
PMSA (Antarctica, high-latitude Southern Hemisphere)
TIXI (Eurasia, eastern Northern Hemisphere)

*KIV (Eurasia, eastern Northern Hemisphere)

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ANMO (Albuquerque, New Mexico, USA) - Best Single Station
https://earthquake.usgs.gov/monitoring/operations/stations/IU/ANMO/
34.94591 -106.4572
IU.ANMO.00.BHZ

MIDW (Midway Island - Central Pacific, Equatorial Northern Hemisphere)
https://earthquake.usgs.gov/monitoring/operations/stations/IU/MIDW/
28.2156 -177.3698

CTAO (Charters Towers, Australia - Oceania, Equatorial Southern Hemisphere)
https://earthquake.usgs.gov/monitoring/operations/stations/IU/CTAO/
-20.08765 146.24998

PMSA (Palmer Station, Antarctica, High-Latitude Southern Hemisphere)
https://earthquake.usgs.gov/monitoring/operations/stations/IU/PMSA/
-64.7744 -64.0489

TIXI (Tiksi, Russia, Russia, Eurasia, Eastern Northern Hemisphere)
https://earthquake.usgs.gov/monitoring/operations/stations/IU/TIXI/
71.6341 128.8667

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http://service.iris.edu/fdsnws/station/1/query?network=IU&station=ANMO&level=response

```
const url = `https://service.iris.edu/fdsnws/dataselect/1/query?
net=IU&sta=ANMO&loc=00&cha=BHZ&starttime=${startTime}&endtime=${endTime}
&format=miniseed`;
```

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```
import { miniseed, seismogram } from './seisplotjs_3.1.4_standalone.mjs';
```

*** seisplotjs_3.1.4_standalone.mjs is too large 2.3mb
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// Ultra-minimal MiniSEED parser for IU.ANMO.00.BHZ (assumes Int32 data)

Avoids heavy libraries like seisplotjs or obspy for the browser.

Using GPT-3.5 mostly (some GPT-4.0)

Agent Seismic Sound (ASS) is a living digital sound engine—an autonomous generative research agent that listens to Earth's seismic activity and transforms it into evolving soundscapes. Rooted in the concept of sonification as communication, ASS draws from real-time seismic data, granular synthesis, and minimalist audio engineering. Its purpose is both scientific and poetic: to explore Earth's voice, unlock sub-audible language patterns, and push the boundaries of human perception. Leveraging LLMs, ASS becomes adaptive—an AI companion evolving in cyberspace, composing perpetual, resonant Earthcore muzak as an ambient digital archive of planetary motion.

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raspberryshake.org generates EHZ data similar to GSN BHZ data but IRIS not host...

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Here's the direct link to the IRIS Dataselect Builder:

👉 https://service.iris.edu/irisws/timeseries/1/builder

This tool helps you manually construct and test waveform requests by selecting:

    Network (e.g., IU)

    Station (e.g., ANMO)

Location (e.g., 00 or leave blank)

Channel (e.g., BHZ)

Start/End times

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History Early ElectroAcoustic Music

Kontakte by Karlheinz Stockhausen 1958-1960
https://en.wikipedia.org/wiki/Kontakte
https://stockhausenspace.blogspot.com/2018/03/kontakte-electronic-music-techniques.html

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