

Modular Synthesizers

A Brief History and Functional Description of the Modular Music Synthesizer

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Mod•u•lar - *adjective*

French modulaire or directly from Modern Latin modularis, from Latin modulus "a small measure"

1 : of, relating to, or based on a module or a modulus

2 : constructed with standardized units or dimensions for flexibility and variety in use, as in *modular* furniture

3 : composed of interchangeable units (first recorded 1936)

Syn•the•sis - *noun*

Etymology: Greek, from *syntithenai* to put together

1 : the composition or combination of parts or elements

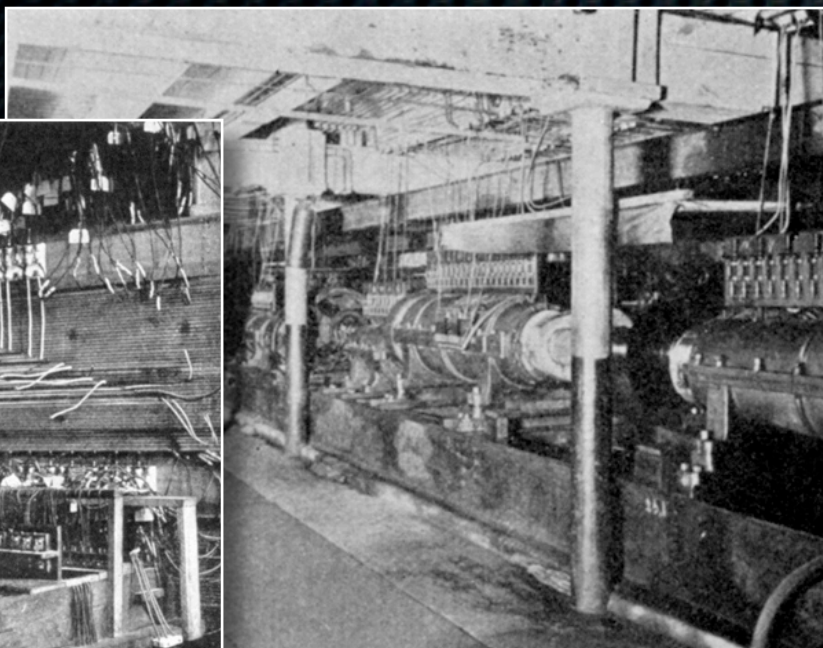
so as to form a whole

2 : the combining of often diverse conceptions into a

coherent whole; *also* : the complex so formed

Who's on first?

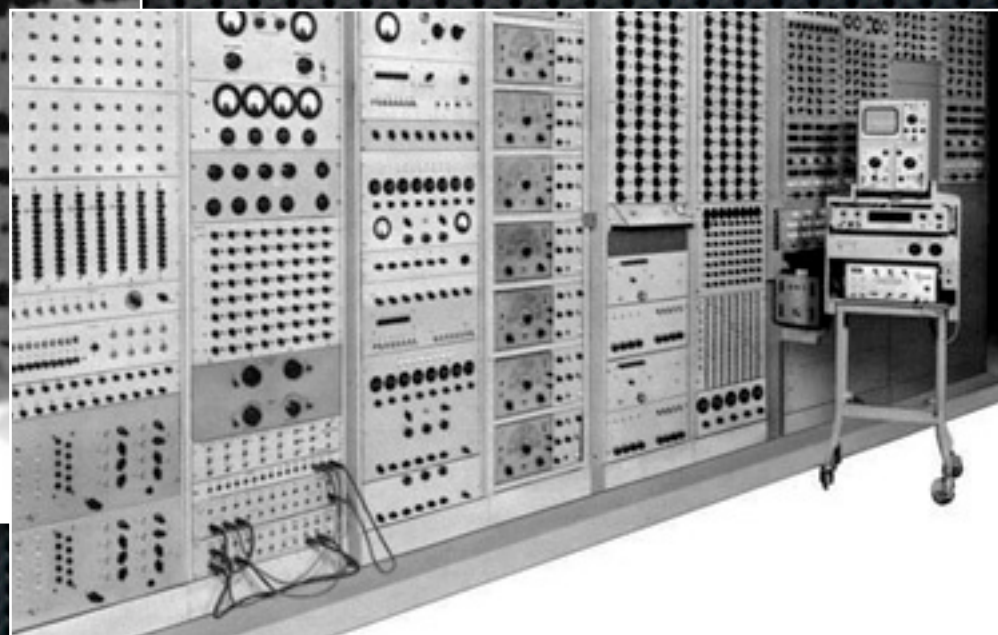
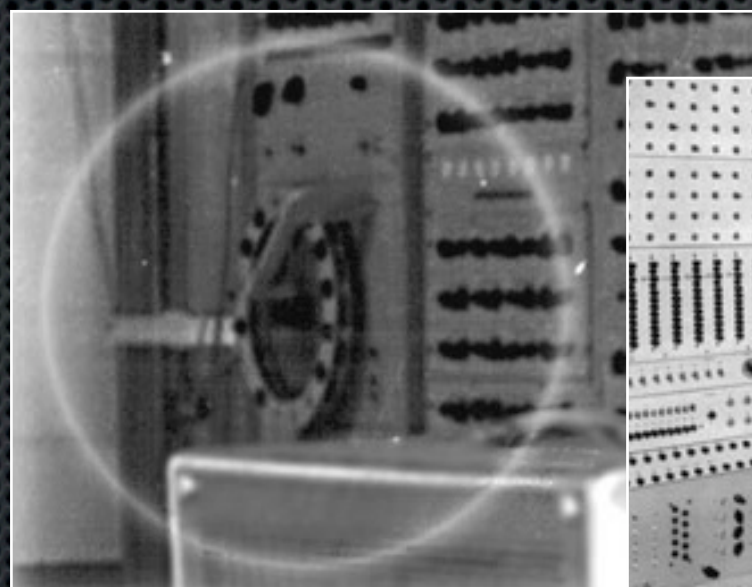
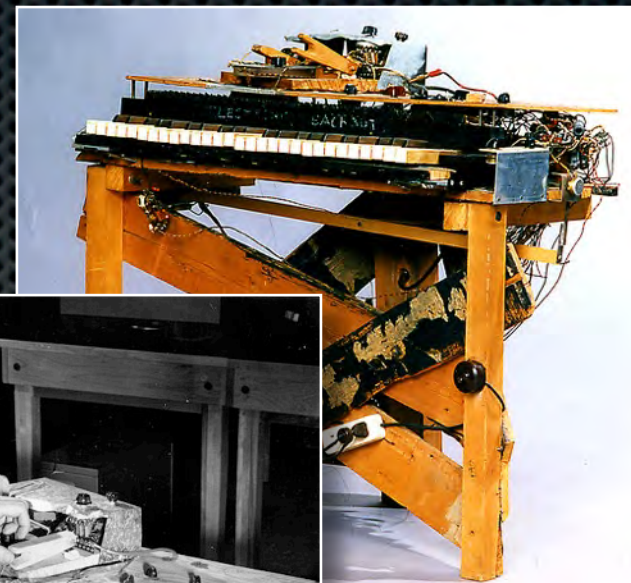
- 1837 - **C.G. Page** (Salem, Mass) - first to produce electronically generated sound (not necessarily associated with a musical instrument).
- 1885 - **Person and Ernst Lorenz** - '*Elektrisches Musikinstrument*' - the first musical instrument designed to produce electrically generated sound.
- 1897 - **Taddaeus Cahills** - *Telharmonium* - electromechanical instrument.
- 1936 - **Oskar Sala** - *Mixturtrautonium* - first synth using Subharmonic synthesis
- 1939 - **Homer Dudley** invents the *Parallel Bandpass Vocoder (VODER)* - A key operated speech synthesizer
- 1940 - **Homer Dudley** invents the *The Voder* speech synthesizer as a way to transmit speech over telephone lines
- 1948 - **Hugh LeCaine** - *Electronic Sackbut* - First voltage-controlled synthesizer
- 1948 - **Dr. Raymond Scott** - *Wall of Sound* - First polyphonic Sequencing Workstation (electromechanical) and the *Electronum* - first sequencer.
- 1950 - **CSIR - Mk 1** - The first known use of a digital computer for the purpose playing music
- 1956 - **Louie and Bebe Barron** - Produced the first all-electronic musical score for a major motion picture - MGM's 'Forbidden Planet'
- 1957 - **Max V. Mathews** at Bell Labs - *MUSIC* - the first digital synthesizer. Technically, it was a computer program, though it set the stage for every digital synthesizer that proceeded it.
- 1963/64 - **Don Buchla** - *model 100 modular* - 1st "modern" modular synth
- 1967 - **Robert Moog** - *Moog modular synthesizer I, II & III* - 1st commercial modular synth.
- 1969 - **EMS** - *Synthi VCS-3* - first non-modular mini-synth
- 1970 - **Robert Moog** - *Minimoog* - 1st Mono Synth with keys (non-modular)
- 1971 - **Tonus/ARP** - *Soloist* - 1st preset mono synth
- 1971 - **John Chowning** - developed *FM synthesis* using the *MUSIC-IV* language, a direct descendent of Mathew's



Telharmonium



Electronic Sackbut



Wall of Sound

When Modulars Roamed The Earth



E-Mu



EMS



Moog



ARP



Serge



Buchla

The Current Modular Landscape



Shared Standards?

- Pitch Control Voltage = 1V/octave
- Gate Signals are positive voltages, typically in the +5V to +15V range
- Waveforms are typically bipolar $\pm 5V$ and unipolar 0 - 10V
- Systems should be designed to handle all the above without dying

System Differences

- Module size
- Power Supplies and power busses -
+/-15V, +/-12V, Headers or Sockets
- Patch System Religious Wars - 1/4",
1/8", 3.5mm, and Banana
- Adaptors are available for cross-system
integration

Some Current Modular Makers

4ms • ADDAC • Analogic-ACS • Analogue Solutions • Analogue Systems • Bubblesound • Bananalogue • Blacet Research
Buchla & Associates • Club of the knobs • Curetronic • Cwejman
Cyndustries • Doepfer Musikelektronik • Division-6 • Elby
FLAME • Flight of Harmony • Future Sound Systems • Intellijel
Livewire • Macbeth Studio Systems • Makenoise • Malekko
Heavy Industry Mattson Mini Modular • Metalbox • Metasonix
MFB • Modcan Oakley Sound Systems • PAiA Electronics • Plan B
Synthesizers Sound Transform Systems (Serge) • STG Soundlabs
• Synthesis Technology (MOTM) • Synthesizers.com • Synthetic
Music Systems • Synthtech • Synthwerks • The Harvestman
Tiptop Audio • Technosaurus • Toppobrillo
Wiard Synthesizer Company

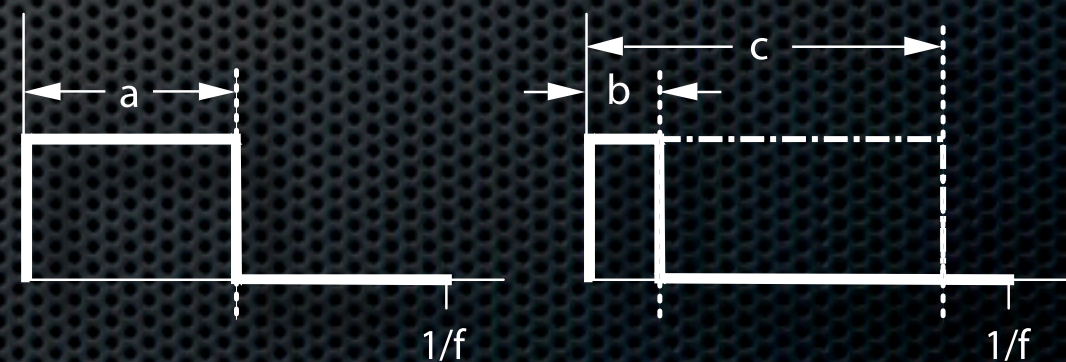
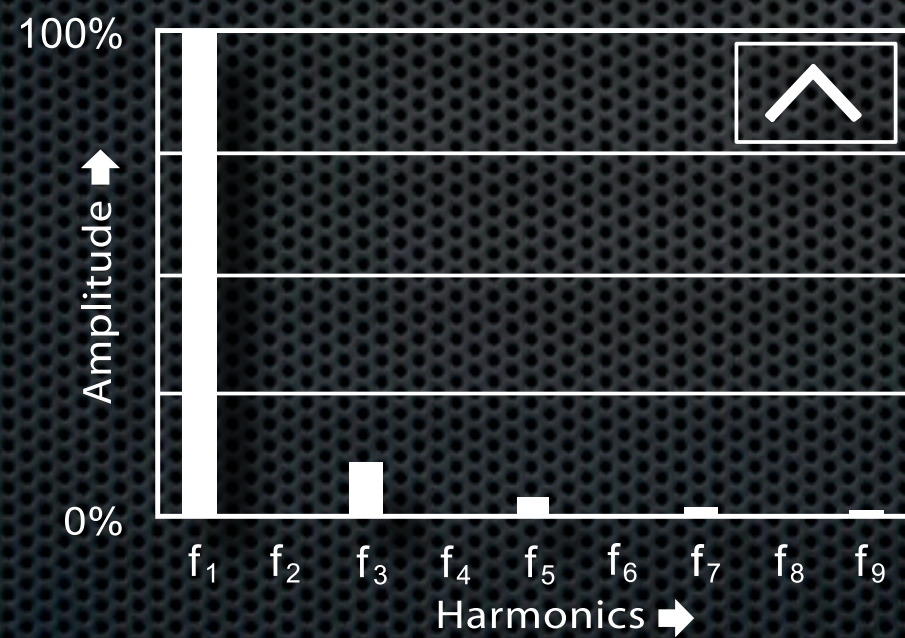
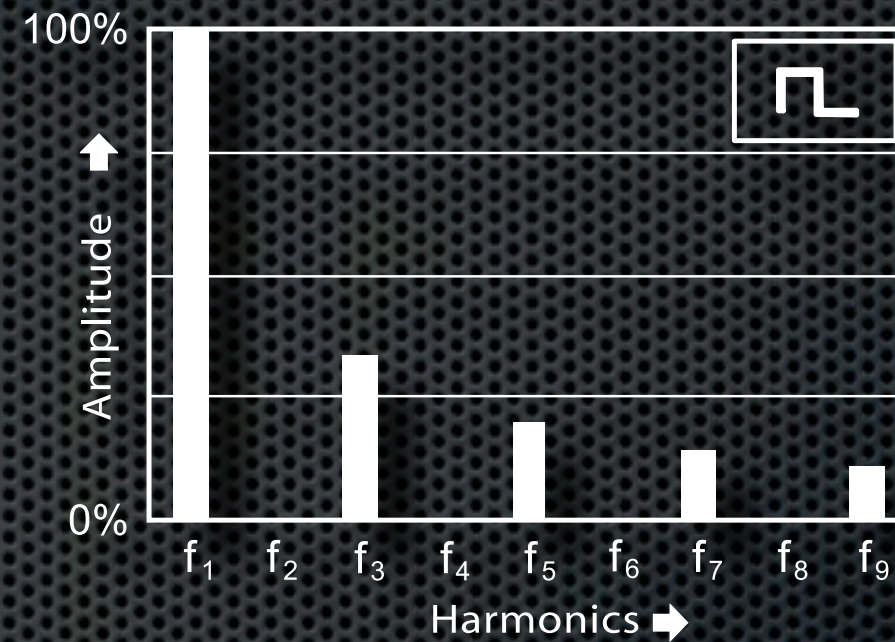
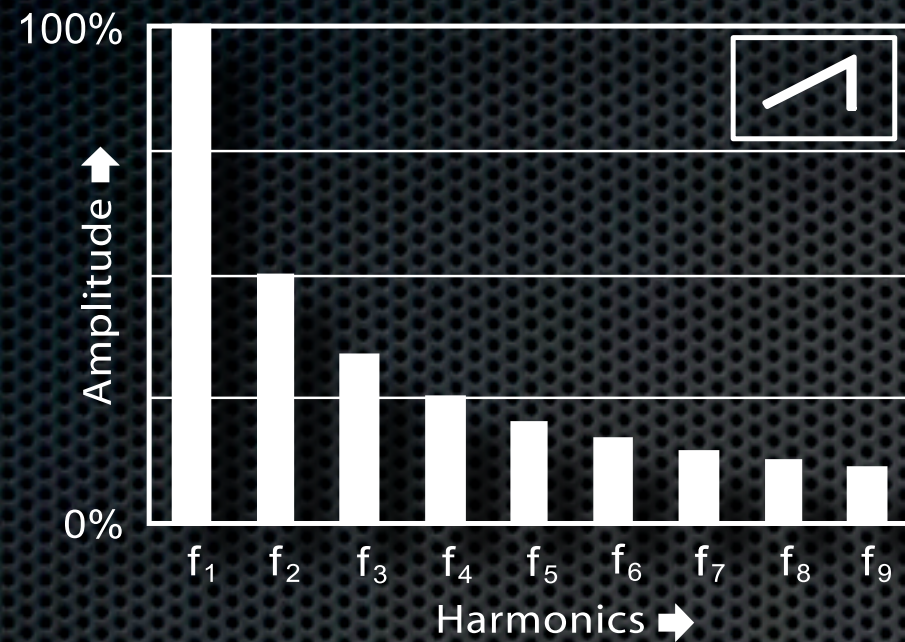
Module Types

- Audio Generators
- Audio Modifiers
- Control Voltage Generators
- Control Voltage Modifiers

Audio Generators

- Voltage Controlled Oscillators (VCO)
- Wavetable Generators
- Clock Generators
- Noise Generators
- Periodic Waveform Generators
- External Audio Sources

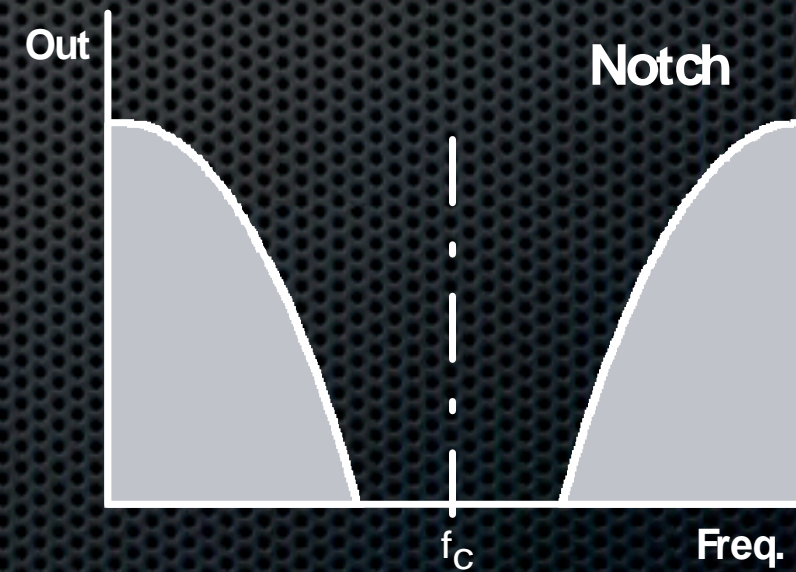
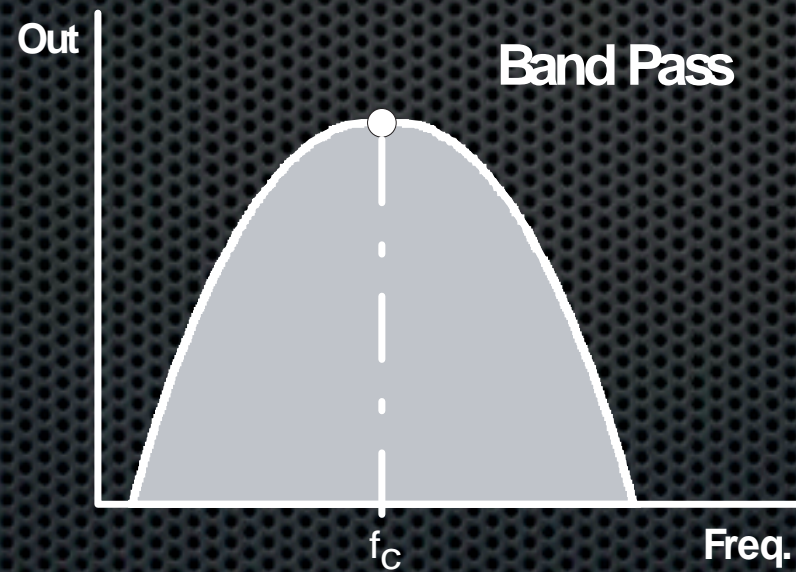
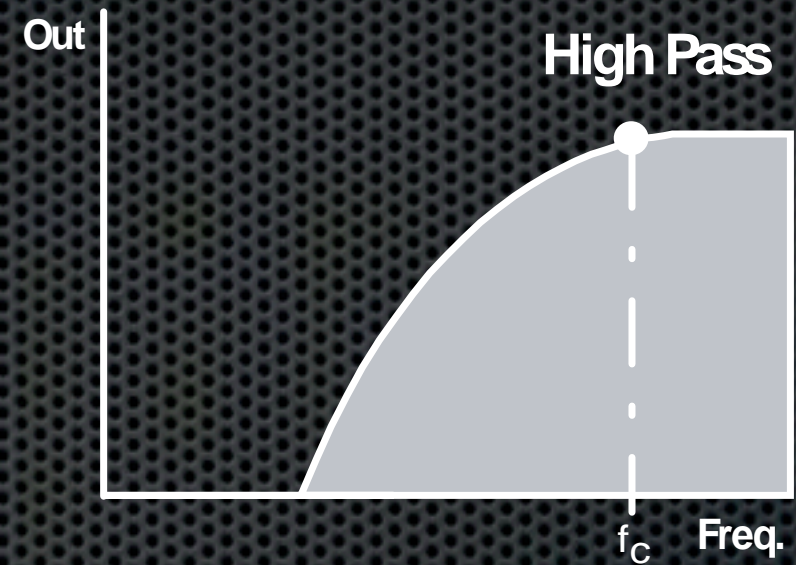
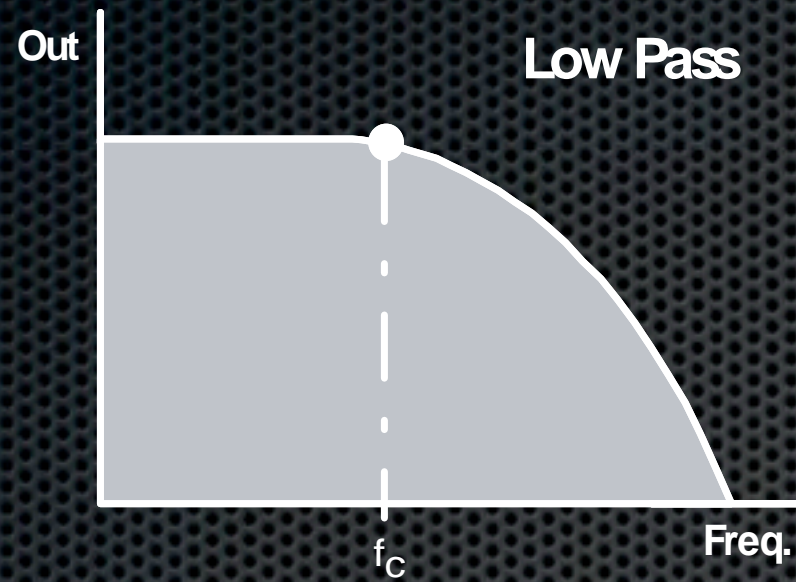
Standard Waveforms



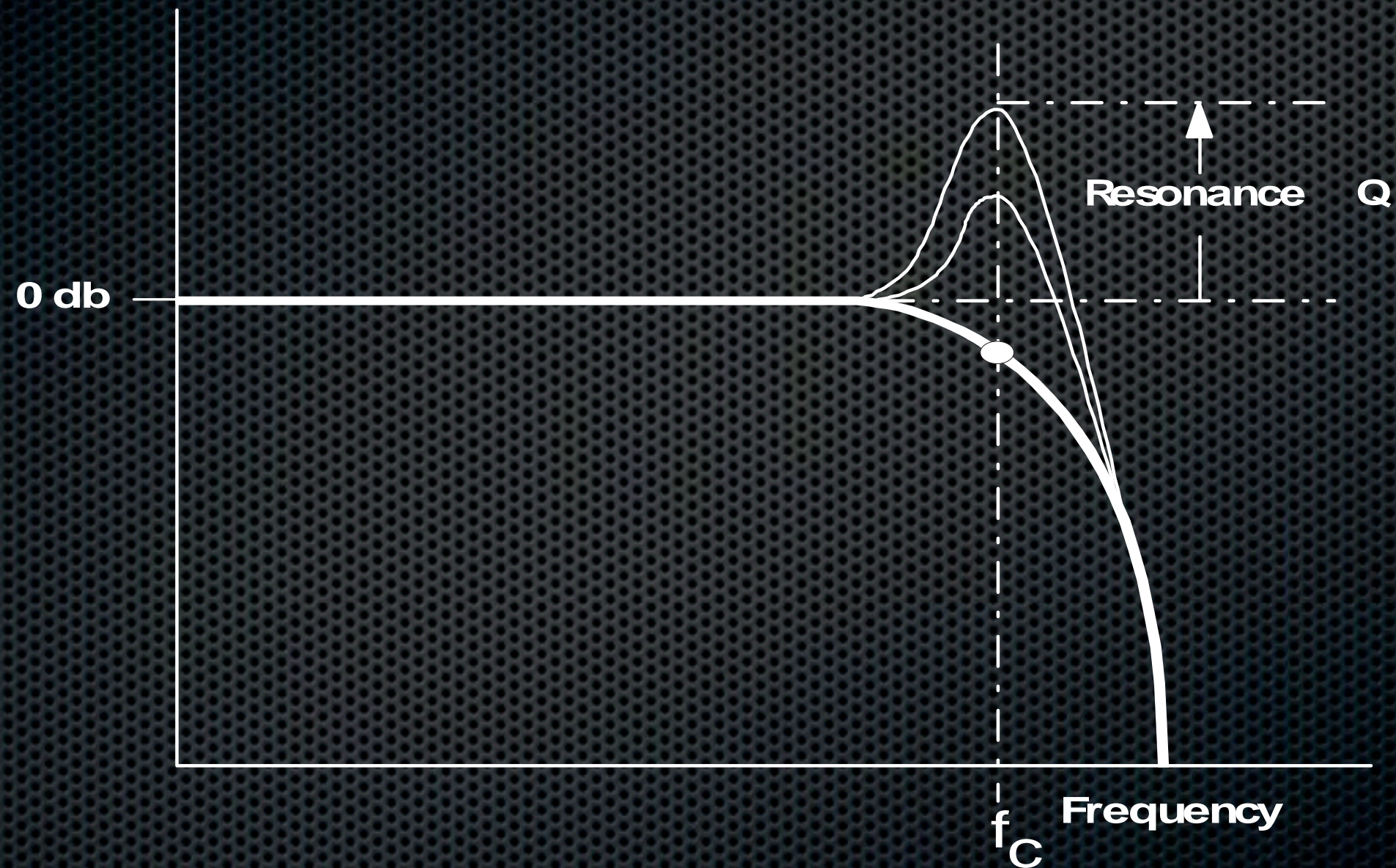
Audio Modifiers

- Voltage Controlled Filters
- Voltage Controlled Amplifiers
- Ring Modulators
- Phasers, Flangers and Time-based
- Audio Dividers and Wave Multipliers
- Clippers and Symmetry Processors
- Mixers, Panners, and Location control

Standard Filters



Filter Resonance



CV Generators

- **Periodic**
 - LFO, Sequencers, and Arpeggiators
- **Aperiodic**
 - Envelope Generators and followers, Random Voltage Generators
- **Manual Controls**
 - Joysticks, Knobs, Keyboards, and Touch Plates
- **Exotic Controls**
 - Motion, Light, Pressure Sensors, MIDI to CV Converters, and DAW Audio Interfaces

CV Modifiers

- Polarity Inverters
- Mixers and Manual Level Controls
- Slew Rate Converters
- VC Polarizers and Polarizing Mixers
- Logic Modules
- Quantizers and Level Detectors

Combo Modules

- Vocoder Systems
- Voice Modules
- Filter Banks and Formant Filters
- Multiples of Standard Modules

Layout and Patching

- The Banana and Coaxial Patch Cord
Religious War
- Pin Matrix
- Switch Matrix
- Dedicated and Semi-Patched Systems

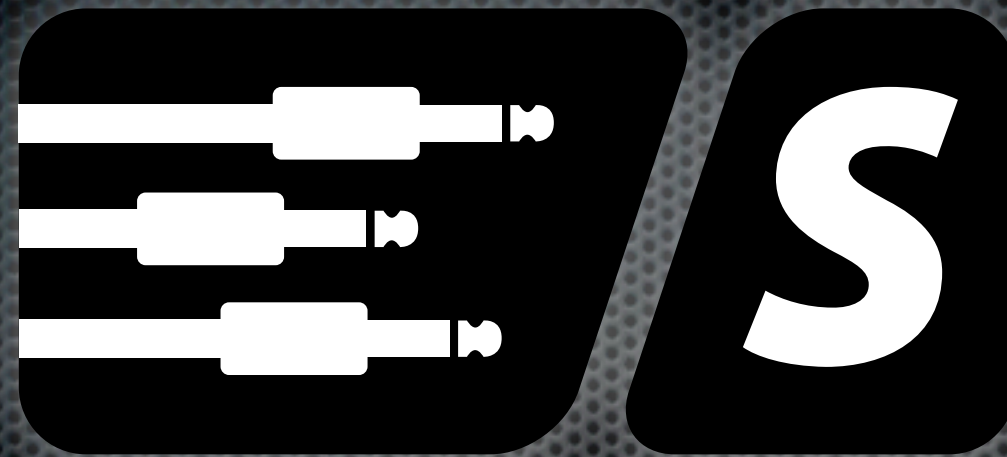
Patch Memory

- Photos and Drawings
- “Presto-Patches” and plug cards
- Dedicated Digital Programmers
- Programmable Normalization



www.mostlymodular.com





SYNTHWERKS

www.synthwerks.com

