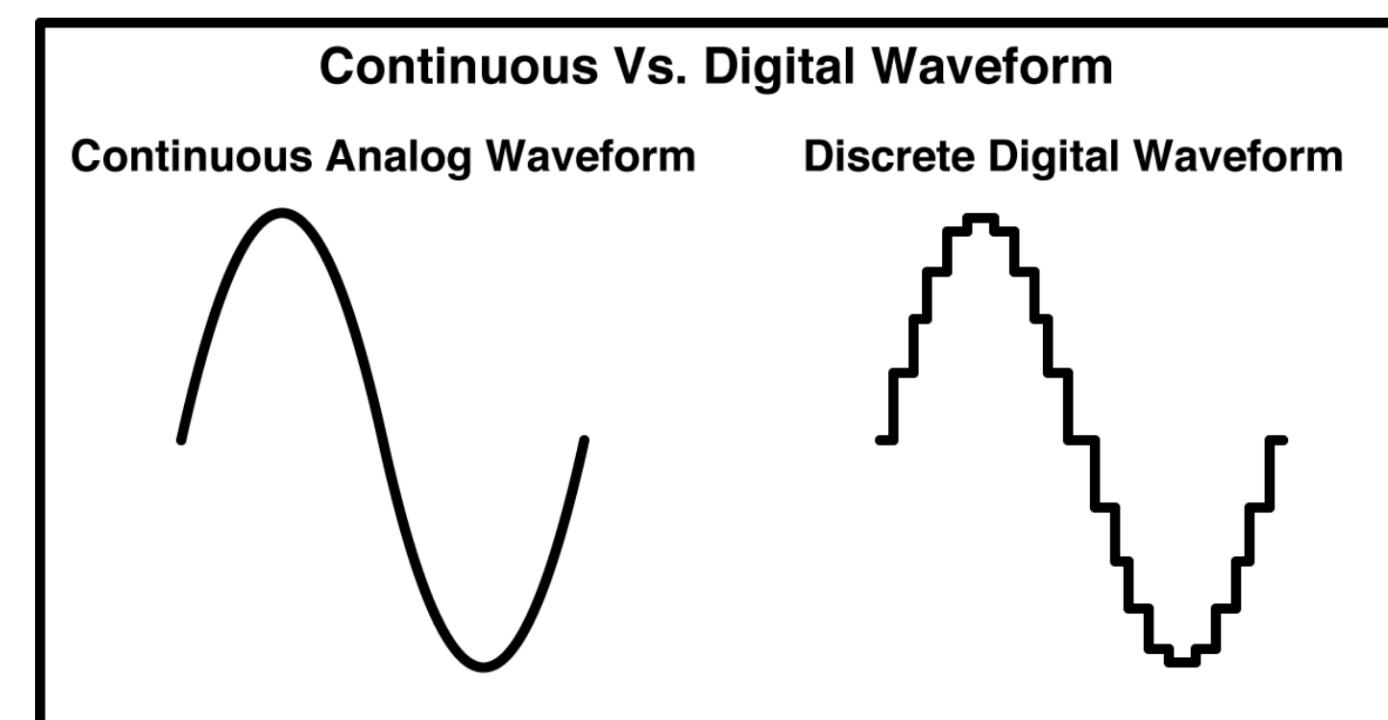


Analoge Klangsynthese

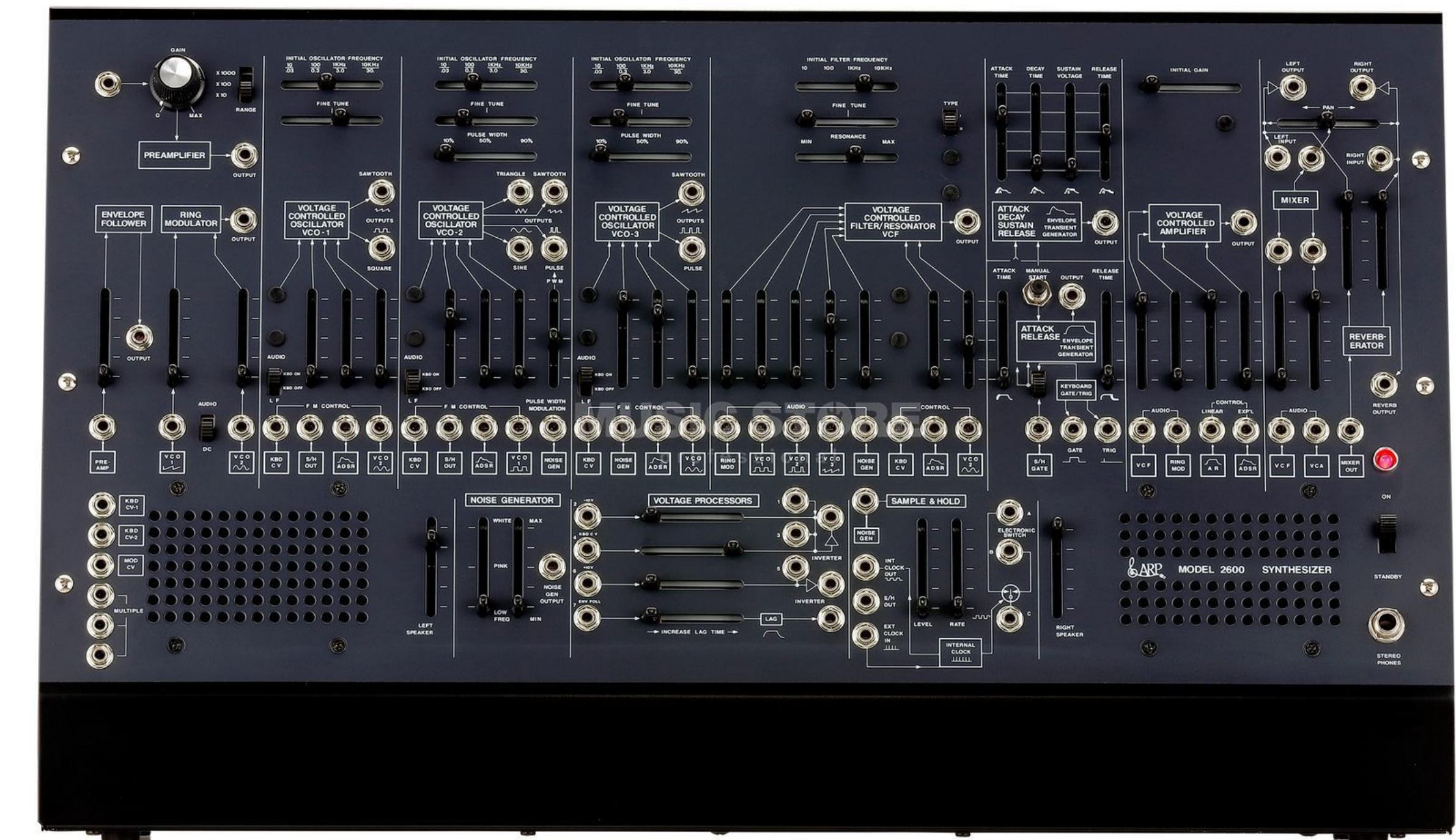
Analog – Digital

- kontinuierlich
- Welle wird durch analoge elektronische Schwingkreise (mittels elektronischer Bauteile wie Resistoren, Kondensatoren etc. erzeugt)
- viel Platz; wenig Funktion -> teuer
- möglicher Datenverlust durch Materialabnutzung
- z.B. Kassette, Tonband, Film
- „zeitdiskret“ → Punkte
- Welle wird digital erzeugt/verarbeitet
→ muss von analog zu digital (ADC) bzw. digital-analog (DAC) gewandelt werden
- viel Funktion auf wenig Platz -> billig
- wenig bis kein Datenverlust
- z.B. CD, mp3, .mpeg



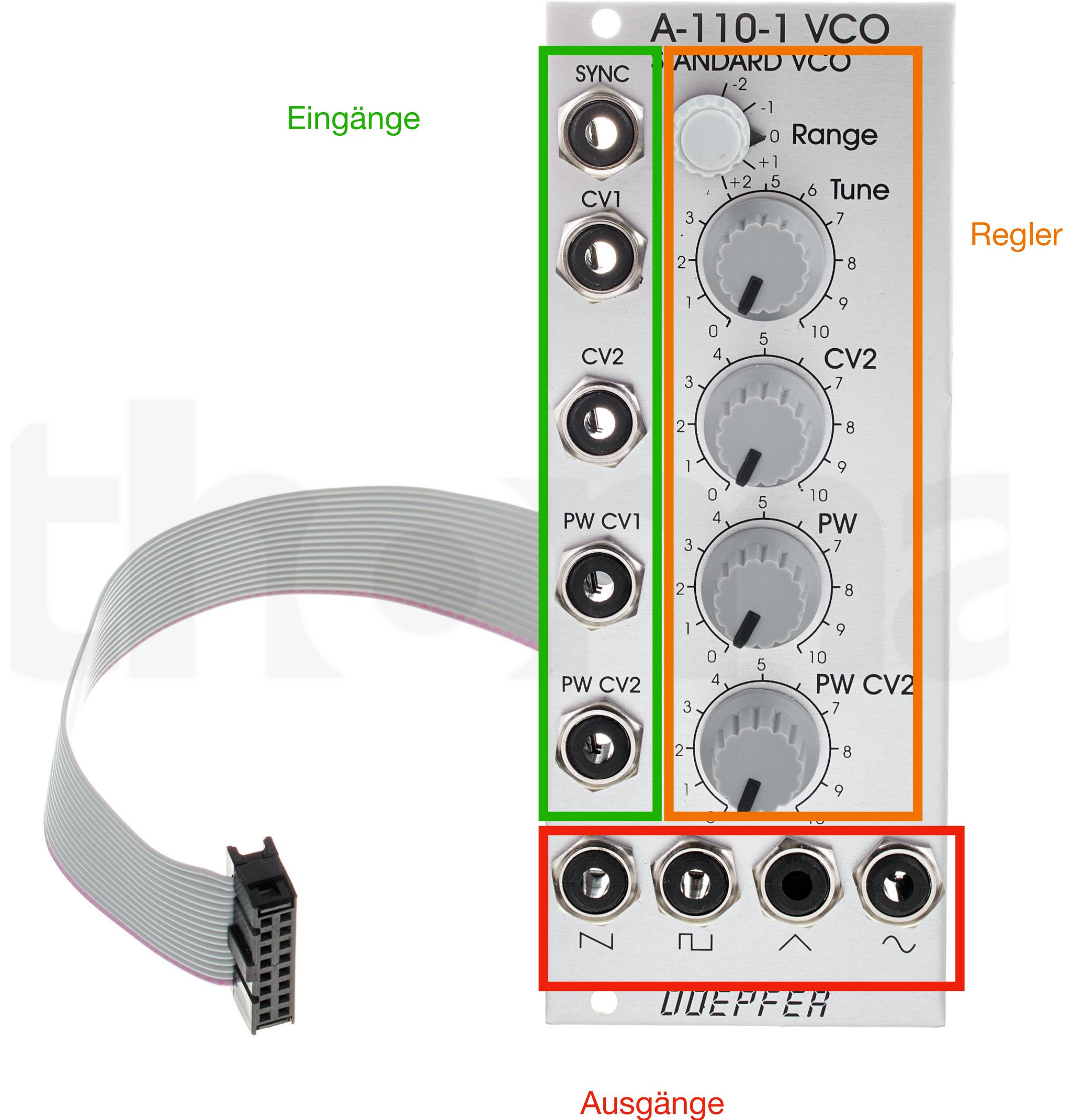
Semimodular – Modular

- Modular: System besteht aus Modulen, die jeweils eine Funktion in der Signalkette übernehmen (z.B. Generatoren, Lautstärke etc.) Diese können je nach Bedarf miteinander kombiniert werden. Signal wird über Patchkabel übertragen.
- Semi-Modular: Signalwege teilweise „vorgepatcht“, Veränderung über Patchkabel möglich.



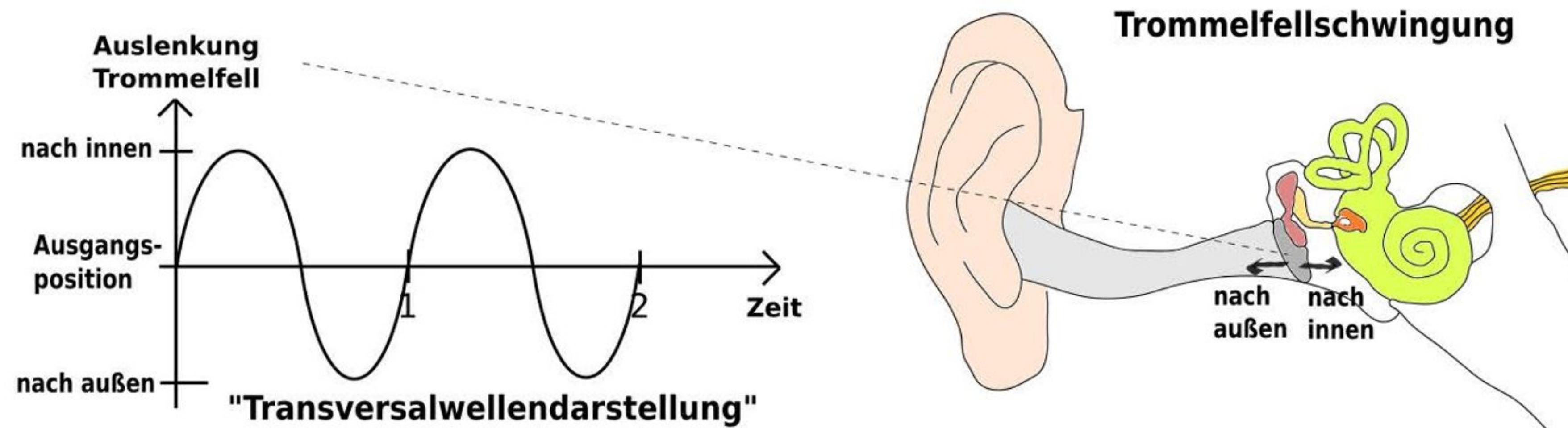
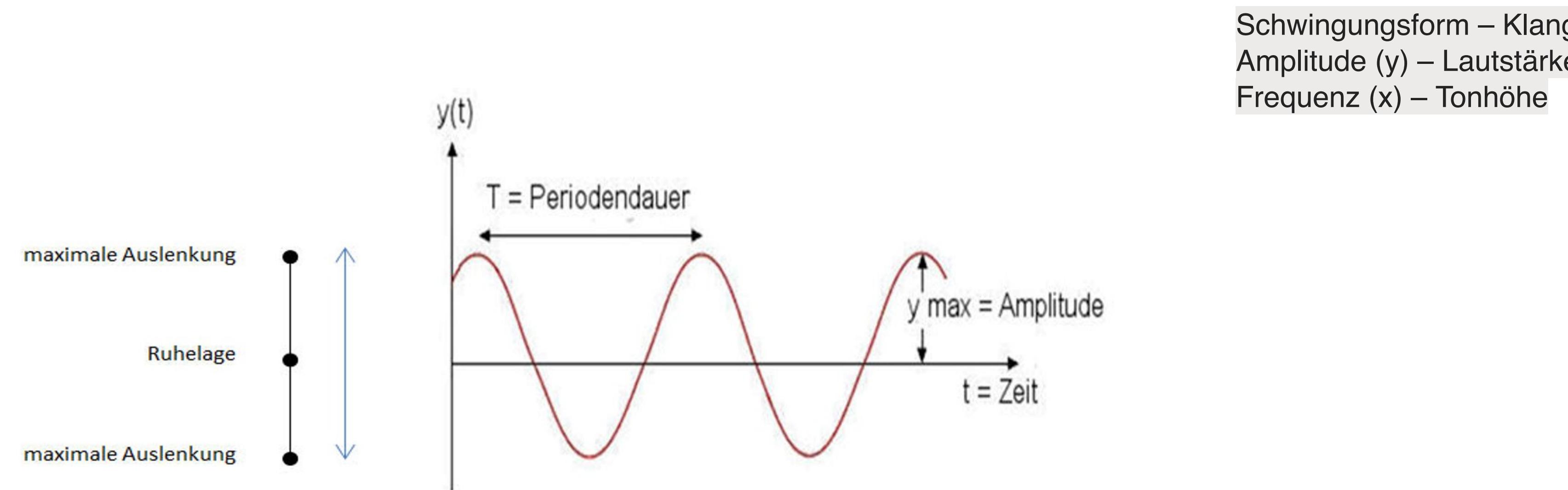
Modul

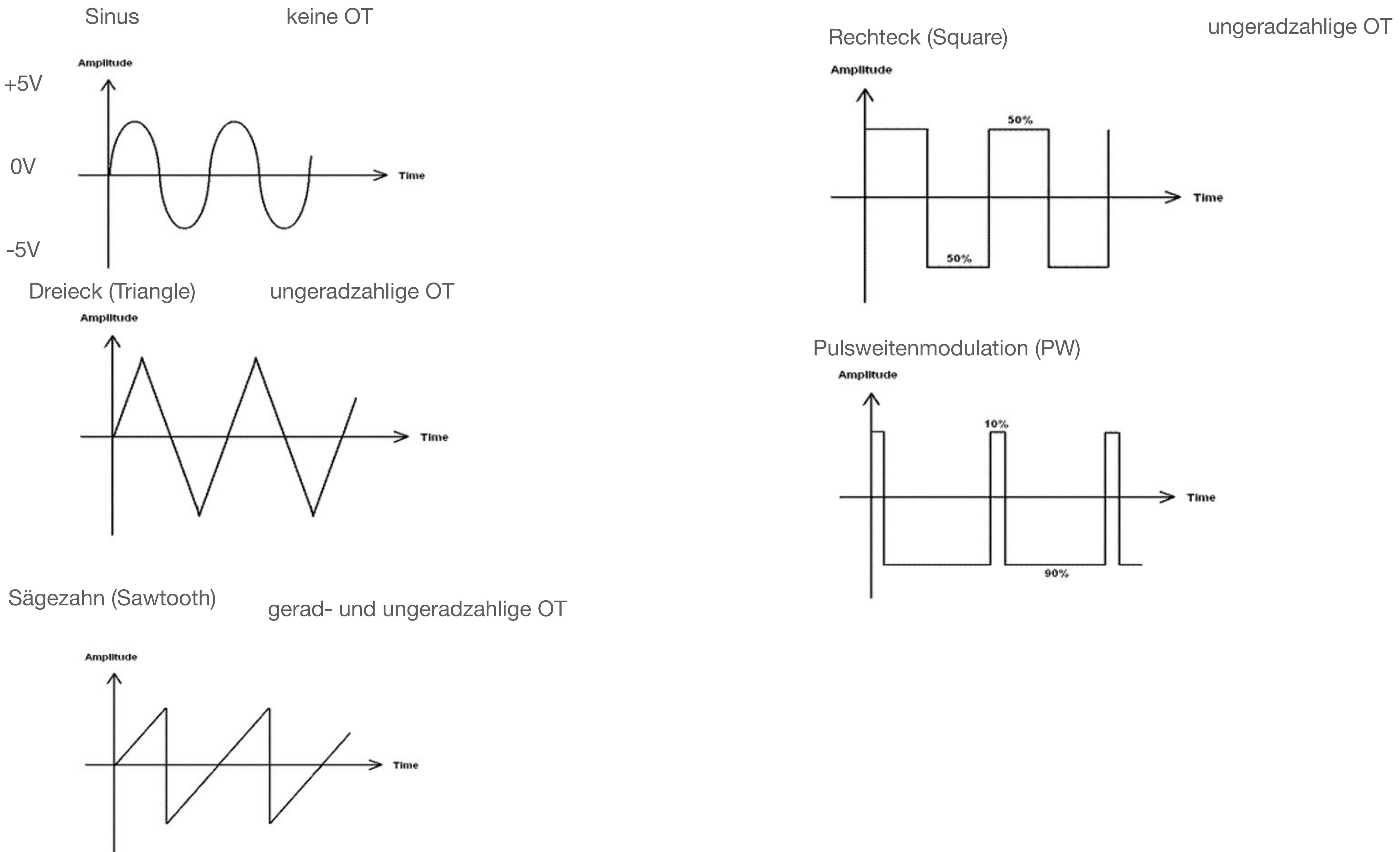
- sog. „Eurorack“-Format
- PCB (Leiterplatte; „Printed Circuit Board“)
- Frontplatte (Panel)
- Ein- und Ausgänge (Buchsen)
- Regler („Pots“)
- Stromkabel
- Patchkabel



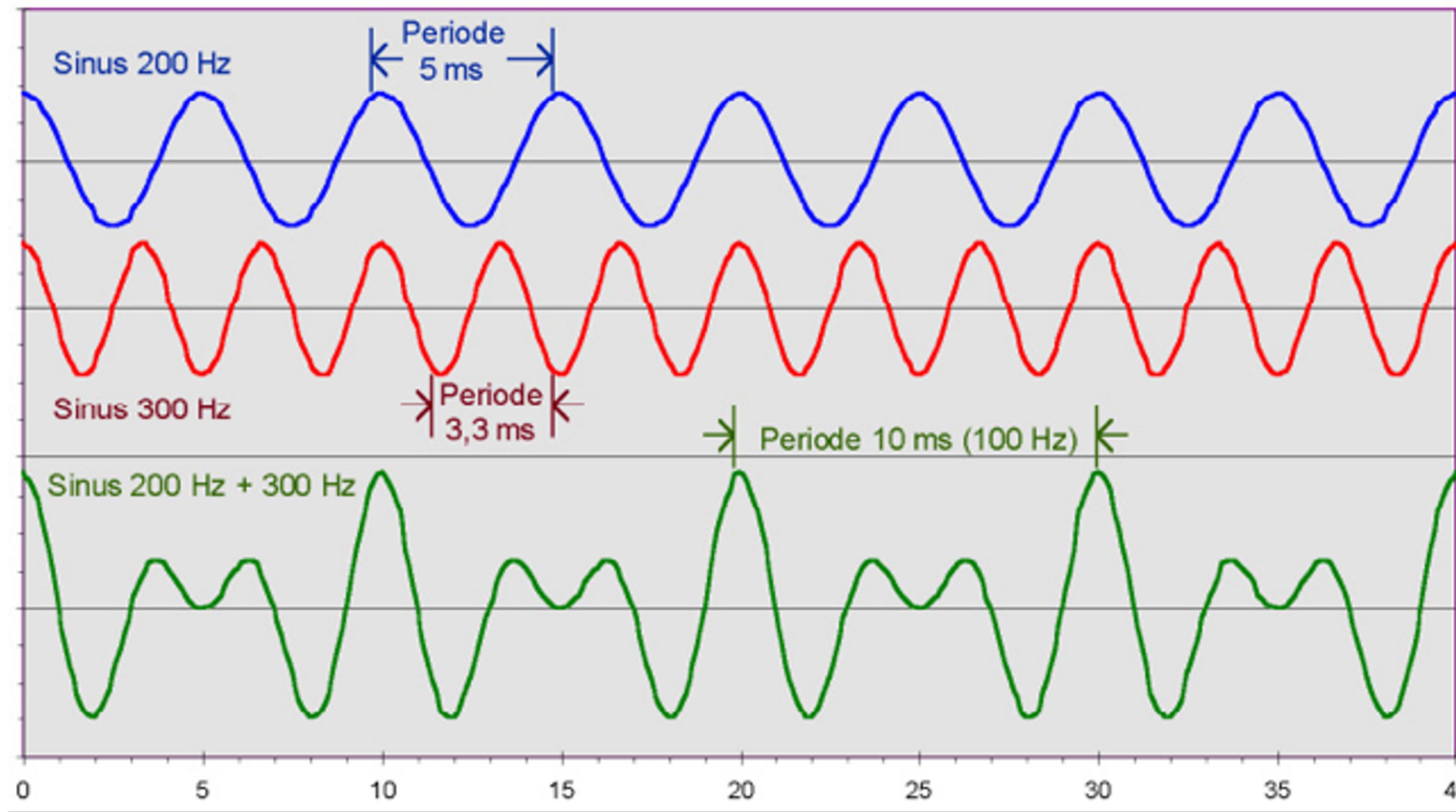
Einige Beispiele für Module

- VCO (Voltage-Controlled Oscillator)
- LFO („Low-Frequency Oscillator“)
- VCA (Voltage-Controlled Amplifier)
- Noise → Rauschen / Zufallsgenerator
- Filter
- Sample & Hold
- Envelope Generator (Hüllkurvengenerator)
- Clock
- Sequencer



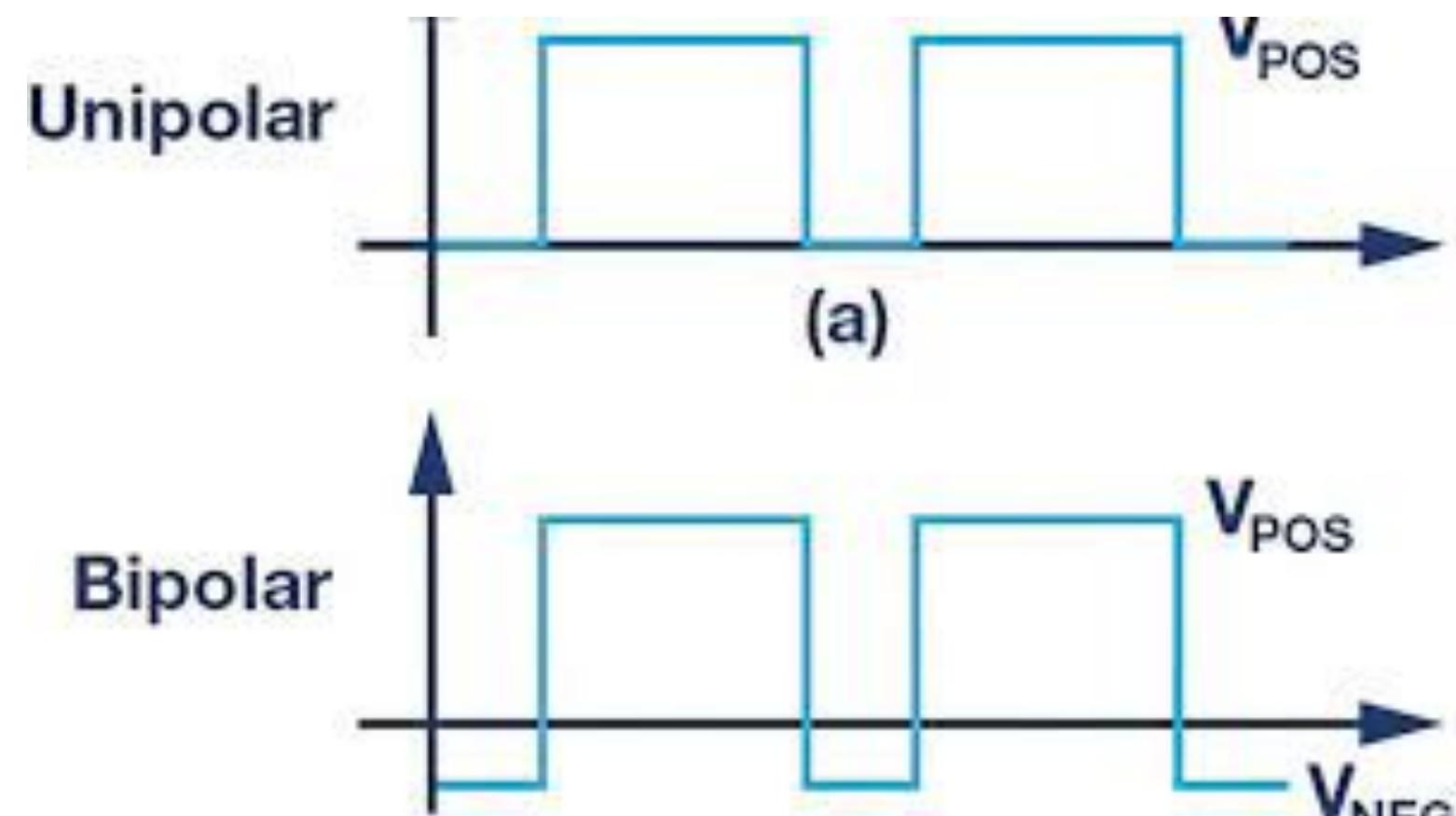


Addition von Schwingungen

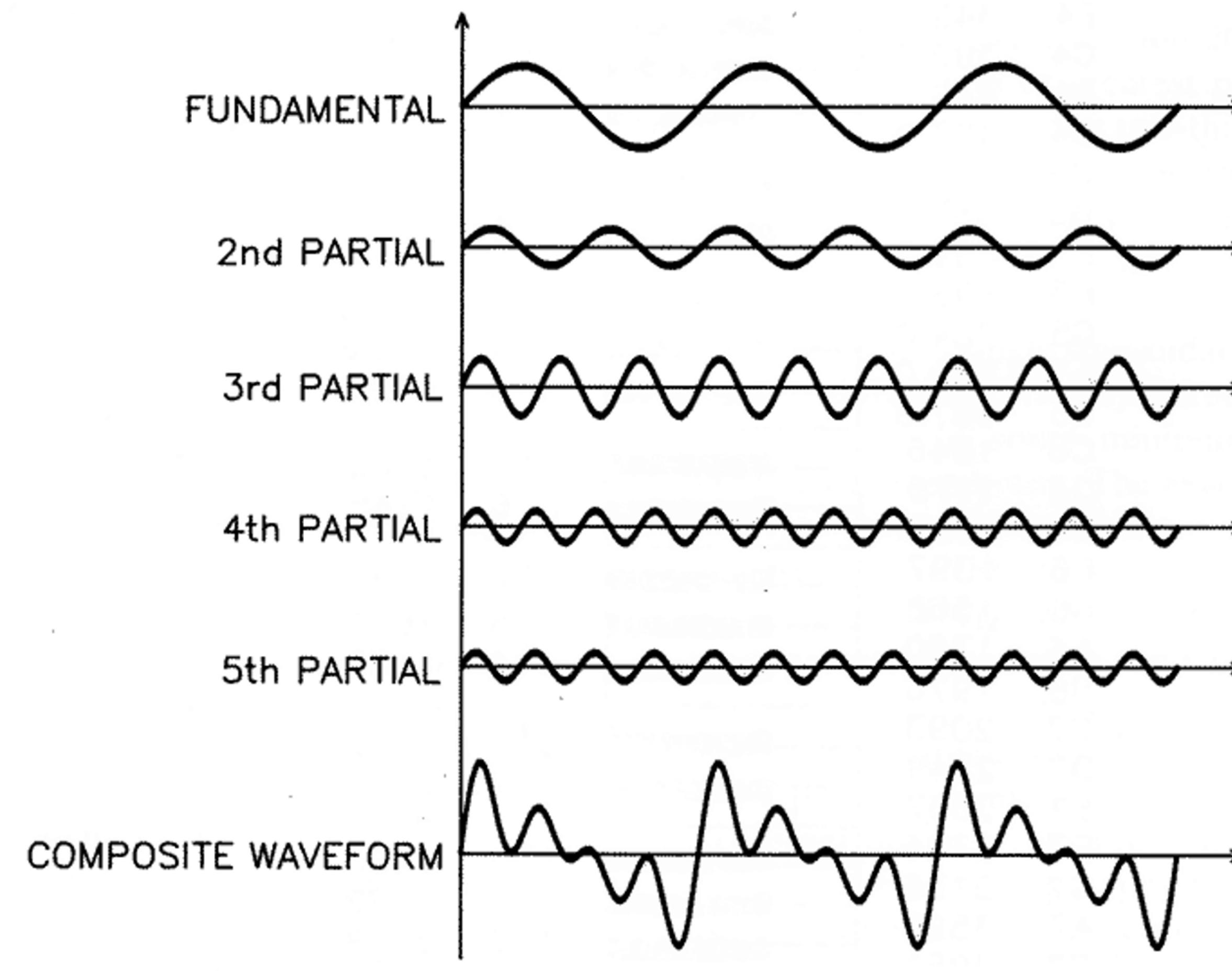


Audio VS CV

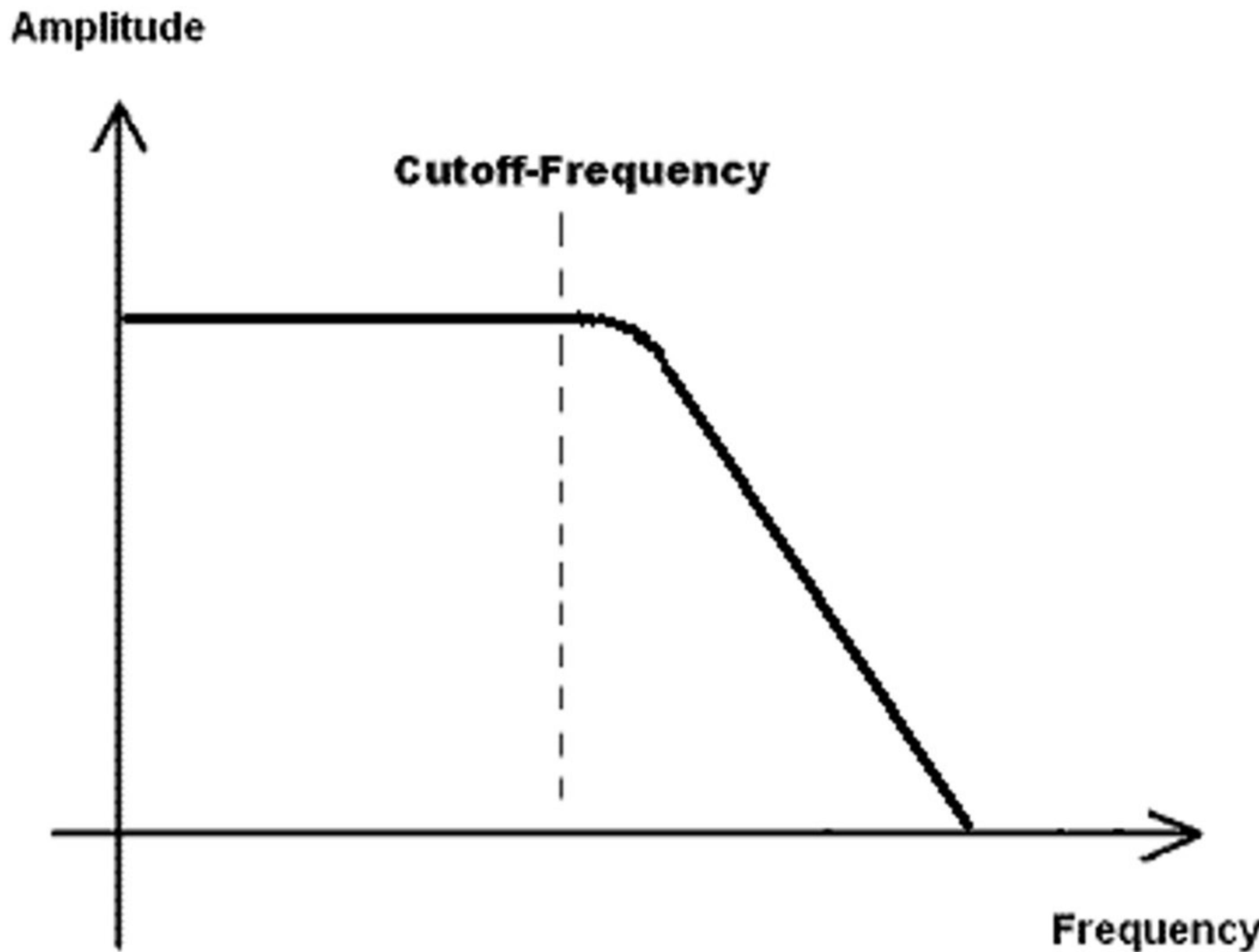
- → Alles ist Spannung!
- CV („Control Voltage“) → steuern diverse Parameter (Lautstärke / Tonhöhe etc.)
- ob Audio oder CV hängt u.A. von der Geschwindigkeit ab
- Polarität



Additive Synthesis

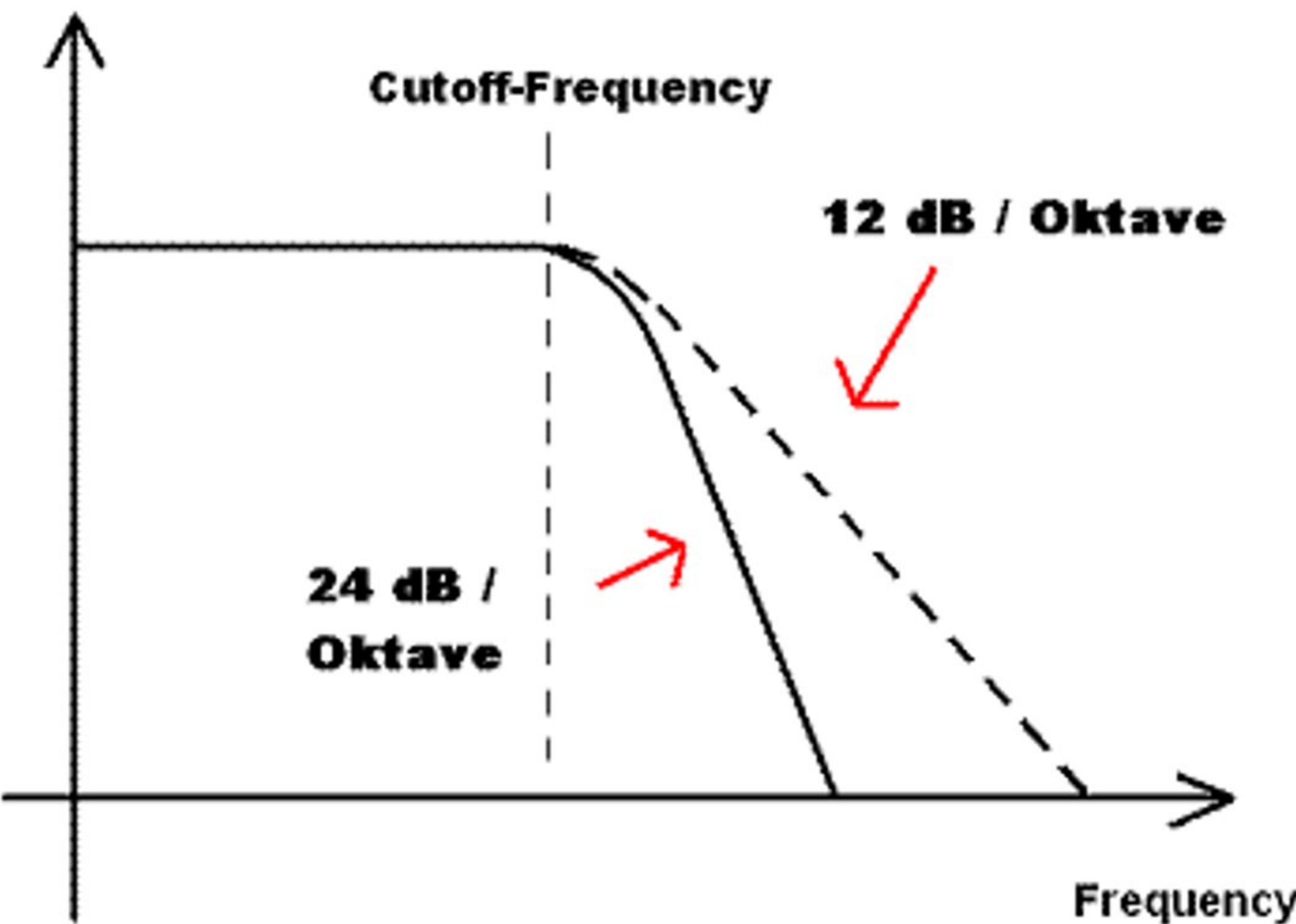


Filter (Subtraktive Synthese)

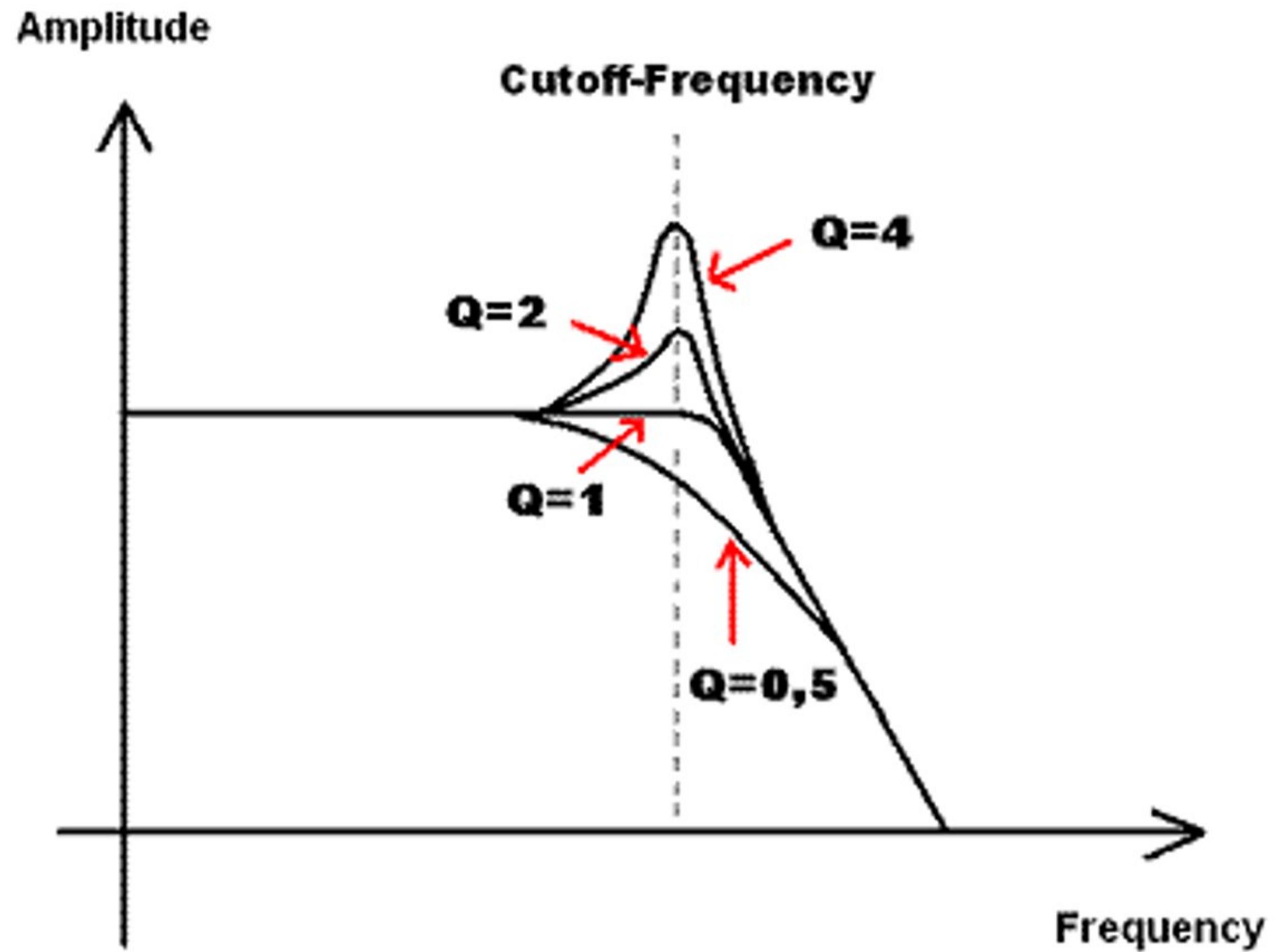


Filter-Q („Güte“)

Amplitude

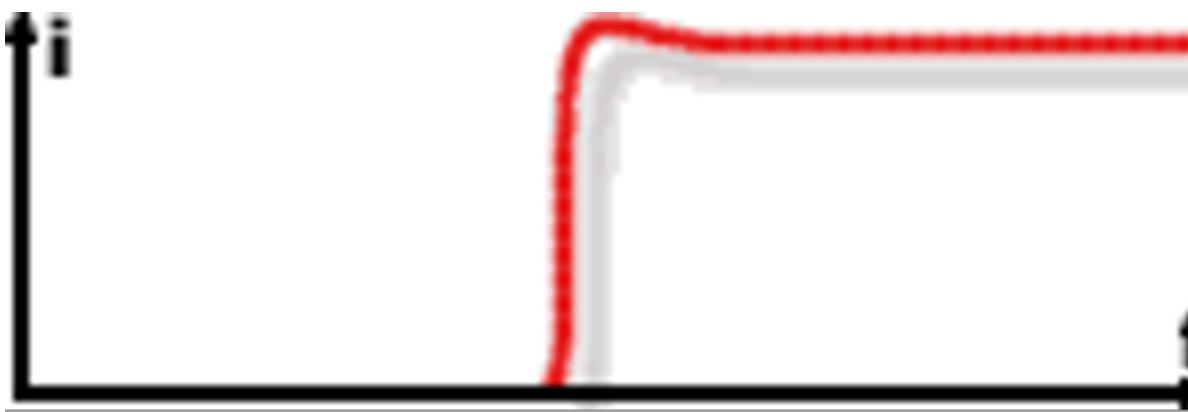


Filterresonanz

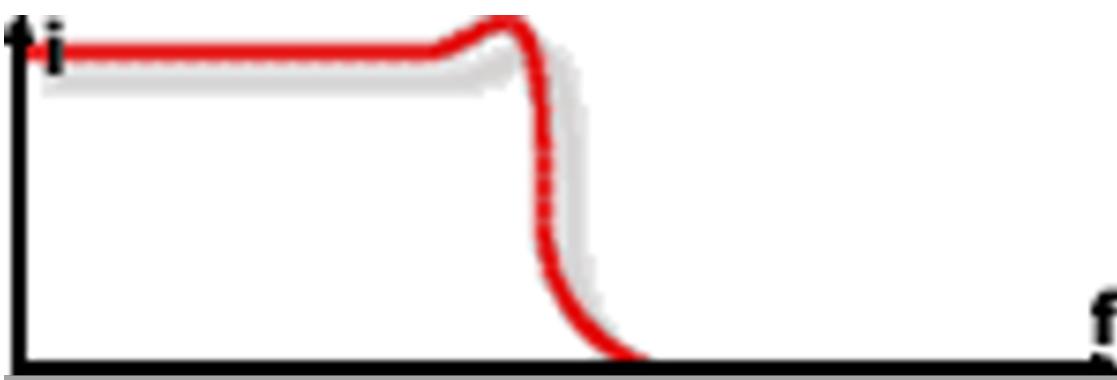


Filterarten

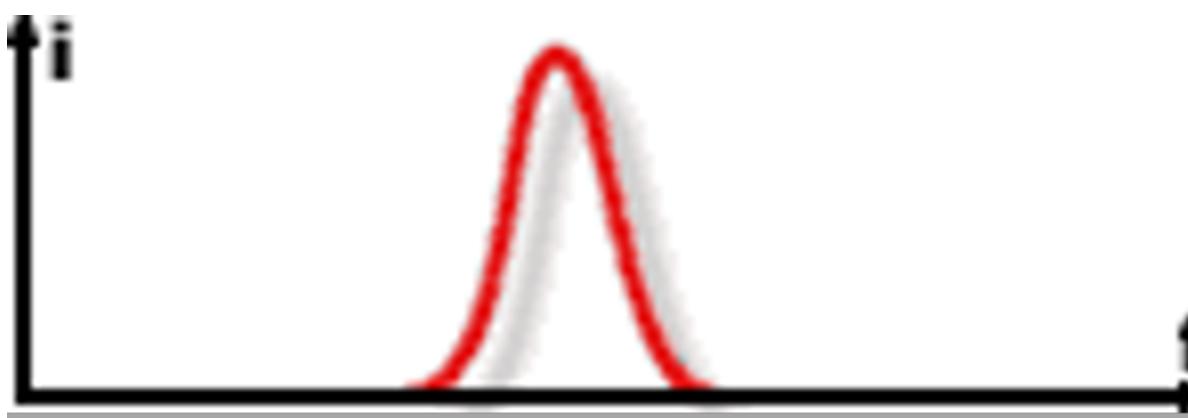
- High Pass



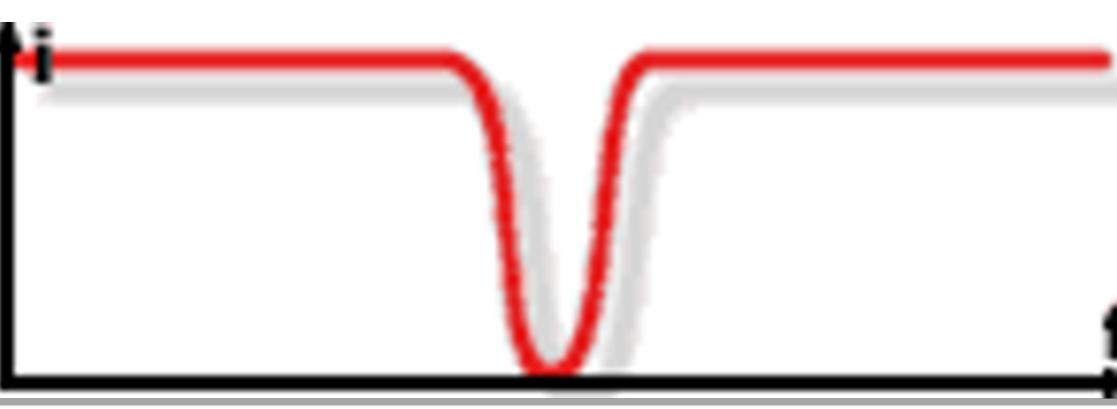
- Low-Pass



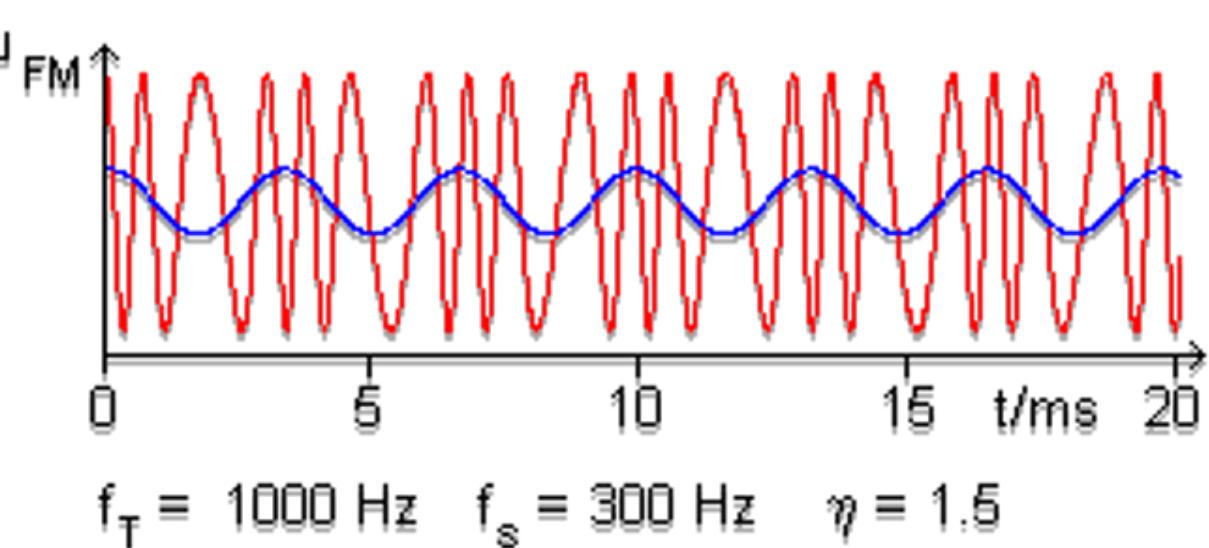
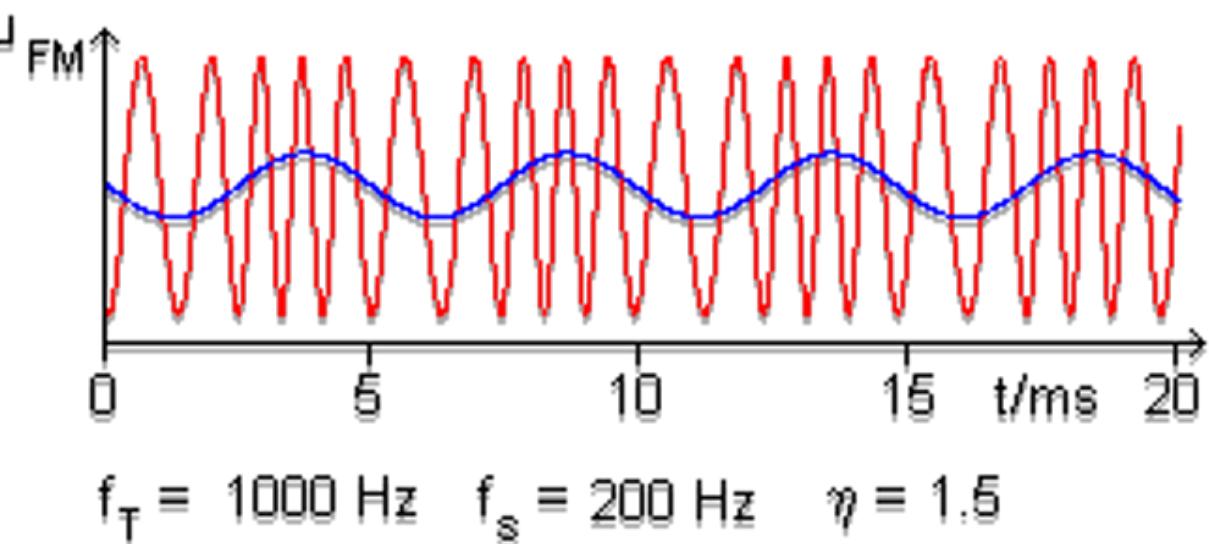
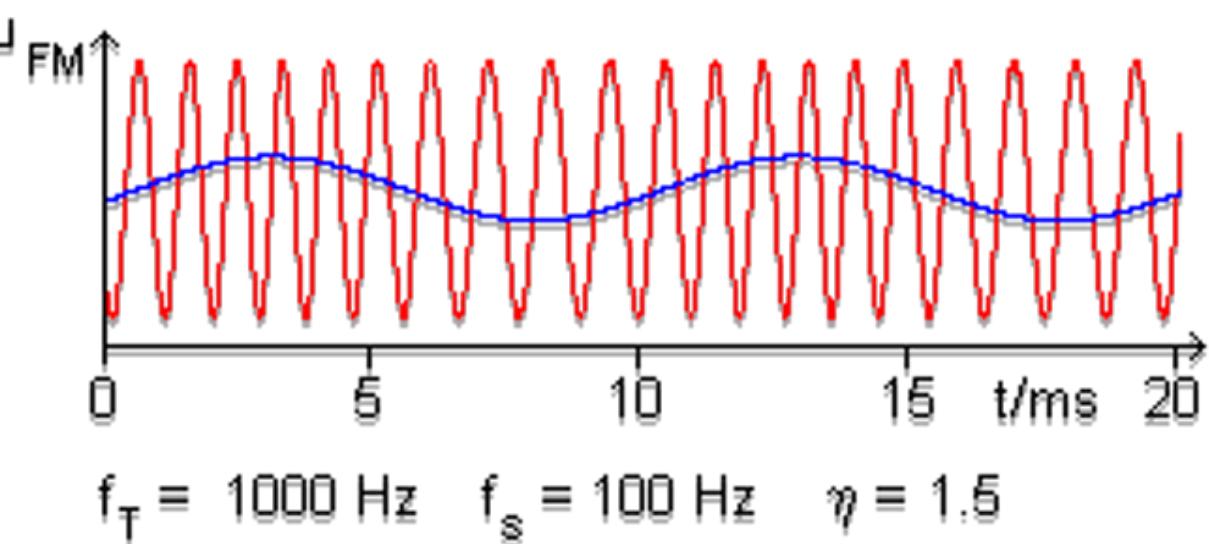
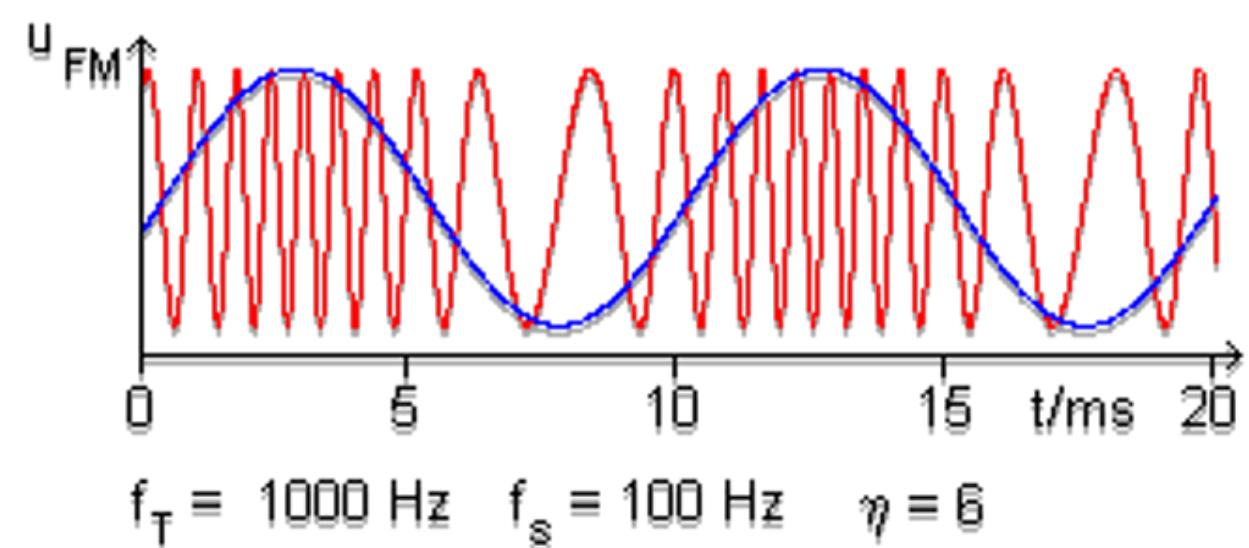
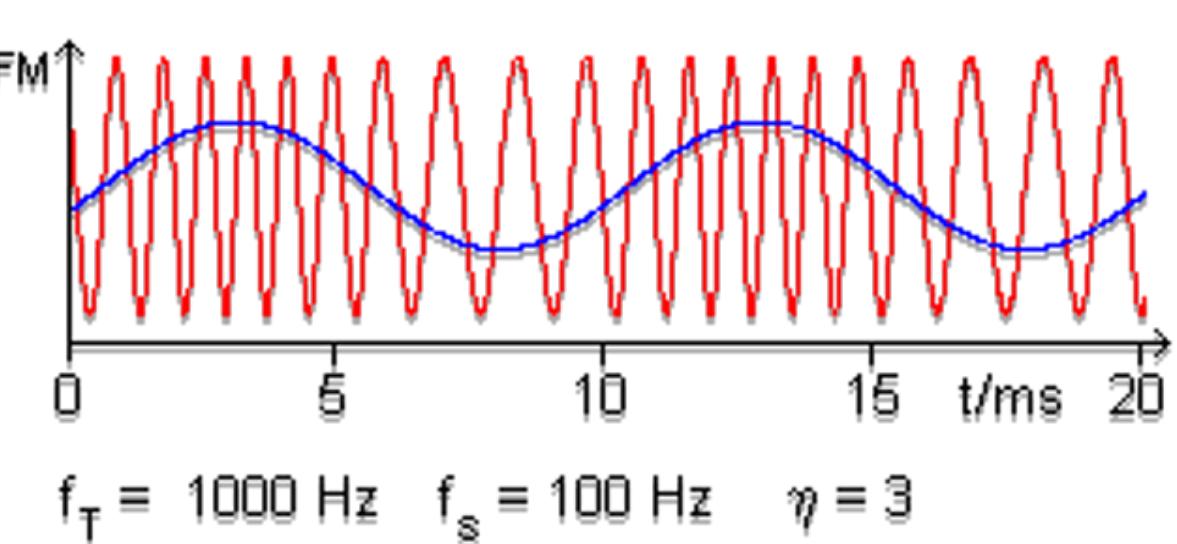
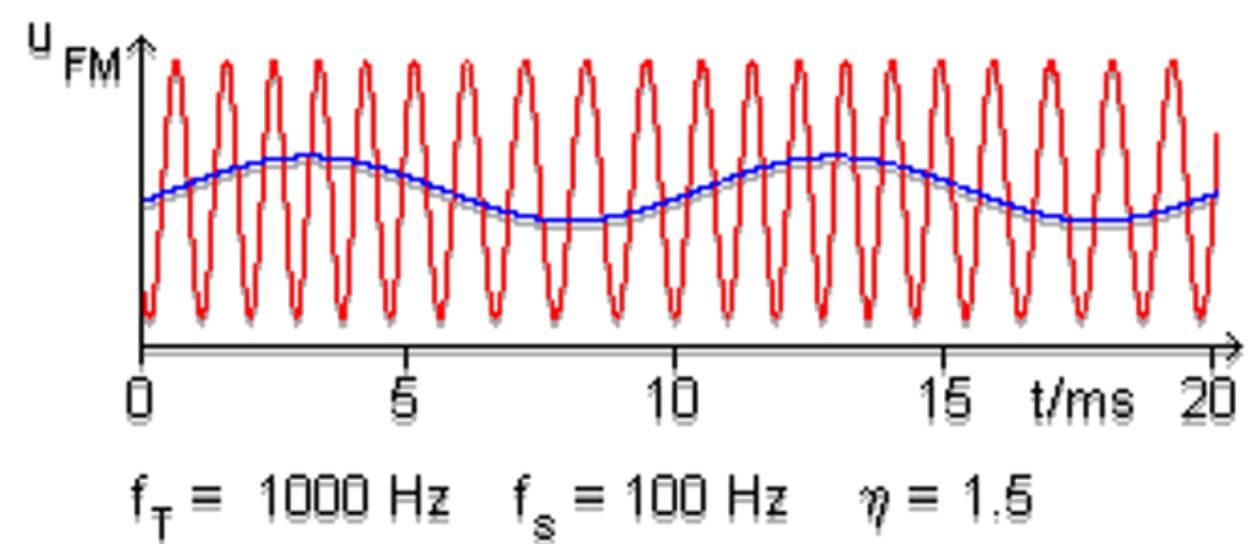
- Band-Pass



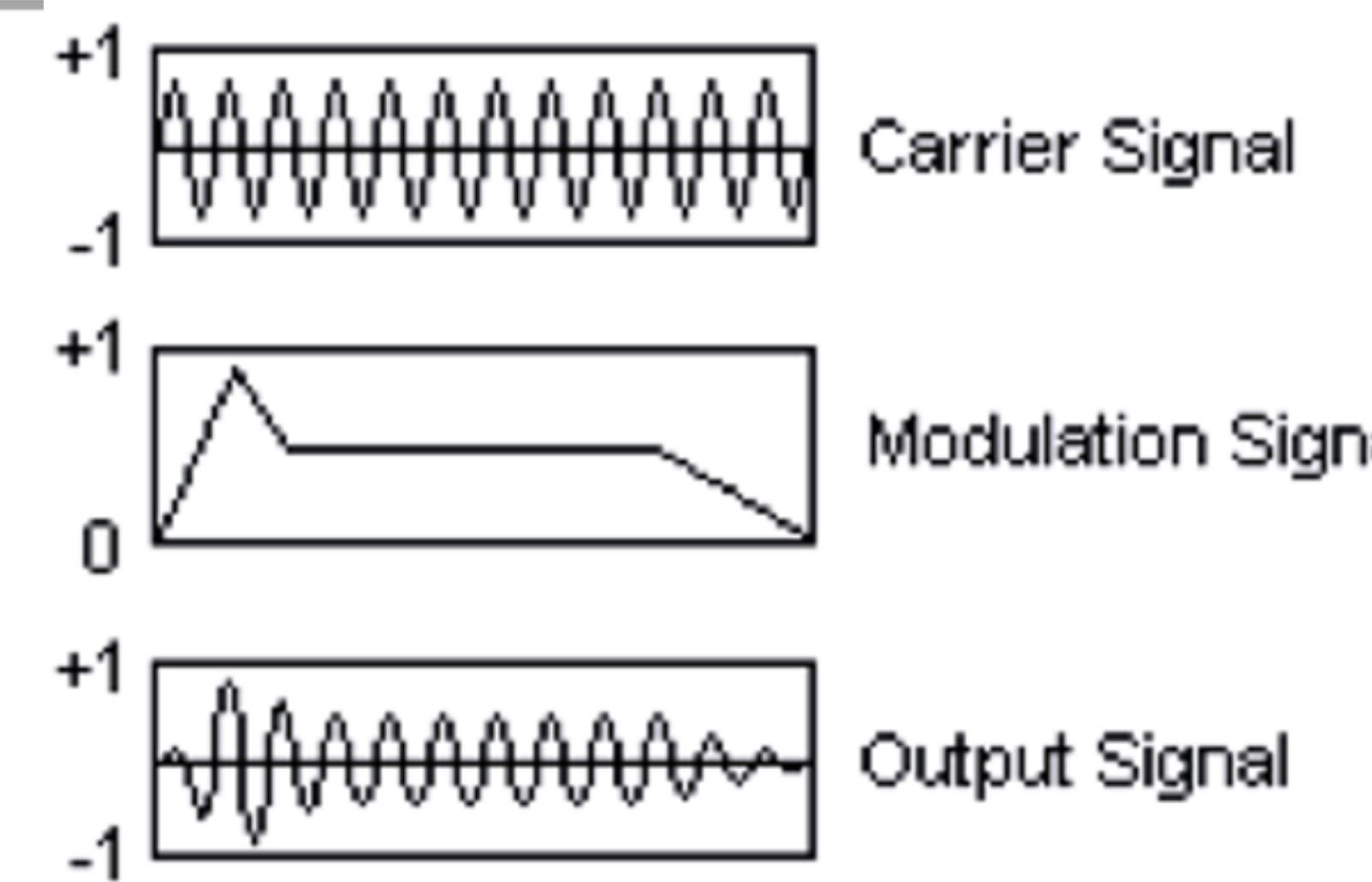
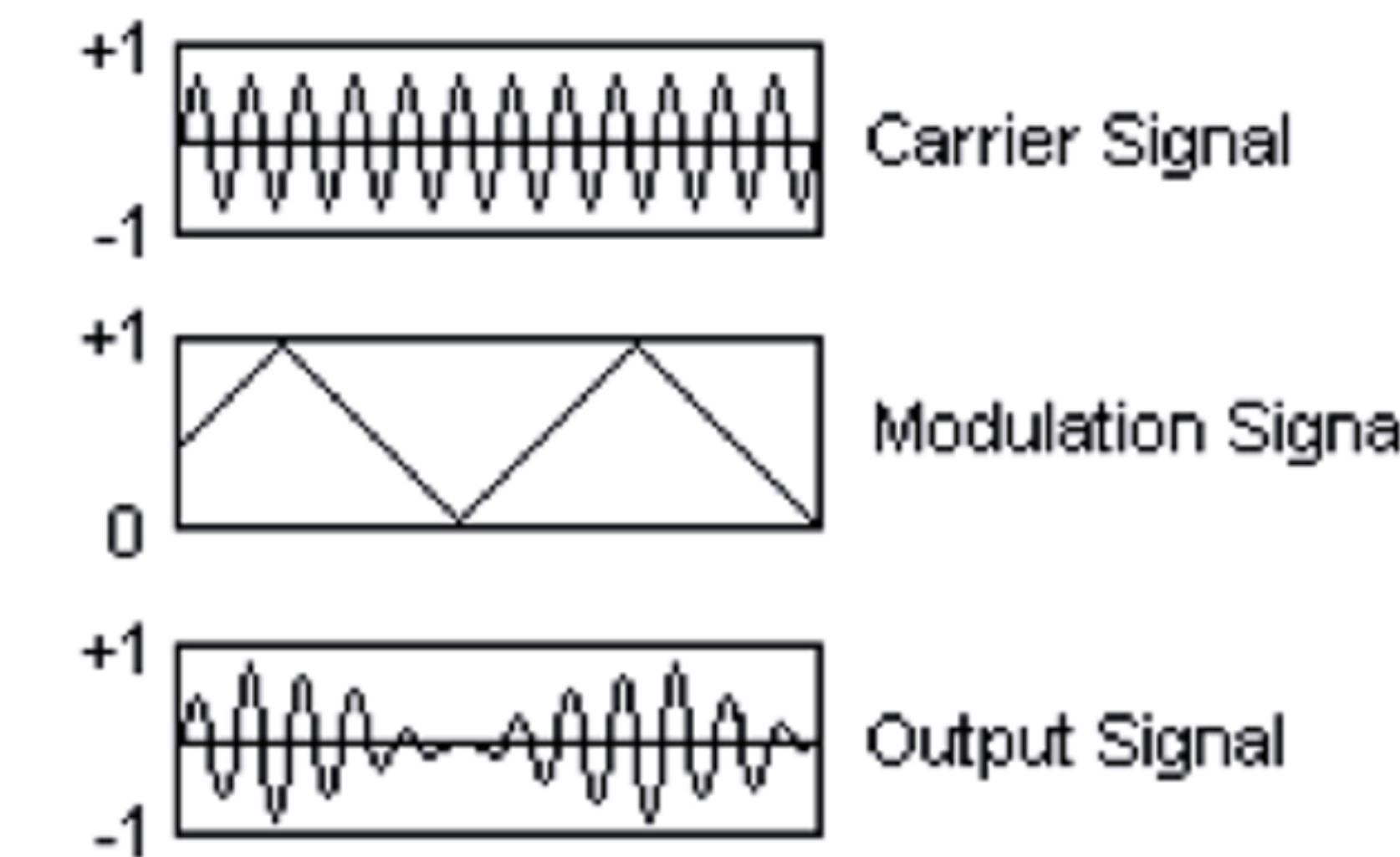
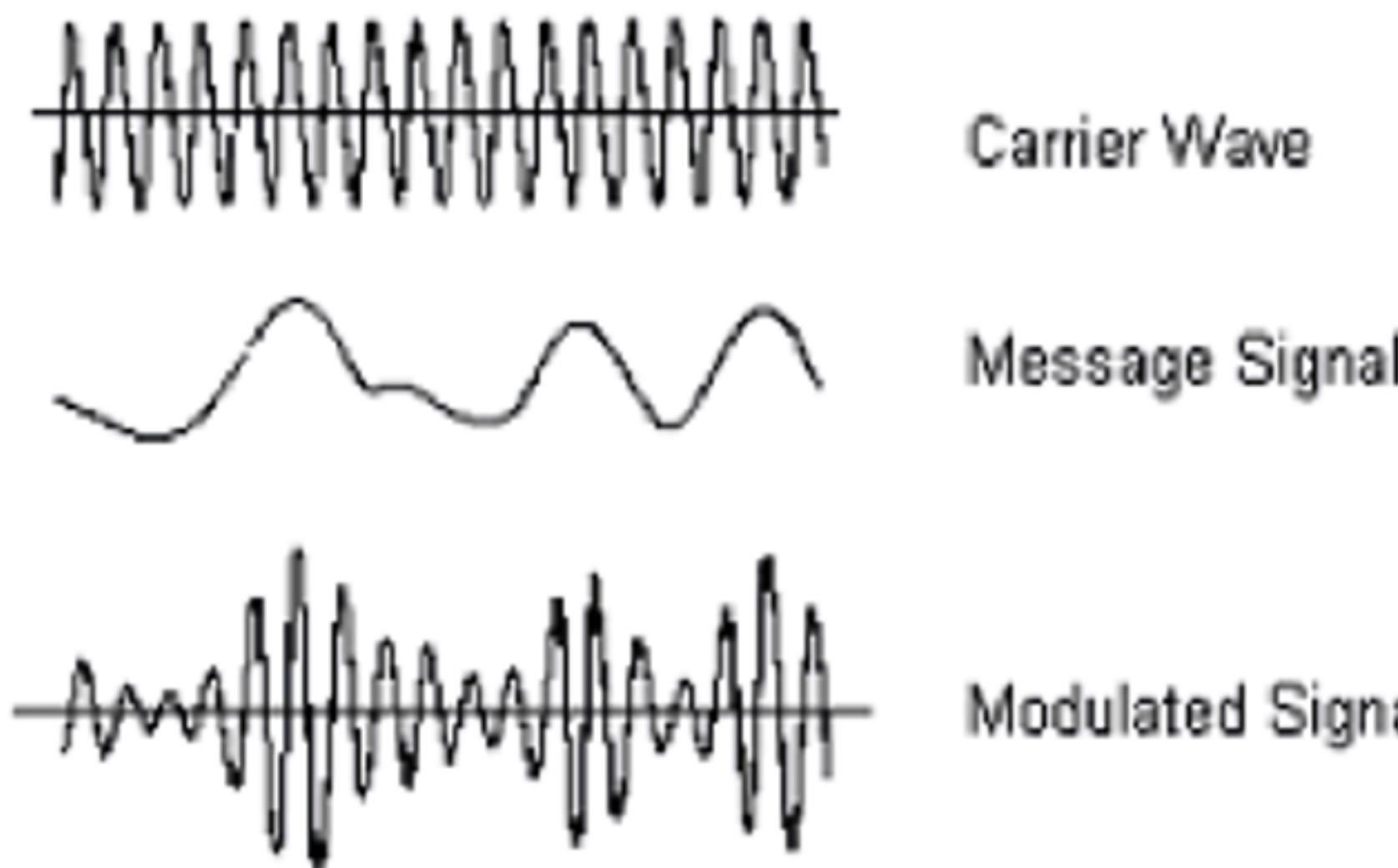
- Notch



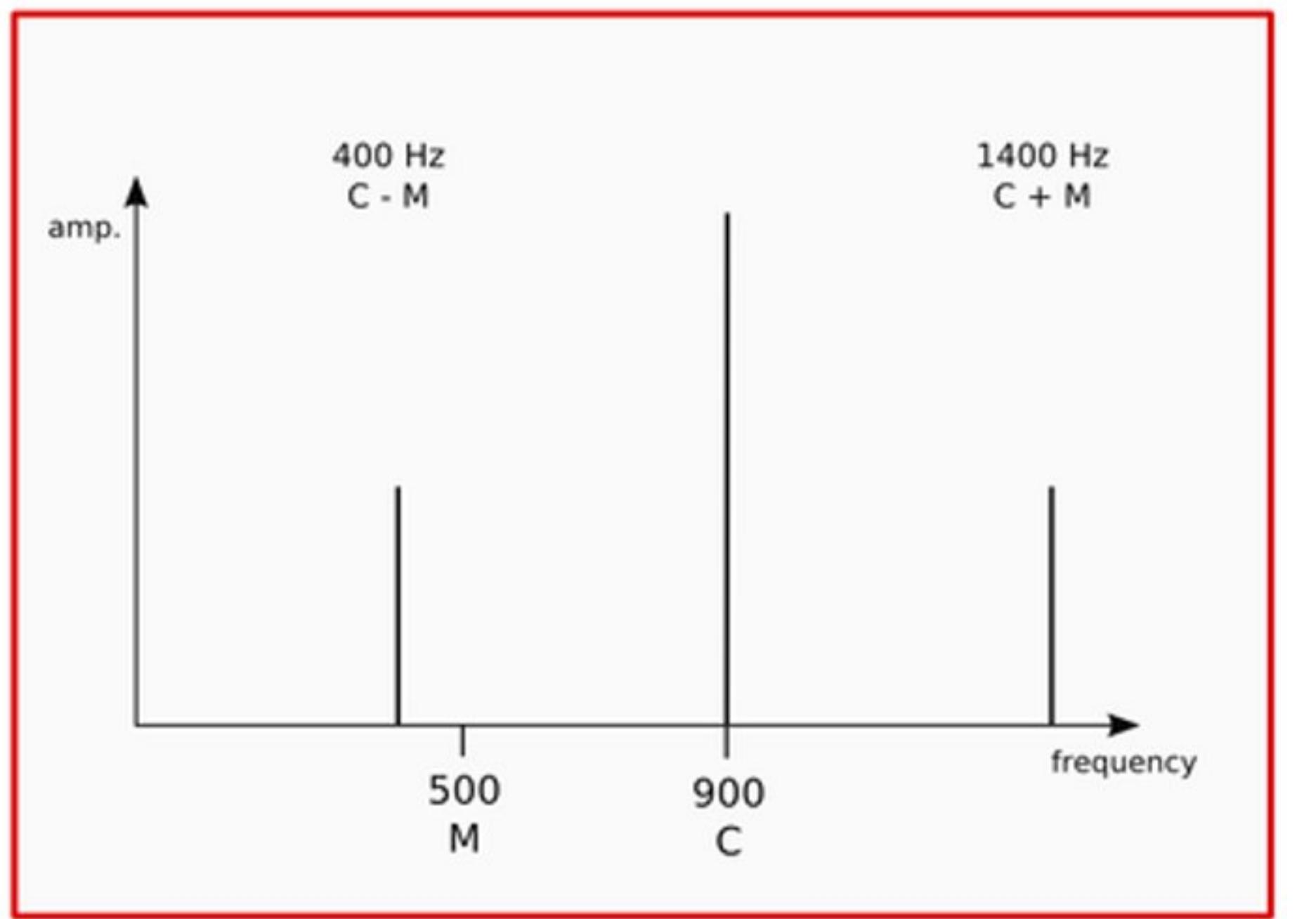
Frequenzmodulation



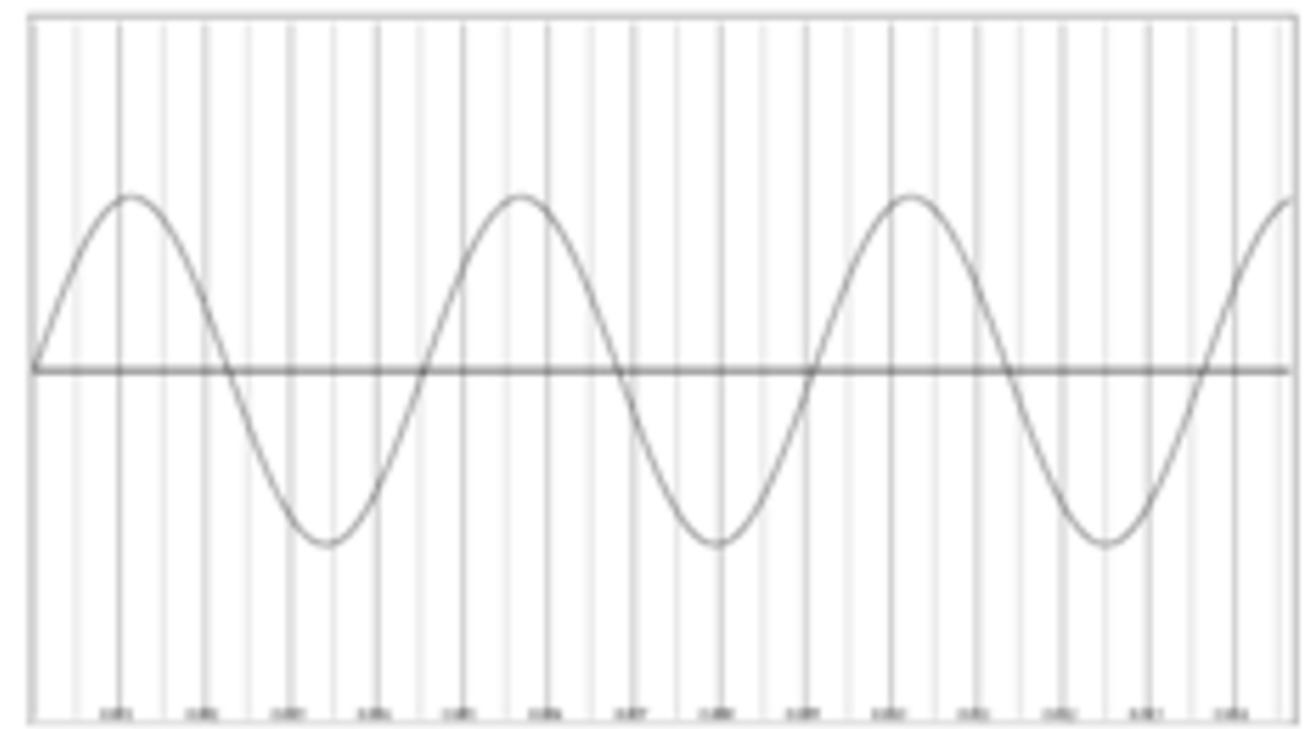
Amplitudenmodulation



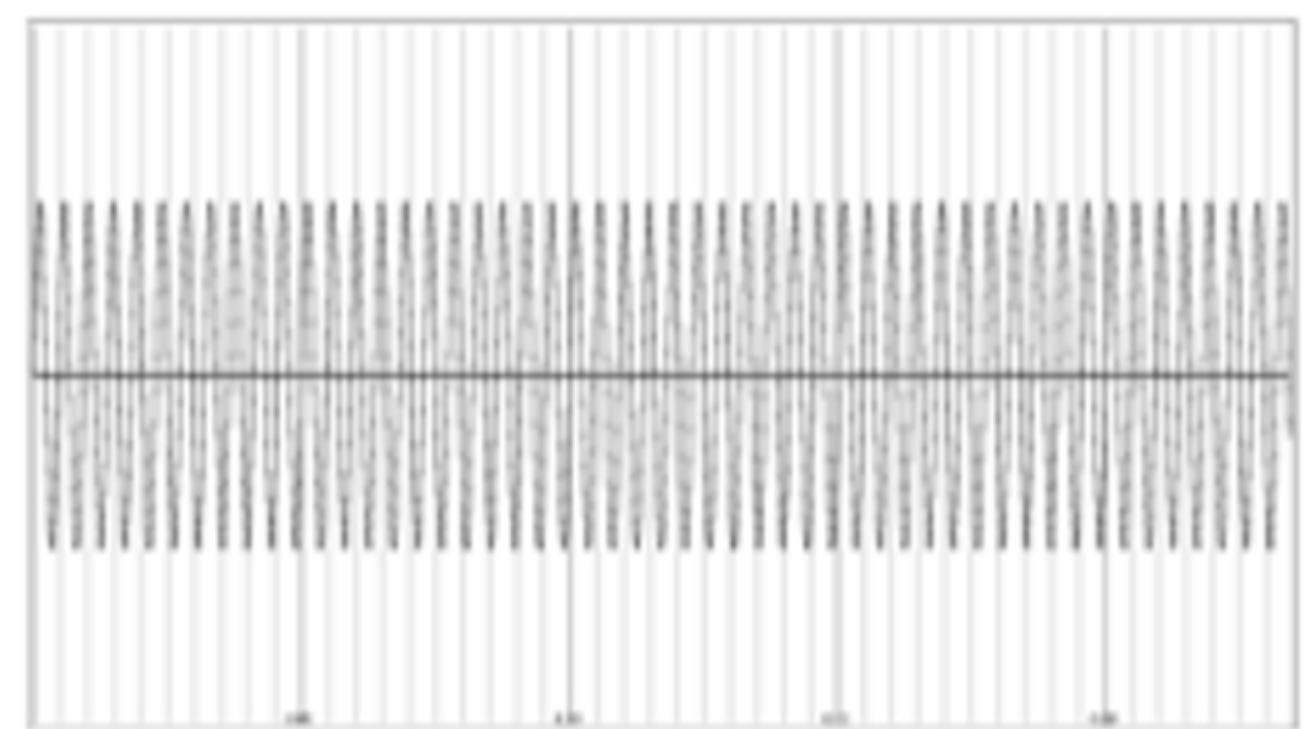
Seitenbänder



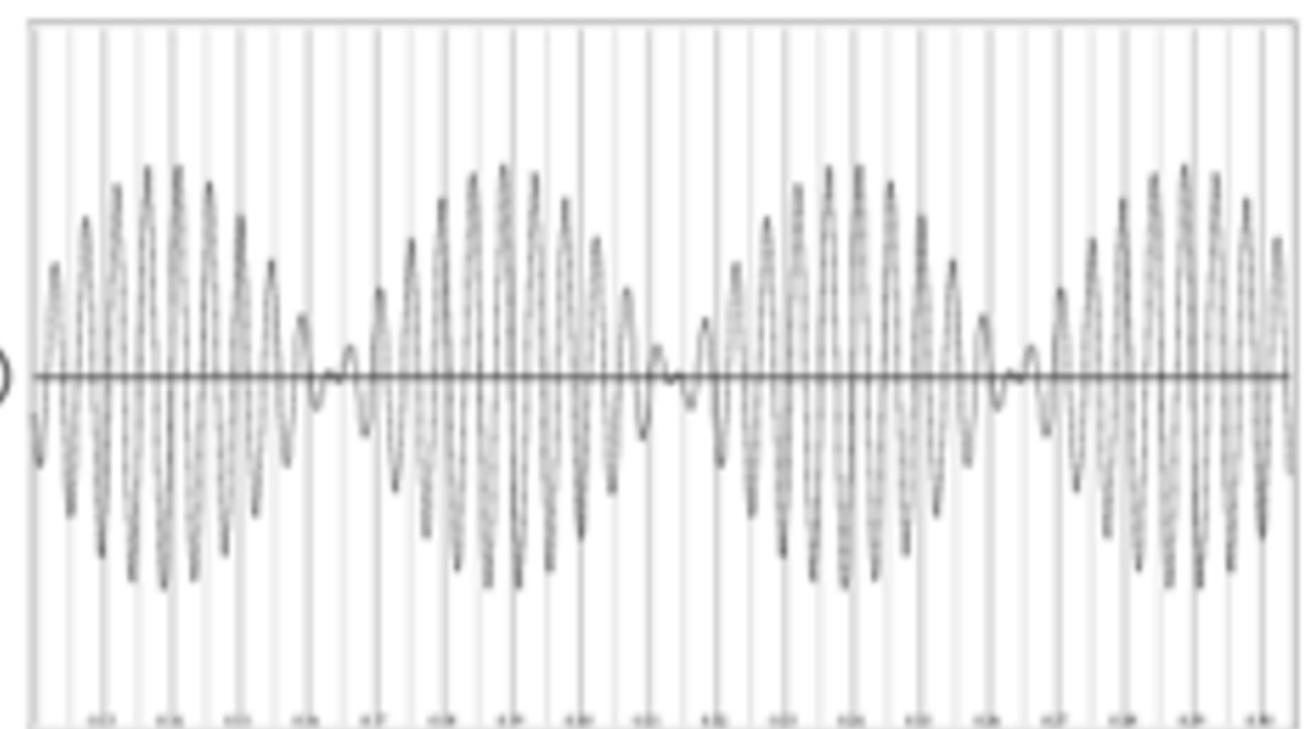
$M(t)$



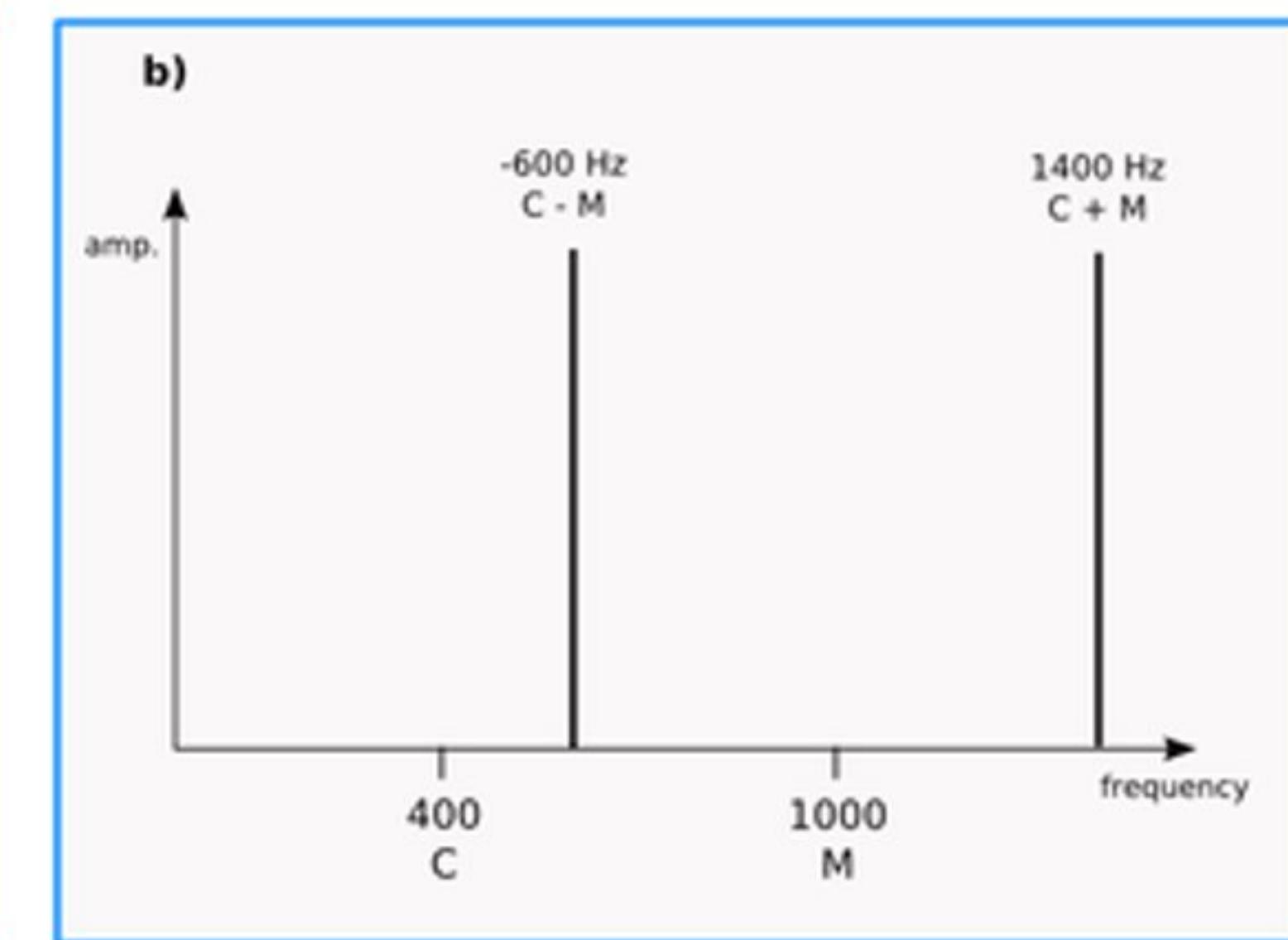
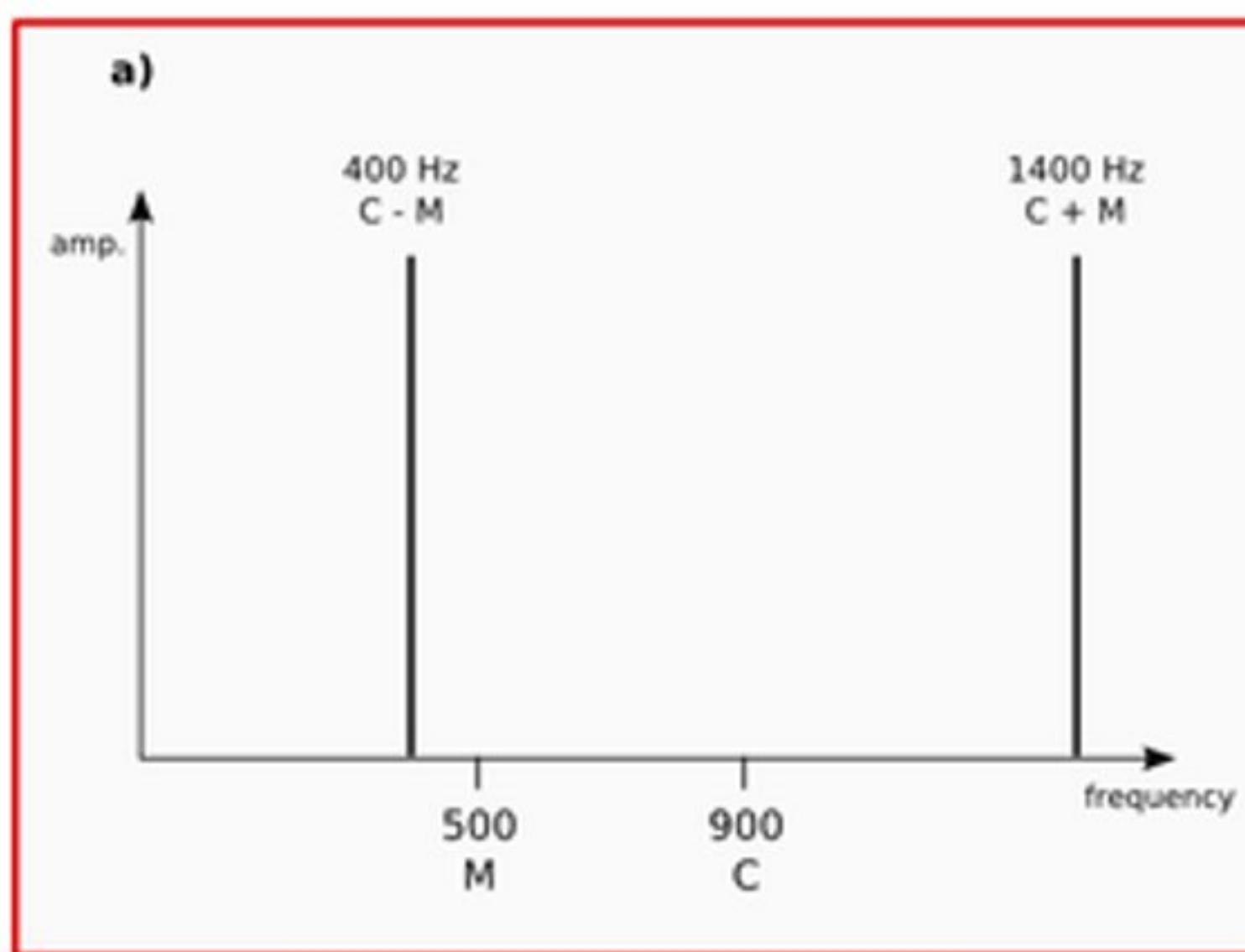
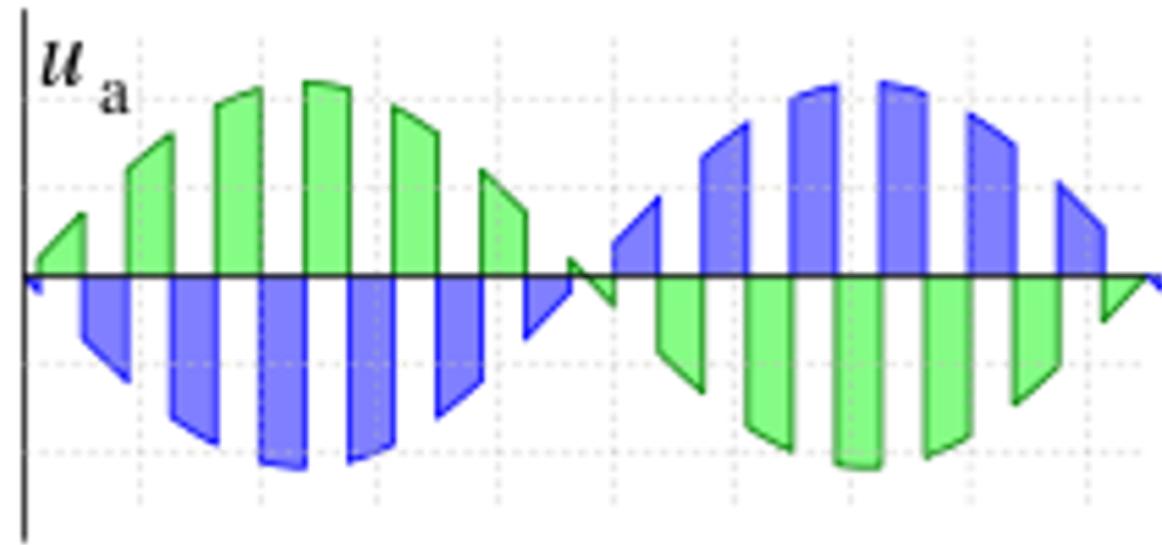
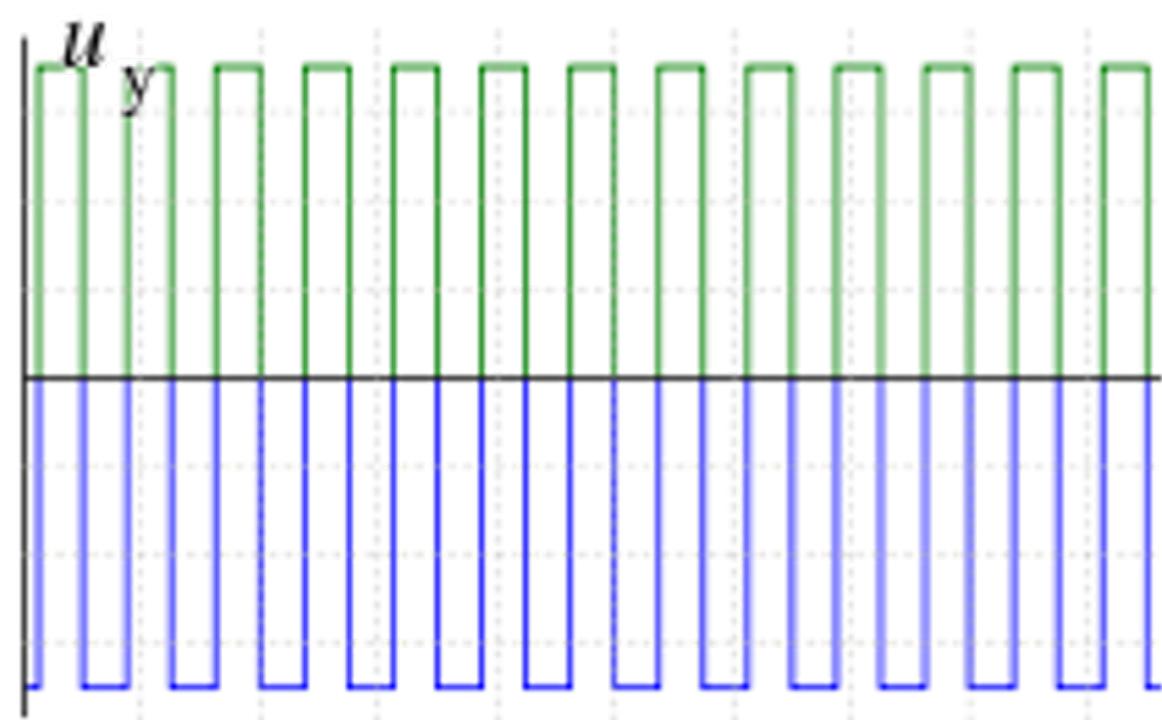
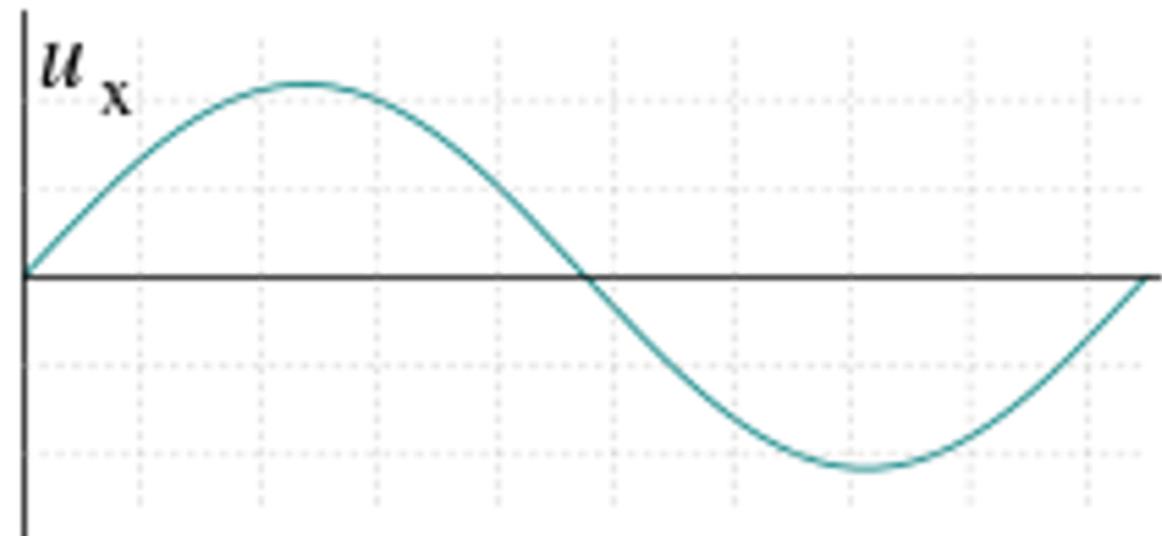
$C(t)$

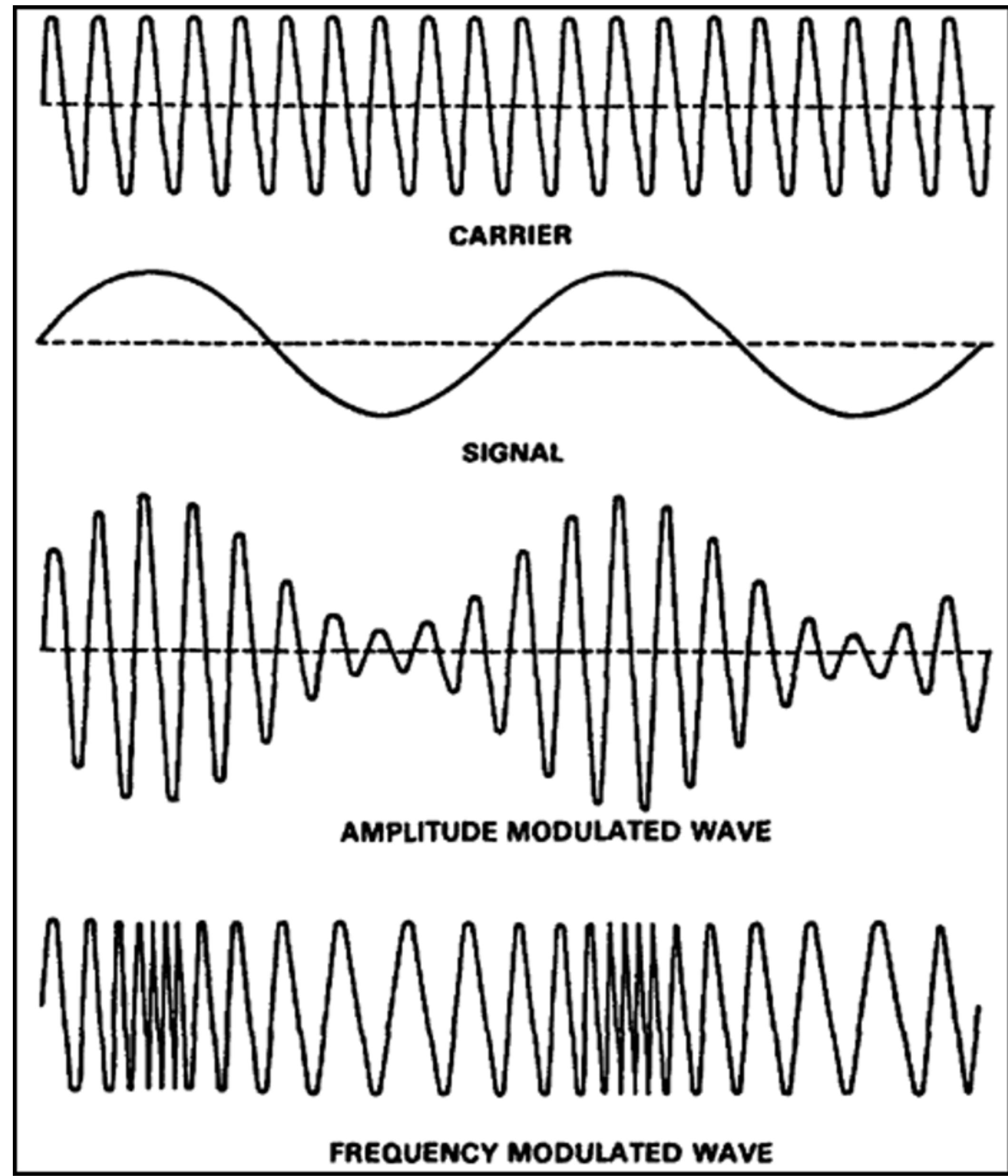


$M(t) \times C(t)$

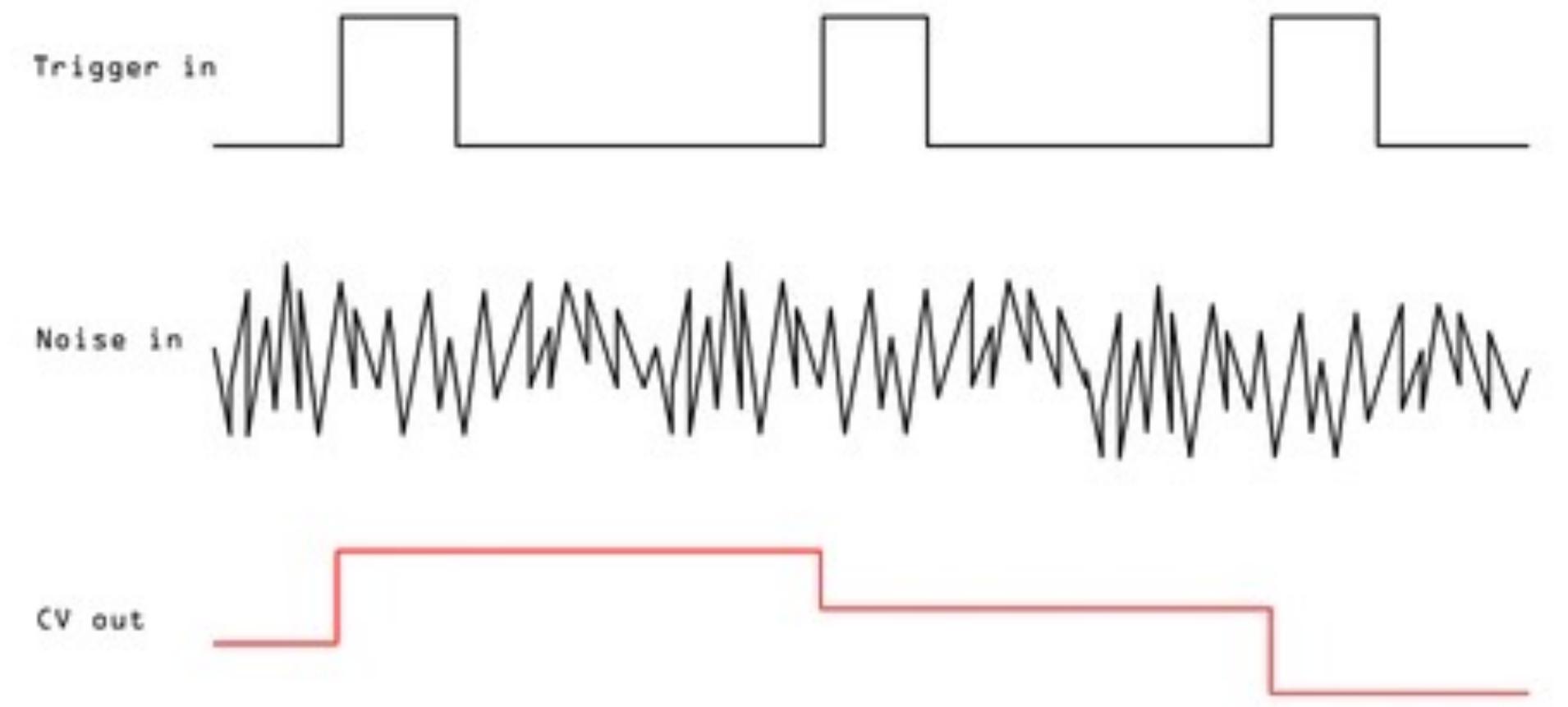
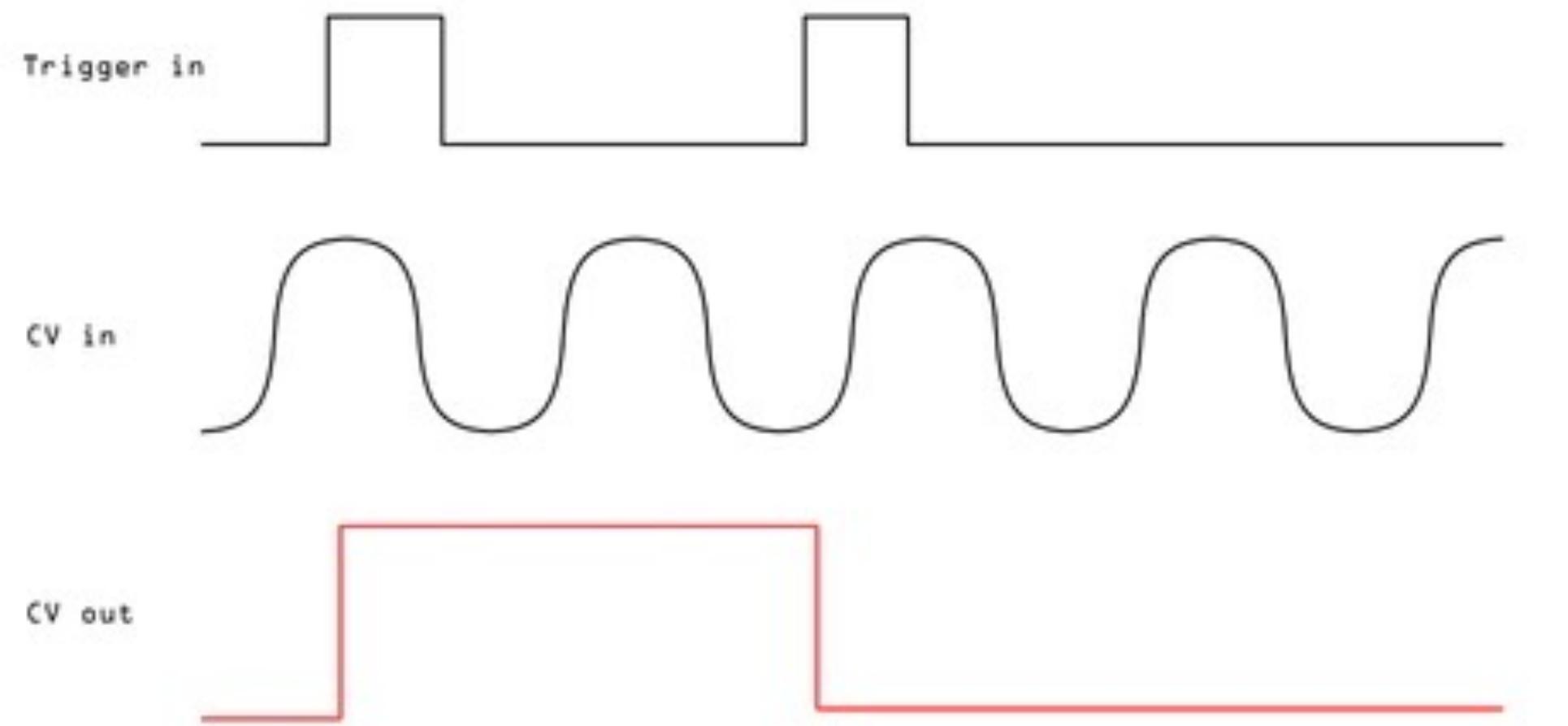


Ringmodulation





Sample & Hold



CV / GATES / TRIGGER

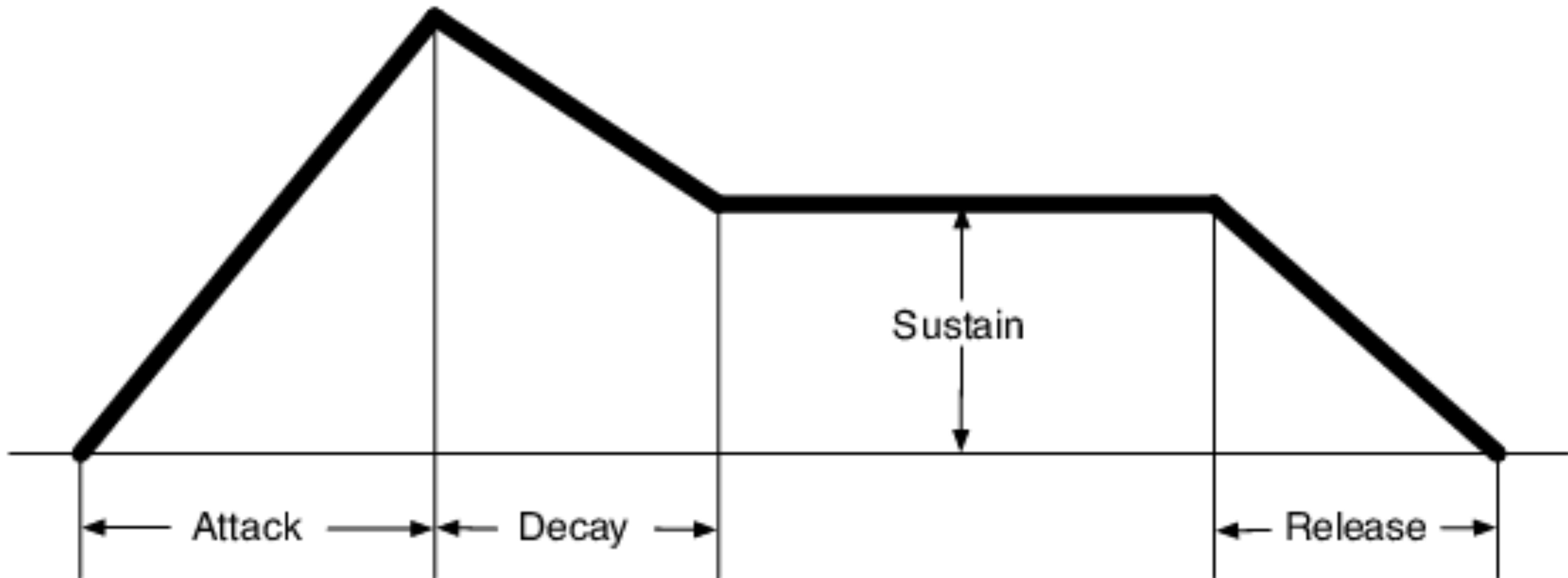
Gates



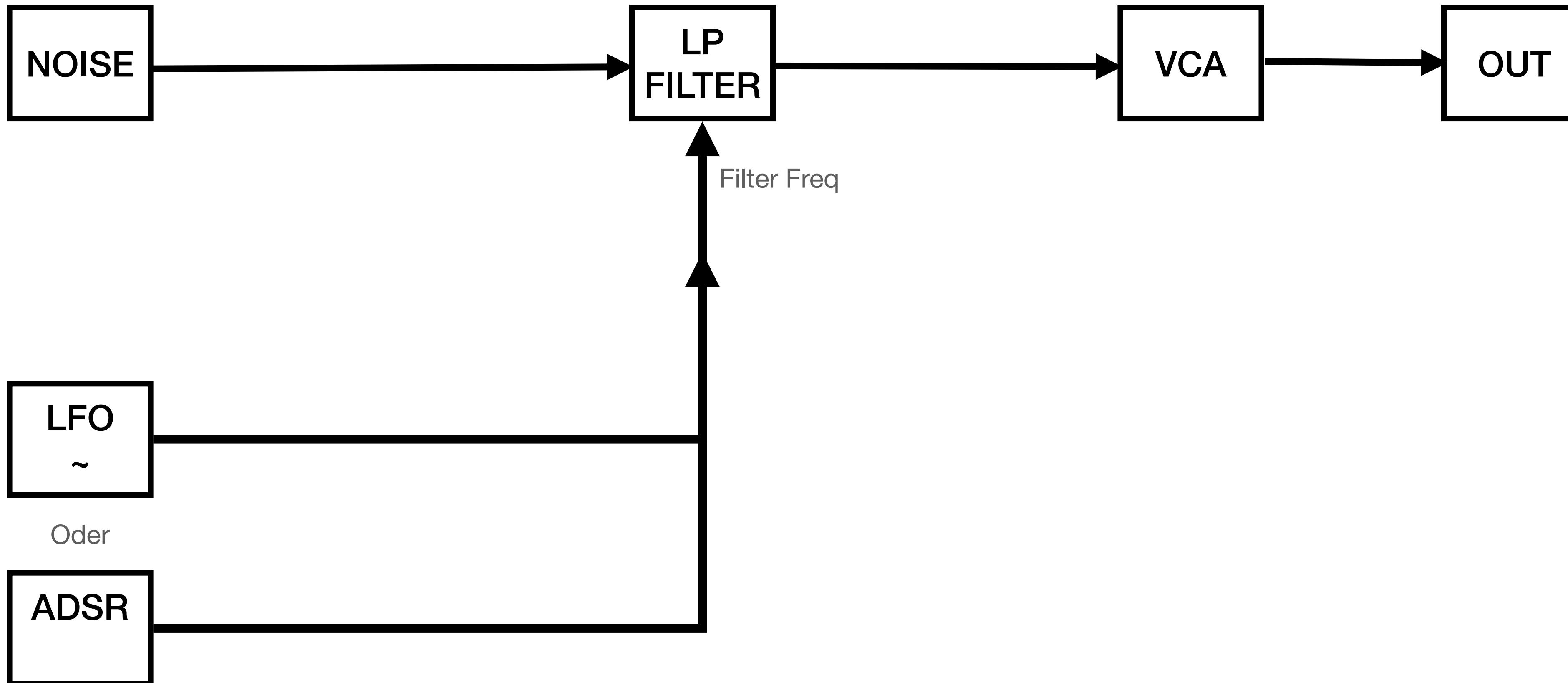
Triggers



ADSR



WELLEN



GLOCKEN

