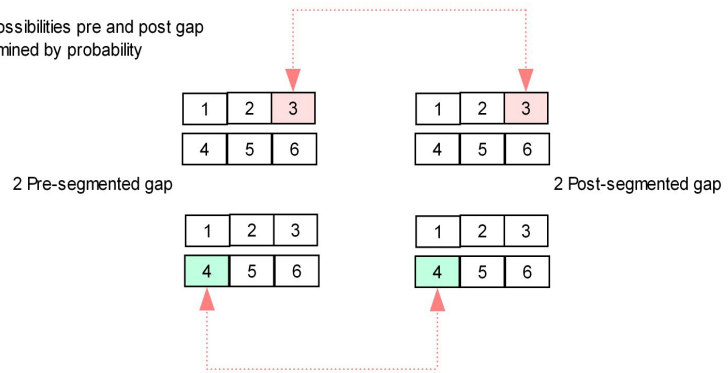


(a) - 6 connection possibilities pre and post gap positions determined by probability



Probability of sound passing through a segmented gap

Composer:

Dimitri Voudouris

Composed:

2023

Composition:

$\Sigma$ (sg2)

Duration:

14 min 37 sec

Sound transmission  
through segmented partition

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## Physiological information on synaptic transmission

The synapse is a point where one neuron communicates with another.

Type of Synapse	Distance between Pre + post synaptic membranes	Ultra Structural components	Agent of Transmission	Synaptic delay	Direction of Transmission	State of excitation
Electrical	3.5nm	Yes	Gap Junction channels	Virtually absent	Bi directional	Highly
Chemical	20-40nm	No	Pre Synaptic Vesicles Post Synaptic Receptors	1-5 ms or longer	Uni directional	Excitatory or Inhibitory

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**fig1**

Postsynaptic inhibition	A synaptic inhibition occurring when an inhibitory neuron (releasing inhibitory substances) acts on a postsynaptic neuron leading to hyperpolarization.
Presynaptic inhibition	A synaptic inhibition occurring when an inhibitory synaptic knob laying on the termination of a presynaptic excitatory fiber releases a transmitter which inhibits the release of excitatory transmitters.
Temporal summation	The type of summation where the frequency of stimulation from the same presynaptic fiber is increased.
Spatial summation	Eliciting an action potential in a neuron with input from multiple presynaptic cells
Synaptic vesicles	Vesicles that store various neurotransmitters that are released at the synapse.
Excitatory neurotransmitters	Neurotransmitters that increase the rate or likelihood of a neuron firing by depolarizing the neuron.
Inhibitory neurotransmitters	Neurotransmitters that decrease the rate or likelihood of a neuron firing by hyperpolarizing the neuron.

**fig2**

## **Neurotransmitter release is probabilistic**

1. *The transmitter is released in quantum which produces a postsynaptic potential of a fixed size.*
2. *The probability that a loaded vesicle is a quantum of transmitter is directly dependent on the amount of  $\text{Ca}^{2+}$  influx into the presynaptic terminal.*
3. *Alterations in  $\text{Ca}^{2+}$  concentration affect the average number of quanta and not the size released to a presynaptic action potential. Thus it obeys Poisson statistics at low probabilities of release and measures  $m$  (direct method), compare to  $m$  calculated from the failures method - estimation of whether a change in the size is caused by a change in quantal content.*

## **Synaptic Transmission at Chemical Synapses**

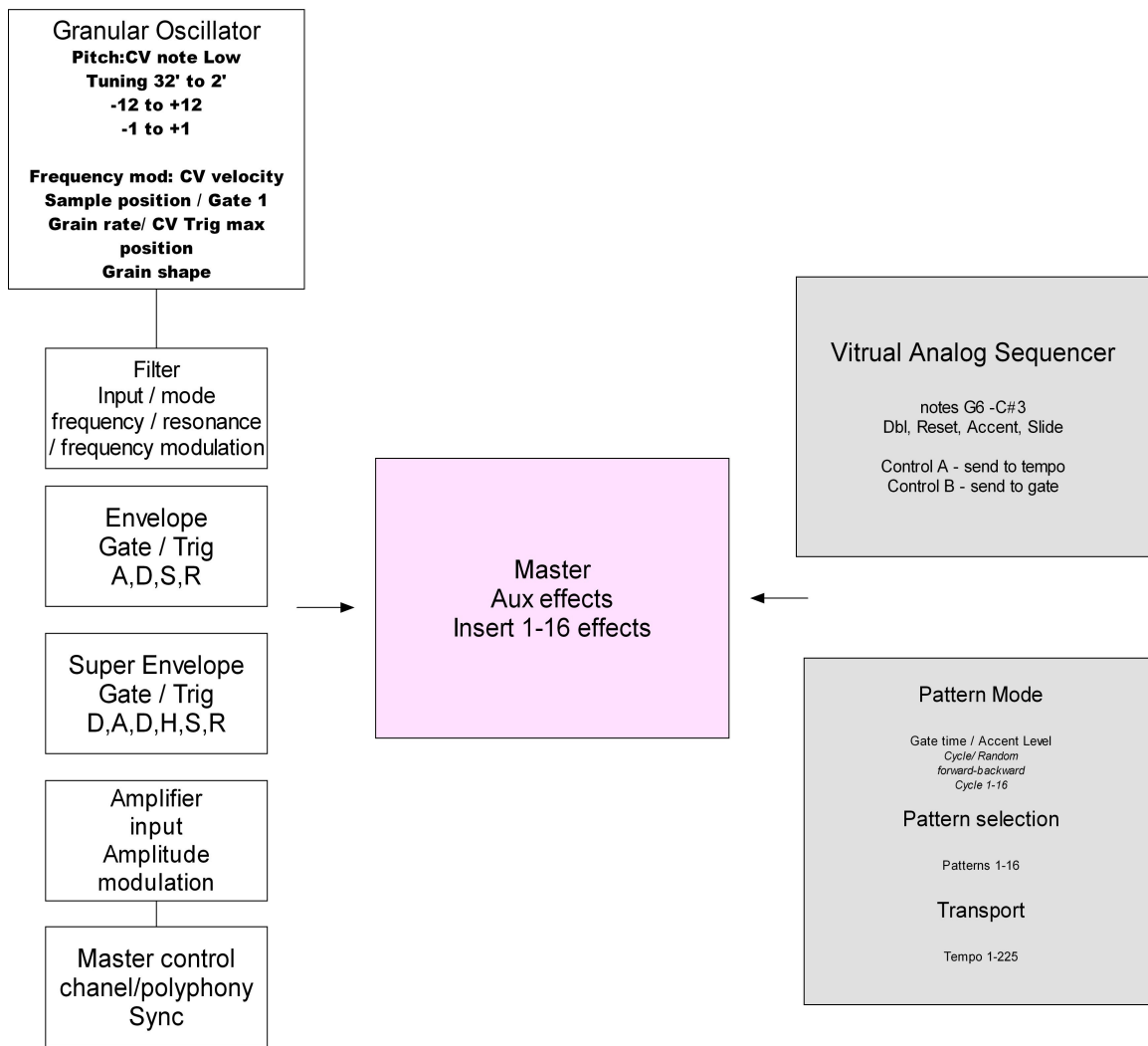
1. *Action potential arriving at a presynaptic terminal determined by swelling of the axon causes voltage-gated  $\text{Ca}^{2+}$  channels at the active zone (membrane specialized for releasing a neurotransmitter) to open.*
2. *The influx of  $\text{Ca}^{2+}$  causes synaptic vesicles containing a neurotransmitter to fuse with the presynaptic cell membrane.*
3. *Vesicles release their contents into the synaptic cleft (a process termed "exocytosis").*
4. *Released neurotransmitter molecules diffuse across the synaptic cleft and bind to specific receptors on the post-synaptic membrane.*
5. *Receptors cause ion channels to open (or close), thereby changing the membrane potential of the post-synaptic cell.*
6. *If the membrane of the post-synaptic cell crosses a threshold, then the action potential is propagated.*
7. *Chemical Synapses amplify signals*

## Composition

Transmission in neuro-segmentation and cellular uptake depends on two factors chemical and electrical biological performance, in nerve conduction, cellular inhibition.

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In the construction of a modular-neuro partition, the expansion of sound activity allows the listener to focus on the movement of sound between opposite poles whilst experiencing the formations of sound from fragmentation in its transition.

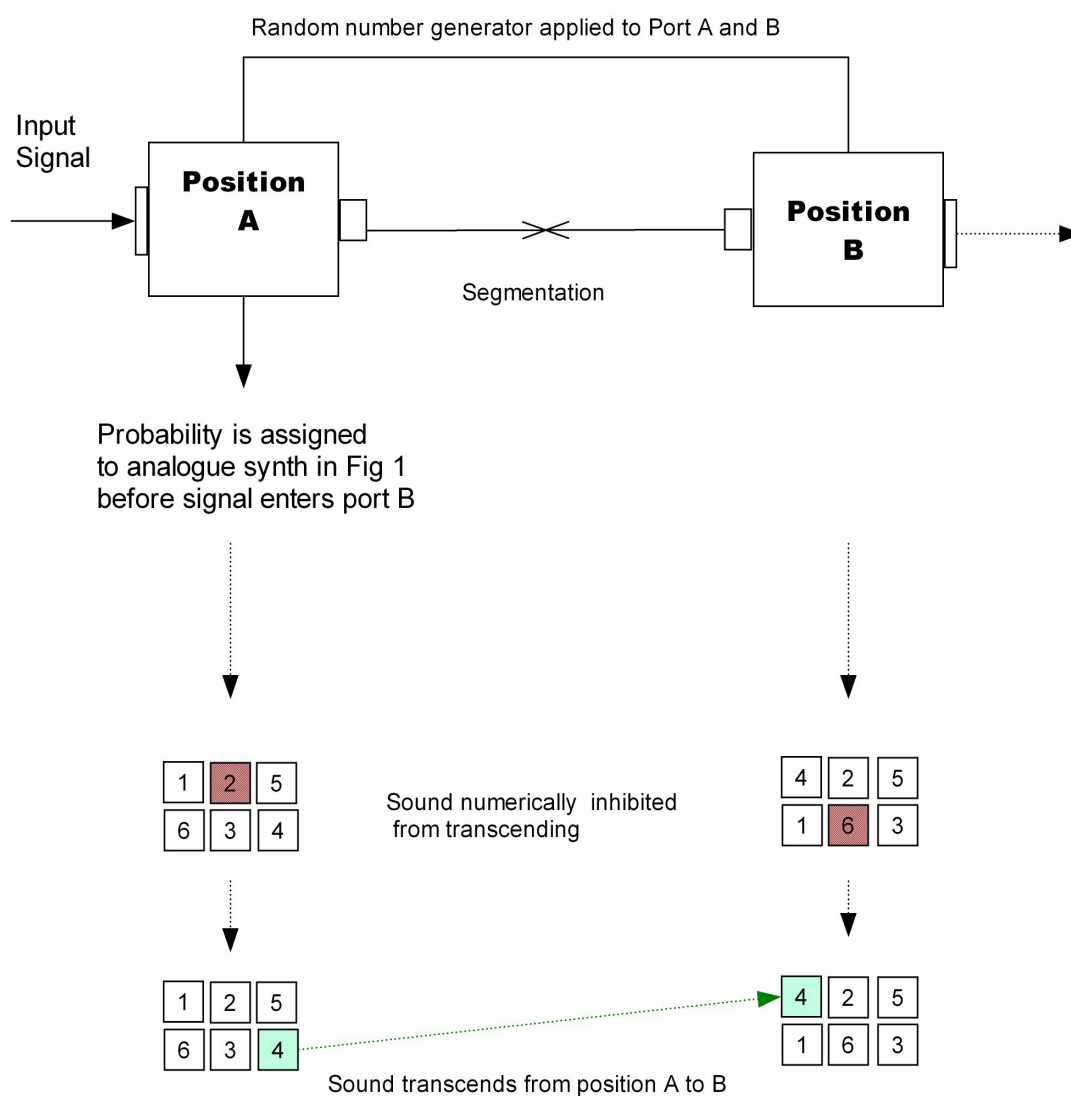


**fig:3**

**Sound transmission in neuro segmentation**

1. In fig:4 position A is the area the signal gets processed by the specified synth patch.in fig:3.
2. The signal must be allowed access to position B on leaving position A.
3. The opposite positions are simultaneously applied to probability the random number generator generates x amount of number/s allowing for 1 not exceeding 6 numbers in signal generation, which pass uninhibited through when similar numbers are activated in both positions e.g. 4 in position B and identical number in position A.

4. The signal bounces back and forth amongst the deactivated positions not as a loop. Selections of multiple fragments from the sound are made randomly allowing sound to leave that position and bounce to the opposite position once, another random selection of the sound is made from the opposite position allowing the sound to bounce to the opposite position and this carries on uninterrupted. This delay in sound selection occurs in a few milliseconds.
5. The selected sound fragments vary between 40ms to 500ms in time duration.
6. The signal passes through two segmented partitions from 5 and 6 to position 7 according to the original modular neuro-synthesis. **the sketch in the introduction page:** The  $\Sigma$  of the signals from modular neurons 1,3,4,5,6 minus the signal from neuron 2 (inhibiting) arrive to cross partition and activate neuron 7.



**fig:4**

## References

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- 2]** Gonzalez-Islas, C., Bülow, P., and Wenner, P. (2018). Regulation of synaptic scaling by action potential-independent miniature neurotransmission. *J. Neurosci. Res.* 96, 348–353. doi: 10.1002/jnr.24138
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