Bob Moog on Creativity—We are like an antenna that receives inspiration and creative ideas from the "cosmic network."

Chapter Q: Moog Synthesizer II.  PHYS 102: The Physics of Sound and Music (Prof. Ruiz)

Sergei Rachmaninoff (1873-1943). Late Romantic. What is his story?

Had a nervous breakdown after they poorly performed his First Symphony and it received a bad review. Dr. Dahl cured him by constantly telling him he would compose a concerto with ease and that the ideas would come. "Rach" did and dedicated his 2nd piano concerto to Dr. Dahl. See André Watts perform the Rach 2nd (ending in Section Q12).

Noise Generator. Produces all frequencies. Since white light is a mixture of all the colors in the spectrum, we define white noise as all frequencies between 100 and 10,000 Hz. No control voltage is needed since N puts out all frequencies.

A Voltage-Controlled Filter can be LP, BP, or HP. Label the filters below. Where is the central frequency for the BP filter below? Indicate the bandwidth.

Transmission

LP

Frequency

cutoff f

Transmission

BP

Frequency

Bandwidth

central f

Transmission

HP

Resonance Filter. A filter that has a transmission profile similar to the resonance graph. Typically one sets the Q-value for the filter. Which filter below has the greater Q-value?

Transmission

Tall and Narrow

Narrow bandwidth "Waist line"

Transmission

Short and Wide

Broad bandwidth

These are examples of bandpass filters.

Can hear a tone coming through. High Q-value Engineers measure Q-value at half maximum—"at the waist."
White Noise. Since the reds represent low-frequency waves, we can define noise which has a greater presence of low-frequencies as “red noise.” By this analogy, “blue noise” consists of high-frequency noise (hiss). What about “green noise”?

How many octaves of spectral colors do we see? ________
How many octaves do we hear? 10

Do Re Mi Fa Sol La Ti Do’ (Past the blue end).
Lower Frequencies  Higher Frequencies

[Image of color spectrum]

A Sigh Sound  A Hiss Sound  (These sounds are mixtures. They sound “noisy.”)

Synthesizing a Group of Whistlers
Use a high Q-value or low Q-value? High Q

Summary and Moog’s solution to controlling “Big 3” characteristics of sound.

1. Frequency Pitch
2. Waveform Timbre
3. Amplitude Shaping

Note the three columns.

The basic arrangement. Recall the “big three?” The connection from the KBD to the VCF is necessary so that the filter cutoff can follow the tones you play. As you play up the scale, your filter needs to adjust to filter the same harmonics each time, which get higher as you go up the scale. Label the name for this near the wire.

Developed by Google and “Switched-On Bach”

Online replica of the “classic” Minimoog Synthesizer to celebrate The late Moog’s 78th birthday in 2012