4.3 RANDOM VOLTAGE GENERATORS

The Buchla has three different "random" control voltage generators, contained in the SOURCE OF UNCERTAINTY module, located just to the right of the oscillators. All have inputs on the left and outputs on the right. The LED beside each output indicates the relative strength of that output voltage.

4.3.1 Fluctuating Random Voltages

The FLUCTUATING RANDOM VOLTAGES module supplies two separate, but similar, control voltages. Each generates a gradually changing random voltage. Both the voltage itself and the rate of change are constantly changing but the "probable rate of change" can be set using the pot beside each output. The scales on these pots don't have too much meaning because, despite the fact that they are the same, the lower output actually varies at a considerably faster rate than the top output even when the pots are at the same setting. The "probable rate of change" can be voltage controlled through the control voltage input beside each pot.

4.3.2 Quantized Random Voltages

The QUANTIZED RANDOM VOLTAGES module offers two distinct but related outputs. Both outputs generate "stepped" random voltages meaning their output changes from one voltage to another in discrete steps. Each change must be triggered by a pulse presented to the pulse input jack on the right. An input pulse will cause both outputs to change to another voltage. (It is possible the next voltage chosen might be the same as the last voltage in which case no change would be noticed.)

The QUANTIZATION pot, which is voltage controllable through the input beside it, determines the value of "N" in each of the short equations beside the outputs. Under voltage control the value of "N" increases from where the pot is set as the control voltage increases. The top output offers "2 to the Nth" possible voltages ("states") for output. If the pot is in its lowest position, ("1"), the output will change back and forth between two different voltages. In its highest position sixty four different voltages, (between 0 and +10 volts), can be generated. With each input pulse one of these voltages is selected, at random, for output. The lower output offers "N + 1" different voltages.

The DISTRIBUTION graph beside each output indicates the "weighting" of the random choice. For the top output there is equal probability that the next voltage will be any one of the possible states. The graph for the lower output indicates that there is a greater probability that the next voltage will be in the middle range and less chance that it will be a high or low voltage.

NOTE: There seem to be very small places **between** each different setting of the QUANTIZATION pot where the output changes from distinct voltages into garbage. If you are getting a static filled "noise-like" signal, when you don't expect it, this could be the cause.

4.3.3 Stored Random Voltages

Similar to the QUANTIZED RANDOM VOLTAGES, the STORED RANDOM VOLTAGES also require a pulse to change voltages but they generate completely "random" voltages. The DISTRIBUTION graphs again indicate probability distribution. From the top output there is equal probability that the next voltage could be anywhere between 0 and +10 volts. The probability distribution of the bottom output is determined by the pot and control voltage input. At its LOW setting the output will contain mostly low voltages and in its HIGH position mostly high voltages.