

**THE MUSE**  
**(as described in Hal Chamberlin's Book)**

Thirty-eight different digital signals are generated by several counter stages and a 31-stage shift register. These signals, along with constants 0 and 1, are connected to 40 signal rows. Eight 40-position slide switches, divided into two groups of four, act as columns and can connect to any individual row signal. Four of these switches, which are called THEME controls feed a parity generator, whose output feeds the 31-position shift register. The other four switches, designated INTERVAL controls, are connected through some translation logic to a 5-bit DAC, which drives a VCO tone generator. The VCO and DAC are adjusted so that the step size is a semitone on the equi-tempered scale. The translation logic converts its 4-bit input into 5-bit output according to the conventions of the major musical scale. An adjustable low-frequency oscillator clocks the counters and shift register.

The rows driven by the counters and constants 0 and 1 are designated as the "C" (counter) region. Five of these rows are connected to a simple 5-bit counter, while two more connect to a divide-by-6 and a divide-by-12 counter. The outputs of the various counts are normally used for short, highly ordered, sequences. For example: if the "A" switch is set to row "C1", B to C2, C to C4 etc., the device will generate an ascending major scale. Essentially, a binary counter has been connected to the DAC, which would be expected to generate an ascending staircase waveform.

If switch A is moved to the C $\frac{1}{2}$  position, the scale will still ascend, but by alternate intervals of one note and three notes. Moving D and B back to the OFF position (constant 0 row), results in a pair of trills: C-D-C-D-G-A-G-A-C-D... Many other combinations, of course, are possible, but the sequence length will never be more than 64 notes using the C6 row, or 32 notes otherwise.

The 31 rows in the "B" (binary) region are driven by the 31-stage shift register, which shifts downwards from row 1 to 2 to 3 etc. The four THEME switches are used to control the shift register by determining what will be shifted into the register's first stage input. If they are set in the C region, then the register acts merely as a delay line. This can be useful in creating canon effects. However, if one or more are set in the B region, then a feedback path into the shift register is created and complex sequences can result. One possibility is to set the THEME switches for a complex sequence, set three of the INTERVAL switches in the C region for a repetitive tone pattern, and set the fourth somewhere in the B region. The result is that the repetitive pattern is modified according to the shift register pattern. The number of unique combinations is, for all practical purposes, infinite.