**Sackbut**

Gayle Young

The Electronic Sackbut was designed at Le Caine’s home studio in Ottawa, Canada, beginning in 1945. All electronic instruments were to some extent precursors of the synthesizer, but this instrument stands out for its innovative character. Le Caine’s Sackbut used an entirely different method of sound generation and control, voltage control: a method that later became standard in electronic music. Because it pioneered this technique the Sackbut is considered to have been the first synthesizer.

The Sackbut produced only one note at a time, but its systems for control of that one sound were extraordinary: the keyboard was sensitive to vertical pressure, so that alterations of pressure produced changes in volume; it was also laterally sensitive so that side-to-side motion produced sliding changes in the pitch of the sound. While the right hand played the keyboard, selecting notes and controlling volume and vibrato, the left hand operated an innovative waveform control device that could continuously change aspects of the texture of the sound: frequency modulation with low register noise, continually and quickly varying the wave forms. The ability to gradually change from one sound to another was an innovation which enabled the player to avoid sudden switching between sounds.

In 1954 the Sackbut was brought to NRC for further development. This is the only model that survives of four versions of the Sackbut. A second model was built at NRC labs between 1954 and 1960; two further models were built there between 1969 and 1973 in an attempt to make the instrument available commercially as a synthesizer, but the instrument was never manufactured.

Le Caine was convinced that familiar electronic test equipment had musical possibilities, and adapted many of these devices for use in the Sackbut. He believed, based on his experience, that the subtle shading of the characteristics of a sound was responsible for musical and expressive qualities, and so the Sackbut keyboard allowed musicians to vary the articulation of a note’s pitch and volume. Two innovative techniques stand out in the design of the Sackbut: the use of adjustable waveforms as timbres and the development of voltage control. Le Caine found voltage control essential in obtaining adequate pitch control. It is in this regard that the Sackbut is recognized to be the forerunner of the synthesizers of the 1970s when comparable compact portable pre-patched synthesizers became popular instruments for performance. Le Caine believed strongly in the musical value of a monophonic instrument which provides greater freedom for musical expression than a polyphonic instrument. It seems he was right. The first generation of synthesizer soloists became stars who headlined rock bands, but when polyphony became available the synthesizer promptly receded to the back of the band.