

MUSIC FOR THE SPACE AGE

It's the only one of its kind. It slurs, it slides; it's classical, jazz and rock; it can sound like an ancient reed instrument, a medieval stringed instrument, or a space ship travelling through the atmosphere. It's called the sackbut and it's destroying the limitations of all previous keyboard instruments.

Invented by Dr. Hugh LeCaine of the National Research Council of Canada's Radio and Electrical Engineering Division, this electronic monophonic instrument places continuity of pitch, intensity and tone colour within fingertip reach on a keyboard the size of a small electric organ.

"It's a superb instrument," says Dave Wilson, president and founder of Dayrand Limited, Montreal, the company that is manufacturing the sackbut under licence from Canadian Patents and Development Limited, a subsidiary of NRC which patents government-owned inventions and licenses them to industry. "We're naturally excited about it because it's Canadian and we're Canadian, but we're aiming it at the world market."

NEW SOUND OF MUSIC

Electronic experiments began about the turn of the century. Previously, music-making was limited by the mechanical qualities of instruments and the physical capabilities of the performers. But the first real breakthrough occurred in France in 1948 with the idea that sounds could be treated as sound objects, or pieces of sound recorded on tape. Once recorded, these pieces could then be subjected to all kinds of treatment - speeded up, played backwards or cut in half. The idea caught on very quickly and composers all over the world were trying it. Music probably never will be the same again. New sounds and new notations have influenced modern orchestral scoring as well as expanding the field of electronic music.

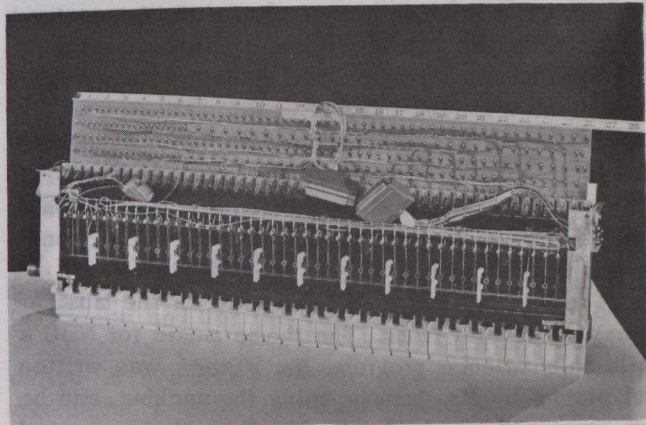
Dr. LeCaine began work privately on the sackbut in 1945. Nine years later, NRC entered the picture, encouraging the project as a form of communication between Canadian artists and scientists.

"My primary concern," says the musician-physicist, "was making an electronic instrument that was musically expressive. I felt that all previous electronic instruments were cold and mechanical. I thought that we must have some means of controlling the sound in an artistic way."

Dr. LeCaine has achieved just that. The sackbut is extremely sensitive to the touch, so that the emotion and musical expression of the instrumentalist becomes very important. A composer can "externalize" his musical ideas through the keyboard, communicating changes in mood and feeling directly and continuously. As a monophonic instrument, the sackbut plays only a single note at a time. But unlike



Ottawa composer Peter Jermy demonstrates the "one-note-at-a-time" instrument that uses the piano keyboard.



Close up view of the interior of the sackbut. Vertical pressure on a key controls pitch. A glide strip on the keyboard enables the player to glide from one note to another. The free hand operates several controls that vary the wave forms, timbre, etc. Another control gives an effect similar to a muted trumpet. Twenty-four controls can create repetitive patterns into which other notes fit, producing the effect of more than one note playing at the same time.

other instruments with a keyboard, it can slur and slide from note to note, produce continuously variable sounds in real time and constantly adjust tone, colour and pitch. It has definite uses as a part of musical groups - rock bands, classical or jazz groups or an electronic group. It can adapt virtually to every kind of music. In addition, the sackbut does not go out of tune from heat affecting voltage circuits. It is a great deal smaller, more compact, less temperamental and cheaper than many synthesizers (instruments consisting solely of electronic sound generators with tone modifiers and other controls). With the