

James Swail

25 years of inventions



James Swail demonstrates his ultrasonic obstacle detector in office corridor.

James Swail fait la démonstration de son détecteur d'obstacles.

It's been 25 years since James Swail — freshly graduated from McGill University's Faculty of Science — joined the National Research Council of Canada. His objective: to make a personal contribution in the struggle of blind people to achieve an independent way of life in a sighted world.

In the two decades since Jim Swail went on staff with the Instrument Section of NRC's Radio and Electrical Engineering Division, he has produced close to 100 instruments and devices for increasing the mobility and job

skills of the sightless.

In the process he has gone a long way to demonstrate, by personal example, how to live and work creatively despite such a handicap. For Jim Swail has been blind since the age of four. His university days were hard ones. He took his notes in Braille and relied on fellow students to read to him. The tape recorder and many other electronic devices now in use by the blind were non-existent in the early 1940s.

During his first five years with NRC Mr. Swail developed special electronic

equipment to help him conduct his own research. There followed a steady and continuing stream of mechanical and electronic devices. Some, like the Braille thermometer for a blind man to measure the melting point of type metal in a print shop and special meters which enabled a blind radio announcer to be licenced to monitor all the functions of a broadcast station, were designed to help one specific person surmount one specific obstacle. Others have universal application. The most recent is an ultrasonic obstacle detector for the blind.

The ultrasonic detector is Jim Swail's approach to the blind man's problem of how to navigate in restricted areas without the traditional long white cane or the seeing eye dog, today's principal navigational aids. There are certain situations where both the cane and the dog become, in Jim's words, "socially unacceptable." Indoors, in a crowded house party setting, for example, the cane tends to trip people and becomes a bit of a nuisance to have around. The same applies to the dog. A similar situation occurs when a blind man navigates between rows of tables in a restaurant. He lives with the fear that his cane, in searching out obstacles, will inadvertently slide under one of the tables and touch another person — to everyone's intense embarrassment.

For such situations, but more generally when a blind person is not called upon to move quickly nor perform actions calling for much care and attention, (i.e. scanning an office or corridor for newly-placed or disarranged articles such as chairs, tables, wastebaskets, etc.), the handheld ultrasonic detector is expected to prove highly useful.

The device, essentially, is a simple radar unit using inexpensive transducers similar to those used in the television industry for remote control of television channel switching. It is packaged in a pocket-sized plastic carrying case with integral handle.

Power for the unit is derived from built-in rechargeable batteries. The device generates 40 kHz, or 70 kHz, transmitted as two-millisecond pulses in a narrow beam at a pulse repetition rate of 10 per second. The receiver unit is turned on immediately after the termination of the pulse. A range switch mounted on the handle selects the length of time the receiver remains on after each pulse.