1125-K1-1977   **Robert O. Shelton*** (`robert.o.shelton@nasa.gov`), NASA Johnson Space Center, Mail Code ER7, 2101 NASA Parkway, Houston, TX 77058. *Communicating Mathematics Independent of Vision.* Preliminary report.

I lost most of my usable vision in 1960 when I was 11years old. The next 27 years as a student, researcher and professor of mathematics offered a unique perspective on the process of communicating mathematical examples, concepts, theory and practice when at least one party is missing a sense. Math was always easy for me, but as I progressed through undergraduate and graduate school, one fact that emerged was that vision is not necessary for almost all levels and areas of mathematics. Like most pedagogy, transfer of mathematical knowledge is a signals problem. The student needs information, a way to manipulate that information, and a way to return results of that synthesis as questions, solutions or proofs. Decades ago, my only options were human readers and Nemeth code for scratch work. It will be shown how modern technology can eliminate most of this part of the problem. A second aspect of the signals problem is finding representations for concepts which do not rely on vision. For example, simple sonification can convey rate of change with respect to time, whereas slope is a purely spatial representation of the same concept. An alternative non-visual method for attacking a vexing volume problem from elementary calculus will also be demonstrated. (Received September 19, 2016)