Time-delayed feedback occurs in many systems and is particularly important at high-speeds, where the time it takes signals to propagate through device components is comparable to the time scale of the signal fluctuations. A fascinating feature of systems with delay is that even seemingly simple devices can show exceedingly complex dynamics. I will talk about the experimental implementation of such oscillators and the observed dynamics, which ranges from sinusoidal oscillations to chaos. Theoretical approaches that explain some of the observed behavior will also be discussed.