

16.120 Compressible Flow**Problem Set # 8****Assigned: May 8, 2003****Due: May 15, 2003**

A point source of sound moves through a stationary homogeneous atmosphere at velocity u_0 . The constant source frequency is ω_0 and the speed of sound is c_0 . Find the apparent frequency on the ground, $\omega = \omega(\theta, M_0)$, where θ is the source position at the time of sound emission, i.e., earlier than the time of reaching the observer, and $M_0 = u_0 / c_0$. Determine whether propaganda broadcast from a hypersonic source ($M_0 \gg 1$) would have to be played backward.