Multiple High-Bandwidth Channels Over Fiber Optic Cable
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Our idea is to create a device capable of transmitting multiple high-bandwidth signals over a fiber optic cable. Ideally we will be able to transmit four NTSC video signals over several meters with very little signal degradation. We believe this project will present interesting technical challenges.

The project divides naturally into two major pieces. A transmitter board will take in video signals and modulate them up to much higher frequencies, with a minimum 5MHz of bandwidth between adjacent signals to account for NTSC color burst. A receiver board will then take care of demodulation and amplification of these signals.

To achieve these very high carrier frequencies, we hope to use a crystal oscillator, which we can then divide down to half and quarter frequencies. We will then build voltage controlled oscillators centered around these frequencies in order to perform the frequency modulation of the NTSC signals.

After the signals are mixed and sent over the fiber optic cable, our job is to then demodulate and amplify. We are currently investigating demodulation techniques; quadrature detectors look like a promising first step.