AM Receiver with Galvanometer Displayed AM Spectrum

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For this project, we are proposing to design a radio whose bandwidth is the entire AM spectrum, and which displays the energy spectrum of the full AM spectrum via a feedback controlled laser display. This project will incorporate aspects from all the labs including, but not limited to, modulation/demodulation, signal amplification, ramp voltages, and other topics. The project will include three main subsystems: the AM receiver, the spectrum sweep, and the galvanometer control circuitry. We plan to subdivide the work for this project into two categories: those related to the radio and sweep and those related to the visual display circuitry.

While we’re very enthusiastic for the project, we understand that there are a many challenges that will likely be associated with creating a functional system. Because the AM spectrum ranges into the Megahertz range, it is unlikely that we would be able to breadboard our circuit. We’ll need to keep in mind the additional time requirement that will result from building and debugging a circuit on a ground plane or PCB rather than the breadboard. If we find the full AM spectrum requirement to be too strict, we might consider making a system that works on only the lower half of the band instead. We also recognize that the feedback control for the visual aspect of the project is a substantial challenge in itself, which is why we intend to use a commercial galvanometer in the case that we are unsuccessful in designing and building and working laser system.

If we find the project is completed quicker than we expect, our reach goals include playing the sound, and increasing the functionality of the sweep and visual display of the circuit. For example, we could consider using these subsystems with other inputs, and use them as another type of test equipment (maybe an oscilloscope).