

VLA Solar Telescope

How Does it Work?

- There are **8 resistors** on the board. Use the resistor color code chart to see if you can identify the resistor ohm values.
- If pointing at just the sky, nothing should be showing on analog voltmeter and the red LED on the circuit board will not be lit.
- When pointing directly at the Sun, the meter should have a voltage readout that pushes the analog voltmeter peg all the way to the right and the red LED on the circuit board will light up. If you put your hand or body in front of the telescope the light and meter will also sense your RF from your body. The sensing of voltage demonstrates how the antennas collect the signals coming from space and amplify them for data collection.
- In order for all of this to happen, the telescope takes the input Radio Frequency (RF) signal from the Sun, puts the signal through 4 different amplifiers, and then has the RF voltage change occur at the detector diode you see on the circuit diagram in the Gift Shop.
- The voltage signal is in the small, negative millivolt (mV) range. The input voltage gets amplified with a cascading op-amp circuit that is created with the IC chip that is on the circuit board. The first stage is an inverting stage with little gain and the last stage is a non-inverting stage with a lot of gain. This is what allows the voltmeter to see the voltage signal as a positive 2+ VDC voltage reading.
- The blue and green LEDs indicate the power needed by the operational amplifier is working.

