

CONSTRUCTION OF A CATHODE RAY OSCILLOSCOPE  
AND A 12 INCH NEWTONIAN TELESCOPE  
USING SURPLUS WAR MATERIALS

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Utilization of donable property from the war assets administration, along with other odd items that can be secured easily, can yield very useful pieces of laboratory apparatus. During the past year two such instruments have been completed, one a Newtonian reflecting telescope, and the other a cathode ray oscilloscope.

An army radio transmitter was disassembled to provide a chassis and parts for the oscilloscope. With the exception of a few potentiometers and condensers, the transmitter supplied the necessary components. The cathode ray tube and other vacuum tubes used, were part of a stock of tubes donated by the war assets administration. A three inch cathode ray tube was used because of the lower voltage requirements. The assembly consists of a separate amplifier for both horizontal and vertical deflection circuits, a sweep oscillator consisting of a condenser discharging through a thyratron tube, focus, positioning and intensity controls, and a power supply which furnished 800 volts.

Before attempting the grinding and polishing of a 12 inch telescope mirror a 6 inch glass blank was obtained along with the necessary grinding compound and jeweler's rouge. The six inch blank was ground until a spherical cavity was formed, depressed approximately .05 inches in the center. The blank was then ground with successively finer grades of grit, till its surface was nearly transparent. A pitch lap was poured on the tool and the glass polished on this, using jeweler's rouge. The mirror was tested for shape by Foucault's method. When the shape of the mirror was reduced to a paraboloid, the mirror was sent to a commercial firm for aluminizing. A tube for the mirror was constructed by joining two

stovepipes. An equatorial mounting of the German type has been given us, eliminating a good deal of work. A combination prism and eyepiece holder was put together from scrap, sheet brass and some brass tubing. Subsequent sights made on the planet Venus and the moon have shown good resolution of detail. During the polishing of the six inch mirror, grinding was commenced on the 12 inch mirror. That mirror has been completed in the same manner as the six inch mirror and the Foucault test shows the figure to be very close to a perfect paraboloid.