

1. source antenna and transmitting system
2. receiving system
3. positioning system
4. recording system
5. data-processing system

A block diagram of a system that possesses these capabilities is shown in Figure 16.17.

The source antennas are usually log-periodic antennas for frequencies below 1 GHz, families of parabolas with broadband feeds for frequencies above 400 MHz, and even large horn antennas. The system must be capable of controlling the polarization. Continuous rotation of the polarization can be accomplished by mounting a linearly polarized source antenna on a polarization positioner. Antennas with circular polarization can also be designed, such as crossed log-periodic arrays, which are often used in measurements.

The transmitting RF source must be selected so that it has [7] frequency control, frequency stability, spectral purity, power level, and modulation. The receiving system could be as simple as a bolometer detector, followed possibly by an amplifier, and a recorder. More elaborate and expensive receiving systems that provide greater sensitivity, precision, and dynamic range can be designed. One such system is a heterodyne receiving system [7], which uses double conversion and phase locking, and it

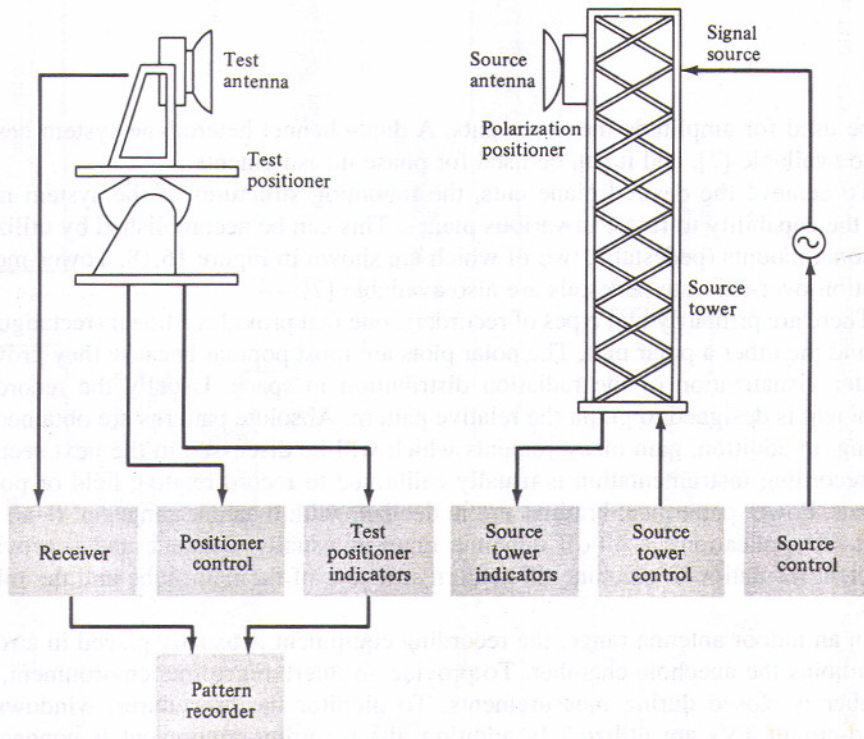


Figure 16.17 Instrumentation for typical antenna-range measuring system. (SOURCE: *IEEE Standard Test Procedures for Antennas*, IEEE Std 149-1979, published by IEEE, Inc., 1979, distributed by Wiley)