

Outdoor Far-Field Range

In an outdoor far-field range configuration, the test antenna is installed on the test positioner located on a tower, roof or platform outside the instrumentation control room. The receiver front end (Local Oscillator) is usually located at the base of the test positioner, with the mixer connected directly to the test antenna port. This configuration requires only a single RF path through the positioner, greatly simplifying system design. Use of the remote front end also minimizes local oscillator power loss to the mixer and maximum system sensitivity. An outdoor enclosure protects the local oscillator from the weather and temperature extremes. For multi-ported antennas, simultaneous measurements can be made on all ports through the use of multiplexers installed in front of the mixer. The receiver front end is remotely controlled from the control console through interfaces with the receiver.



The test positioner axes are controlled and read out by the position control and readout units. A typical control system consists of a control unit located in the operator's console. It is interfaced to a power amplifier unit located near the test positioner. This configuration keeps the high power drive signals near the positioner and away from sensitive measurement instruments while providing remote control of positioner functions from the equipment console.

The source antenna is commonly located at the opposite end of the range on a tower or other supporting structure. The signal source is installed near the source antenna to minimize signal loss. An outdoor enclosure protects the source from the elements. For some applications a multiplexer can be used between the signal source and a dual polarized source antenna. This configuration allows simultaneous co- and crosspolarization measurements to be performed. Motorized axes to position the source antenna's polarization, height and boresight are controlled by a position control system. The signal source and position axes are remotely controlled from the operator's console via serial digital link(s). Twisted pair cable, fiber optics or Ethernet can be used to interface the digital link from the source site to the control console.

One or two position control systems may be used on an outdoor range depending upon the length of the range and the total number of axes to be controlled. On very long ranges, or in cases where the control room is not close to either positioner, it may be advantageous to use a separate control unit for each end of the range. Also, since outdoor ranges frequently have many axes due to the source tower axes, multiple controllers may be required to control all axes.