

Array Maintenance

Once per year, before the beginning of an observing season or after the end of the thunderstorm season – or any time damage is suspected or proper operation is in question – the array should be inspected, cleaned, and tested for proper operation (procedures 1 and 2 below). A more in-depth impedance test (procedure 3 below) may be performed if one has access to a VNA or antenna analyzer.

1) Visual Inspection and Cleaning

- a) Adjust element halyards and center support ropes as necessary to keep the elements in a horizontal plane. The droop at the element feed point should be kept to a minimum.
- b) Inspect all coax sheaths for damage (cracks, cuts, abrasion, etcetera); all damaged coax should be replaced with new coax of the appropriate electrical length and impedance.
- c) Remove insect debris from the junction box(es), baluns, and terminating resistors. Have a spray can of wasp & hornet killer on hand when opening the junction box(es).

CAUTION: Never attempt to remove corrosion from the copper-clad antenna wires with a file or coarse sandpaper. The copper layer is very thin. If it is removed, the steel core will be exposed and will rapidly rust. If the wires must be cleaned where they connect to the balun binding posts, use 400-grit or higher emery cloth.

- d) Ensure that all balun binding posts are tight. DO NOT OVERTIGHTEN. The balun housing and binding post keyways are plastic.
- e) Ensure that the terminating resistor PL-259 plugs are tight. DO NOT OVERTIGHTEN. The Budwig housing is fiberglass reinforced plastic.

2) Operational Verification Test

- a) Disconnect all elements feeds from the power combiners in the junction box.
- b) With a strip chart or spectrograph recording

the signal from the array, connect one element for 10 to 15 seconds, then disconnect. Repeat for the remaining elements. It is not necessary to terminate the disconnected element feeds or the open combiner ports for this test (but it won't hurt, either).

- c) Review the recorded data to ensure all elements are producing signals at similar amplitudes.
- d) If all elements produce similar signal levels, reconnect all element feeds to the proper combiner ports. If one or more elements are markedly weaker than the others, determine the cause and repair the array (see the Troubleshooting section of this manual), then perform this Operational Verification test again.

3) Element SWR and Impedance Test

- a) Ensure all elements are connected.
- b) Disconnect one element feed from its associated power combiner.

CAUTION: Never connect a VNA or antenna analyzer to a feed line leading to a receiver or amplifier; the signal produced by the test instrument can be strong enough to fry the receiver or amplifier.

- c) Use a VNA or antenna analyzer looking into the 26-foot element feed line toward the TFD element to measure the element SWR and impedance and from 10 to 40 MHz.
- d) Record the measured SWR and impedance in the station engineering log.
- e) Compare with the values previously recorded in the station engineering log or with those shown in Plot 1 in the Troubleshooting section of this manual.
- f) If one or more elements diverge markedly from the others (or diverge wildly from Plot 1 below with no ground plane is present), determine the cause and repair the array (see the Troubleshooting section of this manual), then perform the Element SWR and Impedance Test and Operational Verification Test again.
- g) Repeat this procedure for each array element.