# Locating Open Shields with the HST-3000


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# Locating Open Shields – Use the Opens Measurement

A complete open on a shield may be located through use of the opens measurement on the HST-3000. To perform this test, two measurements are required: one measurement on each side of the open shield.

**D = Distance to Open on Shield**
**F = First Measurement Performed**
**S = Second Measurement Performed**
**B = F + S**
**T = Total Length of Section**

Below are the steps for performing the necessary measurements. <u>Measurements must be performed on both sides of the open shield (F – First measurement, S- Second measurement)</u>. Use the diagram on the following page as a reference:

1) Choose a side to begin testing
2) Remove the Ground from the Shield
3) Connect the Tip lead of the HST-3000 to Shield
4) Connect the Ring lead of the HST-3000 to Ground
5) Perform an Opens measurement
6) Record result
7) Re-attach Ground
8) Move to second test location

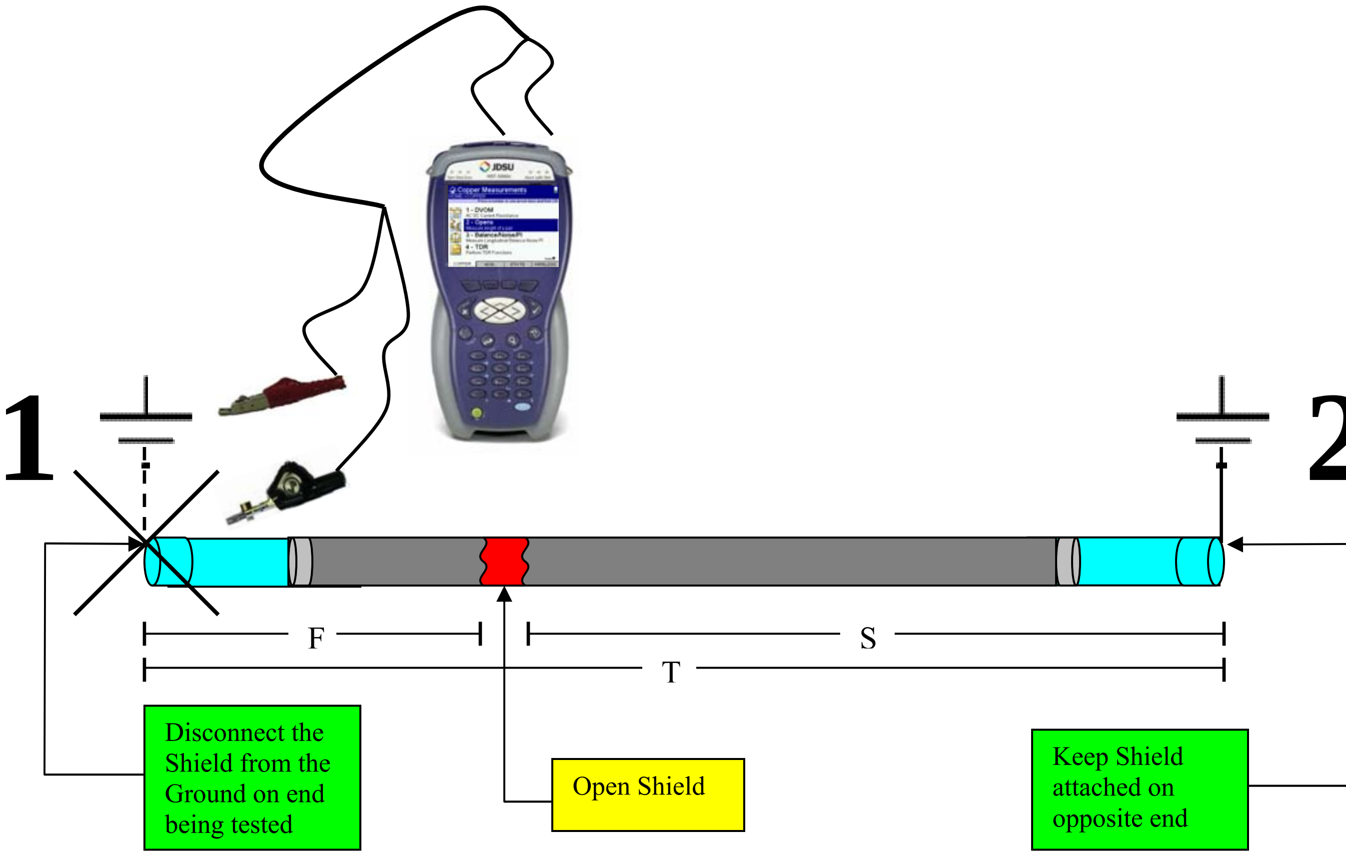
The results from the Opens measurement do not provide an estimate of where the open is located; however, using both results a calculation can be performed to determine the location of the open shield.

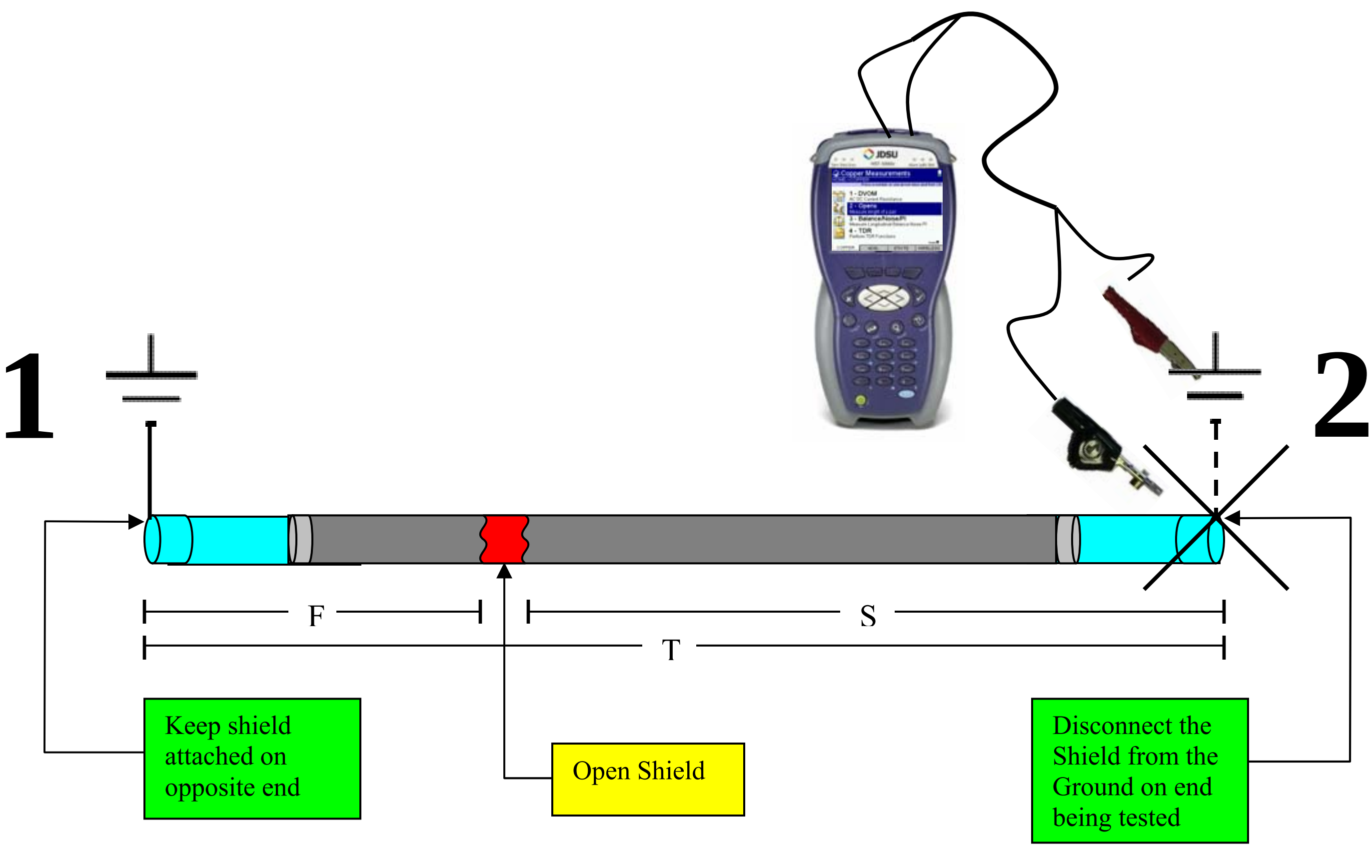
After performing the measurements, the Distance can be calculated as follows:

$$D = \frac{(F \text{ or } S) * T}{B}$$

(F or S) = Use the smaller of the two values

Where D is the distance from where the shorter of the two measurements was made.


1
2
F
S
T
Disconnect the Shield from the Ground on end being tested
Open Shield
Keep Shield attached on opposite end


1
2
F
S
T
Keep shield attached on opposite end
Open Shield
Disconnect the Shield from the Ground on end being tested

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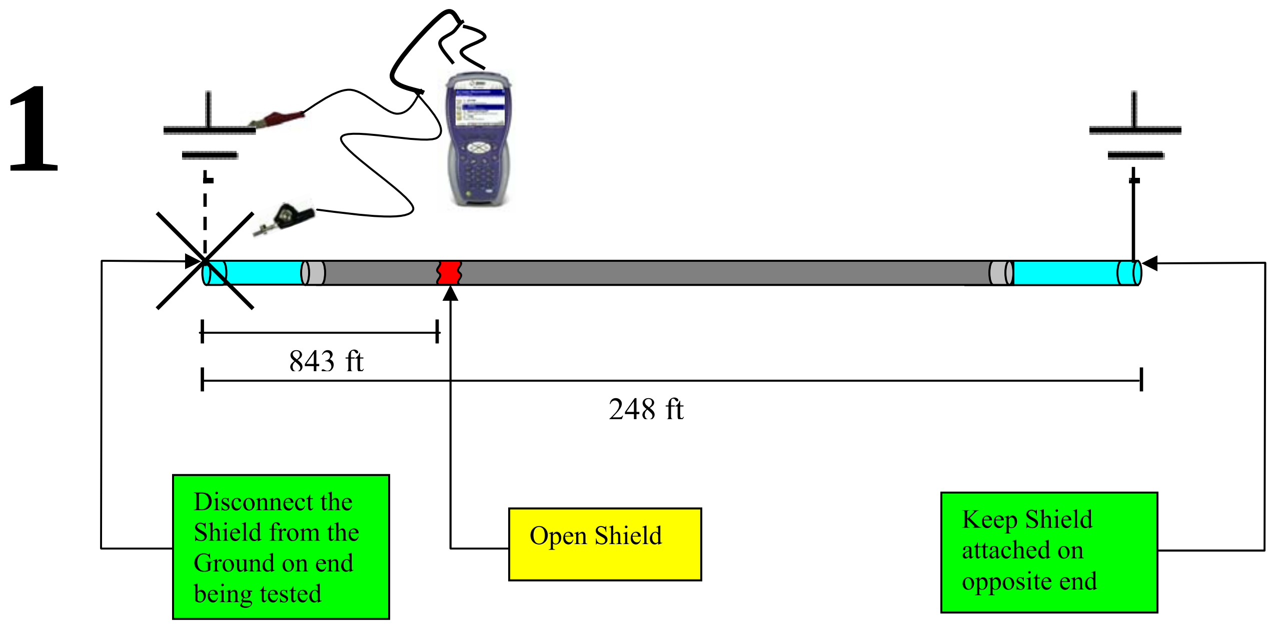
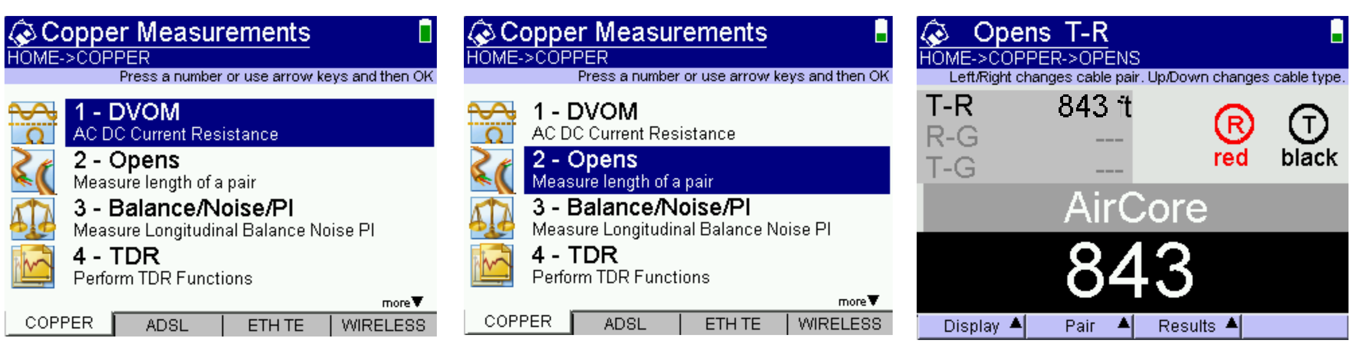
# Example of Detecting Open Shield

1) Go to a test end, shown as "1" below. This may or may not be the test point closest to the open shield.
2) Determine Total Length (T) and record the result (in this example, a measurement of 248 feet is used)
   a. Can be done by testing length of copper pair by using Opens, TDR, Distance to short, etc.




3) Perform an Opens measurement with Tip connected to Shield and Ring connected to Ground

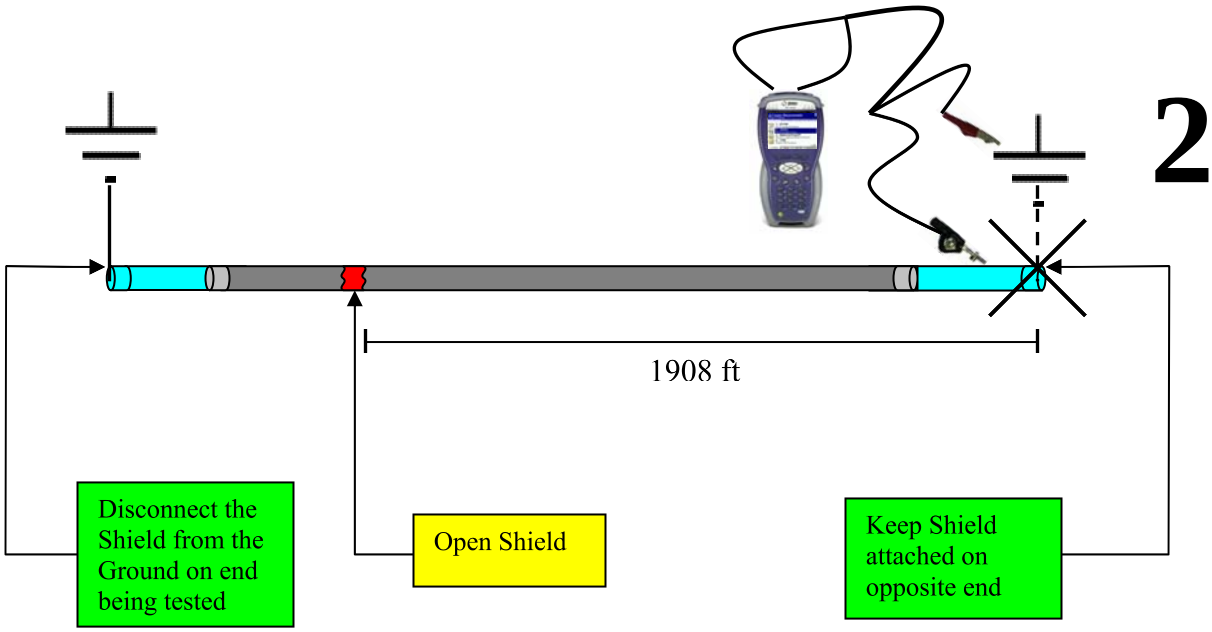



4) Record result for Tip-Ring Open and re-attach Shield to Ground. In the example, a measurement of 843 feet is used.

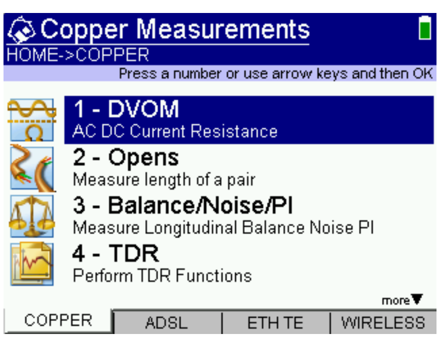
NOTE: The measurement may not appear realistic. The reason behind this is that Shield and Ground to not have capacitance of 0.083 µF/mile. This will be resolved when performing the calculation.

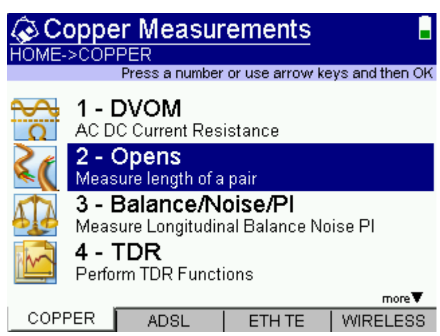
JDSU

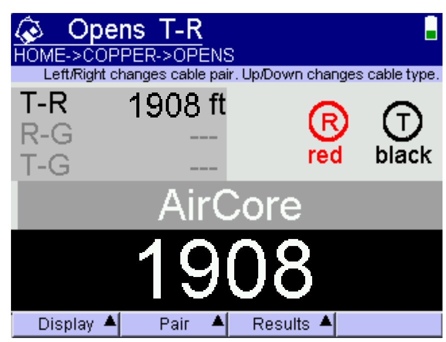
5) Go to second test end, shown as “2” below. This may or may not be the test point closest to the open shield.




6) Perform an Opens measurement with Tip connected to Shield and Ring connected to Ground




7) Record result for Tip-Ring Open and re-attach Shield to Ground. In the example, a measurement of 1908 feet is used.

NOTE: Again, the measurement may not appear realistic. This will be resolved when performing the calculation.

6) Using the formula, $\mathbf{D = \dfrac{\underline{(F\ or\ S) * T}}{B}}$, calculate the real distance to the open shield.

In our example, we recorded the following measurements:

F = 843 feet
S = 1908 feet (F or S) = 843 feet
T = 248 feet

B = 843 feet + 1908 feet = 2751 feet

$$D = \frac{843 * 248}{2751}$$

D = 76 feet

The result of the calculation represents the distance the open shield is from the shorter of the two measurements (F or S). Therefore, in the example, the open shield is located 76 feet from the test point "1".