

TECHNICAL NOTE # 912

Re: Using parallel wires to shunt MicroTrack™ RF field
Date: June 01, 2017

INTRODUCTION

This technical note is a guide for using a shunt to reduce or eliminate the MicroTrack RF field from coupling to fences or other wiring/materials that run parallel to the MicroTrack cables or where the cables make sharp turns. In certain applications, like sandy soil, where there is very little or no attenuation for the MicroTrack cables, the RF field can become very wide and couple onto objects which can result in nuisance alarms.

Any type of 14 gauge insulated wire can be used but an easily available source is a 100 foot (30.5m) extension cord. At the end of the wire, 6 (six) snap on ferrite beads will be attached at 3.3 foot (1m) intervals on each end of the shunt to decay the RF signal. These items are shown in Figure 1.



Figure 1

DESCRIPTION

For this example we will consider a fence to be in the RF field. The cable is 656 feet (200m) in length and 7.5 feet (2.29m) off the fence.

The idea is to position the shunt at the location which eliminates or reduces the noise as much as possible without reducing the primary detection field.

Figure 2 shows a shunt at the corner where the RF can couple to the outer fence and a shunt along the cable where the RF can couple onto the parallel inner fence.

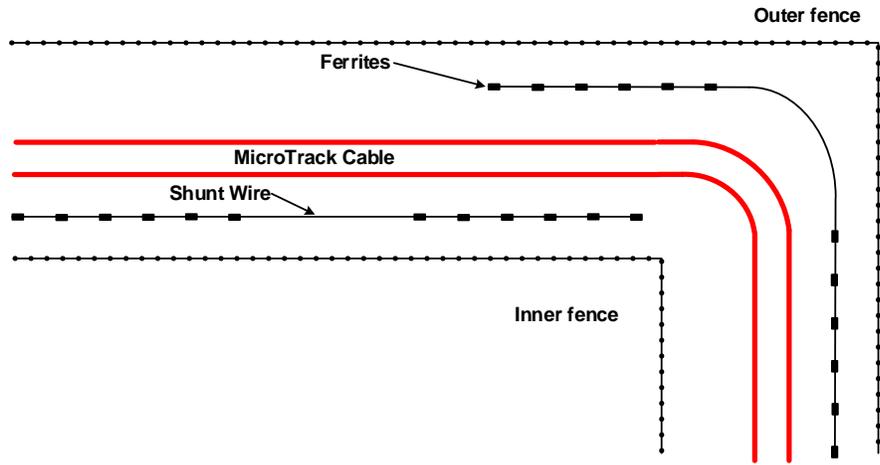


Figure 2

The shunt cable needs to be moved between the fence and the MicroTrack cable to find the location that eliminates or reduces the effects of the RF on the fence. This is best done using a flexible wire such as a limp extension cord. Several extension cords can be plugged together for a greater length.

Prepare the test cable by attaching the ferrites to the two ends. Attach 6 ferrites on each end approximately 3.2 feet (1m) apart. Lay the cable on the ground parallel to MicroTrack cable in a way that minimizes any movement of the wire (movement of the wire will generate a target). Objects can be placed on the wire to hold it down if needed.

With the wire in place, clear the Max Peak hold on the Target Location screen of the UIST II, then walk along the outside of the fence and shake the fence along the entire area. Save the Target Location screen and note the distance that the wire is from the fence. Move the wire about 1 foot to the side and repeat the test. Do this several times gathering the data from each test.

Figure 3 starts off with no shunt. Figure 4 has the shunt 1 foot (.3m) off the fence.

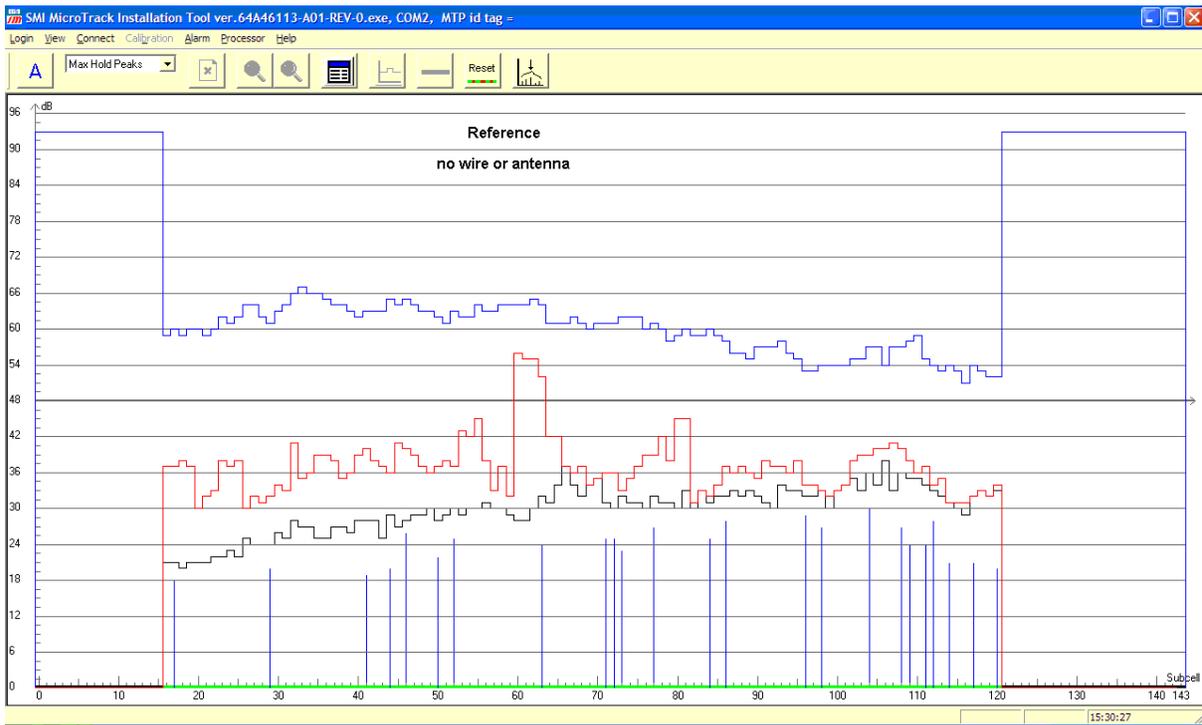


Figure 3



Figure 4

Figure 5 has the shunt 2 foot (.61m) off the fence.



Figure 5

Figure 6 has the shunt 3 foot (.91m) off the fence.

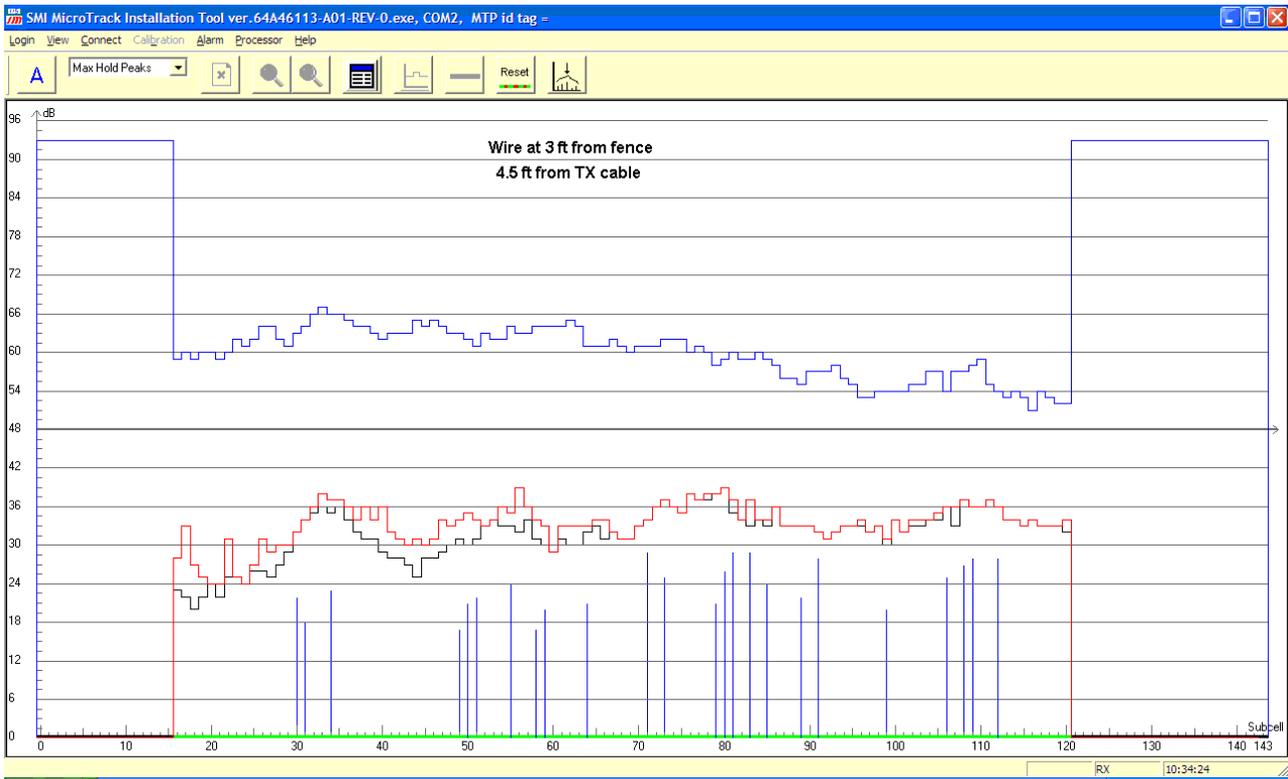


Figure 6

Figure 7 has the shunt 3.5 feet (1.07m) off the fence.

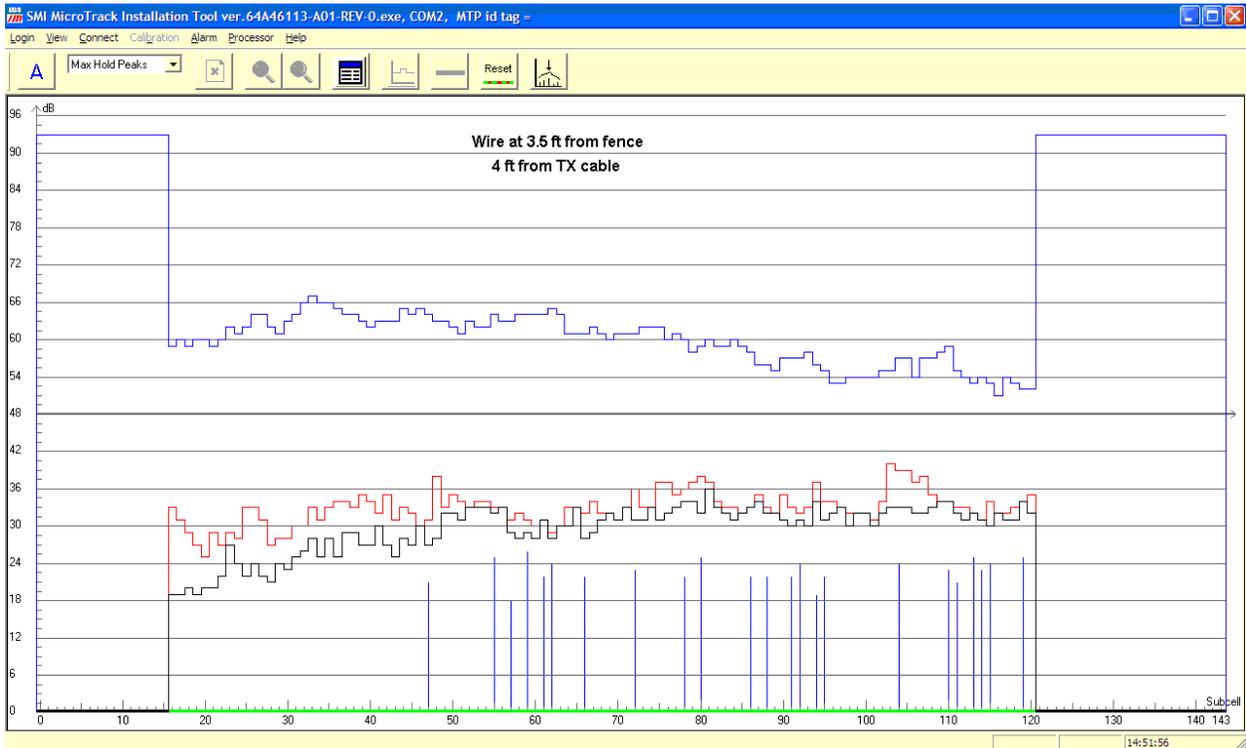


Figure 7

Figure 8 has the shunt 4 feet (1.22m) off the fence.

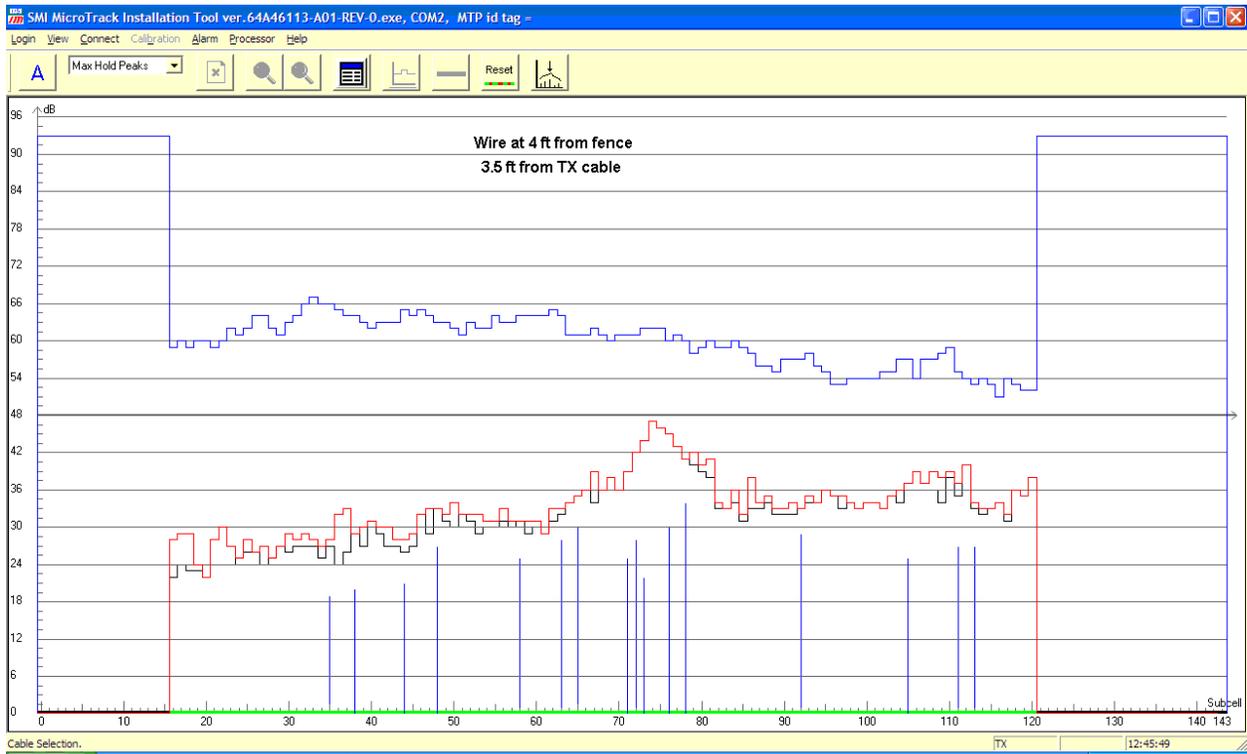


Figure 8

Figure 9 has the shunt 5 feet (1.52m) off the fence.



Figure 9

Looking at the data in the figures above placing the shunt at either 3 foot or 3.5 foot (.91 or 1.07m) from the fence provided the greatest reduction from the RF signal being coupled to the fence. This is the location where the cable with the ferrites should be buried. Once the best location is found the shunt can be buried in place at an approximate depth of 2 inches (50.8mm).

The ferrites should be covered before burial with the wrapping tape supplied with the MicroTrack MTT or something similar. This serves to protect the ferrites and to keep the ferrites in place on the cable at the appropriate spacing.

Note: The screens used in this example were from the MicroTrack IST.