

# **Westhold Race Management System**

## **Troubling Shooting Guide**

# Trouble Shooting

## 1. Introduction

This document describes how to spot signs of poor performance and methods for trouble-shooting these problems. It will focus on identifying and addressing these issues. The document is structured such that the most common problems are described towards the beginning of the document and the rarer problems are towards the end.

## 2. Transponder Mounting

### Symptoms:

1. Missed crossings
2. Low hits and or power numbers

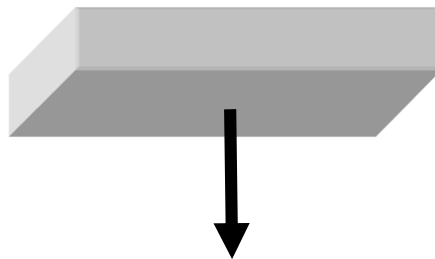
Hits is the number of times the system “sees” the transponder as it crosses the loop. When the cars are traveling slowly you should see higher numbers, for example 100+ at parade speed (up to 30-50 Miles per hour). As the vehicles travel faster the numbers will get smaller as the system “sees” the transponder in detection range for a shorter amount of time. This is normal. However, if the numbers are dropping under 20 hits then this indicates possible mounting problems – either poor location or incorrect orientation.

Power should be consistent from lap to lap and from vehicle to vehicle. If one vehicle is showing about 60 from lap to lap and another is showing 50 it represents a huge power difference. A 10 difference indicates a loss of more than half the power.

### Fixes:

1. The most common problem is incorrect mounting position of the transponder. Most problems can be resolved by proper mounting

## Transponder Mounting



These transponders should be mounted horizontally with the **label** side facing the track

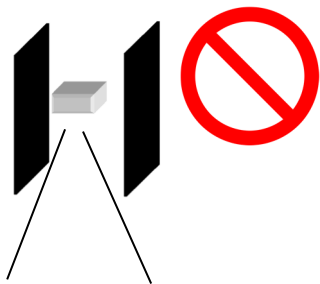




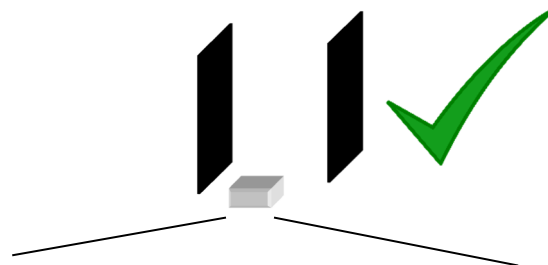
No metal or carbon fiber should be between the transponder and the track. These types of material will block the signal of the transponders.

**Note: Signals can go through plastic so it is possible to use a piece of plastic as a mounting plate.**

It is possible to recess the transponder, however keep in mind that recessing the transponder can create problems such as shown below.



**Poor location:** Narrow window for detection. The signal can't be seen



**Good location:** No metal to block the signal. The detection window is very wide.

## 2. Cabling Problems

Cabling problems can cause both poor hit or power numbers.

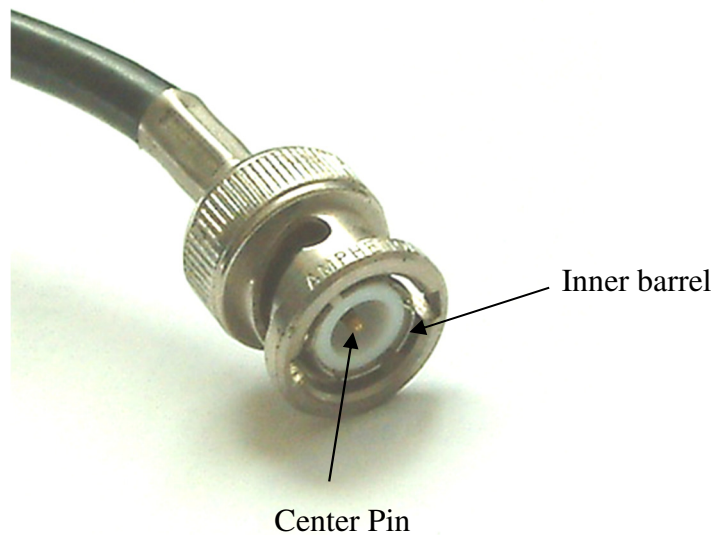
Cable problems affect all transponders. They will not follow a single transponder. For example, all hits will be lower or all power for all transponders will be lower than usual.

Sometimes it will appear to follow a transponder. You may notice a single transponder being detected intermittently. That just means the transponder is right on the edge of detection due to poor mounting location or orientation.

Note that sometimes these problems are intermittent. This can happen with a bad connection. If the coax cable is wiggled the performance may go up. That is usually a good sign something is loose or the cable is starting to break.

### 2.1 Check Coax Connector at Decoder.

This connector is handled the most frequently and is often the source of cable related problems.



Make sure the center pin and inner barrel are flush on both ends of the cable. This is often the source of low hit numbers.

Test: Place transponder on the coax cable about 5 feet from the decoder. The detection light will remain solidly on. Gently pull on coax cable near the decoder. There will be a springy feeling due to some leaf springs in the BNC connector. If the detection light goes off the connector needs to be replaced.

Other things to check for:

Measure the resistance (ohms) between the center pin and outer barrel with the balun connected on the other end. It should read only 2-3 ohms. If it's more than a few ohms difference from these numbers you have a problem. If you see 0 ohms or if you see an open or some large number then there is something wrong with the cable or connector.

**NOTE:** AMB/MyLaps will measure 100,000 (ie 100K) ohms. Their balun includes a 100K resistor.

If using a coax A/B switch such as the one shown below it is possible one channel is bad and will perform worse than the other. This is not uncommon in low cost A/B switches.



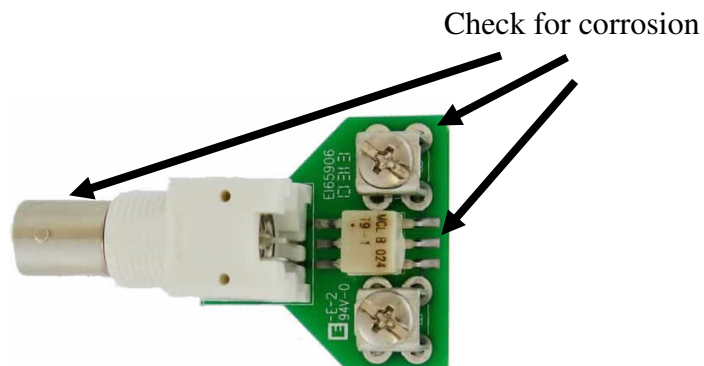
## 2.2 Check for Water in the Conduit Containing the Antenna Loop

Water touching the loop will result in reduced detection sensitivity. You can see both low power and low hits.

## 2.3 Check Balun

Verify the antenna loop wire is tightly fastened to the screw terminals. Loose wires will result in low hits. Power will likely be unaffected.

Inspect for signs of corrosion at the below indicated areas. Corrosion can result in lower power and low hits.



## **2.3 Check Antenna Loop Resistance**

Disconnect the antenna loop from the balun terminals and measure between the two ends of the loop using an Ohm meter. It should read about 470 ohms. If it is within +/- 50 ohms then the reading is ok.

Large resistance = incorrect resistor

Open/no reading = Break in the wire.

Very low resistance = no resistor or short.

Loops are not as likely to have problems as the balun and coax, but they can be the source of inconsistent detection. It is generally the interfaces between the different pieces that are the points of failure.

## **3. RF Interference**

This is one of the most uncommon problems. Symptoms are constant or intermittent low hits, but power remains consistent.

Make sure other electronic equipment or cables carrying signals are not near the decoder or the coax cables or antenna loop. If there are any electronic devices immediately next to or on top of the IDU or IDEC decoding equipment or the coax cable move the devices away. Usually a few feet is sufficient.