

Fix a Leaky Wind Instrument

By Michael Simpson



After about a month of operation my 1-Wire Network began to fail. At times it would report a short and other times no devices could be found.

The Problem

Isolating the problem was very easy due to the fact that I had wired the junction box shown in Figure 2. I simply removed the Wind Instrument and the problem went away. This told me that the problem was either the cable going to the Wind Instrument or the Wind Instrument itself.



Figure 2

I removed the Wind Instrument from the pole. After cutting away all the sealer I had used I disassembled the two halves of the unit. I found quite a bit of moisture inside. The PCB was wet but since it is coated this was not the problem. The two RJ12 connectors are not protected. They were loaded with water. This was the problem area.

The PCB board in the Wind Instrument is sealed but the problem seemed to be the RJ12 connector.

The Fix

To fix the problem I decided to remove the two connectors and attach wires directly to the PCB. I also made a few modifications to the mounting bar. Let me take you step by step through the modifications I made.

Step 1

The first thing I did was to remove the connectors shown in Figure 3. I simple solder sucker worked fine.

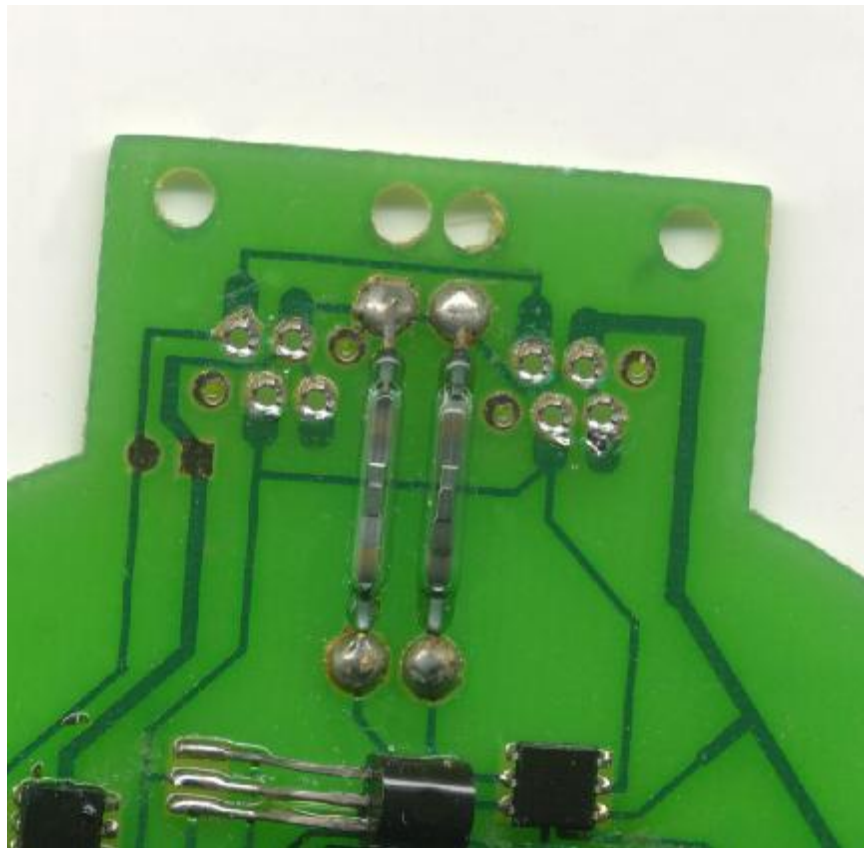


Figure 3

Step 2

Next I soldered a 2' Red and Black wire to the two inside pads and a jumper to the two outside pads as shown in Figure 4.

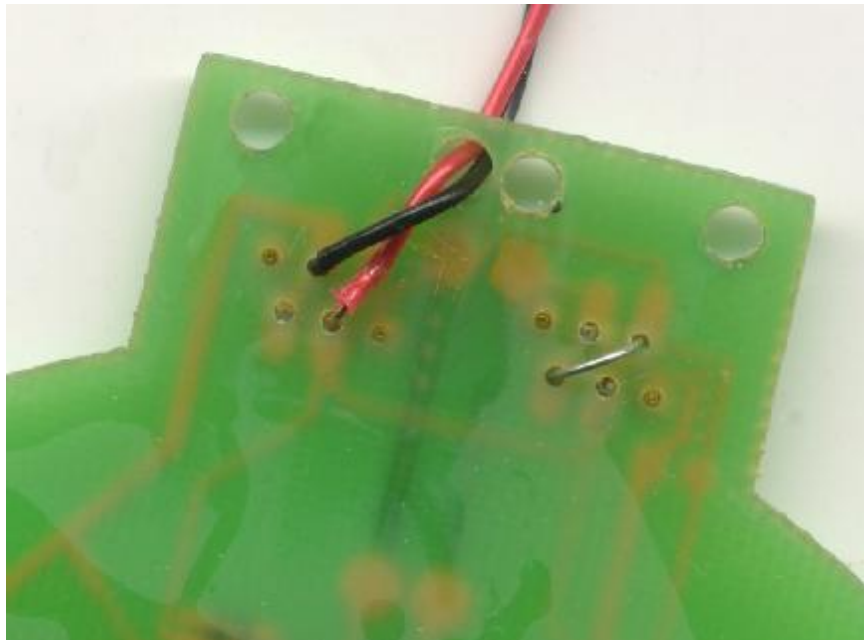


Figure 4

Step 3

I added solder to all the pads as shown in Figure 5.

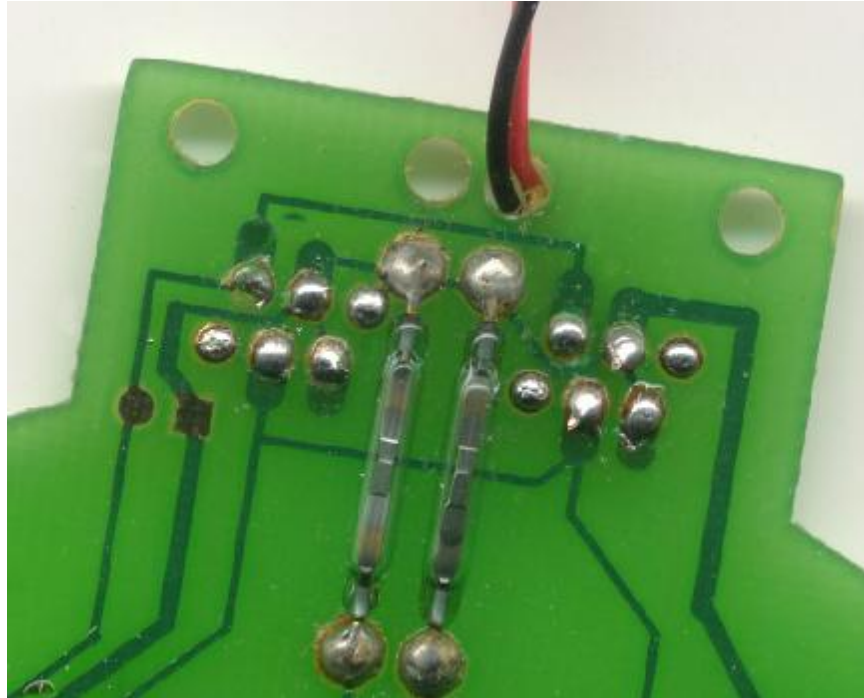


Figure 5

!!!Important!!!

Before moving on to step 4 you should test your connections. The best way to do this is with one of our 1Wire search programs. It should report 3 devices.

Step 4

I coated all exposed contacts and joints on the underside of the board with Liquid Electrical Tape as shown in Figure 6.



Figure 6

Step 5

I then coated the upper portion of the board as shown in Figure 7. I did this because some of the component leads were exposed.



Figure 7

Step 6

Next I ran a bead of clear gutter sealer in the groove where the two covers join together. Place a drop of sealer on each of the screw holes shown in Figure 8.

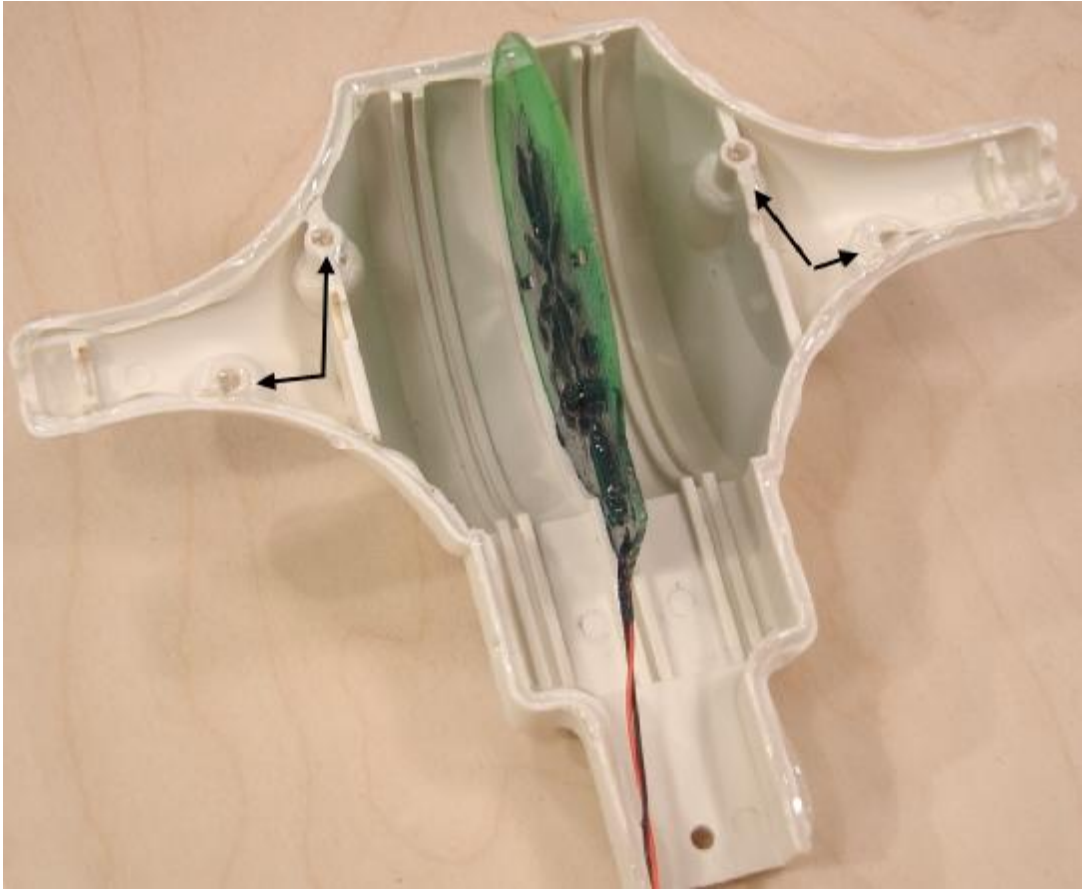


Figure 8

Step 7

Insert the two bearings and assemble the two halves of the Wind Instrument. Squeeze them together until the two pieces just start to meet as shown in Figure 9. The key here is to leave a small bit of sealer in the groove. (Don't squeeze it all out) Once it dries it will form a rubber gasket.



Figure 9

Let the sealer harden for 24 hours then bolt the two halves together.

Step 8

I found that one of the hardest places to keep moisture out of the Wind Instrument was the mounting bar. So in order to help solve this point I placed a slight 1-2 degree slope on the bar when mounted then drilled drain holes into the end of the bar on the under side. This would allow any water that enters Wind Instrument via the bar to roll towards the end and drain.

Drill a few 1/8" holes into the end of the mounting bar. These holes should be on the opposite end to which the Wind Instrument is connected. Drill them close the end of the bar as shown in Figure 10. The holes should be oriented so that they are on the bottom of the bar as shown in Figure 11.



Figure 10

Step 9

Run the two wires through the bar then attach the bar to the Wind Instrument as shown in Figure 11. Place a bit of gutter seal at the point where the bar enters the Wind Instrument.

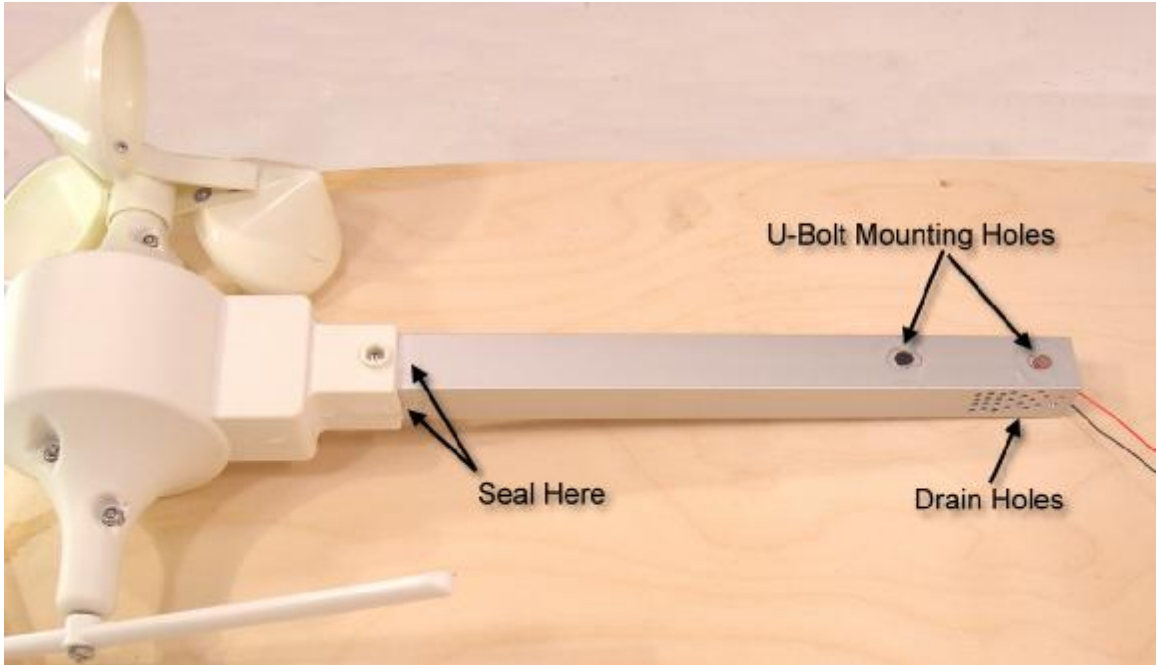


Figure 11

Step 10

Cut a slit or drill a hole for the two wires to pass into the end cap. Add a bit of gutter seal to the cap before inserting into the mounting bar. As shown in Figure 12.

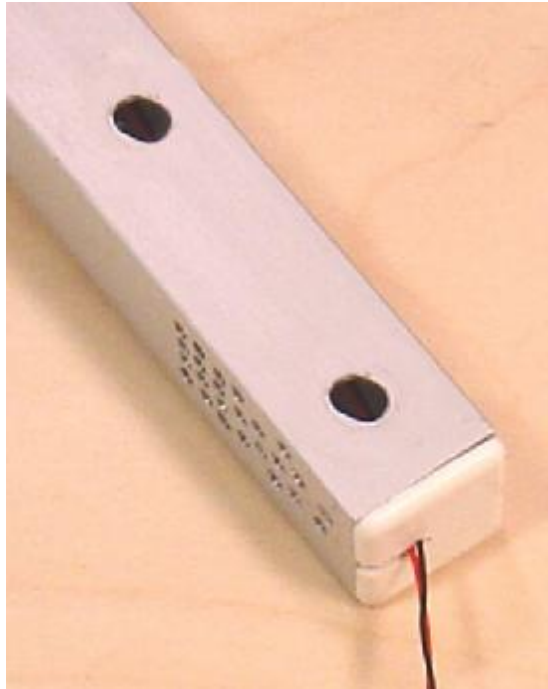


Figure 12

All Done

Now all that's left is to mount the Wind Instrument to your weather pole. When mounting it is important that there is a slight 1-2 degree angle in the bar so that the water can drain towards the holes you drilled in step 8.

Run a Cat 3 cable from the junction box to the two wires. I used a couple small wire splices I picked up from my home center then coated each with Liquid Tape. At the end where the Cat 3 connects to the Junction box I used a RJ12 connector.

So far the Instrument is working perfectly. And after a couple real hard rains I have yet to experience a failure.

Links

Hobby Boards

<http://www.hobby-boards.com>

Kronos Robotics

<http://www.kronosrobotics.com/xcart/customer/home.php>

KRMicros

<http://www.krmicros.com/Development/ZeusPro/ZeusPro.htm>

AAG Electronica

<http://www.aagelectronica.com/aag/>