

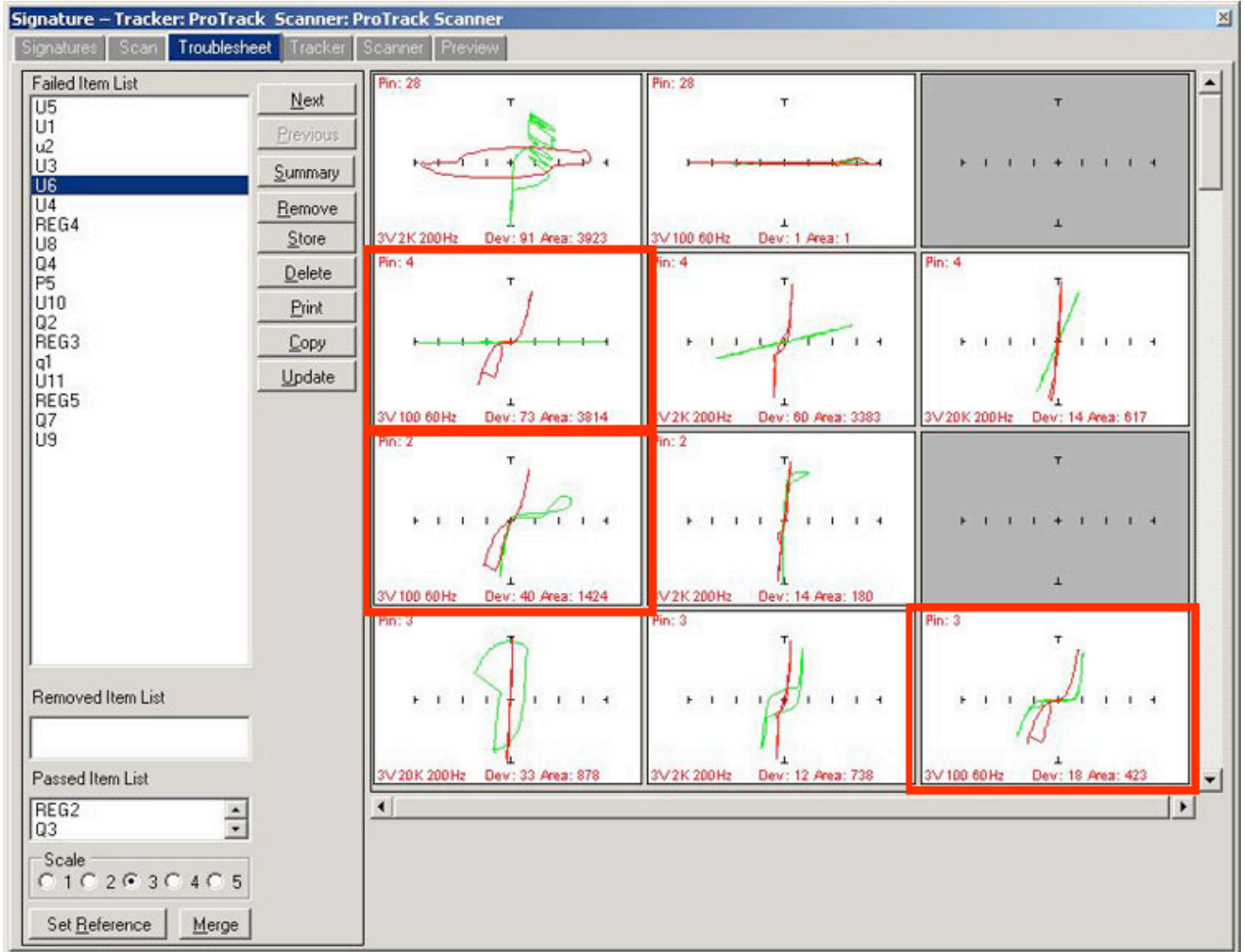
Images and Analysis of a PCB Failure

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The information on this page presents an analysis of a PCB when using a Huntron Tracker system for troubleshooting to the component level. Sometimes when analyzing signatures sampled from bad PCBs it is important to note "what is not there" as well as "what is there". This can tell you much about the nature of the actual failure.

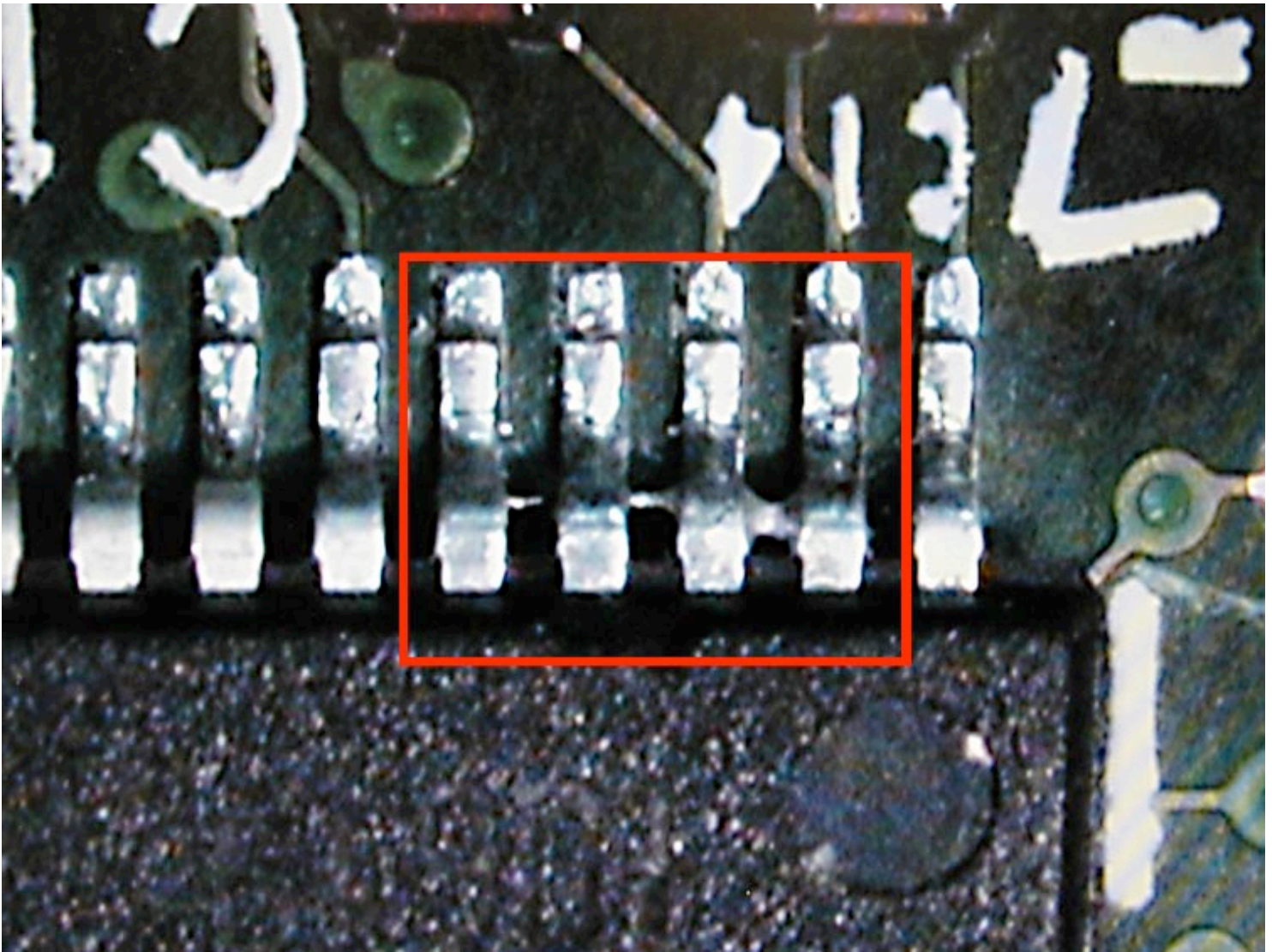
In this analysis, the customer provided two boards, one good example and one bad example of the same type and revision. A test for the TOP side of the PCB was developed in Huntron Workstation for a Huntron ProTrack using a Huntron Access Prober. Signatures from the known GOOD PCB were stored as a test reference and used for comparison when the test was run on the BAD PCB. The image below shows the Troubleshoot (error log of signatures) from Huntron Workstation displaying signatures from the device U6. The Reference (stored) signatures are shown in green with the signatures from the bad board overlaid in red.

Signature Analysis and Inspection Images



The key signatures in this analysis are indicated with red boxes. Note that the red signatures are very much the same where the green signatures for those same pins are very different from each other. The only way these signature differences are possible is by a very low resistance short circuit connecting the pins together. Note that pin 4 normally indicates a resistive signature (the angled signature in green; very likely caused by a connected pull-down resistor) whereas the red signature indicates that the normally connected resistance is being bypassed. In Signature Analysis troubleshooting, any resistive change is worth investigating.

Further analysis with a high powered video camera of the suspect pins (see image below) verified the actual problem of pins shorted together by solder. This appears to be production process error.



Final thoughts..

The purpose of this test was to prove concept and the usefulness of Signature Analysis as a troubleshooting tool.

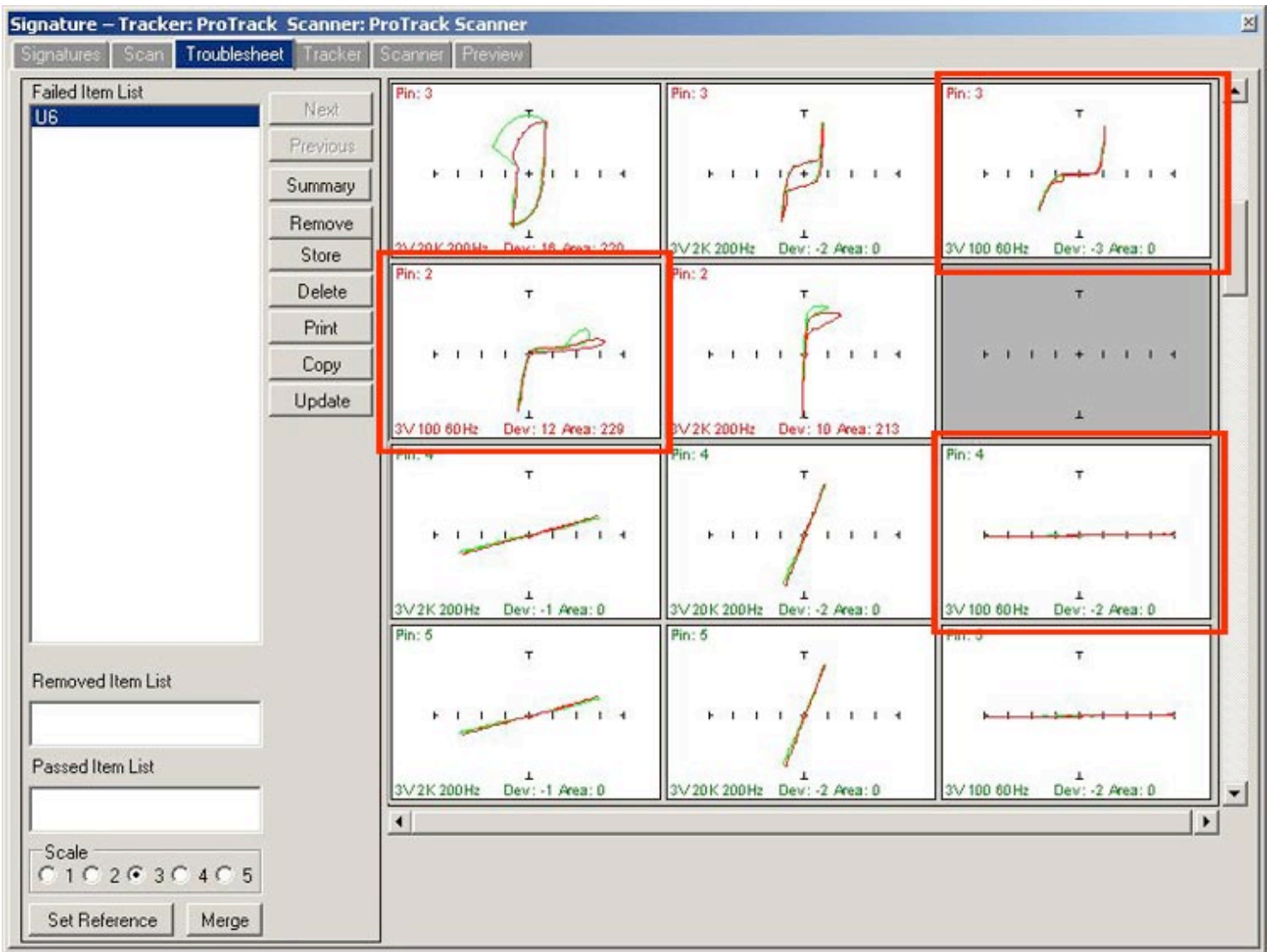
The test used in this analysis was created manually in Huntron Workstation. The test ranges used were: 3V, 100ohm, 60Hz; 3V, 2Kohm, 200Hz; 3V, 20Kohm, 200Hz.

The Troubleshoot created from this TOP side only test had several components that indicated signature differences and most of these failures were caused by signature instability. Further refinement of the test ranges would reduce the Troubleshoot to fewer components. The signatures from pins 2, 3 and 4 on U6 were caused by a real failure and not signature instability (unlike pin 28).

Contact Huntron Technical Support if you have any questions regarding this analysis.

Further Analysis (Addition to Original Report)

At request of the customer, the solder shorts from U6 were removed and the component retested with the Huntron ProTrack and Access Prober. The resulting signatures for the test are displayed below.



The signatures that indicated the failure in the previous test are highlighted in the image. The analysis shows that the signatures are (for the most part) passing the comparison with the stored reference signatures. Removing the solder shorts from the IC pins effectively fixed the problem indicated by the original test. Once again, additional refinement of the test would result in more stable signatures and further reducing the size of the Troubleshoot.