JTAG Tool Testing

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Outline

- JTAG Definition
- Why test JTAG tools?
- JTAG methods
- Preliminary Observations
- Plans for CFTT JTAG Tool Testing

What is JTAG?

- JTAG = Joint Test Action Group – method for testing circuits
- IEEE codified the JTAG efforts – IEEE Standard 1149.1
- Technique used to acquired data directly from a mobile device's Printed Circuit Board (PCB)

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Why doing JTAG?

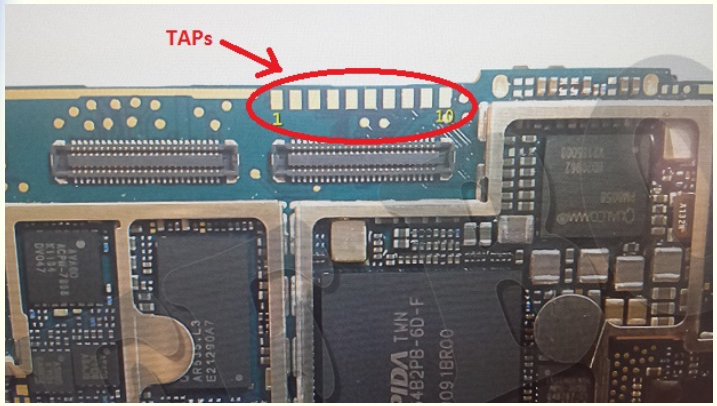
- Bypasses passwords/gesture swipes – python scripts
- Data dumps from Windows Phones
- Water damaged phones – mobile device repair

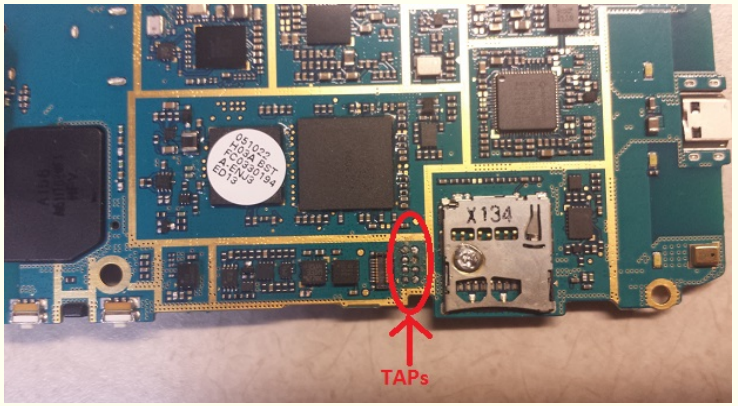
Importance of JTAG Tool Testing

- Goal of testing: Support the admissibility of JTAG acquired
- Goal for Preliminary Observations: share what we have learned so far

JTAG Requirements

- Memory, Power, TAPs & Processor
  - processor – makes a device JTAG-able
- TAPs = Test Access Ports
  - different: sizes, location, shapes & quantity





JTAG Cycle

TAPs ⟷ Processor ⟷ Memory

Are all mobile devices devices JTAG-able?

- **NO!**
  - mostly applies to Android + Windows
  - device may not have TAPs
  - device not supported by JTAG tool *
  - processor may be supported but:
    - TAPs configuration has not been discovered (iOS devices)
    - TAPs may be disabled
    - TAPs shut down by OS
    - fuse in processor may be bad

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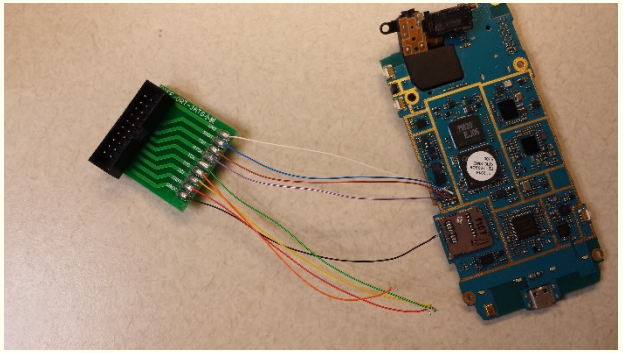
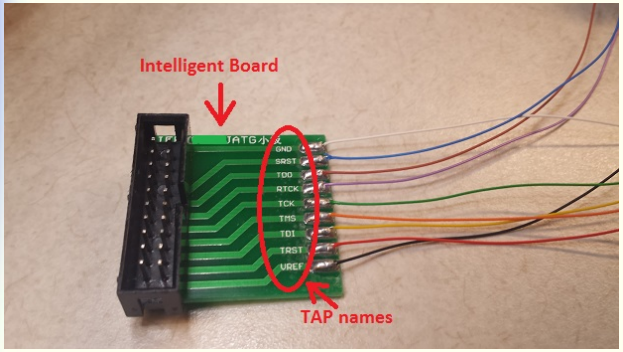
Device not supported? – still a chance

- Look for device's processor
- Is there another device using the same processor?
- Use that device's profile – known as sister phone's profile
- Probe each TAP to identify them
- Hopefully connection between phone and JTAG box is established

Methods to JTAG a mobile device

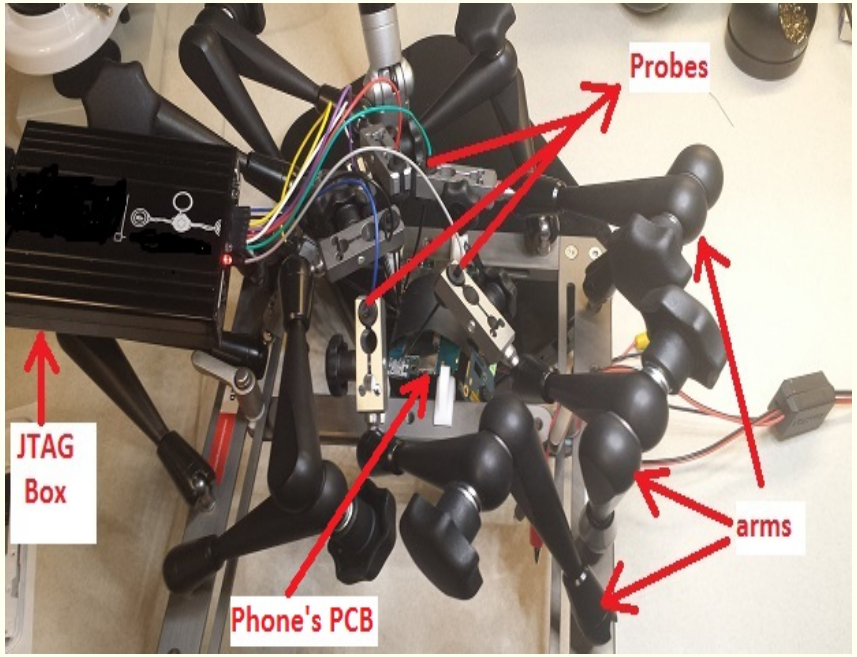
Soldering Method 1

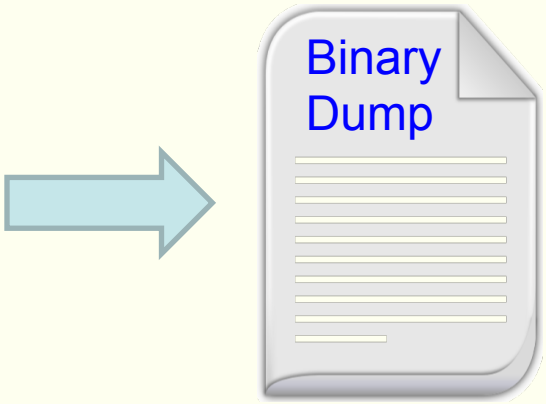




Binary
Dump

Solderless Method 2





Preliminary Observations

- Solderless method seems to be easier
- When JTAGing a phone, tool may crash few times before it can finish the acquisition a 100%.
- Acquisition speed may vary depending on the length of the wires
- Acquisition speed may also vary depending on the solder points

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More Observations

- Solder vs Solderless method
  - speed
  - extracted data
  - binary compare – not hashes
- Analyze and compare data acquired
  - Binary dumps - import data file acquired into forensic tool capable of parsing binary dumps

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Still Learning…

- To identify:
  - differences/similarities between both JTAG methods
  - differences between analysis tools
  - how to combine JTAG boxes and analysis tools

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