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**REPORT**

**Test Results for Hardware Write Block Device:  
Tableau T8 Forensic USB Bridge (USB Interface)**

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**U.S. Department of Justice  
Office of Justice Programs**

810 Seventh Street N.W.  
Washington, DC 20531

**Michael B. Mukasey**  
*Attorney General*

**Jeffrey L. Sedgwick**  
*Acting Assistant Attorney General*

**David W. Hagy**  
*Director, National Institute of Justice*

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**AUG. 08**

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**David W. Hagy**

*Director, National Institute of Justice*

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**June 2008**

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## Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the National Institute of Justice (NIJ), the research and development organization of the U.S. Department of Justice, and the National Institute of Standards and Technology's (NIST's) Office of Law Enforcement Standards, and Information Technology Laboratory. CFTT is supported by other organizations, including the Federal Bureau of Investigation, the U.S. Department of Defense Cyber Crime Center, Internal Revenue Service Criminal Investigation's Electronic Crimes Program, and the U.S. Department of Homeland Security's Bureau of Immigration and Customs Enforcement, U.S. Customs and Border Protection, and U.S. Secret Service. The objective of the CFTT program is to provide measurable assurance to practitioners, researchers, and other applicable users that the tools used in computer forensics investigations provide accurate results. Accomplishing this requires the development of specifications and test methods for computer forensics tools and subsequent testing of specific tools against those specifications.

Test results provide the information necessary for developers to improve tools, users to make informed choices, and the legal community and others to understand the tools' capabilities. This approach to testing computer forensic tools is based on well-recognized methodologies for conformance and quality testing. The specifications and test methods are posted on the CFTT Web site (<http://www.cftt.nist.gov/>) for review and comment by the computer forensics community.

This document reports the results from testing the **Tableau T8 Forensic Bridge (USB Interface)** write blocker, against the *Hardware Write Blocker (HWB) Assertions and Test Plan Version 1.0* and *Hardware Write Blocker Device (HWB) Specification, Version 2.0*, available at the CFTT Web site ([http://www.cftt.nist.gov/hardware\\_write\\_block.htm](http://www.cftt.nist.gov/hardware_write_block.htm)). This specification identifies the following top-level tool requirements:

- A hardware write block (HWB) device shall not transmit a command to a protected storage device that modifies the data on the storage device.
- An HWB device shall return the data requested by a read operation.
- An HWB device shall return without modification any access-significant information requested from the drive.
- Any error condition reported by the storage device to the HWB device shall be reported to the host.

Test results from other software packages can be found on NIJ's computer forensics tool testing web page, <http://www.ojp.usdoj.gov/nij/topics/technology/electronic-crime/cftt.htm>.





# Test Results for Hardware Write Block Devices

Device Tested: Tableau T8 Forensic USB Bridge<sup>1</sup>  
Model: T8  
Serial No: T005A016186,000ecc010008030a  
Firmware: Jul 26 2005 15:01:41

Host to Blocker Interface: USB  
Blocker to Drive Interface: USB

Supplier: Tableau, LLC

Address: N8 W22195 Johnson Drive, Suite 100  
Waukesha, WI 53186  
<http://www.tableau.com/>

## 1 Results Summary by Requirements

- **An HWB device shall not transmit a command to a protected storage device that modifies the data on the storage device.**  
For all test cases run, the device always blocked any commands that would have changed user or operating system data stored on a protected drive.
- **An HWB device shall return the data requested by a read operation.**  
For all test cases run, the device always allowed commands to read the protected drive.
- **An HWB device shall return without modification any access-significant information requested from the drive.**  
For all test cases run, the device always returned access-significant information from the protected drive without modification.
- **Any error condition reported by the storage device to the HWB device shall be reported to the host.**  
For all test cases run, the device always returned error codes from the protected drive without modification.

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<sup>1</sup> Tableau produces this write block device for resale under various partner labels. See <http://www.tableau.com> for information on resellers.

## 2 Test Case Selection

Since a protocol analyzer was available for the interface between the blocker and the protected drive, the following test cases were appropriate:

- HWB-01
- HWB-03
- HWB-05
- HWB-06
- HWB-08
- HWB-09

For test case HWB-03, two variations were selected: file (attempt to use operating system commands to create and delete files and directories from a protected drive) and image (use an imaging tool to attempt to write to a protected drive).

## 3 Testing Environment

The tests were run in the NIST CFTT lab. This section describes the hardware (test computers and hard drives) available for testing.

### 3.1 Test Computers

One test computer, **JohnSteed**, with the following configuration was used:

Intel® Desktop Motherboard FIC IC-VL67 (865G; S478; 800MHz)  
BIOS Phoenix Award version v6.00PG  
Intel® Pentium™ 4 CPU  
Plextor DVDR PX-716A, ATAPI CD/DVD-ROM Drive  
Western Digital Corporation WD800JB-00JJC0, 80 GB ATA disk drive  
1.44 MB floppy drive  
Three IEEE 1394 ports  
Four USB ports

### 3.2 Protocol Analyzer

A Data Transit bus protocol analyzer (Bus Doctor Rx) was used to monitor and record commands sent from the host to the write blocker. Two identical protocol analyzers were available for monitoring commands.

One of two Dell laptop computers (either **Chip** or **Dale**) was connected to each protocol analyzer to record commands observed by the protocol analyzer.

### 3.3 Hard Disk Drives

Two USB interface devices were used in testing:

- 48-u12 is a Maxtor 3000LS with 80293248 sectors (40 GB).
- D4-thumb is a USB flash memory drive.

|                                  |       |           |           |             |             |      |                |
|----------------------------------|-------|-----------|-----------|-------------|-------------|------|----------------|
| Drive label: 48-U12              |       |           |           |             |             |      |                |
| 80293248 total number of sectors |       |           |           |             |             |      |                |
| Non-IDE disk                     |       |           |           |             |             |      |                |
| Model (F040L0)                   |       |           |           |             |             |      |                |
| N                                | Start | LBA       | Length    | Start C/H/S | End C/H/S   | boot | Partition type |
| 1                                | X     | 000016065 | 080276805 | 0001/000/01 | 1023/254/63 | 0F   | extended       |
| 2                                | S     | 000000063 | 000032067 | 0001/001/01 | 0002/254/63 | 01   | Fat12          |
| 3                                | x     | 000032130 | 000080325 | 0003/000/01 | 0007/254/63 | 05   | extended       |
| 4                                | S     | 000000063 | 000080262 | 0003/001/01 | 0007/254/63 | 0B   | Fat32          |
| 5                                | x     | 000112455 | 002345490 | 0008/000/01 | 0153/254/63 | 05   | extended       |
| 6                                | S     | 000000063 | 002345427 | 0008/001/01 | 0153/254/63 | 07   | NTFS           |
| 7                                | S     | 000000000 | 000000000 | 0000/000/00 | 0000/000/00 | 00   | empty entry    |
| 8                                | P     | 000000000 | 000000000 | 0000/000/00 | 0000/000/00 | 00   | empty entry    |
| 9                                | P     | 000000000 | 000000000 | 0000/000/00 | 0000/000/00 | 00   | empty entry    |
| 10                               | P     | 000000000 | 000000000 | 0000/000/00 | 0000/000/00 | 00   | empty entry    |
| Drive label: d4-thumb            |       |           |           |             |             |      |                |
| 505856 total number of sectors   |       |           |           |             |             |      |                |
| Model (usb2.0Flash Disk)         |       |           |           |             |             |      |                |

### 3.4 Support Software

The software in the following table was used to send commands to the protected drive. One widely used imaging tool, IXimager, was used to generate disk activity (reads and writes) consistent with a realistic scenario of an accidental modification of an unprotected hard drive during a forensic examination. This does not imply an endorsement of the imaging tool.

| Program  | Description   |
|----------|---|
| sendSCSI | A tool to send SCSI commands wrapped in the USB or IEEE 1394 (FireWire) protocols to a drive.   |
| FS-TST   | Software from the FS-TST tools was used to generate errors from the hard drive by trying to read beyond the end of the drive. The FS-TST software was also used to setup the hard drives and print partition tables and drive size. |
| IXimager | An imaging tool (ILook IXimager version 1.0, August 25, 2004) for test case 04-img.   |

## 4 Test Results

The main item of interest for interpreting the test results is determining the conformance of the device with the test assertions. Conformance with each assertion tested by a given test case is evaluated by examining the Blocker Input and Blocker Output boxes of the test report summary.

## 4.1 Test Results Report Key

A summary of the actual test results is presented in this report. The following table presents a description of each section of the test report summary.

| Heading            | Description   |
|--------------------|---|
| First Line         | Test case ID; name, model, and interface of device tested.  |
| Case Summary       | Test case summary from <i>Hardware Write Blocker (HWB) Assertions and Test Plan Version 1.0</i> .   |
| Assertions Tested  | The test assertions applicable to the test case, selected from <i>Hardware Write Blocker (HWB) Assertions and Test Plan Version 1.0</i> .   |
| Tester Name        | Name or initials of person executing test procedure.  |
| Test Date          | Time and date that test was started and completed.  |
| Test Configuration | Identification of the following: <ol style="list-style-type: none"> <li>1. Host computer for executing the test case.</li> <li>2. Laptop attached to each protocol analyzer.</li> <li>3. Protocol analyzers monitoring each interface.</li> <li>4. Interface between host and blocker.</li> <li>5. Interface between blocker and protected drive.</li> <li>6. Execution environment for tool sending commands from the host.</li> </ol>   |
| Hard Drives Used   | Description of the protected hard drive.  |
| Blocker Input      | A list of commands sent from the host to the blocker. <p>For test case HWB–01, a list of each command code observed on the bus between the blocker and the protected drive and a count of the number of times the command was observed is provided.</p> <p>For test cases HWB–03 and HWB–06, a list of each command sent and the number of times the command was sent.</p> <p>For test case HWB–05, a string of known data from a given location is provided for reference.</p> |
| Blocker Output     | A list of commands observed by the protocol analyzer on the bus from the blocker to the protected drive. <p>For test case HWB–01, a list of each command code observed on the bus between the blocker and the protected drive and a count of the number of times the command was observed is provided. Also, a count of the number of unique commands sent (from the Blocker Input box) and a count of the number of unique commands observed on the bus</p>                    |

| Heading  | Description   |
|----------|---|
|          | <p>between the blocker and the protected drive.</p> <p>For test cases HWB-03 and HWB-06, a list of each command sent and the number of times the command was sent.</p> <p>For test case HWB-05, a string read from a given location is provided for comparison to known data.</p> <p>For test case HWB-08, the number of sectors determined for the protected drive and the partition table are provided.</p> <p>For test case HWB-09, any error return obtained by trying to access a nonexistent sector of the drive is provided.</p> |
| Results  | Expected and actual results for each assertion tested.  |
| Analysis | Whether or not the expected results were achieved.  |

## 4.2 Test Details

### 4.2.1 HWB-01

| Test Case HWB-01 Variation hwb-01 Tableau T8 USB |   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
|--|---|-------|----------|---|-------|---|-----|---|------|---|---------|---|------|---|-------------|---|-------|---|-----------|
| Case Summary:                                    | HWB-01 Identify commands blocked by the HWB.  |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| Assertions Tested:                               | <p>HWB-AM-01 The HWB shall not transmit any modifying category operation to the protected storage device.</p> <p>HWB-AM-05 The action that a HWB device takes for any commands not assigned to the modifying, read or information categories is defined by the vendor.</p>  |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| Tester Name:                                     | rpa   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| Test Date:                                       | <p>run start Wed Apr 4 13:54:43 2007</p> <p>run finish Thu Apr 5 10:34:41 2007</p>  |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| Test Configuration:                              | <p>HOST: johnsteed</p> <p>HostToBlocker Monitor: dale</p> <p>HostToBlocker PA: aa00111</p> <p>HostToBlocker Interface: usb</p> <p>BlockerToDrive Monitor: chip</p> <p>BlockerToDrive PA: aa00155</p> <p>BlockerToDrive Interface: usb</p> <p>Run Environment: linux</p>   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| Drives:  | <p>Protected drive: 48-u12</p> <p>48-u12 is a Maxtor 3000LS with 80293248 sectors (40 GB)</p>   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| Blocker Input:                                   | <p>Commands Sent to Blocker</p> <table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>BLANK</td> </tr> <tr> <td>1</td> <td>CHG</td> </tr> <tr> <td>1</td> <td>CLOS</td> </tr> <tr> <td>1</td> <td>COMPARE</td> </tr> <tr> <td>1</td> <td>COPY</td> </tr> <tr> <td>1</td> <td>COPY/VERIFY</td> </tr> <tr> <td>1</td> <td>ERASE</td> </tr> <tr> <td>1</td> <td>ERASE(10)</td> </tr> </tbody> </table> | Count | Commands | 1 | BLANK | 1 | CHG | 1 | CLOS | 1 | COMPARE | 1 | COPY | 1 | COPY/VERIFY | 1 | ERASE | 1 | ERASE(10) |
| Count  | Commands  |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | BLANK   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | CHG   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | CLOS  |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | COMPARE   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | COPY  |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | COPY/VERIFY   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | ERASE   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |
| 1  | ERASE(10)   |       |          |   |       |   |     |   |      |   |         |   |      |   |             |   |       |   |           |

**Test Case HWB-01 Variation hwb-01 Tableau T8 USB**

|  |                  |                 |
|--|------------------|-----------------|
|  | 1                | FORMAT          |
|  | 3                | GET             |
|  | 1                | INQUIRY         |
|  | 1                | LK/UNLK         |
|  | 1                | LOAD/UNLOAD     |
|  | 2                | LOG             |
|  | 1                | MECH            |
|  | 1                | MEDIUM          |
|  | 4                | MODE            |
|  | 1                | PAUSE/RESUME    |
|  | 2                | PERSISTENT      |
|  | 5                | PLAY            |
|  | 2                | PLY             |
|  | 1                | PRE-FETCH       |
|  | 1                | PREVENT/ALLOW   |
|  | 7                | RD              |
|  | 13               | READ            |
|  | 547              | READ(10)        |
|  | 1                | READ(12)        |
|  | 1                | REASSIGN        |
|  | 1                | RECEIVE         |
|  | 1                | RECIEVE(6)      |
|  | 1                | RECOVER         |
|  | 1                | RELEASE(10)     |
|  | 1                | RELEASE(6)      |
|  | 1                | REPAIR          |
|  | 5                | REPORT          |
|  | 1                | REQ             |
|  | 232              | REQUEST_SENSE   |
|  | 1                | RESERVE(10)     |
|  | 1                | RESERVE(6)      |
|  | 1                | REZERO          |
|  | 65               | Reserved        |
|  | 1                | SCAN            |
|  | 1                | SEEK(10)        |
|  | 1                | SEEK(6)         |
|  | 9                | SEND            |
|  | 1                | SEND(6)         |
|  | 4                | SET             |
|  | 1                | SND             |
|  | 1                | SPACE           |
|  | 6                | SRCH            |
|  | 1                | START/STOP      |
|  | 1                | STOP            |
|  | 1                | SYNCH           |
|  | 1                | TEST            |
|  | 1                | UPDATE          |
|  | 1                | VERIFY          |
|  | 1                | VERIFY(12)      |
|  | 1                | VERIFY(6)       |
|  | 5                | WRITE           |
|  | 1                | WRITE(10)       |
|  | 1                | WRITE(12)       |
|  | 1                | WRITE/VERIFY    |
|  | 1                | XDREAD(10)      |
|  | 1                | XDWRITE(10)     |
|  | 1                | XDWRITEREAD(10) |
|  | 1                | XPWRITE(10)     |
|  | 66 commands sent |                 |

| Blocker Output: | Commands Allowed by Blocker  |       |          |   |               |     |          |
|-----------------|--|-------|----------|---|---------------|-----|----------|
|                 | <table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PREVENT/ALLOW</td> </tr> <tr> <td>547</td> <td>READ(10)</td> </tr> </tbody> </table> | Count | Commands | 1 | PREVENT/ALLOW | 547 | READ(10) |
| Count           | Commands   |       |          |   |               |     |          |
| 1               | PREVENT/ALLOW  |       |          |   |               |     |          |
| 547             | READ(10)   |       |          |   |               |     |          |

| Test Case HWB-01 Variation hwb-01 Tableau T8 USB |  |                            |
|--|--|----------------------------|
|  | 1                                      | REQUEST_SENSE              |
|  | 1                                      | START/STOP                 |
|  | 1                                      | SYNCH                      |
|  | 1                                      | TEST                       |
|  | 1                                      | VERIFY                     |
| 66 commands sent, 7 commands allowed             |  |                            |
| Results:   | <b>Assertion &amp; Expected Result</b> | <b>Actual Result</b>       |
|  | AM-01 Modifying commands blocked       | Modifying commands blocked |
|  | AM-05 HWB behavior recorded            | HWB behavior recorded      |
| Analysis:  | Expected results achieved              |                            |

## 4.2.2 HWB-03-file

| Test Case HWB-03 Variation hwb-03-file Tableau T8 USB |  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
|---|--|-----------------------------|---------------|----------------------------------|----------------------------|-----------------------------|-----------------------|-----|----------|-----|---------------|-----|------|
| Case Summary:   | HWB-03 Identify commands blocked by the HWB while attempting to modify a protected drive with forensic tools.  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Assertions Tested:                                    | HWB-AM-01 The HWB shall not transmit any modifying category operation to the protected storage device.<br>HWB-AM-05 The action that a HWB device takes for any commands not assigned to the modifying, read or information categories is defined by the vendor.  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Tester Name:  | rpa  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Test Date:  | run start Thu Apr 5 14:20:28 2007<br>run finish Mon Apr 9 10:06:34 2007  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Test Configuration:                                   | HOST: johnsteed<br>HostToBlocker Monitor: dale<br>HostToBlocker PA: aa00111<br>HostToBlocker Interface: usb<br>BlockerToDrive Monitor: chip<br>BlockerToDrive PA: aa00155<br>BlockerToDrive Interface: usb<br>Run Environment: DOS   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Drives:   | Protected drive: 48-u12<br>48-u12 is a Maxtor 3000LS with 80293248 sectors (40 GB)   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Blocker Input:  | Commands Sent to Blocker <table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>MODE</td> </tr> <tr> <td>14</td> <td>READ</td> </tr> <tr> <td>592</td> <td>READ(10)</td> </tr> <tr> <td>124</td> <td>REQUEST_SENSE</td> </tr> <tr> <td>162</td> <td>TEST</td> </tr> </tbody> </table> | Count                       | Commands      | 7                                | MODE                       | 14                          | READ                  | 592 | READ(10) | 124 | REQUEST_SENSE | 162 | TEST |
| Count   | Commands   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 7   | MODE   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 14  | READ   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 592   | READ(10)   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 124   | REQUEST_SENSE  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 162   | TEST   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Blocker Output:                                       | Commands Allowed by Blocker <table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>592</td> <td>READ(10)</td> </tr> <tr> <td>7</td> <td>TEST</td> </tr> </tbody> </table>  | Count                       | Commands      | 592                              | READ(10)                   | 7                           | TEST                  |     |          |     |               |     |      |
| Count   | Commands   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 592   | READ(10)   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| 7   | TEST   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Results:  | <table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-01 Modifying commands blocked</td> <td>Modifying commands blocked</td> </tr> <tr> <td>AM-05 HWB behavior recorded</td> <td>HWB behavior recorded</td> </tr> </tbody> </table>                           | Assertion & Expected Result | Actual Result | AM-01 Modifying commands blocked | Modifying commands blocked | AM-05 HWB behavior recorded | HWB behavior recorded |     |          |     |               |     |      |
| Assertion & Expected Result                           | Actual Result  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| AM-01 Modifying commands blocked                      | Modifying commands blocked   |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| AM-05 HWB behavior recorded                           | HWB behavior recorded  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |
| Analysis:   | Expected results achieved  |                             |               |                                  |                            |                             |                       |     |          |     |               |     |      |



### 4.2.3 HWB-03-img

| Test Case HWB-03 Variation hwb-03-img Tableau T8 USB |  |                             |               |                                  |                            |                             |                       |
|--|--|-----------------------------|---------------|----------------------------------|----------------------------|-----------------------------|-----------------------|
| Case Summary:  | HWB-03 Identify commands blocked by the HWB while attempting to modify a protected drive with forensic tools.  |                             |               |                                  |                            |                             |                       |
| Assertions Tested:                                   | HWB-AM-01 The HWB shall not transmit any modifying category operation to the protected storage device.<br>HWB-AM-05 The action that a HWB device takes for any commands not assigned to the modifying, read or information categories is defined by the vendor.  |                             |               |                                  |                            |                             |                       |
| Tester Name:   | rpa  |                             |               |                                  |                            |                             |                       |
| Test Date:   | run start Mon Apr 9 11:28:15 2007<br>run finish Mon Apr 9 14:05:55 2007  |                             |               |                                  |                            |                             |                       |
| Test Configuration:                                  | HOST: johnsteeed<br>HostToBlocker Monitor: dale<br>HostToBlocker PA: aa00111<br>HostToBlocker Interface: usb<br>BlockerToDrive Monitor: chip<br>BlockerToDrive PA: aa00155<br>BlockerToDrive Interface: usb<br>Run Environment: IX   |                             |               |                                  |                            |                             |                       |
| Drives:  | Protected drive: D4-thumB  |                             |               |                                  |                            |                             |                       |
| Blocker Input:                                       | Commands Sent to Blocker<br><table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>READ(10)</td> </tr> <tr> <td>11</td> <td>TEST</td> </tr> </tbody> </table>   | Count                       | Commands      | 5                                | READ(10)                   | 11                          | TEST                  |
| Count  | Commands   |                             |               |                                  |                            |                             |                       |
| 5  | READ(10)   |                             |               |                                  |                            |                             |                       |
| 11   | TEST   |                             |               |                                  |                            |                             |                       |
| Blocker Output:                                      | Commands Allowed by Blocker<br><table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>READ(10)</td> </tr> <tr> <td>11</td> <td>TEST</td> </tr> </tbody> </table>  | Count                       | Commands      | 5                                | READ(10)                   | 11                          | TEST                  |
| Count  | Commands   |                             |               |                                  |                            |                             |                       |
| 5  | READ(10)   |                             |               |                                  |                            |                             |                       |
| 11   | TEST   |                             |               |                                  |                            |                             |                       |
| Results:   | <table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-01 Modifying commands blocked</td> <td>Modifying commands blocked</td> </tr> <tr> <td>AM-05 HWB behavior recorded</td> <td>HWB behavior recorded</td> </tr> </tbody> </table> | Assertion & Expected Result | Actual Result | AM-01 Modifying commands blocked | Modifying commands blocked | AM-05 HWB behavior recorded | HWB behavior recorded |
| Assertion & Expected Result                          | Actual Result  |                             |               |                                  |                            |                             |                       |
| AM-01 Modifying commands blocked                     | Modifying commands blocked   |                             |               |                                  |                            |                             |                       |
| AM-05 HWB behavior recorded                          | HWB behavior recorded  |                             |               |                                  |                            |                             |                       |
| Analysis:  | Expected results achieved  |                             |               |                                  |                            |                             |                       |

## 4.2.4 HWB-05

| Test Case HWB-05 Variation hwb-05 Tableau T8 USB |   |                             |               |                             |                       |
|--|---|-----------------------------|---------------|-----------------------------|-----------------------|
| Case Summary:                                    | HWB-05 Identify read commands allowed by the HWB.   |                             |               |                             |                       |
| Assertions Tested:                               | HWB-AM-02 If the host sends a read category operation to the HWB and no error is returned from the protected storage device to the HWB, then the data addressed by the original read operation is returned to the host.           |                             |               |                             |                       |
| Tester Name:                                     | rpa   |                             |               |                             |                       |
| Test Date:                                       | run start Wed Apr 11 10:38:39 2007<br>run finish Wed Apr 11 10:43:35 2007   |                             |               |                             |                       |
| Test Configuration:                              | HOST: johnsteed<br>HostToBlocker Monitor: dale<br>HostToBlocker PA: aa00111<br>HostToBlocker Interface: usb<br>BlockerToDrive Monitor: none<br>BlockerToDrive PA: none<br>BlockerToDrive Interface: usb<br>Run Environment: linux |                             |               |                             |                       |
| Drives:  | Protected drive: 48-u12<br>48-u12 is a Maxtor 3000LS with 80293248 sectors (40 GB)  |                             |               |                             |                       |
| Blocker Input:                                   | Commands Sent to Blocker<br>Read sector 32767 for the string: 00002/010/08 000000032767   |                             |               |                             |                       |
| Blocker Output:                                  | 00002/010/08 000000032767   |                             |               |                             |                       |
| Results:   | <table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-02 Read commands allowed</td> <td>Read commands allowed</td> </tr> </tbody> </table>           | Assertion & Expected Result | Actual Result | AM-02 Read commands allowed | Read commands allowed |
| Assertion & Expected Result                      | Actual Result   |                             |               |                             |                       |
| AM-02 Read commands allowed                      | Read commands allowed   |                             |               |                             |                       |
| Analysis:  | Expected results achieved   |                             |               |                             |                       |

## 4.2.5 HWB-06

| Test Case HWB-06 Variation hwb-06-img Tableau T8 USB |  |                             |               |                             |                       |  |  |                             |                       |
|--|--|-----------------------------|---------------|-----------------------------|-----------------------|--|--|-----------------------------|-----------------------|
| Case Summary:  | HWB-06 Identify read and information commands used by forensic tools and allowed by the HWB.   |                             |               |                             |                       |  |  |                             |                       |
| Assertions Tested:                                   | <p>HWB-AM-02 If the host sends a read category operation to the HWB and no error is returned from the protected storage device to the HWB, then the data addressed by the original read operation is returned to the host.</p> <p>HWB-AM-03 If the host sends an information category operation to the HWB and if there is no error on the protected storage device, then any returned access-significant information is returned to the host without modification.</p> <p>HWB-AM-05 The action that a HWB device takes for any commands not assigned to the modifying, read or information categories is defined by the vendor.</p> |                             |               |                             |                       |  |  |                             |                       |
| Tester Name:   | rpa  |                             |               |                             |                       |  |  |                             |                       |
| Test Date:   | run start Wed Apr 11 11:02:37 2007<br>run finish Wed Apr 11 11:45:15 2007  |                             |               |                             |                       |  |  |                             |                       |
| Test Configuration:                                  | HOST: johnsteeed<br>HostToBlocker Monitor: dale<br>HostToBlocker PA: aa00111<br>HostToBlocker Interface: usb<br>BlockerToDrive Monitor: chip<br>BlockerToDrive PA: aa00155<br>BlockerToDrive Interface: usb<br>Run Environment: IX   |                             |               |                             |                       |  |  |                             |                       |
| Drives:  | Protected drive: D4-thumB  |                             |               |                             |                       |  |  |                             |                       |
| Blocker Input:                                       | Commands Sent to Blocker <table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>INQUIRY</td> </tr> <tr> <td>9</td> <td>READ(10)</td> </tr> <tr> <td>21</td> <td>TEST</td> </tr> </tbody> </table> <p>3 commands sent</p>  | Count                       | Commands      | 2                           | INQUIRY               | 9  | READ(10)                                 | 21                          | TEST                  |
| Count  | Commands   |                             |               |                             |                       |  |  |                             |                       |
| 2  | INQUIRY  |                             |               |                             |                       |  |  |                             |                       |
| 9  | READ(10)   |                             |               |                             |                       |  |  |                             |                       |
| 21   | TEST   |                             |               |                             |                       |  |  |                             |                       |
| Blocker Output:                                      | Commands Allowed by Blocker <table border="1"> <thead> <tr> <th>Count</th> <th>Commands</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>READ(10)</td> </tr> <tr> <td>21</td> <td>TEST</td> </tr> </tbody> </table> <p>3 commands sent, 2 commands allowed</p>  | Count                       | Commands      | 9                           | READ(10)              | 21   | TEST                                     |                             |                       |
| Count  | Commands   |                             |               |                             |                       |  |  |                             |                       |
| 9  | READ(10)   |                             |               |                             |                       |  |  |                             |                       |
| 21   | TEST   |                             |               |                             |                       |  |  |                             |                       |
| Results:   | <table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-02 Read commands allowed</td> <td>Read commands allowed</td> </tr> <tr> <td>AM-03 Access Significant Information unaltered</td> <td>Access Significant Information unaltered</td> </tr> <tr> <td>AM-05 HWB behavior recorded</td> <td>HWB behavior recorded</td> </tr> </tbody> </table>   | Assertion & Expected Result | Actual Result | AM-02 Read commands allowed | Read commands allowed | AM-03 Access Significant Information unaltered | Access Significant Information unaltered | AM-05 HWB behavior recorded | HWB behavior recorded |
| Assertion & Expected Result                          | Actual Result  |                             |               |                             |                       |  |  |                             |                       |
| AM-02 Read commands allowed                          | Read commands allowed  |                             |               |                             |                       |  |  |                             |                       |
| AM-03 Access Significant Information unaltered       | Access Significant Information unaltered   |                             |               |                             |                       |  |  |                             |                       |
| AM-05 HWB behavior recorded                          | HWB behavior recorded  |                             |               |                             |                       |  |  |                             |                       |
| Analysis:  | Expected results achieved  |                             |               |                             |                       |  |  |                             |                       |

## 4.2.6 HWB-08

| Test Case HWB-08 Variation hwb-08 Tableau T8 USB |   |                             |               |  |  |
|--|---|-----------------------------|---------------|--|--|
| Case Summary:                                    | HWB-08 Identify access significant information unmodified by the HWB.   |                             |               |  |  |
| Assertions Tested:                               | HWB-AM-03 If the host sends an information category operation to the HWB and if there is no error on the protected storage device, then any returned access-significant information is returned to the host without modification.                             |                             |               |  |  |
| Tester Name:                                     | rpa   |                             |               |  |  |
| Test Date:                                       | run start Wed Apr 11 14:18:24 2007<br>run finish Wed Apr 11 14:23:26 2007   |                             |               |  |  |
| Test Configuration:                              | HOST: johnsteed<br>HostToBlocker Monitor: none<br>HostToBlocker PA: none<br>HostToBlocker Interface: usb<br>BlockerToDrive Monitor: none<br>BlockerToDrive PA: none<br>BlockerToDrive Interface: usb<br>Run Environment: linux                                |                             |               |  |  |
| Drives:  | Protected drive: 48-u12<br>48-u12 is a Maxtor 3000LS with 80293248 sectors (40 GB)  |                             |               |  |  |
| Blocker Output:                                  | cmd: /mnt/floppy/partab hwb-08 johnsteed rpa /dev/sda -all<br>80293248 total number of sectors  |                             |               |  |  |
| Results:   | <table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-03 Access Significant Information unaltered</td> <td>Access Significant Information unaltered</td> </tr> </tbody> </table> | Assertion & Expected Result | Actual Result | AM-03 Access Significant Information unaltered | Access Significant Information unaltered |
|  | Assertion & Expected Result   | Actual Result               |               |  |  |
| AM-03 Access Significant Information unaltered   | Access Significant Information unaltered  |                             |               |  |  |
| Analysis:  | Expected results achieved   |                             |               |  |  |

## 4.2.7 HWB-09

| Test Case HWB-09 Variation hwb-09 Tableau T8 USB |   |                             |               |                           |                     |
|--|---|-----------------------------|---------------|---------------------------|---------------------|
| Case Summary:                                    | HWB-09 Determine if an error on the protected drive is returned to the host.  |                             |               |                           |                     |
| Assertions Tested:                               | HWB-AM-04 If the host sends an operation to the HWB and if the operation results in an unresolved error on the protected storage device, then the HWB shall return an error status code to the host.  |                             |               |                           |                     |
| Tester Name:                                     | rpa   |                             |               |                           |                     |
| Test Date:                                       | run start Wed Apr 11 14:26:43 2007<br>run finish Wed Apr 11 14:50:14 2007   |                             |               |                           |                     |
| Test Configuration:                              | HOST: johnsteed<br>HostToBlocker Monitor: none<br>HostToBlocker PA: none<br>HostToBlocker Interface: usb<br>BlockerToDrive Monitor: none<br>BlockerToDrive PA: none<br>BlockerToDrive Interface: usb<br>Run Environment: linux  |                             |               |                           |                     |
| Drives:  | Protected drive: 48-u12<br>48-u12 is a Maxtor 3000LS with 80293248 sectors (40 GB)  |                             |               |                           |                     |
| Blocker Output:                                  | 04997/254/63 (max cyl/hd values)<br>04998/255/63 (number of cyl/hd)<br>80293248 total number of sectors<br>cmd: /mnt/floppy/diskchg hwb-09 johnsteed rpa /dev/sda -read 90293248 0 2<br>Disk addr lba 90293248 C/H/S 5620/126/11 offset 0<br>Disk read error 0xFFFFFFFF at sector 5620/126/11 |                             |               |                           |                     |
| Results:   | <table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-04 Error code returned</td> <td>Error code returned</td> </tr> </tbody> </table>   | Assertion & Expected Result | Actual Result | AM-04 Error code returned | Error code returned |
| Assertion & Expected Result                      | Actual Result   |                             |               |                           |                     |
| AM-04 Error code returned                        | Error code returned   |                             |               |                           |                     |
| Analysis:  | Expected results achieved   |                             |               |                           |                     |

## About the National Institute of Justice

NIJ is the research, development, and evaluation agency of the U.S. Department of Justice. NIJ's mission is to advance scientific research, development, and evaluation to enhance the administration of justice and public safety. NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 U.S.C. §§ 3721–3723).

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### Strategic Goals

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#### Creating relevant knowledge and tools

1. Partner with State and local practitioners and policymakers to identify social science research and technology needs.
2. Create scientific, relevant, and reliable knowledge—with a particular emphasis on terrorism, violent crime, drugs and crime, cost-effectiveness, and community-based efforts—to enhance the administration of justice and public safety.
3. Develop affordable and effective tools and technologies to enhance the administration of justice and public safety.

#### Dissemination

4. Disseminate relevant knowledge and information to practitioners and policymakers in an understandable, timely, and concise manner.
5. Act as an honest broker to identify the information, tools, and technologies that respond to the needs of stakeholders.

#### Agency management

6. Practice fairness and openness in the research and development process.
7. Ensure professionalism, excellence, accountability, cost-effectiveness, and integrity in the management and conduct of NIJ activities and programs.

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or contact:

National Criminal Justice  
Reference Service  
P.O. Box 6000  
Rockville, MD 20849–6000  
800–851–3420  
<http://www.ncjrs.gov>