



# Test Results for Write Protected Drive - **Apricorn Aegis Fortress Firmware Version 0510**

Federated Testing Suite for Hardware Write Blocking

May 2020



**Homeland  
Security**

Science and Technology

This report was prepared for the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) by the Office of Law Enforcement Standards of the National Institute of Standards and Technology.

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## Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), National Institute of Justice (NIJ), and National Institute of Standards and Technology (NIST) Special Programs Office and Information Technology Laboratory (ITL). CFTT is supported by other organizations, including the Federal Bureau of Investigation; U.S. Department of Defense Cyber Crime Center; U.S. Internal Revenue Service Criminal Investigation Division Electronic Crimes Program; and the DHS Bureau of Immigration and Customs Enforcement, Customs and Border Protection and 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. The CFTT approach to testing computer forensics tools is based on well-recognized methodologies for conformance and quality testing. Interested parties in the computer forensics community can review and comment on the specifications and test methods posted on the CFTT Web site (<https://www.cftt.nist.gov/>).

This document reports the results from testing the read-only function of the Apricorn Aegis Fortress firmware version 0510 using the CFTT Federated Testing Test Suite for Hardware Write Blocking, Version 3.1.

Federated Testing is an expansion of the CFTT program to provide forensic investigators and labs with test materials for tool testing and to support shared test reports. The goal of Federated Testing is to help forensic investigators to test the tools that they use in their labs and to enable sharing of tool test results. CFTT's Federated Testing Forensic Tool Testing Environment and included test suites can be downloaded from <https://www.cftt.nist.gov/federated-testing.html> and used to test forensic tools. The results can be optionally shared with CFTT, reviewed by CFTT staff, and then shared with the community.

Test results from this and other tools can be found on DHS's computer forensics web page, <https://www.dhs.gov/science-and-technology/nist-cftt-reports>.

## How to Read This Report

This report is organized into the following sections:

1. **Tested Device Description:** The device name, version, and vendor information are listed.
2. **Testing Organization:** Contact information and approvals.
3. **Results Summary:** This section identifies any significant anomalies observed in the test runs. This section provides a narrative of key findings, identifying where the device meets expectations, and provides a summary of any ways the device did not meet expectations. The section also provides any observations of interest about the device or about testing the device, including any observed limitations on device use.
4. **Test Environment:** Description of hardware and software used in device testing.
5. **Test Result Details by Case:** Automatically generated test results that identify anomalies.
6. **Appendix:** Additional details. Additional details for each test case.

# Federated Testing Test Results for Write-Protected Drive: Apricorn Aegis Fortress Firmware Version 0510

## 1 Device Description

Device Name: Aegis Fortress  
Firmware Version: 0510

Manufacturer Contact:

Manufacturer: Apricorn  
Address: 12191 Kirkham Road  
Poway, CA 92064  
Tel: (800) 458-5448  
Website: <https://www.apricorn.com>

## 2 Testing Organization

Organization conducting test: Apricorn  
Contact: Kevin Su  
Report date: 8-22-19  
Authored by: Mark D

## 3 Results Summary

Data on the test device was unchanged.

## 4 Test Environment

Hardware: tests were run using a computer with an ASUS ROG STRIX B450-F Gaming motherboard, AMD Ryzen 5 2600 Six Core CPU, and 16 GB DDR4 Corsair memory.

Aegis Fortress, firmware version 0510. Put the drive in read-only mode before testing to repeat the tests.



## 5 Test Result Details by Case

This section presents test results grouped by case.

### 5.1 FT-HWB-USB

#### 5.1.1 Test Case Description

Test a USB key or USB portable drive's ability to write-protect when Read-Only mode is enabled. Test the ability of the USB key or USB portable drive to block write commands from the ATA and SCSI command sets issued from a test computer.

#### 5.1.2 Test Drive Description

Manufacturer, model & size of the test drive used for this test: Aegis Fortress (A25-3PL2546F-xxxx) configured in read-only mode; 1 TB used for the test.

#### 5.1.3 Test Evaluation Criteria

The number of 'writes not blocked' should be 0.

#### 5.1.4 Test Case Results

The following table presents results for the test case.

| Test Results for FT-HWB-USB  |                     |                    |
|------------------------------|---------------------|--------------------|
| Computer to Drive Connection | Write Commands Sent | Writes Not Blocked |
| USB 3                        | 36                  | 0                  |

#### 5.1.5 Case Summary

Test drive unchanged.

## 6 Appendix: Additional Details

### 6.1 FT-HWB-USB

#### 6.1.1 USB 3

```
/usr/lib/cgi-bin/test-hwb Thu Aug 22 09:10:58 2019
@(#) test-hwb.c Linux Version 1.3 created 05/17/18 at 15:05:48
compiled May 17 2018 15:06:05 with gcc Version 5.4.0 20160609
@(#) wrapper.c Linux Version 1.5 support lib created 08/03/17 at 13:05:44
@(#) ataraw.c Linux Version 1.3 support lib created 08/03/17 at 13:05:44
@(#) ataraw.h Linux Version 1.3 created 08/03/17 at 13:06:12
cmd: /usr/lib/cgi-bin/test-hwb -bh -p /media/cftt/FT-LOGS/FT-HWB-usb/ Mark_D.
AMD-5 FT-HWB-usb usb3 usb /dev/sda
operator: Mark_D.
host: AMD-5
test case: FT-HWB-usb
connection type: usb3
drive/media type: usb
device: /dev/sda
device type (ATA or SCSI - /usr/lib/cgi-bin/test-hwb tries to guess):
    SCSI
```

| Opcode | Command Name                   | Status | Lba/Sector | Result    |
|--------|--------------------------------|--------|------------|-----------|
| 30h    | (ATA) WRITE SECTOR(S)          | Sent   | 12288      | Unchanged |
| CAh    | (ATA) WRITE DMA                | Sent   | 51712      | Unchanged |
| CCh    | (ATA) WRITE DMA QUEUED         | Sent   | 52224      | Unchanged |
| C5h    | (ATA) WRITE MULTIPLE           | Sent   | 50432      | Unchanged |
| 31h    | (ATA) WRITE SECTOR(S)          | Sent   | 12544      | Unchanged |
|        | w/o retries                    |        |            |           |
| CBh    | (ATA) WRITE DMA w/o retries    | Sent   | 51968      | Unchanged |
| 3Ch    | (ATA) WRITE VERIFY             | Sent   | 15360      | Unchanged |
| 34h    | (ATA) WRITE SECTOR(S) EXT      | Sent   | 13312      | Unchanged |
| 39h    | (ATA) WRITE MULTIPLE EXT       | Sent   | 14592      | Unchanged |
| CEh    | (ATA) WRITE MULTIPLE FUA EXT   | Sent   | 52736      | Unchanged |
| 3Bh    | (ATA) WRITE STREAM EXT         | Sent   | 15104      | Unchanged |
| 35h    | (ATA) WRITE DMA EXT            | Sent   | 13568      | Unchanged |
| 3Dh    | (ATA) WRITE DMA FUA EXT        | Sent   | 15616      | Unchanged |
| 36h    | (ATA) WRITE DMA QUEUED EXT     | Sent   | 13824      | Unchanged |
| 3Eh    | (ATA) WRITE DMA QUEUED FUA EXT | Sent   | 15872      | Unchanged |
| 3Ah    | (ATA) WRITE STREAM DMA EXT     | Sent   | 14848      | Unchanged |
| 38h    | (ATA) CFA WRITE SECTORS        | Sent   | 14336      | Unchanged |
|        | W/O ERASE                      |        |            |           |
| CDh    | (ATA) CFA WRITE MULTIPLE       | Sent   | 52480      | Unchanged |
|        | W/O ERASE                      |        |            |           |
| C0h    | (ATA) CFA ERASE SECTORS        | Sent   | 49152      | Unchanged |
| 0Ah    | (SCSI) WRITE 6                 | Sent   | 2576       | Unchanged |
| 2Ah    | (SCSI) WRITE 10                | Sent   | 10768      | Unchanged |
| AAh    | (SCSI) WRITE 12                | Sent   | 43536      | Unchanged |
| 8Ah    | (SCSI) WRITE 16                | Sent   | 35344      | Unchanged |
| 7Fh    | (SCSI) WRITE 32                | Sent   | 32528      | Unchanged |
| 2Eh    | (SCSI) WRITE AND VERIFY 10     | Sent   | 11792      | Unchanged |
| AEh    | (SCSI) WRITE AND VERIFY 12     | Sent   | 44560      | Unchanged |
| 8Eh    | (SCSI) WRITE AND VERIFY 16     | Sent   | 36368      | Unchanged |
| 7Fh    | (SCSI) WRITE AND VERIFY 32     | Sent   | 32529      | Unchanged |
| 41h    | (SCSI) WRITE SAME 10           | Sent   | 16656      | Unchanged |
| 93h    | (SCSI) WRITE SAME 16           | Sent   | 37648      | Unchanged |

|     |                               |      |       |           |
|-----|-------------------------------|------|-------|-----------|
| 7Fh | (SCSI) WRITE SAME 32          | Sent | 32530 | Unchanged |
| 3Fh | (SCSI) WRITE LONG 10          | Sent | 16144 | Unchanged |
| 9Fh | (SCSI) WRITE LONG 16          | Sent | 40720 | Unchanged |
| 32h | (ATA) WRITE LONG              | Sent | 12800 | Unchanged |
| 33h | (ATA) WRITE LONG w/o retries  | Sent | 13056 | Unchanged |
| 45h | (ATA) WRITE UNCORRECTABLE EXT | Sent | 17664 | Unchanged |

36 writes sent, 0 write(s) not blocked, 0 write commands unsupported.

RESULTS: test drive unchanged

run start Thu Aug 22 09:10:58 2019  
run finish Thu Aug 22 09:10:58 2019  
elapsed time 0:0:0  
Normal exit

Status Key:

Sent - the ioctl used to send this command returned without error and the ATA error bit (if applicable) was not set.

Not supported - the ioctl used to send this command return with an error status or the command completed with the ATA error bit set.

Test terminated - the test was terminated for dangerous commands because 3 or more previous commands were not blocked.

Result Key:

Unchanged - no changes to the test drive were detected.

Not Blocked - sending this command resulted in a change to the test drive.

This command was NOT blocked!

n/a - Not applicable.

## 6.2 Test Setup & Analysis Tool Versions

Version numbers of tools used are listed.

| Setup & Analysis Tool Versions                            |
|---|
| test-hwb.c Linux Version 1.3 created 05/17/18 at 15:05:48 |

Tool: @(#) ft\_hwb\_prt\_test\_report.py Version 1.2 created 04/26/18 at 10:11:19

OS: Linux Version 4.13.0-37-generic

Federated Testing Version 3.1, released 5/25/2018