

Hammer™



User's Guide

Version 5.0



"Helping You Find What You're Looking For"

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Your Data Is Most Important!

Your data and the security of your data are paramount. CPR Tools recognizes this and has developed a unique and bold method for ensuring that the security of your data is maintained from the beginning of the erasure process through the successful end of the erasure process.

Using Hammer™, you have three choices when it comes to erasing your data:

1. Normal 'wiping' of your data (Clear)
2. Security Erase (Purge) with Standard Password
3. Security Erase (Purge) with Random Password¹

CPR Tools offers this diverse choice of methods so that informed users may select configurations which apply to their unique circumstances.

CPR Tools recommends using the maximum security possible when eradicating data because we understand that the owner of the data is not always in physical control of the drive which contains the data. At some point, control is relinquished to someone else to perform the actual data erasure. By following CPR Tools' recommended implementation of Security Erase, you are stating that the security of your data is more important than the drive itself.

Begin the process by *locking your drive with a randomly generated password*. Using a random password ensures that the data is completely inaccessible.

When a drive is locked, all data access commands are disabled.

- When a standard password is used, Hammer will unconditionally unlock the drive, independent of the success of the operation. (Hammer™ default)
- With a random password your drive remains locked until the Security Erase process completes successfully. (CPR Tools recommendation)

If the Security Erase process does not complete or is interrupted, your drive remains locked. Your data remains safe and completely inaccessible. Simply re-attach the drive to Hammer™ and restart the Security Erase process. If the drive is unable to complete the Security Erase process due to drive errors, the drive will remain locked. If the Security Erase process is not able to continue, CPR Tools recommends degaussing the drive, followed by complete drive destruction using a hard drive shredder.

When Security Erase completes successfully, your drive is unlocked and may be put back into service.

This bold method is unique in the industry. Implementing this method is the only way to ensure that data scheduled for erasure is completely secured until erasure has completed.

¹ This method represents CPR Tools' Best Practice Recommendation for data eradication

Why NIST?

For many years, the standard for data eradication was the US Department of Defense directive known as 5220.22-M which defined an overwrite pattern and number of times this pattern would need to be overwritten to a hard drive to ensure that all data was eradicated. As of the February 2006 reissuance of this directive, specifics of data eradication are no longer listed, leaving the Cognizant Security Agency (CSA) responsible for ensuring that erased data is, in fact, erased. The US Government's standards setting organization, NIST has defined eradication standards in their Special Publication 800-88.

The National Institute of Standards and Technology (NIST) was founded in 1901 as a non-regulatory agency within the US Department of Commerce whose mission is to promote US innovation and industrial competitiveness by advancing measurement science, standards and technology.

NIST 800-88 has become the de-facto standard for data eradication, defining both 'clean' and 'purge' criteria, among others.

Disclaimer and Notice

Hammer™ is a data eradication tool.

The primary purpose of this device is to **remove data so that it is no longer recoverable by any means**. CPR Tools provides this ability in order to protect privacy and sensitive data and is not responsible for misuse or accidental data eradication. CPR Tools recommends all users of Hammer™ familiarize themselves with the device and the host utility software, CPR Toolbox™ fully before using Hammer™.

By using this device, you agree to hold harmless CPR Tools, Inc., employees of CPR Tools, Inc., assignees of CPR Tools, Inc. and the developers of Hammer™ and CPR Toolbox™, for any accidental data erasure. Users assume full responsibility for any such accidental erasures caused by Hammer™.

Trademark Disclaimer

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Company Information

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CPR Tools has been a leader in the field of data recovery for nearly three decades. As experts in data recovery, we feel that recovery engineers are best qualified to determine what makes data 'unrecoverable'. Based upon our knowledge and years of research and testing, we have developed this unique tool.

With added features designed to enhance productivity of IT department personnel, Hammer™ from CPR Tools is an important innovation. Designed for use in the field or the lab, Hammer™ will provide years of consistent and reliable service.

Hammer™ - Highlighted Features

This exciting new release of Hammer™ and the CPR Utilities Suite (including CPR Toolbox™) include several enhancements and new features. These include:

1. An option to store logs to drives attached to Hammer™
2. New 'EZ-Hammer' tab: erases data and prints Certs in one easy step
3. Enhanced 'Quick Lock' feature to keep data safe and secure prior to eradication
4. Audible 'Buzzer' to signal the end of an operation
5. Enhanced Audit Trail functions - Organize Tasks into 'Jobs'
6. New Reporting & Update Feature – Hammer™ sends you emails with progress updates
7. Improved progress indicators using percentages
8. Customize CPR Toolbox and Certificates' Look and Feel with your company's logo graphic
9. Options to erase data to 3 pass or 7 pass specifications
10. New gRase™ function to eradicate HDD defect list.

NOTE: This release of CPR Tools Utilities Suite and related Hammer™ / SCSI Hammer™ firmware represents the last release which will support the optional Bluetooth Printer and related label printing functions.

What does 'Data Eradication' really mean?

Most computer users don't realize that when they delete files from their systems, the data remains. Deleting a file or files through the operating system simply marks that space as 'available'. This means that anyone with a little time and knowledge may recover all of the 'deleted' data.

Data eradication with Hammer™ exceeds standards set by the National Institute of Standards and Technology (NIST). Hammer™ natively supports NIST 800-88 'clear' and 'purge' functions and provides the facility to add additional security to pre-purged drives to ensure that drives scheduled for erasure are unusable until after data eradication has completed.

Limited Warranty Statement

CPR Tools, Inc. products are warranted by CPR Tools, Inc. against manufacturing defects in material and workmanship under normal use for one (1) year from the date of purchase from CPR Tools, Inc. or its authorized re-sellers. To receive warranty service, users must register their products at <http://www.cprtools.net/>.

EXCEPT AS PROVIDED HEREIN, CPR TOOLS, INC. MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. EXCEPT AS PROVIDED HEREIN, CPR TOOLS, INC. SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM LOST OR CORRUPTED DATA, INCONVENIENCE, LOSS OF TIME, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF CPR TOOLS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the limitations on how long an implied warranty lasts or the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

In the event of a product defect during the warranty period, obtain return approval from CPR Tools, Inc. prior to product return. CPR Tools, Inc. will, at its option, unless otherwise provided by law: (a) correct the defect by product repair without charge for parts or labor; (b) replace the product with one of the same or similar design. All replaced parts and products, and products on which a refund is made, become the property of CPR Tools, Inc. New or reconditioned products may be used in the performance of warranty service. Repaired or replaced products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does not cover: (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs other than those provided by CPR Tools, Inc. or its authorized representatives; (c) consumables such as fuses or batteries; (d) cosmetic damage; (e) transportation, shipping or insurance costs; or (f) costs of product removal, installation, set-up service adjustment or reinstallation.

This warranty gives you specific legal rights, and may also have other rights which vary from state to state. Terms are subject to change at any time. See company policies at www.cprtools.net for latest warranty information. Optional extended warranty coverage for select products is available for purchase from CPR Tools, Inc.

Introduction

Congratulations on your purchase of Hammer™ from CPR Tools.

This quality product was developed by CPR Tools' engineers in answer to our own data security and IT needs.

Hammer™ is a data elimination tool. Connect up to four (4) drives and erase them securely and simultaneously.

Designed with data security and re-usability in mind, a primary feature of Hammer™ is that the user is able to set one drive as the 'Master' and when Hammer™ has completed the erasure process it will create an exact copy of the 'Master' drive on up to 3 other connected drives. This feature is a 'must-have' for IT personnel rolling out identical drives for multiple users.

Why Clone with Hammer™?

IT departments love this feature. By allowing a user to first securely erase up to three drives, then create exact duplicates of a 'master' drive, rolling out systems to users has never been easier, or more secure!

Hammer™ was built from the ground up with focus on features and flexibility. Hammer™ can perform ATA Security Erase on drives which support it. For drives which do not support ATA Security Erase, Hammer™ falls back to an embedded version of CPR Tools' BangDisk™ data eradication mechanism. Each of these methods complies with [NIST 800-88](http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88_rev1.pdf)² guidelines for erasing data.

At CPR Tools we believe that data recovery engineers are the best people to design data security and recovery tools. If you have any comments, questions or ideas for enhancements or additions to the functionality of Hammer™, email (hammer.support@cprtools.net) or contact us via the contact form at <http://www.cprtools.net>.

² http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88_rev1.pdf

Hammer™ Quick Start

Out of the box, your Hammer™ is ready to start erasing drives. To quickly clear all data from up to four (4) drives:

1. Connect data and power cables to as many as two (2) SATA and two (2) PATA drives and to Hammer™.
 - Power splitters may be used if needed.
2. Power on Hammer™ by pressing the white 'Power' button.
 - Wait for Hammer™ to 'Scan for Drives'.
3. When the LCD reads 'Start', press the RIGHT navigation button to initiate the erasure process on all attached drives simultaneously.

That's all there is to it!

NOTE:

Most PATA drives have 'master', 'slave' and 'cable select' jumper positions printed on the drive container. PATA drives must be set to 'master' to work consistently with Hammer™.

NIST 800-88 Compliance:

Using factory default settings, Hammer™ complies with NIST 800-88 'purge' specifications. Drives connected to Hammer™ will be subjected to eradication in compliance with the most stringent standards for data removal.

Hammer™ may be set to perform NIST 800-88 'clear' functions simply by enabling 'Bang' under the 'Erasure Method' menu of the device.

Users are encouraged to become familiar with all features included with Hammer™ in both stand-alone mode or with a host PC running the CPR Toolbox™ companion software.

Using Hammer™ with a PC

System Requirements

To use Hammer™ with the CPR Toolbox™ or CPR Flash™ utilities, ensure that the host PC meets the minimum system requirements. These are:

1. Operating System:
 - Microsoft® Windows XP® SP2
 - Microsoft® Windows Vista®
 - Microsoft® Windows 7®
2. USB
 - USB 2.0 or higher

Getting Started

Before starting to use your new Hammer™, take a moment to examine the contents of your package.

- 1 x Hammer
- 1 x CPR Tools Utilities Suite & Documentation CD
- 2 x SATA Data/Power Cables
- 2 x PATA Data Cables
- 1 x USB Cable³
- 1 x AC Power Supply
- 1 x AC Power Cord

Figure 1 illustrates the entire contents of your Hammer™ package.



Figure 1 - Hammer™ Package – Contents

³ USB cable provided for use with CPR Toolbox™ and CPR Flash™; USB 2.0 required

Overview

Hammer™ is a data elimination device, designed to comply with data erasure standards as defined by the National Institute of Science and Technology (NIST) guidelines. NIST document 800-88 is the source from which the definitions of data 'clearing' and data 'purging' have been derived.

Before using Hammer™, take a moment to familiarize yourself with the device itself. Notice that Hammer™ is labeled with a letter 'A' on the left, and 'B' on the right.

Hammer™ is controlled by five buttons, shown in Figure 2. The white power button is used to power the unit on or off. Upon turning the unit on, the LCD screen will display 'CPR Tools –Hammer' and the version number. Hammer™ will then display 'Scanning for Drives' as it probes each of the four (4) ports for attached hard drive devices.

Upon completion of the initial scan, Hammer™ will briefly display the capacity of each drive found during the scan; Hammer™ will then display the topmost menu item, 'Start'. A detailed review of all menu items will be presented later in this guide.

Using the four navigation buttons and the backlit LCD screen, a user may traverse the menu structure to instruct Hammer™ to perform tasks. We will refer to these buttons as 'UP', 'DOWN', 'LEFT' and 'RIGHT'.

Hammer™ features two (2) PATA and two (2) SATA ports for Parallel ATA and Serial ATA drives, respectively. Hammer™ is capable of safely powering four (4) drives simultaneously, two on each side of the device (Side A and Side B).

To ensure consistent and safe operation of Hammer™, CPR Tools advises powering off Hammer™ prior to attaching hard drives to either Side A or Side B. Failure to do this may result in damage to your hard drives or void your Hammer™ warranty.

Figure 3 and Figure 4 offer an annotated, close-up view of 'Side A' and 'Side B' of Hammer™.



Figure 2 - Front Panel, Hammer™

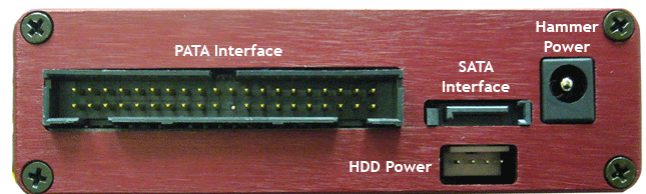


Figure 3 - Hammer™ Side A

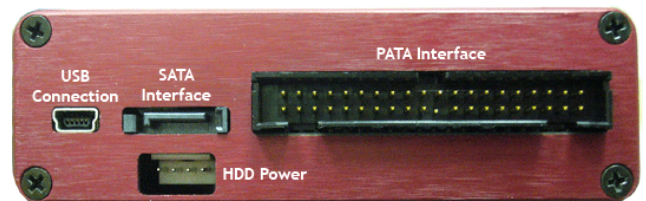


Figure 4 - Hammer™ Side B

Overview (continued)

Audit Trails

Keeping strict records of 'clearing' or 'purging' of data is required by most specifications. For this reason, Hammer™ comes equipped with Non-Volatile RAM (NVRAM) on board. This is used to track device activity which can then be transferred to a host PC through the USB 2.0 port or printed via the optional Bluetooth printer.

The optional Bluetooth printer may be used to generate labels for each drive upon which Hammer™ has acted.

For every action Hammer™ performs, a log is kept. The last action is always logged to NVRAM; in addition, users may choose to store this information on the drives upon which an action is taken.

This is useful when working with many drives; Hammer™ may be instructed to use the data written to the drive as a source for generating labels and/or certificates.

Bluetooth Printer – Compliance and Audit Trails:

Compliance with regulations, rules and laws generally call for an audit trail of some type. Hammer™ and CPR Toolbox™ facilitate this through the use of generated 'Certificates of Compliance'.

The optional Bluetooth Printer makes asset tracking and maintaining audit trails even easier. As drives are erased – with or without CPR Toolbox™ - labels may be printed which detail the erasure process. These may then be affixed to the processed drive, providing anyone with physical access to them with the information needed to track their further use. Choosing to store log information on the drive allows administrators to print Certificates of Compliance after the fact.

Labels affixed to the drives themselves clearly identify drive status. Certificates of Compliance, generated by CPR Toolbox™, provide documentation of erasure actions taken and may be used to as a record of such erasures.

Hammer™ provides this functionality to help companies, organizations and agencies with the tools to keep records of compliance.

Hammer™ User Interface

The Hammer™ menu structure begins with eight (8) top level menu items. Each of these will be described in detail. The top level menu items are:

1. Start
2. Operations
3. Quick Lock
4. Scan For Drives
5. Identify Drive
6. Verify
7. Print Label
8. Settings

NOTE:

Most PATA drives have 'master', 'slave' and 'cable select' jumper positions printed on the drive container. PATA drives must be set to 'master' to work consistently with Hammer™.

Some Western Digital drives need to be set to 'Single' to work consistently with Hammer™

Hammer™ provides a 2 line by 16 character LCD and 4 push navigation buttons, positioned in a diamond configuration: UP, DOWN, RIGHT and LEFT. When the unit is turned on the main menu is presented. Users may make use of the UP and DOWN navigation buttons to scroll through menu items and/or options. To select an option, the RIGHT button is used. LEFT button is used to cancel a selection or action, or to return to the previous menu.

Additionally, the host companion software, CPR Toolbox™ (part of the CPR Tools Utilities Suite included with Hammer™), may be used to control Hammer™. See the chapter titled 'CPR Toolbox™' for detailed information on using this utility with Hammer™.



Figure 5 - Hammer™ - Navigation buttons

In the menu map for Hammer™ (Figure 6) and in subsequent 'menu map' snippets, an asterisk (*) is used to denote 'active' or 'selected' values.



```

=====
START
=====
OPERATIONS
-----ERASE DRIVE
-----|-----ENABLED*
-----|-----DISABLED
-----ERASURE METHOD
-----|-----BANG
-----|-----SECURITY ERASE*
-----|-----3 PASS
-----|-----7 PASS
-----CLONE
-----|-----ENABLED
-----|-----DISABLED*
-----CLONE SOURCE†
-----|-----SA*†
-----|-----PA
-----CLEAR HPA/DCO
-----|-----ENABLED*
-----|-----DISABLED
-----VERIFY COMMAND
-----|-----ENABLED
-----|-----DISABLED*
-----PRINT LABELS
-----|-----ENABLED
-----|-----DISABLED*
-----POWER DOWN
-----|-----AFTER COMPLETE
-----|-----LEAVE DRIVES ON*
=====
QUICK LOCK
-----ALL DRIVES
-----A PATA
-----A SATA
-----B PATA
-----B SATA
=====
SCAN FOR DRIVES
=====
IDENTIFY DRIVE
-----A PATA
-----A SATA
-----B PATA
-----B SATA
=====
VERIFY
-----VERIFY ERASE
-----VERIFY CLONE
=====
=====
PRINT LABEL
-----FROM MEMORY
-----FROM DISK
-----|-----ALL DRIVES
-----|-----A PATA
-----|-----A SATA
-----|-----B PATA
-----|-----B SATA
=====
SETTINGS
-----TRANSFER RATE
-----|-----AUTO*
-----|-----UDMA MODE 3
-----|-----UDMA MODE 2
-----|-----UDMA MODE 1
-----|-----UDMA MODE 0
-----|-----PIO
-----POWER ON TIMEOUT
-----|-----POWER ON TIMEOUT
-----|-----|--<SELECT TIME IN MS>
-----COMMAND TIMEOUT
-----|-----TIMEOUT COUNT
-----|-----|--<SELECT TIME IN MS>
-----BLUETOOTH T.O.
-----|-----|--<SELECT TIME IN MS>
-----CONNECTION TEST
-----CLOCK/CALENDAR
-----SAVE LOG TO DISK
-----|-----ENABLED
-----|-----DISABLED*
-----SECURE PASSWORD
-----|-----ENABLED
-----|-----DISABLED*
-----QUICK VERIFY
-----|-----ENABLED
-----|-----DISABLED*
-----BUZZER
-----|-----ENABLED
-----|-----DISABLED*
-----SESSION NUMBER
-----|-----DISPLAY SESSION
-----|-----RESET SESSION
-----RESTORE DEFAULTS
=====

```

Figure 6 - Hammer™ Menu Map

*Denotes default values
†Shown only if 'Clone' is enabled

Example: Power On Timeout

The following example is presented to illustrate entering and confirming a Hammer™ value. The example uses the Hammer™ 'Power on Timeout' setting; these techniques may be used for any item which permits user entry of a value.

Where <SELECT TIME IN MS> is shown below, the user may select a value using the navigation buttons as described in the example titled "Power on Timeout".

Once a menu option is desired, use the RIGHT navigation button to select the option. Some menu options may have submenus. Once the user is faced with the final selection of a menu traversal, the RIGHT navigation button is used again to select and execute the function.

When interacting with a Hammer™ menu which requires you to select a numeric or hexadecimal value, remember to use the RIGHT navigation button to move to the rightmost position so that any choices will be accepted by Hammer™. When Hammer™ accepts a value it will display 'Configured' on the LCD to confirm.

'Power on Timeout' is part of the 'Settings' menu tree.

Menu Tree

```
|=====
|SETTINGS
|-----TRANSFER RATE
|-----|-----AUTO*
|-----|-----UDMA MODE 3
|-----|-----UDMA MODE 2
|-----|-----UDMA MODE 1
|-----|-----UDMA MODE 0
|-----|-----PIO
|-----POWER ON TIMEOUT
|-----|-----<SELECT TIME IN MS>
```

Example: Power on Timeout

To change the 'Power On Timeout', scroll through the top level menus until 'Settings' is reached, select it by pressing the RIGHT navigation button. 'Transfer Rate' is shown. Press the DOWN navigation button to display the 'Power On Timeout' screen.



Press the RIGHT navigation button to be presented with the Power On Timeout menu item. The default value of 20000 milliseconds (ms) is shown.



Using the RIGHT arrow to move the cursor right, advance to any digit shown in the numeric display; the UP and DOWN buttons may now be used to change that digit's value.



Continue editing values until finished. Once done, press the RIGHT navigation button to advance the cursor to the right, one position at a time until it is positioned under the last editable value.



One additional press of the RIGHT navigation button instructs Hammer™ to 'accept' your changes. Hammer™ responds with a confirmation screen.



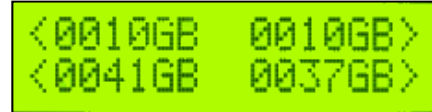
Hammer™ Functions

The menu structure described in Figure 6 is meant to serve as a handy reference. A more in-depth discussion of each menu item available on your Hammer™ is presented here.

When scrolling through menus and submenus for which options may be selected, currently selected values are appended by an asterisk character (*).

Upon power up, Hammer™ will scan for all devices attached to it. After scanning has completed, Hammer™ will briefly display the capacity of each drive discovered during the scan.

In the example shown here, four (4) drives have been identified. Using the guide in Figure 7, it is clear that PATA A and PATA B are connected to 10GB drives and that SATA A and SATA B are connected to 41GB and 37GB drives, respectively.



When information on more than one drive is being displayed, Hammer™ uses the following layout:



Figure 7 - Hammer LCD indicator diagram

Once the initial scan has completed, Hammer™ displays 'Start'. This indicates the device is ready to begin data eradication and/or clone operations.



Hammer™ User Interface (Stand-alone mode)

Using Hammer™ without a USB connection to a PC running CPR Toolbox™ is considered stand-alone mode. The 2 line by 16 character LCD is a valuable resource when working with Hammer™ in stand-alone mode

During an operation, Hammer™ will provide up-to-date information on task progress. In the upper center of the screen, the current step of the operation will be displayed (erase, clone, verify). Below it in the lower center of the screen is the approximate percentage complete for the current task. When the task completes, the lower center screen will display 'DONE'.

For all drives being acted upon, there will be an arrow (< or >) and a letter code. The layout of drive information locations on the LCD is presented in Table 1. Drives used as 'Clone Source' will display > with no letter code.

A Letter Code will be returned for quick summary in the corner status for each drive.

Hammer Letter Codes

Code	Description
SE	Drive is currently undergoing a Security Erase operation.
B	Drive is currently undergoing a Bang ⁴ operation.
C	Drive is currently the destination drive of a clone operation.
V	Drive is currently undergoing a verify operation.
D	Action on drive has completed successfully.
TO	Communication between the Drive and Hammer has timed out, causing the operation to complete unsuccessfully.
ERR	A Drive error was encountered during the operation, causing the operation to complete unsuccessfully.
MIS	A data mismatch was encountered during the Verify operation.
F	Drive has failed to complete the operation successfully.
SEF	The Security Erase operation failed to complete properly.
INT	An error occurred internal to the Hammer firmware. This will cause the current operation to complete unsuccessfully.
B*	Bang operation has encountered drive errors while writing to the drive and is now traversing through the drive with an error jumping algorithm. Percentage complete will likely become inaccurate if any drive begins to encounter errors due to loss of samples in the transfer rate calculation.
D*	Bang operation completed, but drive errors were encountered. All sectors cannot be guaranteed to have been erased.
LCK	A locked drive, unable to be unlocked by Hammer™. Drives marked LCK have been identified but may not participate in any clone or erasure process.

Table 1 - Hammer 'Letter Codes'

⁴ Bang is performed by the embedded version of CPR Tools' BangDisk™ utility which eradicates data in compliance with NIST 800-88 ('clear') guidelines.

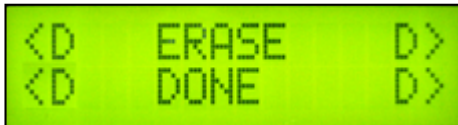
Using the guide in Table 1, the examples shown below may be interpreted:



PATA A & B and SATA B are being Security Erased ('purge'); SATA A is being subjected to 'clearing' (Bang operation). The overall process is 3% complete.



PATA A and B and SATA A have completed. SATA B is still undergoing Security Erase. The overall process is 23% complete



All drives have been successfully erased in compliance with NIST 800-88 guidelines.

If Hammer™ encounters a drive which has been locked by any other device or utility, Hammer™ will be unable to perform clone or erasure actions on this drive, as the locking password is unknown. Any initiated action will proceed, but drives in this state will show LCK on the LCD Screen as shown here and will be excluded from the clone or erasure action.



A blank field indicates that the drive is the source in a Verify/Clone operation, or the current operation was canceled.

Hammer Tips:

During operations in which Hammer™ displays the percentage complete, such as Verify, Clone and Bang, users may depress the DOWN navigation button to display the LBAs upon which Hammer™ is operating.

Depressing the DOWN navigation button will scroll through PATA A, SATA A, PATA B and SATA B respectively. The UP navigation button may be used to return to the 'home' screen where the overall percentage is displayed.

Drives being subjected to Security Erase ('purge') eradications will display N/A.

Start

Menu Tree

```
|=====
|START
|=====
```

Default: N/A

When a scan for drives completes, Hammer™ displays 'Start'. Pressing the RIGHT arrow key will cause Hammer™ to present 'CONTINUE?'. To continue with the **erasure of all attached drives**, press the RIGHT key again. Hammer™ will initiate erasure for all attached drives in accordance with settings in the OPERATIONS menu. Default values may be reviewed in the section on 'Operations', which follows.

Using the default values, Hammer™ will perform a standard erasure using CPR Tools' embedded BangDisk™ product. BangDisk™ complies with NIST 800-88 'clean' specifications.

Hammer™ may be set to perform NIST 800-88 'purge' functions simply by enabling 'Security Erase' under the 'Operations' menu of the device. For additional security, CPR Tools recommends also setting 'Secure Password' under the 'Settings' menu.

Hammer™ will indicate which data erasure routine is being performed. If Security Erase has been enabled, Hammer™ will display **SE** adjacent to an arrowhead (< or >) indicating the drive is being 'purged' by Security Erase. If Security Erase has not been enabled, or when working with drives which do not support ATA Security erase, Hammer™ will display **B**, indicating that these drives will be 'cleared' using the embedded version of CPR Tools' BangDisk™ utility.

The center of the Hammer™ LCD will display progress of purging and/or clearing of drives for which erasure has been configured. Progress is displayed as a percentage of overall completion (all drives).

Note:

For drives which are being subjected to Security Erase ('purge'), the percentage shown is a conservative estimate.

When Hammer™ completes an erasure process the indicator for the drive(s) completed will change from **SE** or **B** to **D** (done).

Using this guide, we can tell from the example shown here that the SATA and PATA drives attached to Side B and the PATA drive on Side A of Hammer™ are being subjected to Security Erase ('purge', marked **SE**). The drive attached to SATA Side A is being Banged ('clear', marked **B**) using the embedded version of CPR Tools' BangDisk™ utility.



<SE ERASE SE>
<B 03% SE>

This example shows three (3) of the drives having completed successfully (marked **D**) while one (SATA B) is still ongoing. The overall process is 23% complete.



<D ERASE D>
<D 23% SE>

Note:

For more descriptions of the LCD display and the information shown there, see the section titled "Hammer™ User Interface (Stand-alone mode)".

Operations

Menu Tree

```
=====
| OPERATIONS
|-----ERASE DRIVE
|-----|-----ENABLED*
|-----|-----DISABLED
|-----ERASURE METHOD
|-----|-----BANG
|-----|-----SECURITY ERASE*
|-----|-----3 PASS
|-----|-----7 PASS
|-----CLONE
|-----|-----ENABLED
|-----|-----DISABLED*
|-----CLONE SOURCE†
|-----|-----SA*†
|-----|-----PA
|-----CLEAR HPA/DCO
|-----|-----ENABLED*
|-----|-----DISABLED
|-----VERIFY COMMAND
|-----|-----ENABLED
|-----|-----DISABLED*
|-----PRINT LABELS
|-----|-----ENABLED
|-----|-----DISABLED*
|-----POWER DOWN
|-----|-----AFTER COMPLETE
|-----|-----LEAVE DRIVES ON*
|=====
```

Defaults: Indicated by * above.

†Shown only if 'Clone' is enabled

The Operations menu tree defines how Hammer™ will act when used in stand-alone mode. The eight (8) operations listed will either be performed or not, depending upon their settings here. Settings changed here will be saved as user defaults. Hammer™ may be restored to factory default settings by navigating to the 'Settings' menu and selecting 'Restore Defaults'.

Best Practice Recommendation:

Once a basic familiarity with Hammer™ has been gained, CPR Tools strongly recommends changing 'Secure Password' to 'enabled'. This option is under the 'Settings' menu; when set to 'enabled', this instructs Hammer™ to secure a drive with a **randomly generated password** which renders the drive useless and unreadable until a Security Erase process has finished.

Operations Submenus

Each of the 'Operations' submenus are described in detail:

Erase Drive

Default: Enabled

This setting instructs Hammer™ to erase all drives attached to the device. If the next item, Security Erase (NIST 800-88 'purge'), is not enabled, Hammer™ will overwrite all sectors with 0x00 (NIST 800-88 'clear'). If Security Erase is enabled, drives which support ATA Security Erase will be issued an ATA Security Erase command.

Erasure Method

*Default: Security Erase**

This setting instructs Hammer to initiate an ATA Security Erase procedure ('purge').

Setting this value to 'Bang' will instruct Hammer™ to use the embedded version of CPR Tools' BangDisk™ utility which will overwrite each sector with 0x00 in accordance with NIST 800-88 'clear' specifications. This is also used if Security Erase is selected and Hammer™ encounters a drive which does not support Security Erase.

Setting this value to '3 Pass' or '7 Pass' will instruct Hammer™ to erase data using methods which comply with specifications outlined for 3 or 7 pass data eradication, respectively.

Clone

Default: Disabled

This setting allows the user to configure a 'source' drive on Side A of the Hammer™. If enabled, the Clone Source menu becomes available.

Clone Source

Default: Hidden

This menu becomes available when 'Clone' is enabled. Using this menu, the user may identify a drive (on Side A) which will be used as 'source'. When Hammer™ completes its configured erasure action(s), the source drive will be cloned onto all other attached drives. Hammer™ may be used to clone from one (1) source drive onto as many as three (3) other attached drives.

Hammer™ Tips:

Only drives on the 'A' side of Hammer™ may be used as 'Clone Source' drives.

Clear HPA/DCO

Default: Enabled

The available space of a drive may be limited by the presence of a Host Protected Area (HPA) or a Device Configuration Overlay (DCO). Enabling this feature will ensure that any such size limitations are removed when Hammer™ performs erasure or clone actions.

Verify Command

Default: Disabled

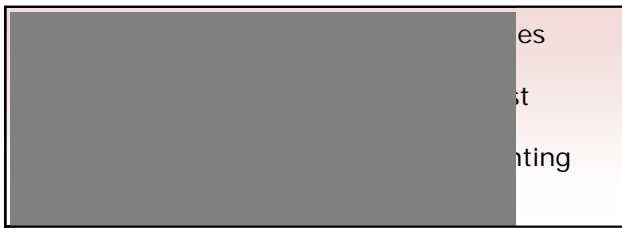
When enabled, 'Verify Command' instructs Hammer™ to do a sector by sector comparison. For Clones, drives onto which data has been cloned are compared to the source. For erasures, Hammer™ performs reads, verifying that 0x00 has been written to each sector.

Print Labels

Default: Disabled

This option is used in conjunction with the optional Bluetooth printer. Enabling this option instructs Hammer™ to print labels for each drive upon which it has performed an action.

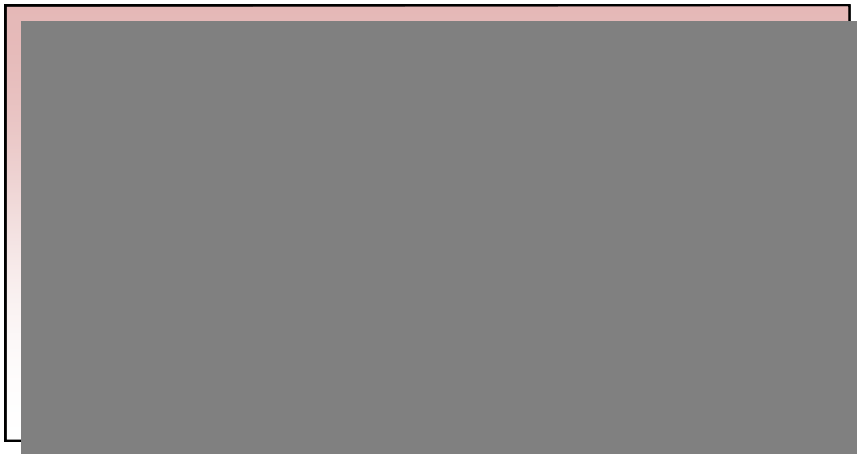
A sample label is depicted here.



Power Down

Default: Leave Drives On

This option allows the user to configure how drive power is handled after Hammer™ has completed its tasks. The default setting instructs Hammer™ to leave drives powered. To instruct Hammer™ to power off all drives after an erasure or clone action, change this setting to 'After Complete'.



Quick Lock

Menu Tree

```
=====
| QUICK LOCK
| -----ALL DRIVES
| -----A PATA
| -----A SATA
| -----B PATA
| -----B SATA
|=====
```

Default: N/A

Note: 'Quick Lock' is only available for drives which support ATA Security Erase.

Selecting 'Quick Lock' enables the user to 'lock' a drive. This is accomplished by establishing a random user password. Once locked, all data on the drive is rendered completely useless through the use of a hardware-level, encrypted random password.

The only action which may be taken to reuse a drive which has been locked is to perform ATA Security Erase on that drive.

Hammer™ Tips:

The **Quick Lock** function is ideal for securing the data on a drive scheduled to be erased at a later time. If a drive is unable to complete the Security Erase process due to errors, the drive will remain locked. For drives where Security Erase process is not able to continue, CPR Tools recommends degaussing the drive, followed by complete drive destruction using a hard drive shredder.

To 'Quick Lock' a drive, select 'Quick Lock' from the Hammer™ menu.



HAMMER
QUICK LOCK

press the RIGHT navigation button. Hammer™ displays 'Quick Lock / All Drives'. To proceed locking all attached drives, press the RIGHT navigation button.



QUICK LOCK
ALL DRIVES

To select an individual drive to lock, press the DOWN navigation button



QUICK LOCK
A PATA

After having chosen 'All Drives' or a specific drive to lock, press the RIGHT navigation button. Hammer™ displays 'Initializing'.



INITIALIZING...

When Hammer™ has completed locking the drive(s), it displays 'Drive Locked'. Press the LEFT navigation button to return to the topmost menu (START).



DRIVE LOCKED

Scan For Drives

Menu Tree

```
|=====
|SCAN FOR DRIVES
|=====
```

Default: N/A

Hammer™ will automatically scan for all attached drives upon power-up. Should you wish to manually initiate a scan for attached drives, navigate to 'Scan For Drives', and press the RIGHT navigation button to execute a manual scan. Hammer™ will briefly display the capacity (in GB) of each attached drive encountered during the scan. If a capacity (in GB) is displayed with the letter 'L', this indicates that the drive is currently locked.

If an attached drive is not identified by Hammer™, ensure all cables are seated firmly and that attached PATA drives are set to 'Master'.

To return to the main menu, depress the LEFT navigation button.

Identify Drive

Menu Tree

```
|=====
|IDENTIFY DRIVE
|-----A PATA
|-----A SATA
|-----B PATA
|-----B SATA
|=====
```

Default: N/A

Selecting 'Identify Drive' will cause Hammer™ to display 'A PATA'. To select 'A PATA' press the RIGHT navigation button. To scroll through the additional Hammer™ ports, press the DOWN navigation button. Pressing the RIGHT navigation button executes the ATA Identify Device command. If a drive is connected and responds to the command, the following data will be displayed on the LCD:

- Model Number
- Serial Number
- Firmware Revision
- PIO Modes Supported
- UDMA Modes Supported
- Major ATA Specification Version Supported
- Maximum LBA

Use the UP and DOWN navigation buttons to scroll through the returned results. Use the LEFT button to return to the menu.

Verify

Menu Tree

```
|=====|
|VERIFY|
|-----|-----|-----|
|-----|-----|-----|
|-----|-----|-----|
|=====|
```

Defaults: N/A

If 'Verify Erase' is enabled, all drives which have been 'Erased' are read, sector by sector, to ensure that the pattern 0x00 has been successfully written to each sector.

If 'Verify Clone' is enabled, drives which have been cloned are compared to the source drive on a sector by sector basis.

Print Label

Menu Tree

```
|=====|
|PRINT LABEL|
|-----|-----|-----|
|-----|-----|-----|
|-----|-----|-----|
|-----|-----|-----|
|-----|-----|-----|
|-----|-----|-----|
|-----|-----|-----|
|=====|
```

Defaults: N/A

NOTE:

This option is only functional when using the optional Bluetooth Printer.

After performing an action on any connected drive, Hammer™ is able to produce a label reflecting what was done to the drive.

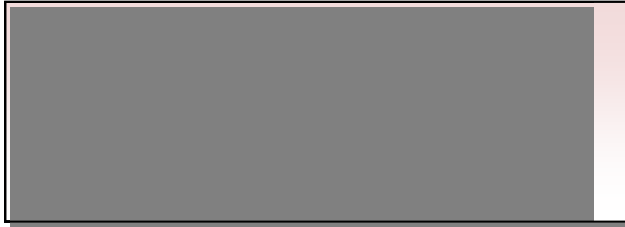
Selecting 'Print Label' from the Settings menu will present the following choices:

- From Memory
- From Disk
 - All Drives
 - A PATA
 - A SATA
 - B PATA
 - B SATA

Hammer™ prints the following information on the label:

- Start Date and Time
- Device (Hammer™ Serial Number)
- Drive Model
- Drive Serial Number
- Action: Outcome
 - Ex: Security Erase: Passed, Erase: Passed... etc.
- End Date and Time
- Check Sum
 - When Hammer™ writes log information to the drive (sector 00), a checksum is generated. This may be used to assist in assuring that the data written is valid and has not been tampered with.

Select one of the choices listed to instruct Hammer™ to print a label for the selected drive. A sample label is presented in Figure 8.



Settings

Menu Tree

```

=====
| SETTINGS
|-----TRANSFER RATE
|-----|-----AUTO*
|-----|-----UDMA MODE 3
|-----|-----UDMA MODE 2
|-----|-----UDMA MODE 1
|-----|-----UDMA MODE 0
|-----|-----PIO
|-----POWER ON TIMEOUT
|-----|-----POWER ON TIMEOUT
|-----|-----|--<SELECT TIME IN MS>
|-----COMMAND TIMEOUT
|-----|-----TIMEOUT COUNT
|-----|-----|--<SELECT TIME IN MS>
|-----BLUETOOTH T.O.
|-----|-----|--<SELECT TIME IN MS>
|-----CONNECTION TEST
|-----CLOCK/CALENDAR
|-----SAVE LOG TO DISK
|-----|-----ENABLED
|-----|-----DISABLED*
|-----SECURE PASSWORD
|-----|-----ENABLED
|-----|-----DISABLED*
|-----QUICK VERIFY
|-----|-----ENABLED
|-----|-----DISABLED*
|-----BUZZER
|-----|-----ENABLED
|-----|-----DISABLED*
|-----SESSION NUMBER
|-----|-----DISPLAY SESSION
|-----|-----RESET SESSION
|-----RESTORE DEFAULTS
=====

```

Default: See individual listings below

The user may set options that will customize certain Hammer™ functions. User selected parameters within the Settings menu are stored in non-volatile memory and may be reset to factory defaults using the 'Restore Defaults' submenu item, if desired.

Each of the 'Settings' submenus are described in detail in the following section.

Hammer™ Settings Submenus

Transfer Rate

Default: Auto

Transfer rate set to the default, 'Auto', allows Hammer™ to use the most efficient transfer rate for the attached drives.

Select a maximum transfer rate from the available choices: 'UDMA Mode 3', 'UDMA Mode 2', 'UDMA Mode 1', 'UDMA Mode 0', 'PIO'. By setting this value to anything other than 'auto', the user is setting an upper limit for transfers. This option is made available to users in the event the user must force a drive to use a lower transfer rate.

Power on Timeout

Default: 20,000ms (20 seconds)

This value defines the maximum time Hammer™ will wait for a drive to come ready on power-up. While this value is typically sufficient for healthy drives, users may wish to increase this value for drives with errors.

This does not mean that every power-up sequence will take the full Power on Timeout period, as Hammer™ will continue as soon as a drive comes ready.

Command Timeout

Default: 6,000ms (6 seconds)

This value defines the time Hammer™ will wait, after a command has been issued, for an attached drive to respond. Drives which do not respond to a command within the time allotted here will generate a timeout error.

Bluetooth T.O

Default: 50,000ms (50 seconds)

This value defines the time Hammer™ will wait when instructed to connect to the optional Bluetooth printer. If a connection is not successful within this time frame, Hammer™ will display a connection error.

Connection Test

Default: Not applicable

Select 'Connection Test' to ensure Hammer™ and the optional Bluetooth printer are communicating properly. Pressing the 'RIGHT' navigation button at this menu will cause Hammer™ to prompt the user with 'Connection Test. Continue?'. Pressing the RIGHT navigation button once more will initiate the Bluetooth Connection Test. Hammer™ will display 'Scanning for Printer'.

If the printer was found, 'Printer Found' is displayed. Hammer™ will then display either 'Testing Connected' or 'Testing Not Connected'. 'Testing Connected' indicates that Hammer™ was able to connect to the printer. The Bluetooth printer will beep to confirm the connection. Press the LEFT to continue using Hammer™ and the Bluetooth printer.

The following list contains connection failure messages and their meanings:

1. 'Connection Failed'
 - Printer found; Hammer™ was unable to connect
2. 'Unable to Locate Printer'
 - Hammer™ was unable to 'find' the printer
3. 'Bluetooth Setup Failed'
 - Printer found; Hammer™ was unable to 'pair' with the printer.

The message 'Bluetooth Module Uninitiated' may also be displayed after any of the connection failure messages.

Clock/Calendar

Default: Not applicable

Selecting 'Clock/Calendar' will display the current date and time settings. These may be synchronized with a host PC through the CPR Toolbox™ application's 'Edit' pull-down menu.

Save Log to Disk

Default: Disabled

Setting this option to 'Enabled' will instruct Hammer™ to save output logs for actions performed on a drive to sector 00 of that drive.

Hammer™ always keeps a log of the last action in its own NVRAM.

When working with multiple drives, the 'Save Log to Disk' function enables the user to retrieve the log for actions performed on that disk, thereby extending the reporting available from within Hammer™. The data written includes a checksum value to aid in the validation of the integrity of what is written in the log.

Secure Password

Default: Disabled

When disabled (default), Hammer™ will use a generic password and always unlock the drive without regard for the success or failure of the instructed operation.

When enabled, Hammer™ will lock drives with a random password that does not allow the drive to be unlocked without a successful completion of a security erase.

Quick Verify

Default: Disabled

When enabled, Hammer™ will perform verification on a statistical sampling of LBAs for the affected drives.

Buzzer

Default: Disabled

Enabling this option will cause Hammer™ to produce an audible signal at the end of an operation.

Session Number

Default: Not applicable

The Session Number notifies the user as to how many session logs are currently stored on the onboard Flash memory. A session log contains Hammer™ command status information for all four ports and can be extracted from the Flash memory using CPR Toolbox™.

A maximum of 256 session logs can be saved to Hammer™. Once this limit is reached, Hammer™ will no longer save session logs to Flash until the logs have been extracted by CPR Toolbox or reset the session number through the standalone Session Number menu.

The Session Number menu presents two sub-options. These are:

1. Display Session
 - Pressing the RIGHT navigation button when Display Session is shown will reveal the number of sessions currently stored.
2. Reset Session
 - Pressing the RIGHT navigation button when Reset Session is shown will reset the current Session Number to a value of zero.

Restore Defaults

Default: Not applicable

Users may globally reset all Hammer™ options to their factory defaults by using this menu item.

To restore defaults, press the RIGHT navigation button when 'Restore Defaults' is displayed on the device's LCD. Hammer™ will respond with 'Configured'; this indicates that the device has been reset to factory default settings.

Software:

CPR Tools Utilities Suite

The CPR Tools Utilities Suite is a collection of software designed to work with Hammer™, PSIClone™ and other CPR Tools devices. The CPR Tools Utilities Suite includes:

1. CPR Toolbox 2010™
 - Host utility
2. CPR Tools Flash Utility + USB Driver
 - Software to update firmware
 - CPR Tools USB Driver
3. Firmware
 - Latest firmware
4. Documentation
 - Release Notes
 - User Guides
 - Specification Sheets

NOTE:

When available, updates to software, firmware and documentation may be downloaded from <http://www.cprtools.net/downloads>.

The next section of this guide will review installation of the CPR Tools Utilities Suite and use of the host companion software, CPR Toolbox™

Working with a Windows XP®, Windows Vista® or Windows 7®

The CPR Utilities Suite is a collection of applications designed to run on Microsoft® Windows XP® SP2, Windows Vista® and Windows 7® Operating Systems. Hammer™ may be connected to a host computer by USB, using the cable provided. CPR Toolbox™ extends functionality and provides a familiar user interface with which Hammer™ may be used.

NOTE:

CPR Tools host utilities interact with Hammer™ via **USB 2.0** connections only.

Installing CPR Utilities Suite

The CPR Tools Utilities Suite is included on the CD which was shipped with Hammer™. Install the software by inserting the CD into the host system. The CPR Tools Utilities Suite installer is packaged as a self-extracting archive.

Double click the file 'CPR Tools Utilities Suite.EXE' to begin the installation process. The install process is guided by the CPR Tools Utilities Suite Setup Wizard.

NOTE:

The latest updates for the CPR Tools Utilities Suite including CPR Toolbox™ are always available at the CPR Tools download page: <http://www.cprtools.net/downloads>.



Figure 9 - CPR Tools Utilities Suite Setup Wizard

Click 'Next' to continue.

The 'License Agreement' screen which follows, is shown in Figure 10.

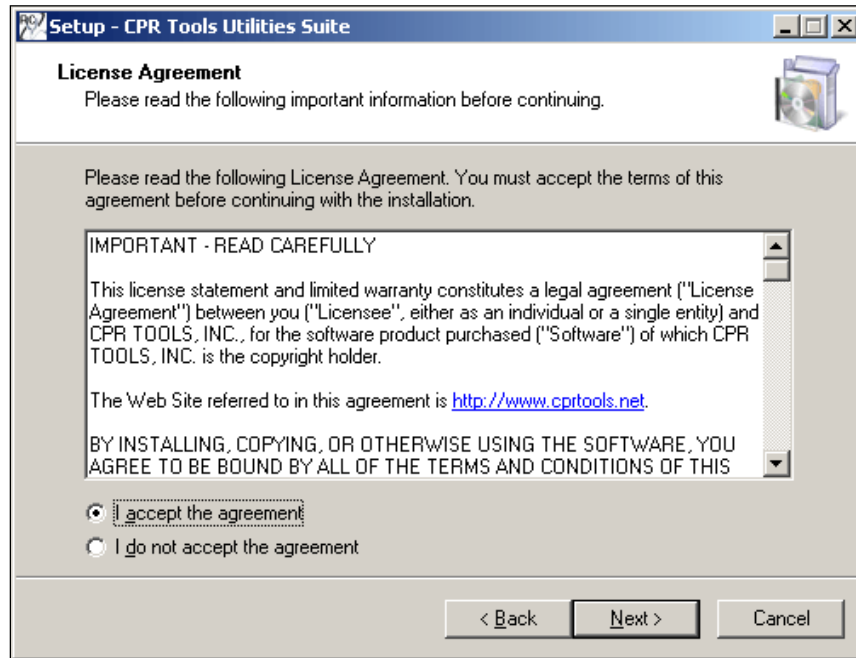


Figure 10 - CPR Tools Utilities Suite License Agreement

The destination of the installation is user configurable. Users may select the default location or specify a path on the host.

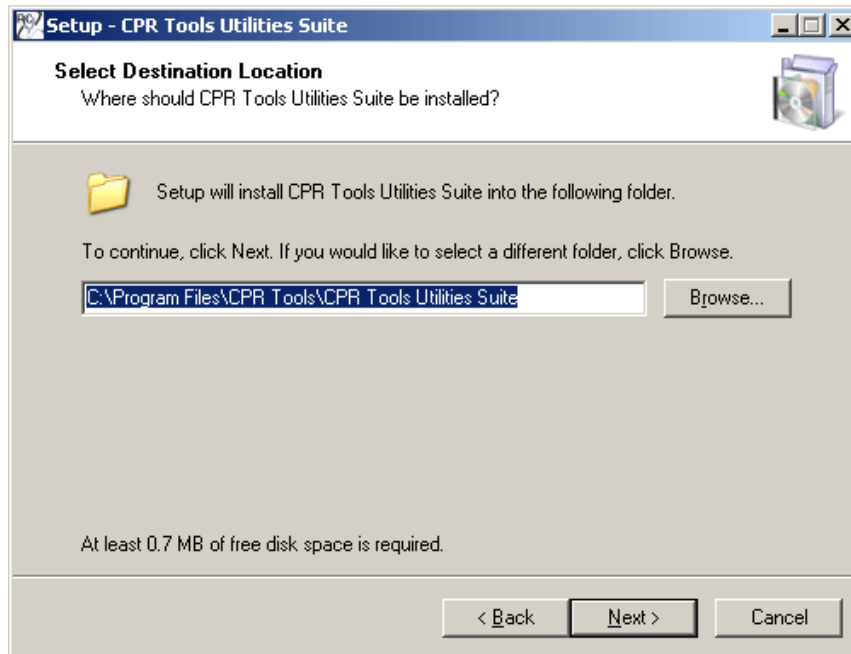


Figure 11 - Select Destination Location

By default, the program will install to the system drive (typically 'C:') under 'Program Files\CPR Tools\CPR Tools Utilities Suite'. To install to the default location, click 'Next'.

Users may select a complete installation or customize the installation of CPR Tools Utilities Suite. Figure 12 depicts the 'Select Components' dialog box which allows for customizing the installation of components.

In this view, 'Full Installation' is selected and shown in the drop-down list at the top of the dialog box. Users may deselect any undesired components by clicking the checkbox beside the listed component. As CPR Utilities Suite contains documentation, firmware and support files for PSIClone™, Hammer™ and SCSI Hammer™, 'Full Installation' includes firmware and documentation for PSIClone™, Hammer™ and SCSI Hammer™.

Users may choose to install only files relating to Hammer™ by selecting 'Hammer Installation' from the drop-down list provided.

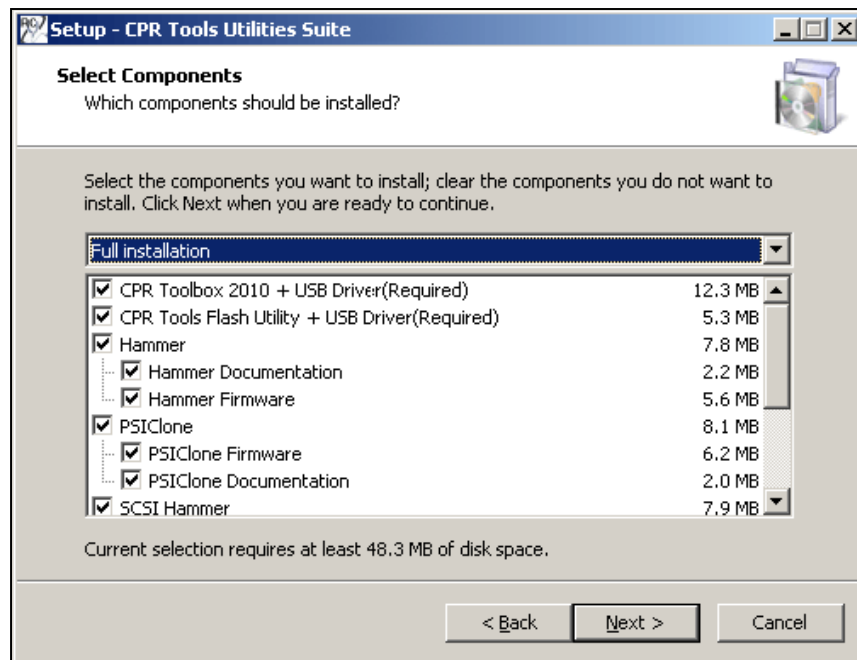


Figure 12 - Full Installation – All items are installed.

After selecting desired components, click 'Next'.

The 'Select Additional Tasks' dialog is presented which offers users the ability to create Desktop and Quick Launch shortcuts for selected components. Items marked with a checkmark will generate Desktop and Quick Launch icons; deselect any item for which neither Desktop nor Quick Launch icons are desired.

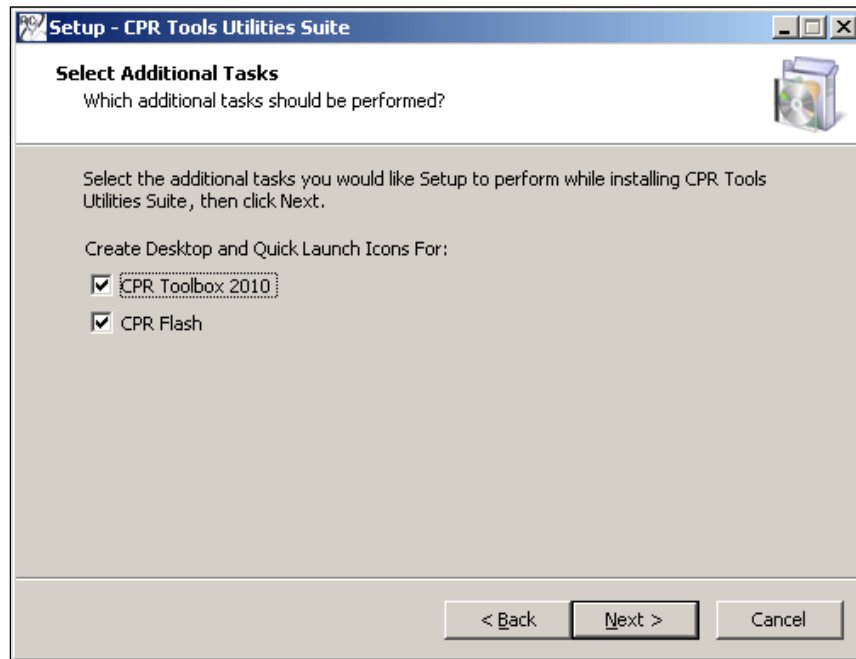


Figure 13 – Select Additional Tasks

Click 'Next'.

The 'Ready to Install' dialog box is presented to confirm all selected components. To change which components are to be installed, click 'Back'.

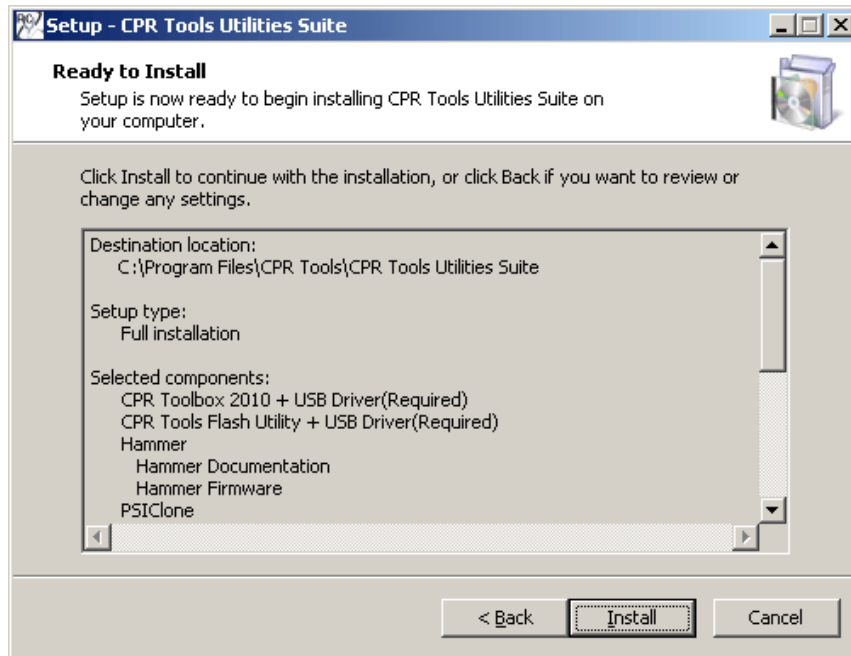


Figure 14 - Ready To Install

To proceed with installing the selected components, click 'Install'.

Installation progress is provided as shown in Figure 15.

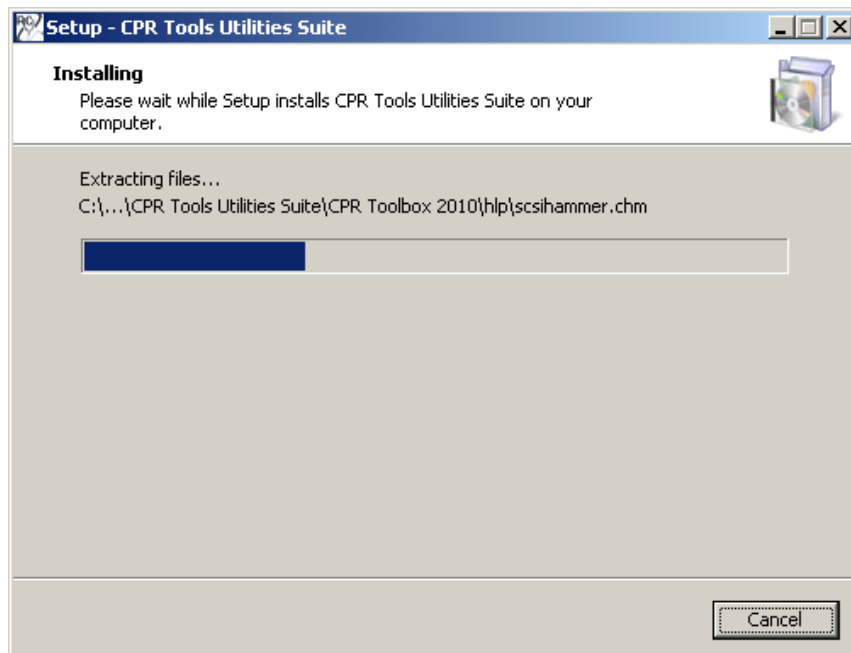


Figure 15 - Installation progress

The default settings for the installer include installation of the CPR Flash™ utility which is used to update the firmware for Hammer™ and CPR Toolbox™ which is the host companion software for PSIClone™, Hammer™ and SCSI Hammer™. This will cause the 'Windows Logo Testing' dialog box to appear.

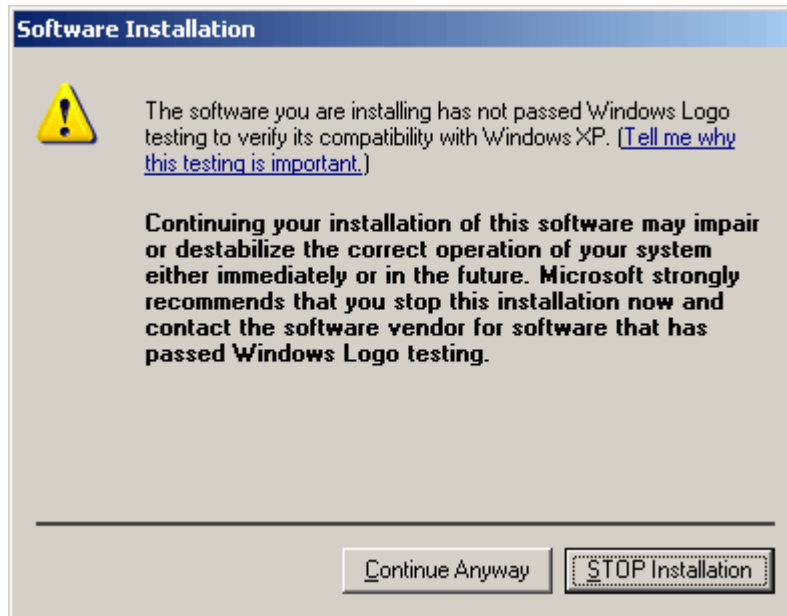


Figure 16 - Windows Logo Testing dialog box.
Click 'Continue Anyway' if this is shown.

Users must click 'Continue Anyway' for the required USB driver to be installed.

The default installation options include files which work with CPR Tools' PSIClone™ data recovery device. If the default options are used, the installer will install driver support for CPR Tools' SeaKey. This is shown below in Figure 17.

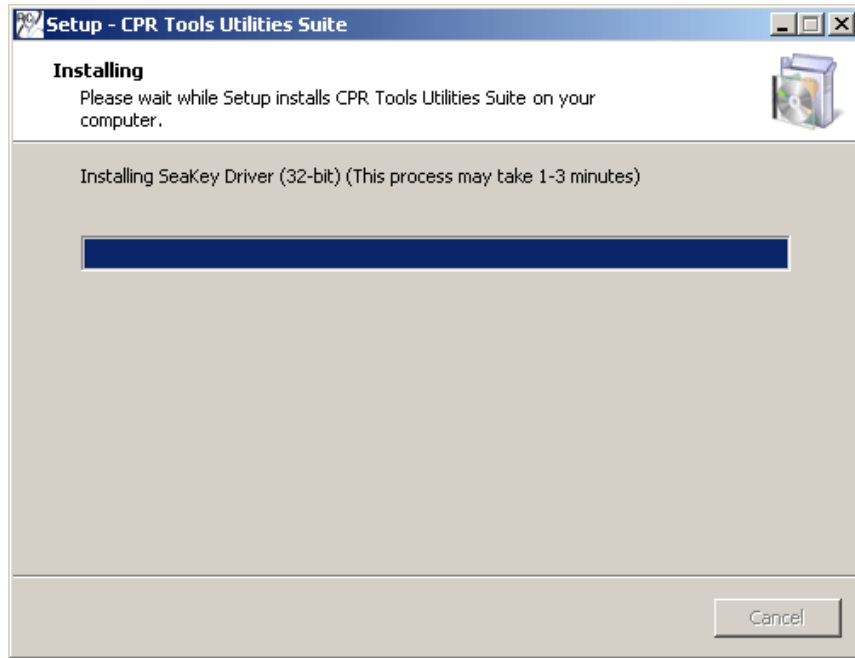


Figure 17 - Installing SeaKey™ support

When the installer has completed, a confirmation message is displayed.

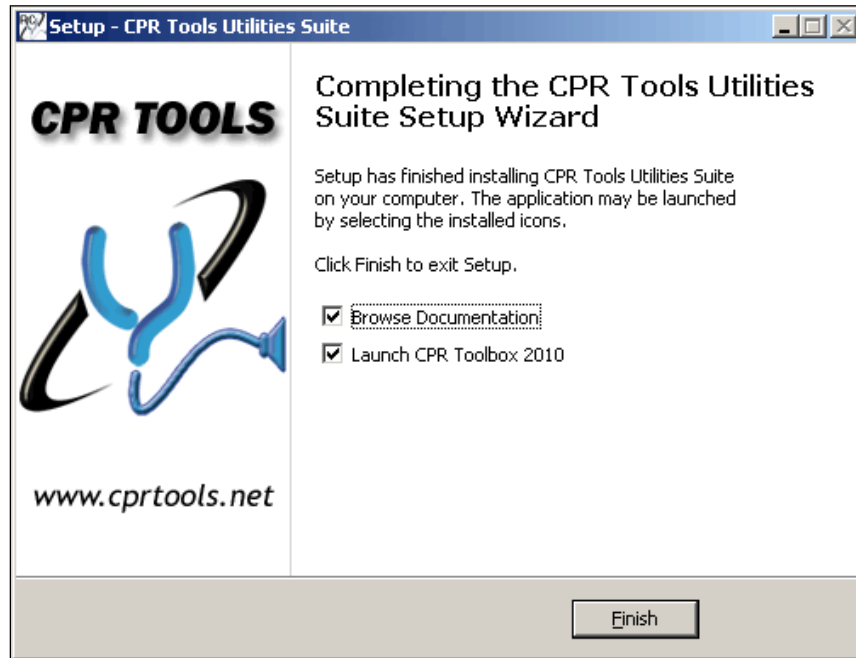


Figure 18 - Installation Complete

To exit the installer, click 'Finish'. If the 'Launch CPR Toolbox 2010' box is checked, CPR Toolbox™ will launch; if the 'Browse Documentation' box is checked, a Windows Explorer window will open to the folder into which documentation was installed. The documentation subfolder contains useful information, including Release Notes, Spec Sheets and User Guides.

The Release Notes folder provides helpful information about Hammer™ as well as the applications installed by CPR Tools Utilities Suite installer, including CPR Flash™ and CPR Toolbox™.

The Spec Sheets folder includes product specifications for Hammer™ SCSI Hammer™ and PSIClone™.

The User Guides folder contains PDF versions of user guides for Hammer™, SCSI Hammer™ and PSIClone™.

Launching CPR Toolbox 2010™

If CPR Toolbox™ was installed using default installer settings, the program may be launched from the Windows Start menu, under Programs/CPR Tools/CPR Toolbox 2010. The application will discover any CPR Tools' devices (PSIClone™, Hammer™, etc...) which are powered and connected to the host system. The image below shows the initial screen when CPR Toolbox™ is launched with a Hammer™ powered and attached to the host PC.

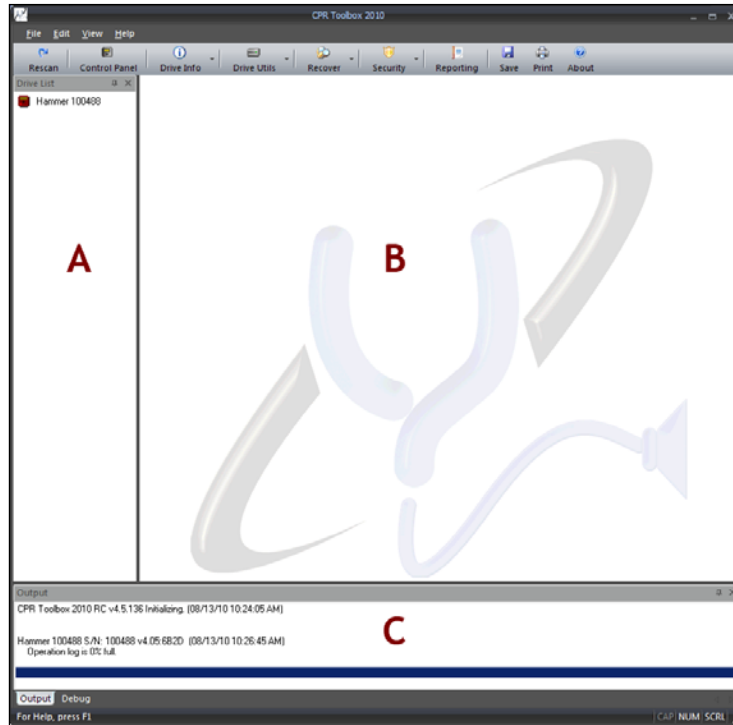


Figure 19 - CPR Toolbox™, Initial Screen

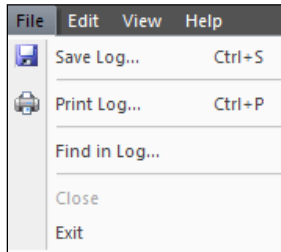
CPR Toolbox™ 2010 displays three main panes of information, a toolbar and typical Windows pull-down menus.

1. The vertical pane at the left of the screen (Labeled 'A') lists CPR Tools' devices and drives attached to CPR Tools' devices.
2. The pane at the right of the screen (Labeled 'B') is the main display window. This will be populated, in tabbed format, as toolbar items are clicked.
3. The lower, horizontal pane (Labeled 'C') displays output; i.e. logs, success/fail information, etc...

The pull-down menu structure within CPR Toolbox™ is:

- | | | | |
|--|--|---|---|
| <p>File</p> <ul style="list-style-type: none"> • Save Log • Print Log • Find in Log • Close • Exit | <p>Edit</p> <ul style="list-style-type: none"> • Preferences • Sync Device Time | <p>View</p> <ul style="list-style-type: none"> • Toolbars and Docking Windows <ul style="list-style-type: none"> ○ Standard* ○ Debug* ○ Drive List* • Status Bar* <p>(* on by default)</p> | <p>Help</p> <ul style="list-style-type: none"> • PSIClone Help • Hammer Help • SCSI Hammer Help • Sledge Hammer Help • Debug Registers • Generate Tech Report • About CPR Toolbox |
|--|--|---|---|

The 'File' menu:



Clicking the 'File' menu reveals options displayed above. 'Save Log', 'Print Log', 'Find in Log', 'Close' and 'Exit' are presented as options.

'Save Log' will save the output log to a file. The user will be prompted for a location in which to save the file. Alternately, the key combination CNTL-S may be used to save the log to a file.

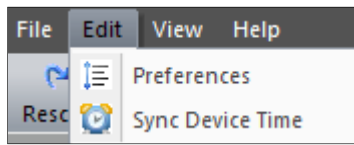
'Print Log' will print the output log. Alternately, the key combination CNTL-P may be used to print the log.

'Find in Log' will present a search box. Using this tool, users may search for a particular string in the active log (displayed in the bottom, horizontal pane, labeled 'C' in Figure 19).

'Close' becomes available when CPR Toolbox is displaying one or more tabs within its main window. Clicking 'Close' will close the current tab.

Clicking 'Exit' will close CPR Toolbox.

The 'Edit' Menu:



The first option under the 'Edit' menu is 'Preferences'. Selecting 'Preferences' will instruct CPR Toolbox™ to present the Preferences editor, shown in Figure 20.

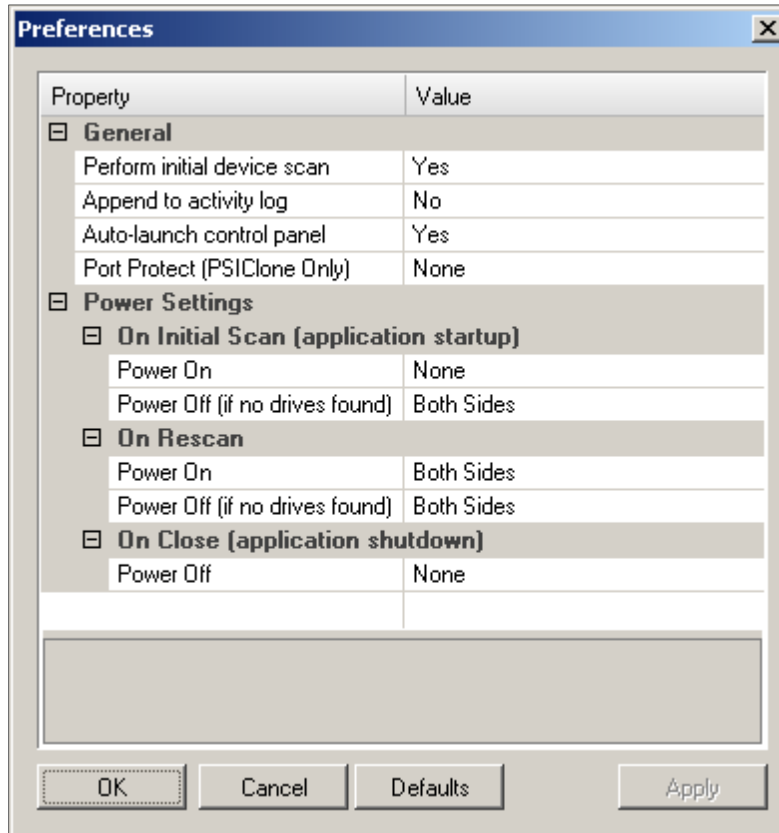


Figure 20 - General Preferences

The Preferences box is divided into two (2) sections labeled General and Power Settings.

General

This section contains options which define how CPR Toolbox™ will behave upon being launched.

By clicking on each line in turn, a dropdown box will appear for the value at right.

Perform initial device scan

By default, CPR Toolbox™ will perform a scan for devices. This may be changed selecting 'No' from the available dropdown box.

Append to activity log

By default, activity logs will be overwritten. To change this behavior, set this value to 'Yes'

Auto-launch control panel

By default, CPR Toolbox will launch the 'Control Panel' whenever a device is selected. Set this to 'No' to alter this behavior.

Port Protect

By default, no ports are protected from initial scans; CPR Toolbox™ will attempt to identify all attached drives when a CPR Tools device is powered. This setting allows for customization of this behavior. Available options are 'Side A', 'Side B', 'Both' or 'None'.

Power Settings

Note:

The 'Power Settings' section is not used when using CPR Toolbox™ with Hammer™.

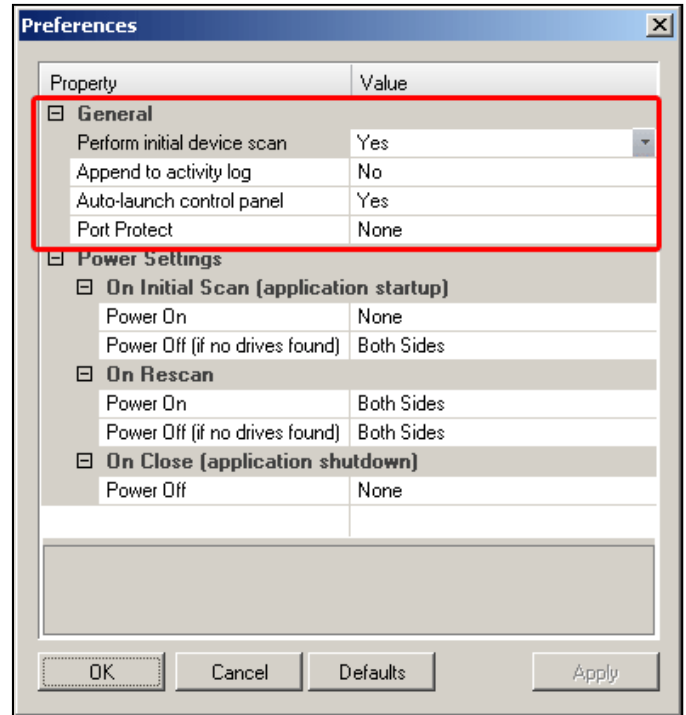


Figure 21 - General Preferences

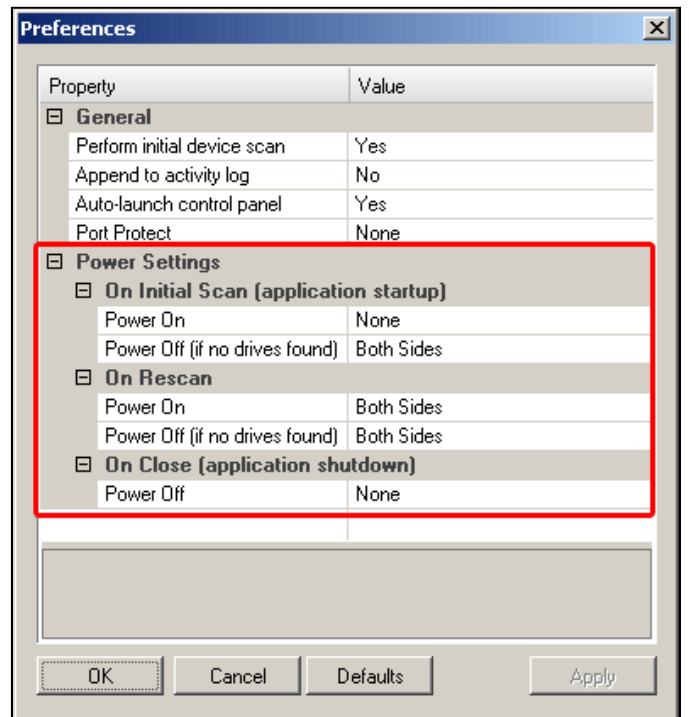
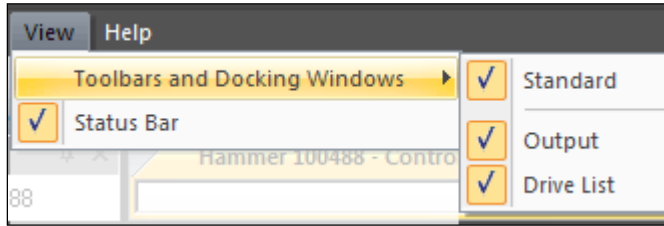


Figure 22 - Power Setting Preferences

The 'View' Menu:



The 'View' menu provides the ability to select or deselect areas of the CPR Toolbox™ from being displayed.

Expanding the item labeled 'Toolbars and Docking Windows' provides the user the ability to toggle viewing of the Standard toolbar, shown in Figure 23, the Output pane and the Drive List pane.



Figure 23 - CPR Toolbox Standard Toolbar

The Output pane and Drive List pane are shown in Figure 24, labeled C and A respectively.

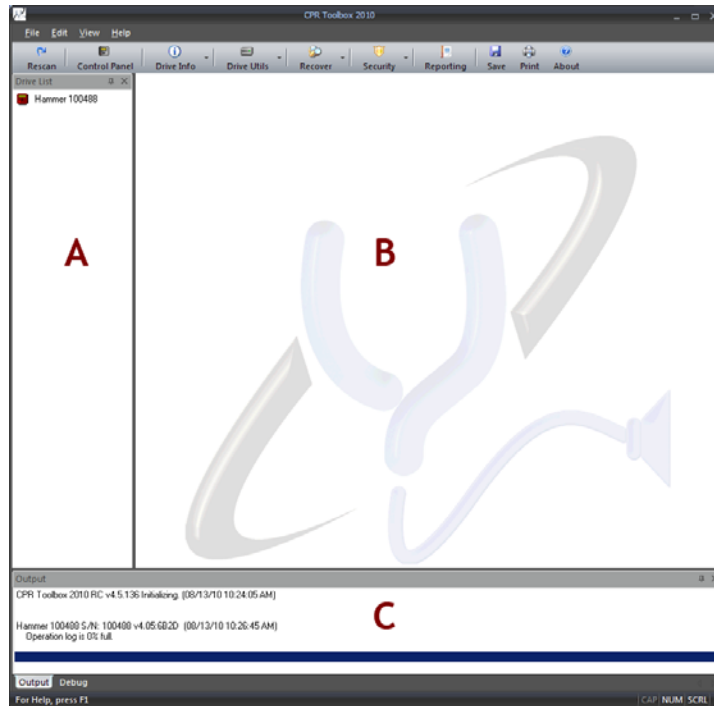
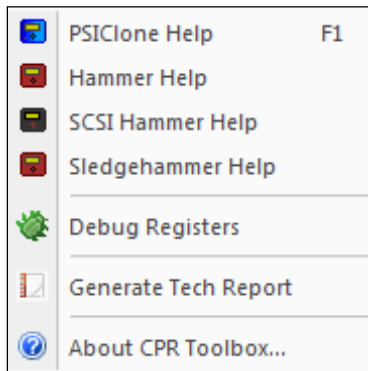


Figure 24 - CPR Toolbox

The Status bar, an informational display located at the very bottom of the main CPR Toolbox™ window, may be toggled on and off by selecting or deselecting it in the 'View' menu.

The 'Help' Menu:



Online help is available from within this menu by clicking 'Help'. The remaining options and their functions are:

PSIClone™ / Hammer™ /SCSI Hammer™ / Sledge Hammer™ Help

CPR Toolbox™ provides help files for PSIClone™, Hammer™, SCSI Hammer™ and Sledge Hammer™ devices.

Debug Registers

This option will open a 'tab' which displays debug registers for the selected device. Use this when instructed to by CPR Tools technical support personnel.

Generate Tech Report

This option will save technical information to a text file of the user's choosing and should be utilized when instructed to by CPR Tools technical support personnel.

About CPR Toolbox

This option displays version information for CPR Toolbox™ and its components.

The CPR Toolbox™ Standard Toolbar

The CPR Toolbox™ software is easily controlled through the convenient button bar at the top of the main Toolbox window. The toolbar is depicted in Figure 25.

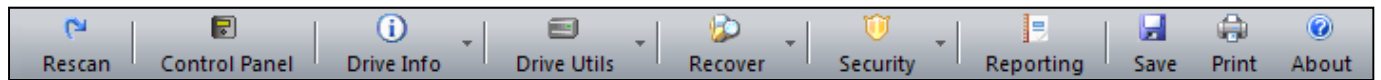
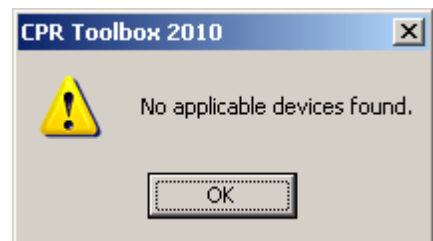


Figure 25 - The CPR Toolbox™ button bar

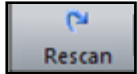
The button bar displays ten (10) buttons, some of which have submenu selections available. The button bar menu structure is displayed here:

- Rescan
- Control Panel
- Drive Info
 - Identify Drive
 - View S.M.A.R.T.
- Drive Utilis
 - Sector Viewer
 - eDrive™⁵
 - gClone™⁵
 - gRase™
- Recovery
 - Image Restore
 - Advanced Recovery⁵
 - iFirmware⁵
 - Mount Image⁵
 - Recover My Files⁵
 - Mount/Unmount Drive⁵
- Security
 - Drive Key⁵
- Reporting
- Save
- Print
- About

If an item selected is not supported by Hammer™, CPR Toolbox will display a message indicating that the selected option requires a device other than Hammer™.

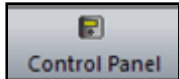


⁵ Not supported by Hammer™ or SCSI Hammer™



Rescan

Clicking this toolbar button will cause the CPR Toolbox™ to rescan for CPR Tools devices (e.g. PSIClone™, Hammer™, Sledge Hammer™, SCSI Hammer™, etc...).



Control Panel

Clicking this toolbar button will launch the Control Panel module. The CPR Toolbox™ Control Panel module is an interface to many data security and data recovery functions. The main window contains several sections, each of which are covered in detail beginning on page 49.

Control Panel options are presented in tabbed format. These include:

- EZ Hammer
- Hammer
- Verify
- Settings

CPR Toolbox™ Control Panel

Upon selecting Control Panel, the “EZ Hammer Tab” is presented

The “EZ Hammer” Tab

The EZ Hammer provides a simple interface which performs common tasks using preset Hammer™ values.

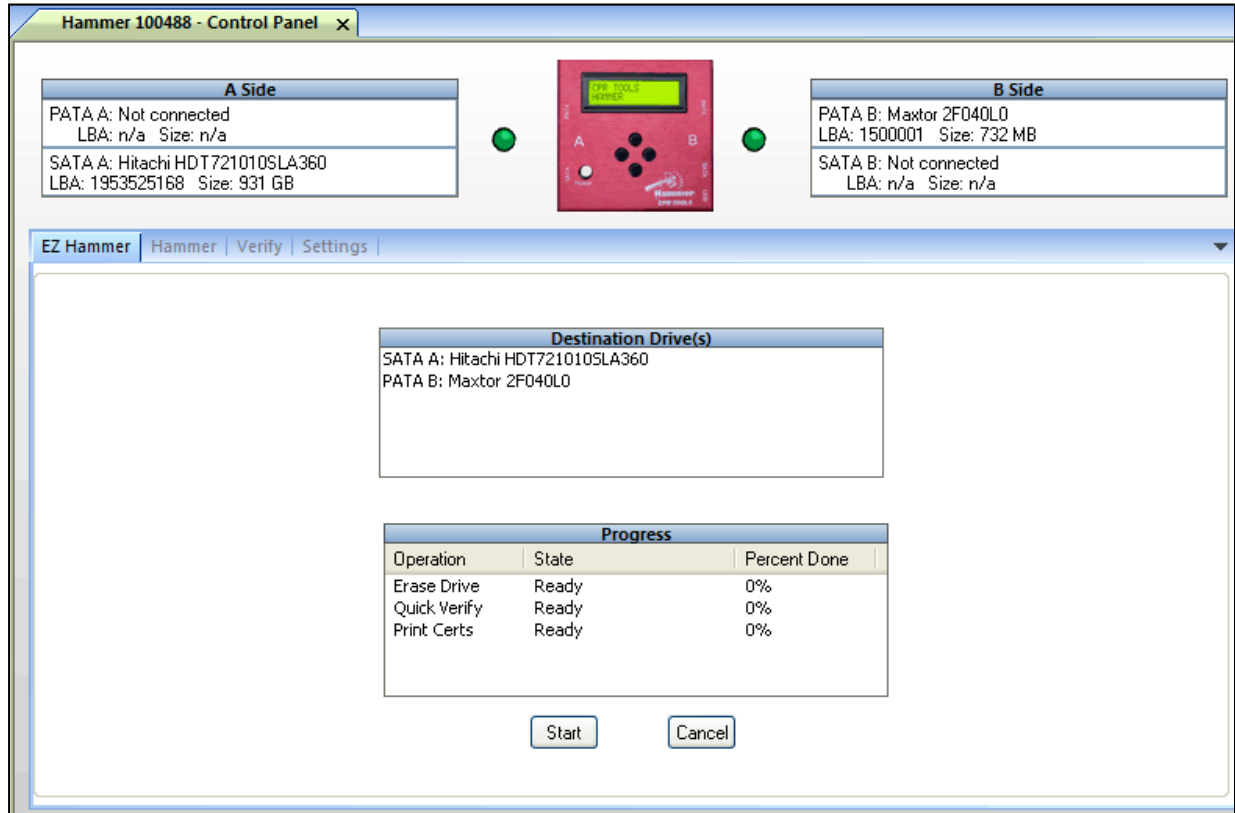


Figure 26 – Upon selecting ‘Control Panel’, the EZ Hammer tab is displayed

As seen in above, the initial ‘Control Panel’ screen (‘EZ Hammer tab’) provides a simple method for quickly and effectively eradicating data on all attached drives using preset defaults.

The EZ Hammer defaults are:

- Bang
- QuickVerify
- Print EZ Certs
- Power-Down drives
- Buzzer On

A Sample EZ Cert is presented here.

Data Erasure

Certificate of Compliance
NIST-800-88

Certificate Number:	100174_1208081258
Date:	Dec 08, 2008
Time:	12:58 PM
Device ID:	100174
Revision:	v4.00:5B2D
Model:	WDC WD100BB-00AUA1
Serial Number:	WD-WMA6Z2710819
Method:	PURGE
Result:	PASS
Verification:	PASS
Checksum:	N/A
Additional Notes:	

This certificate will serve as record of compliant data eradication having been performed on the drive listed above.

Drives annotated with PURGE have been erased with a Hammer™ SECURITY ERASE COMMAND which complies with NIST-800-88 data PURGING guidelines, the strictest erasure method defined by NIST.

Drives annotated with CLEAR have been erased with a Hammer™ ERASE COMMAND which complies with NIST-800-88 data CLEARING guidelines.

Customizing EZ-Certs

To customize EZ-Certs printed from the EZ-Hammer tab, users may:

- Create a custom Bitmap Image file (.bmp) to be used on the EZ-Cert.
 - This should be placed in the **C:\Documents and Settings\\My Documents\CPR Tools Utilities Suite\Images**.
 - Name this bitmap image file **ez_certlogo.bmp**.
- Create a plain text file to be used as the 'new address' on each EZ-Cert printed.
 - This file should be placed in the same folder; name it **ez_address.txt**.
- Create a plain text file to be used as the 'new coupon' on each EZ-Cert printed.
 - This file should be placed in the same folder; name it **ez_certcoupon.txt**.

The "Hammer" Tab – CPR Toolbox™ Control Panel

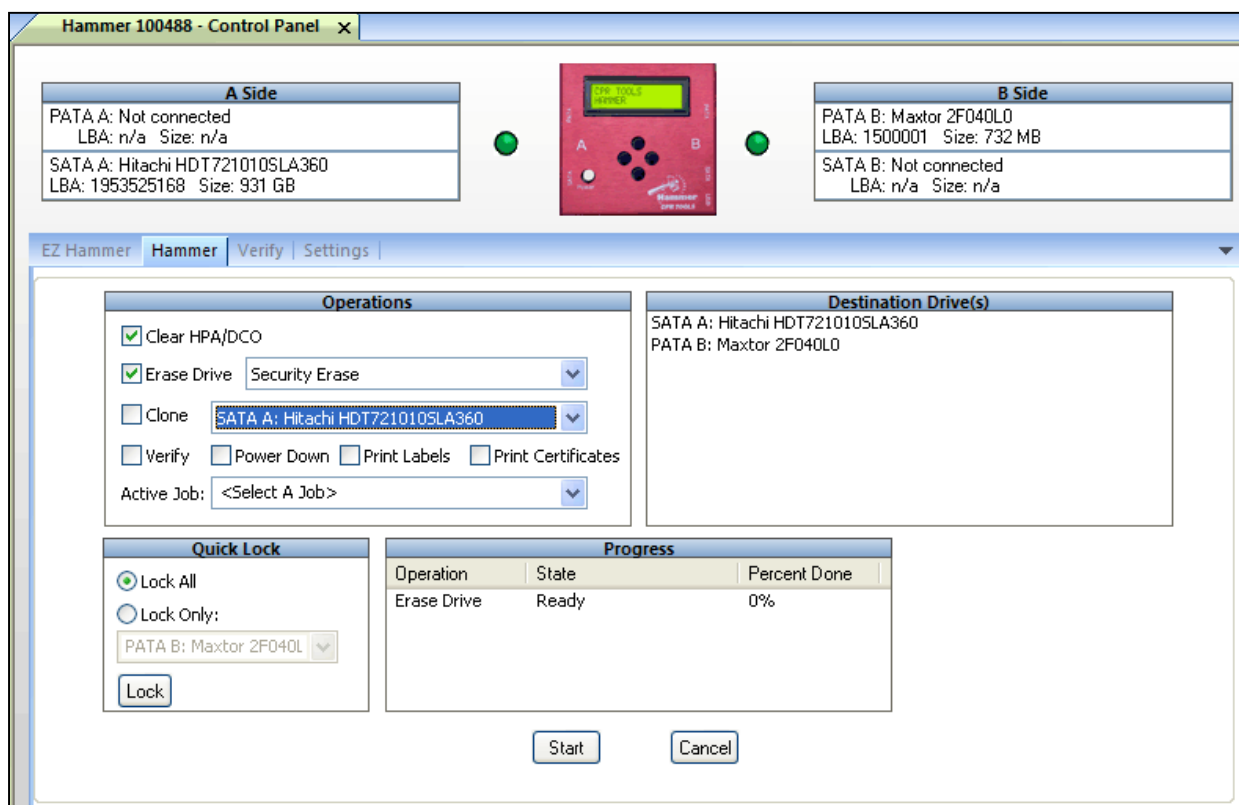


Figure 27 - The 'Hammer' Tab

The Hammer tab provides options for specific Hammer™ actions. The top portion of the screen depicts drive status for each drive connected to Hammer™.

Clear HPA/DCO

Enabled by default, this setting instructs Hammer™ to clear any existing HPA or DCO on a target drive prior to taking an erasure or clone action.

Erase Drive

As Hammer™ is a data eradication device, this setting is enabled by default. The default action for data erasure is 'Erase' which complies with NIST 800-88 'clear'. By using the drop-down box, users may select alternate methods of data erasure. These are:

- Security Erase
- 3 Pass
- 7 Pass

Security Erase

Selecting Security Erase instructs Hammer™ to perform data eradication on the drive in compliance with NIST 800-88 'purge' specifications.

3 Pass

Selecting 3 Pass instructs Hammer™ to write to each sector of the drive three (3) times.

- Pass 1
 - Writes all zeros (0) to each sector of the drive
- Pass 2
 - Writes all ones (1) to each sector of the drive
- Pass 3
 - Writes a random, verifiable pattern to each sector of the drive.

7 Pass

Selecting 7 Pass instructs Hammer™ to write to each sector of the drive seven (7) times.

- Pass 1
 - Writes all zeros (0) to each sector of the drive
- Pass 2
 - Writes all ones (1) to each sector of the drive
- Pass 3
 - Writes all zeros (0) to each sector of the drive
- Pass 4
 - Writes all ones (1) to each sector of the drive
- Pass 5
 - Writes all zeros (0) to each sector of the drive
- Pass 6
 - Writes all ones (1) to each sector of the drive
- Pass 7
 - Writes a random, verifiable pattern to each sector of the drive.

Clone

Disabled by default; select this checkbox to instruct Hammer™ to perform a clone from a chosen source drive to as many as three additional drives.

Additional Options

Below the 'Clone' field, CPR Toolbox™ provides checkboxes so that users may instruct Hammer™ and CPR Toolbox™ to perform specific tasks after eradicating data from drives attached to Hammer™. These are:

- **Verify**
 - Check this box to enable verification of sectors. Hammer™ can be set to 'Quick Verify' on the Settings tab of CPR Toolbox™ or in the Settings menu of the device. Using 'Quick Verify' will examine a sampling of sectors to ensure eradication has been successful. Verification without enabling 'Quick Verify' will examine every sector on each attached drive and will significantly impact the time taken to complete an eradication task.
- **Power Down**
 - Check this box to instruct Hammer™ to power down drives after eradication is complete. This setting may also be made on the device under the 'Operations' menu.
- **Print Labels**
 - This option is only functional when working with Hammer™ and the optional Bluetooth printer.
 - Check this box to instruct Hammer™ to print labels using the optional Bluetooth printer immediately after the eradication process has completed.
- **Print Certificates**
 - Check this box to instruct Hammer™ to print Certificates of Compliance for each drive eradicated immediately after the eradication process has completed.

CPR Toolbox™ Color Codes

CPR Toolbox™ provides a color indicator for actions performed or completed. The background colors for any drives connected to Hammer™ will indicate the following:

Color	Definition
Green	Drive has completed an action without errors
Red	Drive has completed an action with errors
White	Drive is either idle or an action on this drive was cancelled by the user
Yellow	Drive is currently being acted upon; no errors have been encountered
Red on Yellow	Drive is currently being acted upon; errors have been encountered

NOTE: On-Screen Color Codes have changed in this version of CPR Toolbox.

Figure 28 depicts Hammer™ in the process of performing erasure action on the two (2) drives to which it has been attached.

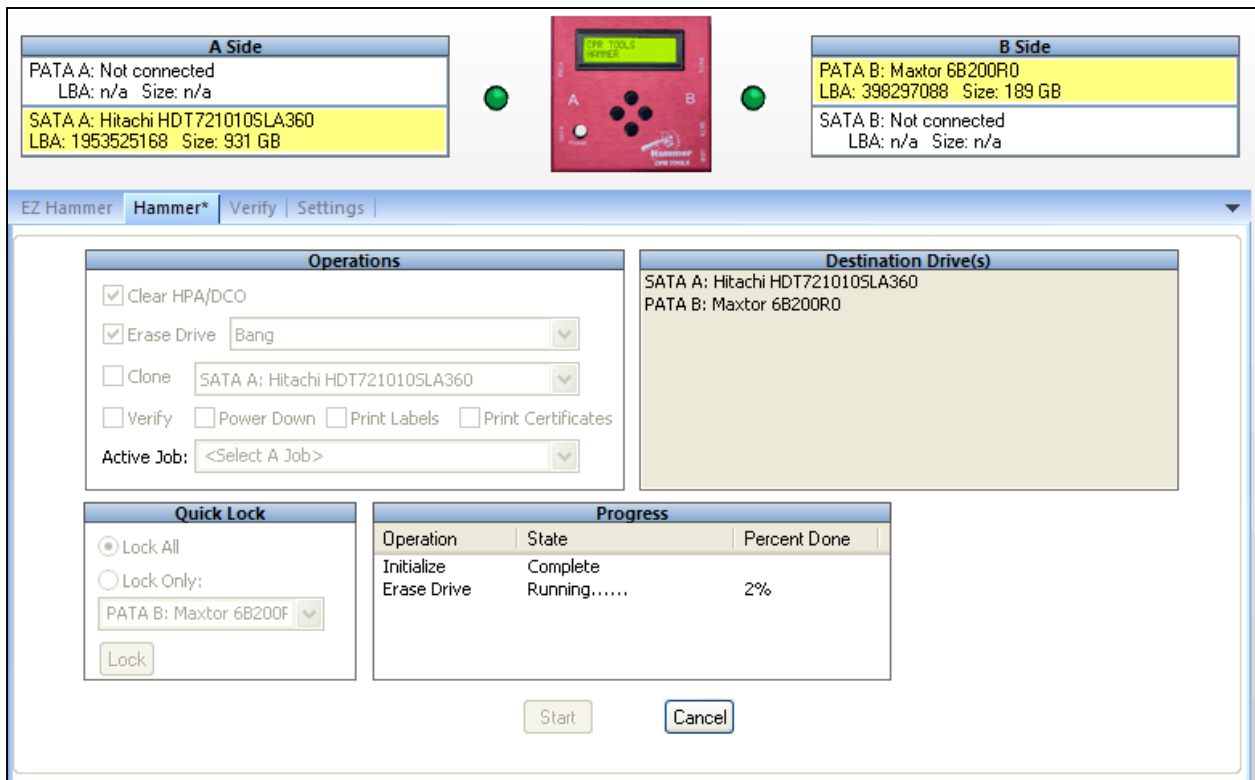
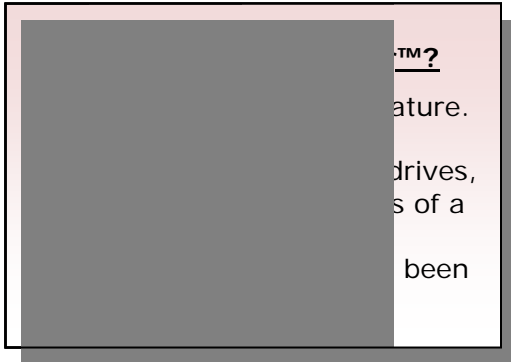
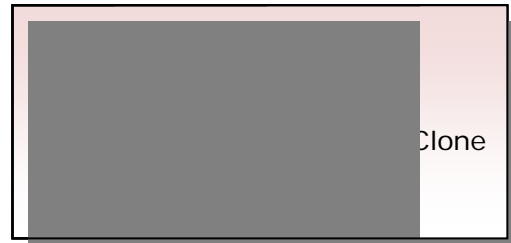


Figure 28 - Hammer, erasing two attached drives

Rapid Redeployment of Erased Drives: Cloning with Hammer™

Device factory defaults of Hammer™ will show the 'Clone' checkbox unchecked. Checking this box will remove the drive listed in the drop-down (source of clone) from the Destination Drives list on the right of the screen and will instruct Hammer™ to perform a clone from the 'source' drive selected onto the destination drive(s) after erasure of the destination drives has been completed.



The ability to clone from a source to as many as three simultaneous targets is a powerful key feature which enables the redeployment of multiple drives quickly and effectively.

Verify

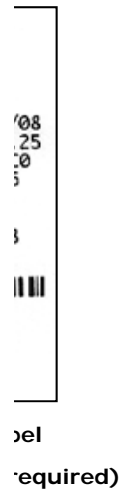
Disabled by default; select this setting to instruct Hammer™ to verify actions taken. Verification involves performing a sector-by-sector read of erased drives to ensure they have been overwritten as instructed. For cloned drives, verification involves performing a sector-by-sector comparison of the 'master' or 'source' drive against the cloned drive. Employing verification will greatly increase the time required for Hammer™ to complete tasks.

Power Down

Disabled by default; select this setting to instruct Hammer™ to turn off power to connected drives after the current action has completed.

Print Labels

Disabled by default; select this setting when using the optional Bluetooth printer. Selecting this setting will instruct Hammer™ to print labels for each attached drive upon which an action has been taken. A sample of a Hammer™ label is provided in Figure 29.



Quick Lock

The 'Quick Lock' section allows users to secure drives quickly and easily. While this setting alone will not eradicate data, it may be used to apply a randomly generated password to the drive(s) selected.

Note: 'Quick Lock' is only available for drives which support the ATA Security command set.

Hammer™ Tips:

The **Quick Lock** function is ideal for securing the data on a drive scheduled to be erased at a later time. If a drive is unable to complete the Security Erase process due to errors, the drive will remain locked. For drives where Security Erase process is not able to continue, CPR Tools recommends degaussing the drive, followed by complete drive destruction using a hard drive shredder.

Progress

The 'Progress' information box at the bottom of the screen will be updated to show each option as it is selected; once 'started', this box will indicate the task progress, shown as a percentage of the total time to complete the configured task.

Hammer™ Tips:

Changes made on the 'Hammer' tab affect the current action only. To make settings changes which may be saved as new user defaults, use the 'Settings' tab.

After configuring Hammer™, the 'Start' button may be clicked to initiate all configured actions. Figure 30 depicts the Hammer™ LCD during a Security Erase action on the drive connected to the PATA port on Side 'A' of the device.



Figure 30 - Hammer™ Display during Security Erase on PATA A

The word 'Erase' denotes the action being taken; the '<SE' indicates a 'Security Erase' action. Placement of this value at the upper left of the LCD indicates that the action is being taken on PATA Side 'A' of the device.

The 33% visible on the second line of the display indicates that the current process is about one-third complete.

A complete Hammer™ LCD display legend is presented in this manual under the heading "Hammer™ User Interface (Stand-alone mode)".

The “Verify” Tab – CPR Toolbox™ Control Panel

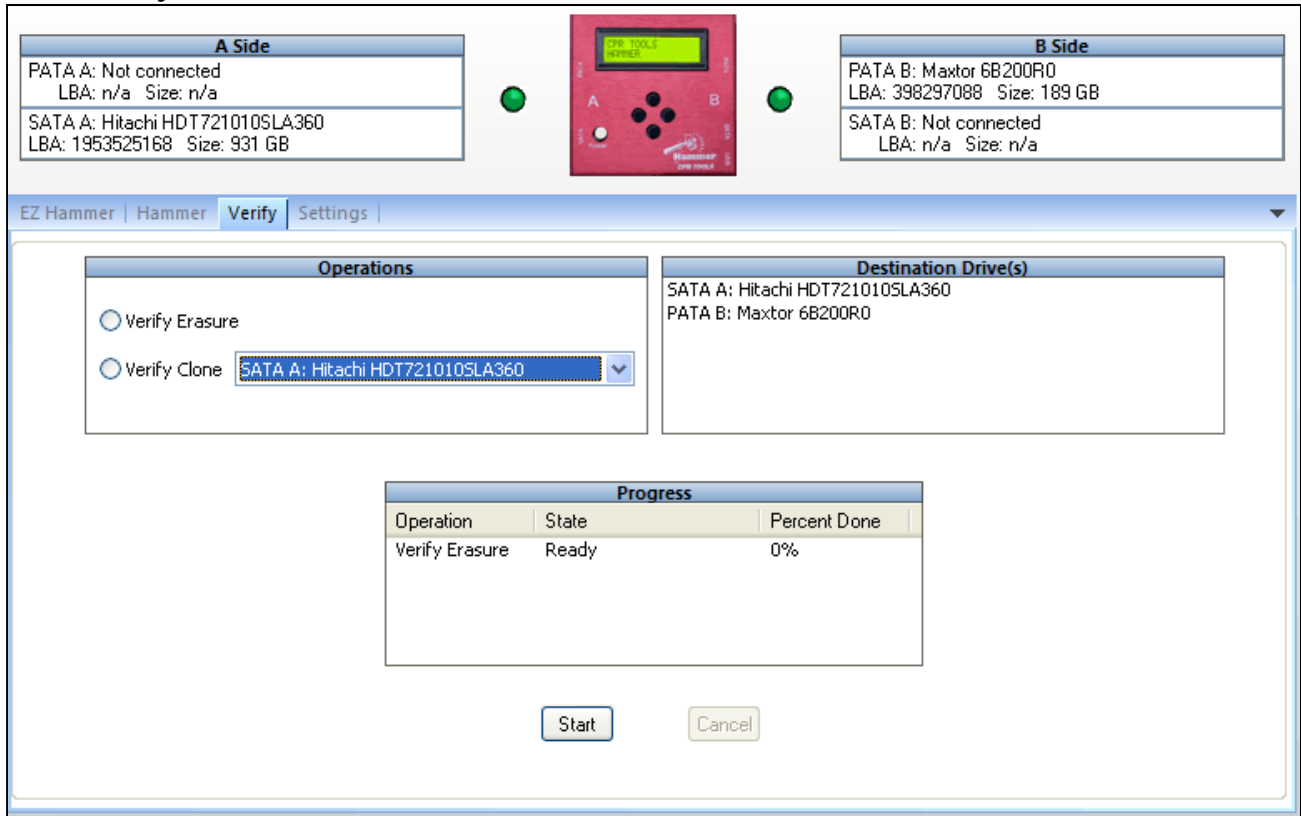


Figure 31 - Verify Tab

The 'Verify' tab provides options to perform verification of previously performed erasure or clone actions.

When verifying Security Erase actions, Hammer™ performs sector-by-sector reads to ensure that the instructed action was accurately performed. When verifying Security Erase or Drive Erase actions, Hammer™ reads each sector expecting to find all zeros (0x00).

For clones, Hammer™ compares the destination drive to the source drive, verifying that the data is a true forensic clone of the original.

The “Settings” Tab – CPR Toolbox™ Control Panel

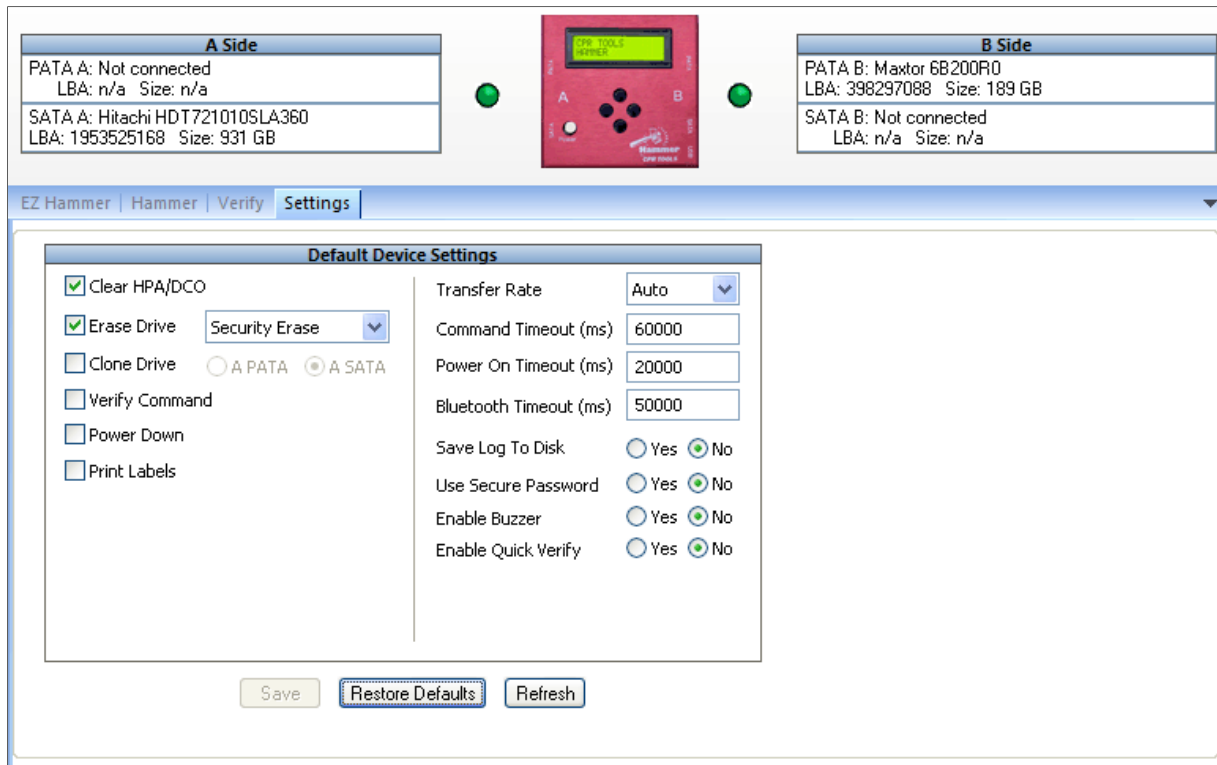


Figure 32 - Settings Tab

The ‘Settings’ tab provides the ability to change default settings for Hammer™ actions. Changes made here are saved on the device in NVRAM.

To restore factory default settings, use the ‘Restore Defaults’ button. depicts the Settings Tab showing default values. These are:

1. Clear HPA/DCO [enabled]
2. Erase Drive [enabled] • Security Erase [disabled]
3. Clone Drive [disabled]
4. Verify Command [disabled]
5. Power Down [disabled]
6. Print Labels [disabled]
7. Transfer Rate [auto]
8. Command Timeout (ms) [4,000]
9. Power On Timeout (ms) [20,000]
10. Bluetooth Timeout (ms) [50,000]
11. Save Log to Drive [no]
12. Use Secure Password [no]
13. Enable Buzzer [no]

NOTE:

To establish new user defaults, make changes on this tab, then click ‘Save’. New user defaults will be displayed on the ‘Hammer’ tab upon subsequent uses of CPR Toolbox™.

Hammer™ may be reset to factory defaults by clicking the ‘**Restore Defaults**’ button.

Clear HPA/DCO

Enabled by default, this setting instructs Hammer™ to clear any existing HPA or DCO™ on a target drive prior to taking an erasure or clone action.

Erase Drive

Enabled by default, this setting instructs Hammer™ to perform NIST 800-88 'clean' operations.

Security Erase

Disabled by default. Enable this setting to instruct Hammer™ to perform ATA Security Erase (NIST 800-88 'purge') actions on any attached drives which support it.

Clone Drive

Disabled by default; select this checkbox to instruct Hammer™ to perform a clone from a chosen source drive to as many as three additional drives.

Verify Command

Disabled by default; select this setting to instruct Hammer™ to verify actions taken. Verification involves performing a sector-by-sector read of erased drives to ensure they have been overwritten as instructed. For cloned drives, verification involves performing a sector-by-sector comparison of the 'master' or 'source' drive against the cloned drive. Employing verification will greatly increase the time required for Hammer™ to complete tasks.

Power Down

Disabled by default; select this setting to instruct Hammer™ to turn off power to connected drives after the current action has completed.

Print Labels

Disabled by default; select this setting when using the optional Bluetooth printer. Selecting this setting will instruct Hammer™ to print labels for each attached drive upon which an action has been taken.

Transfer Rate

This is set to 'auto' by default. The default of 'auto' instructs Hammer™ to interact with drives at their most efficient transfer rate (typically UDMA4). When working with drives with issues, users may opt to step down Hammer™ manually to the options presented here.

They are:

- UDMA3
- UDMA2
- UDMA1
- UDMA0
- PIO

Command Timeout

The default Command Timeout is 4,000ms (4 seconds). This value represents the amount of time Hammer™ will wait for response from an attached drive after issuing an instruction.

Power On Timeout

The default Power On Timeout value is 20,000ms (20 seconds). This value represents the amount of time Hammer™ will wait for a response attached drives subsequent to supplying power to them. Drives which do not 'come ready' within this amount of time will cause Hammer™ to display an error.

Bluetooth Timeout

The default Bluetooth Timeout value is 50,000ms (50 seconds). This value represents the amount of time Hammer™ will wait for a response from the optional Bluetooth printer when trying to establish a connection. Should the time taken to obtain a response from the optional Bluetooth printer exceed this value, Hammer™ will display a connection error.

NOTE: This release of CPR Tools Utilities Suite and related Hammer™ / SCSI Hammer™ firmware represents the last release which will support the optional Bluetooth Printer and related label printing functions.

Save Log to Drive

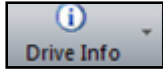
Set this value to 'Yes' to instruct Hammer™ to log actions to the drives being acted upon. This setting is useful when working with multiple drives for which certificates or labels may be printed at a later time.

Use Secure Password

When enabled, Hammer™ will lock drives with a random password that does not allow the drive to be unlocked without a successful completion of a Security Erase. When disabled, Hammer™ will use a generic password and will unlock the drive without regard to success or failure of an action.

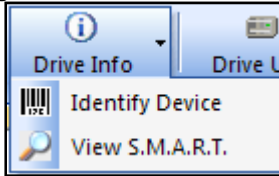
Enable Buzzer

Enabling this option will cause Hammer™ to sound an audible alert upon completion of an action.



Drive Info

Clicking Drive Info reveals two (2) submenu choices, Identify Drive and View S.M.A.R.T.



Identify Drive

Clicking this toolbar button will cause the CPR Toolbox™ to issue an ATA 'Identify Device' command to the selected drive. Information retrieved is presented as a tabbed screen in the main section of the CPR Toolbox™. The 'Identify Device' data tab is depicted in Figure 33. The 'Save' button may be used to write this information to a file. The section of output titled

-----Integrity Word-----

which is presented at the bottom of the output contains a checksum which is used to verify the accuracy of the data being displayed. If the checksum validates, the value valid will be displayed.

Attribute	Value/Supported	Enabled
Device Reset	Supported: No	Enabled: No
Host Protect	Supported: Yes	Enabled: Yes
Write Buffer	Supported: Yes	Enabled: Yes
Read Buffer	Supported: Yes	Enabled: Yes
No Op	Supported: No	Enabled: No
Download Micro Code	Supported: Yes	Enabled: Yes
Read/Write DMA Queued	Supported: No	Enabled: No
CFA	Supported: No	Enabled: No
Advanced Power Management	Supported: No	Enabled: No
Removable Media Status	Supported: No	Enabled: No
Power up StandBy	Supported: No	Enabled: No
Set Features	Supported: No	Enabled: No
Set Max Security	Supported: Yes	Enabled: No
Automatic Acoustic Management	Supported: Yes	Enabled: Yes
48 Bit Address Feature		
Device Configuration Over		
Mandatory FLUSH CACHE		
FLUSH CACHE EXT Com		
----- Security Status -----		
Security	Supported: Yes	Enabled: No
Security Locked	No	
Security Frozen	No	
Security Count Expired	No	
Enhanced Erase	Supported: No	
Security Level	0	
----- Integrity Word -----		
Integrity Signature	0xA5	
Integrity CheckSum	0xBF	Valid
----- Integrity Word -----		
Integrity Signature	0xA5	
Integrity CheckSum	0xBF	Valid

Figure 33 - Identify Drive

View S.M.A.R.T.

Self-Monitoring, Analysis, and Reporting Technology, or S.M.A.R.T., is a monitoring system for computer hard disks to detect and report on various indicators of reliability, in the hope of anticipating failures.

The technical documentation for S.M.A.R.T. is in the **ATA Attachment** standard.⁶

Clicking the View S.M.A.R.T. button will retrieve and display current S.M.A.R.T. data for the selected drive. Figure 34 depicts the View S.M.A.R.T. results displayed in a tab of the main window. Output may be saved by clicking 'File/Save' or by pressing CNTL-S on the keyboard. The radio buttons allow the user to determine the numeric format in which the 'Raw' column data will be displayed and saved.

Raw Values: <input checked="" type="radio"/> Decimal <input type="radio"/> Hex						
Attribute	Name	Value	Worst	Thresh	Raw	Status
N/A	Attribute Checksum	PASS	PASS	PASS	215	PASS: Checksum valid.
N/A	Threshold Checksum	PASS	PASS	PASS	223	PASS: Checksum valid.
01	Raw Read Error	114	68	25	63853436	PASS: Value is normal
03	Spin Up Time	72	70	0	0	PASS: Always passes
04	Start/Stop Count Number	100	100	20	58	PASS: Value is normal
05	Reallocated Sector Count	100	100	36	0	PASS: Value is normal
07	Seek Error Rate	73	60	30	22976823	PASS: Value is normal
09	Power-On Hours Count	89	89	0	10501	PASS: Always passes
0A	Spin-up Retry Count	100	100	0	0	PASS: Always passes
0C	Power Cycle Count	100	100	20	316	PASS: Value is normal
C2	HDA Temperature	26	48	0	26	PASS: Always passes
C3	Hardware ECC Recovered	91	69	0	16	PASS: Always passes
C5	Current Pending Sector Count	100	100	0	0	PASS: Always passes
C6	Offline Scan Uncorrectable Count	100	100	0	0	PASS: Always passes
C7	UltraDMA CRC Error Rate	200	200	0	0	PASS: Always passes
C8	Write Error Rate	100	100	0	0	PASS: Always passes
CA	Data Address Mark Errors	100	253	0	0	PASS: Always passes

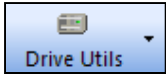
Figure 34 - View S.M.A.R.T.

The first two lines of output in the View S.M.A.R.T. display contain Attribute and Threshold Checksum values. If the data presented is valid, PASS will be displayed for these values.

The View S.M.A.R.T. display includes columns of information. These are:

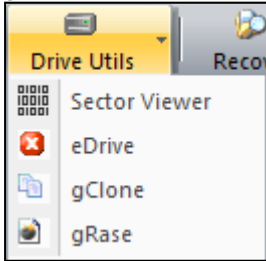
- Attribute: S.M.A.R.T. Attribute as described in the ATA specification
- Name: Canonical meaning of the S.M.A.R.T. attribute
- Value: The current value of the given S.M.A.R.T. attribute
- Worst: Lowest value recorded to date for the selected device for the given S.M.A.R.T. attribute
- Thresh: Reference value. 'Value' should be higher than this reference value for the attribute to be in a 'working state'
- Raw: Vendor specific value for a given S.M.A.R.T. attribute
- Status: Lists the current status for the attribute. Potential status listings are PASS or FAIL, followed by additional information. The additional information listed is dependent upon the type of attribute being monitored by S.M.A.R.T.

⁶ <http://www.t13.org>



Drive Utilities

Clicking Drive Info reveals two (4) submenu choices, Sector Viewer, eDrive™, gClone™ and gRase™.



Sector Viewer

Clicking the 'Sector Viewer' button presents the user with the ability to view sectors of the selected drive. Sector Viewer is useful when visual inspections of drive sectors is needed. The Sector Viewer is comprised of seven (7) distinct zones. Each of these will be described in detail.

The screenshot displays the Sector Viewer application interface. It is divided into several sections:

- Drive Selection:** Lists two drives: PATA A: ST320410A LBA: 39102336 Size: 18 GB and PATA B: ST3300831A LBA: 586072368 Size: 279 GB.
- Navigation:** Includes a 'Seek To' field, 'First', 'Prev', 'Next', and 'Last' buttons, and 'LBA: 0' and 'Of: 39102336' indicators.
- Drive Information:** Shows 'Serial Number: 5FG2HLMF' and 'No HPA or DCO Detected'.
- Scan Settings:** Includes 'Method: Search', 'Sector Value (Hex): 00', and 'Run in Reverse: No'.
- Scan Progress:** Features 'Start', 'Pause', and 'Stop' buttons.
- Data Table:** A large table with columns for 'Offset', '0-9', 'A-F', and 'ASCII'. The data shows hexadecimal values (mostly 00) and their corresponding ASCII representations (mostly dots).
- Footer:** Includes 'LBA Scroll' and 'Save Changes' / 'Read-Only' buttons.

Figure 35 - Sector Viewer

Sector Viewer – Drive Selection

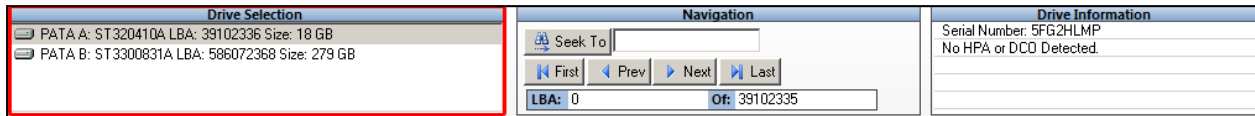


Figure 36 - Sector Viewer: Drive Selection

The top area of Sector Viewer is comprised of three (3) sections. The leftmost section is labeled 'Drive Selection'. The drive selected here will be displayed in the main sector viewer display. Select a drive for which sectors should be displayed by clicking on it in this window.

Sector Viewer - Navigation

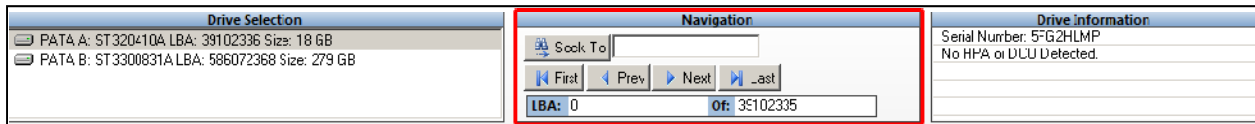


Figure 37 - Sector Viewer: Navigation

The center section is labeled 'Navigation'. This area provides the ability to:

- Seek to a particular LBA
 - Enter a numeric LBA value, then click the button labeled 'Seek To'
- Jump to the First, Previous, Next or Last LBA
 - Click the respectively named buttons to display the First, Previous, Next or Last LBA

The LBA currently being shown in the main sector viewer display is shown at the bottom of this section.

Sector Viewer – Drive Information

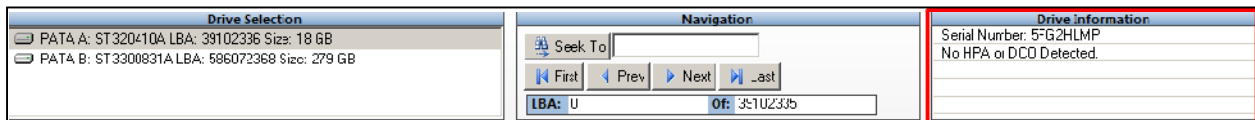


Figure 38 - Sector Viewer: Drive Information

The rightmost section is labeled Drive Information. In the example shown in Figure 38, the Serial Number of the drive connected to PATA A is shown. Sector Viewer also reports that no HPA or DCO has been detected.

Sector Viewer: Main

The screenshot displays the Sector Viewer Main interface. At the top, there are three panels: Drive Selection, Navigation, and Drive Information. The Drive Selection panel shows two drives: PATA A: ST320410A (18 GB) and PATA B: ST3300831A (279 GB). The Navigation panel includes a 'Seek To' field and buttons for First, Prev, Next, and Last. The Drive Information panel shows Serial Number: 5FG2HLMP and No HPA or DCD Detected.

The main area is a large grid of data for sector 0. The columns are labeled Offset, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, and ASCII. The rows represent offsets from 0x00000000 to 0x000001F0. All data cells in the grid contain '00', indicating that the sector has been cleared.

On the right side, there are Scan Settings and Scan Progress sections. The Scan Settings panel includes Method (Search), Sector Value (Hex) (00), and Run in Reverse (No). The Scan Progress panel has Start, Pause, and Stop buttons.

At the bottom, there is an LBA Scroll control and buttons for Save Changes and Read-Only.

Figure 39 - Sector Viewer Main Display

This is the main display of the Sector Viewer module. The image depicted in Figure 39 shows the first sector (sector 0) of the drive connected to the PATA port on Side A of the device. All zeroes (0x00) are displayed as this drive has been subjected to NIST SP800-88 'clear' compliant eradication ('Bang').

gRase™

gRase™ provides the facility to eradicate data from sectors which have been reallocated through a hard drive's defect tracking mechanism. Invoking gRase™ instructs CPR Toolbox to:

1. Eradicate data from sectors which have been remapped by the drive's defect list
2. Clear the drive's defect list mappings
3. Eradicate data from the originally remapped sectors (the actual sectors which had been marked as defective) and save sectors which failed to write.
4. Reapply the drive's defect list mappings

Figure 40 depicts the initial gRase™ screen.

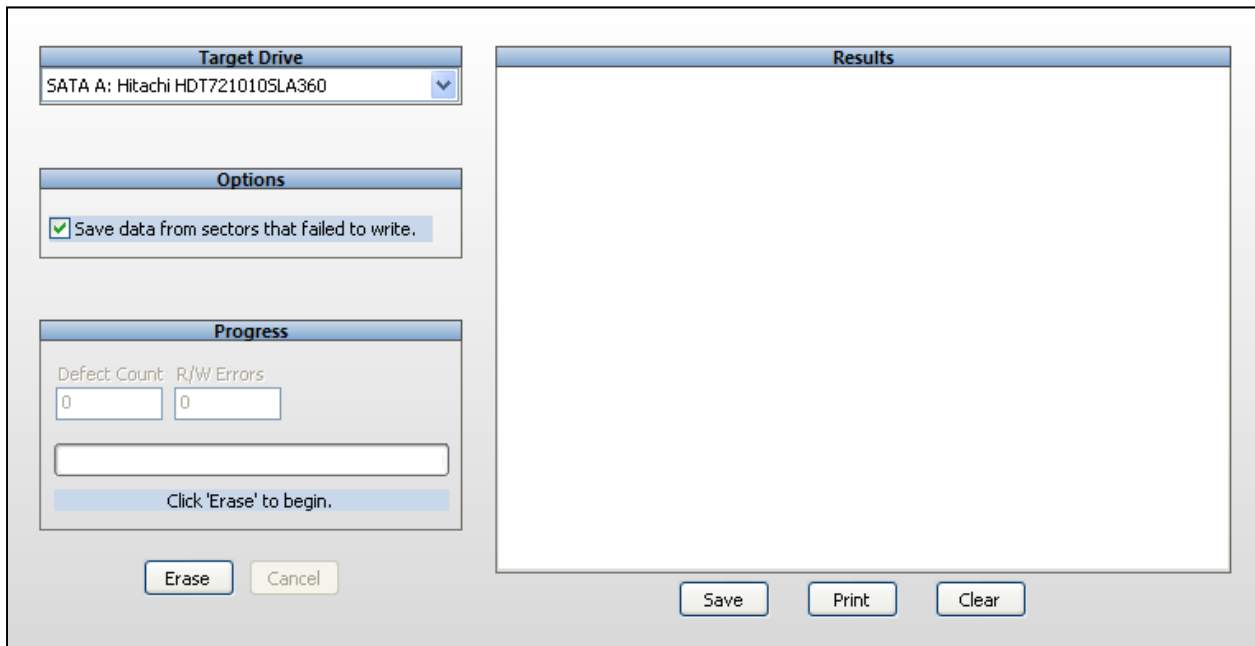
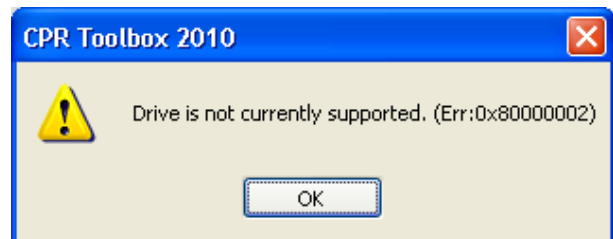


Figure 40 - gRase™ initial screen

Begin by selecting a drive from the drop-down list labeled 'Destination Drive'. CPR Toolbox™ can be instructed to save data from sectors which fail to write by checking the box labeled 'Save data from sectors that fail to write'. If this box is checked, CPR Toolbox™ will prompt for a location into which the binary file will be saved.

To begin, click the button labeled 'Erase'.

Not all drives support gRase™. If the selected drive is not supported, a message is displayed to that effect.



If the drive selected supports gRase™ functions, the process will begin. Progress is shown both in the 'Progress' section of the screen, at left, and in the 'Results' box at the right of the screen.

Figure 41 depicts the gRase™ function in progress.

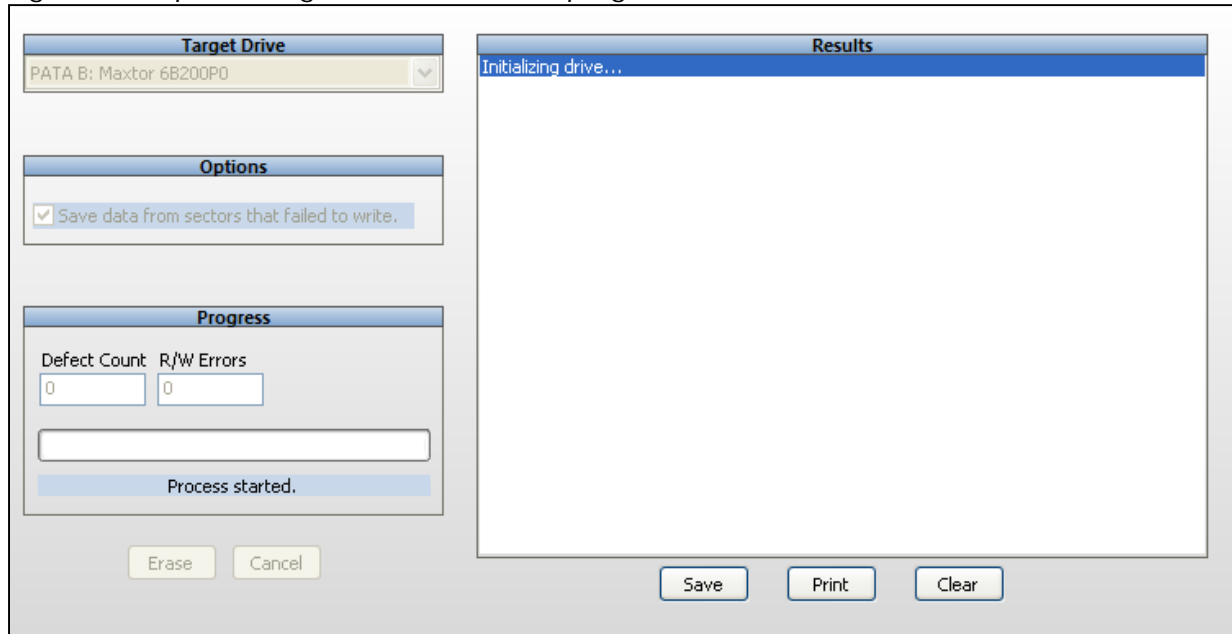


Figure 41 - gRase™ in progress

If the destination drive contains no defects, a message box is displayed:



If the destination drive contains defects and the 'Save data from sectors that fail to write' checkbox is saved, the process of erasing the defect list is detailed in the 'Results' window at the right of the screen.

Figure 42 depicts 'Results' window output if gRase™ encounters sectors in the defect list which it is unable to read.

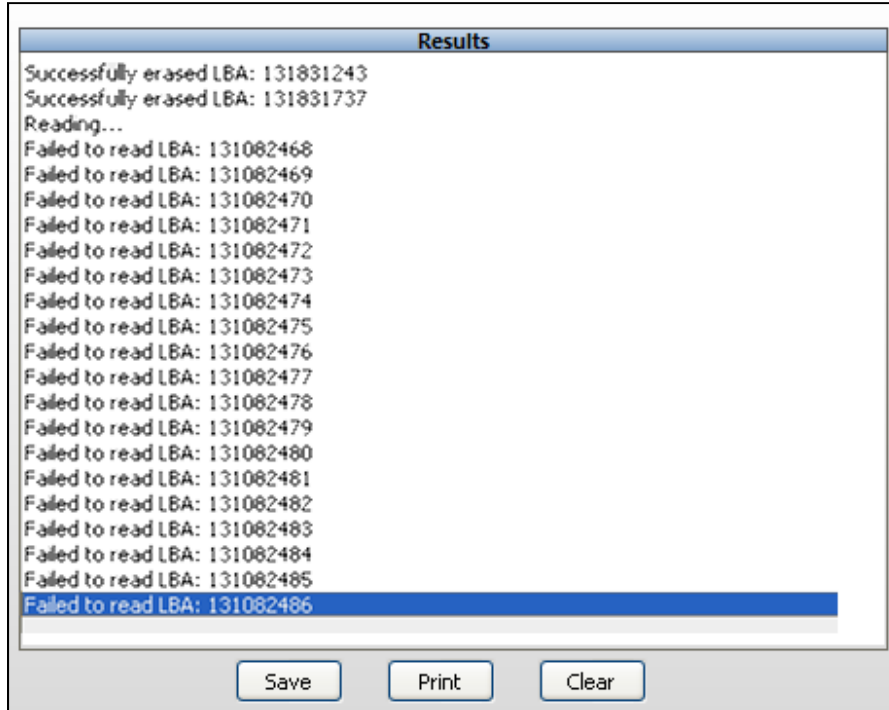


Figure 42 - gRase™ showing failed reads

Figure 43 depicts the 'Results' window after gRase™ has successfully erased a drive's defect list.

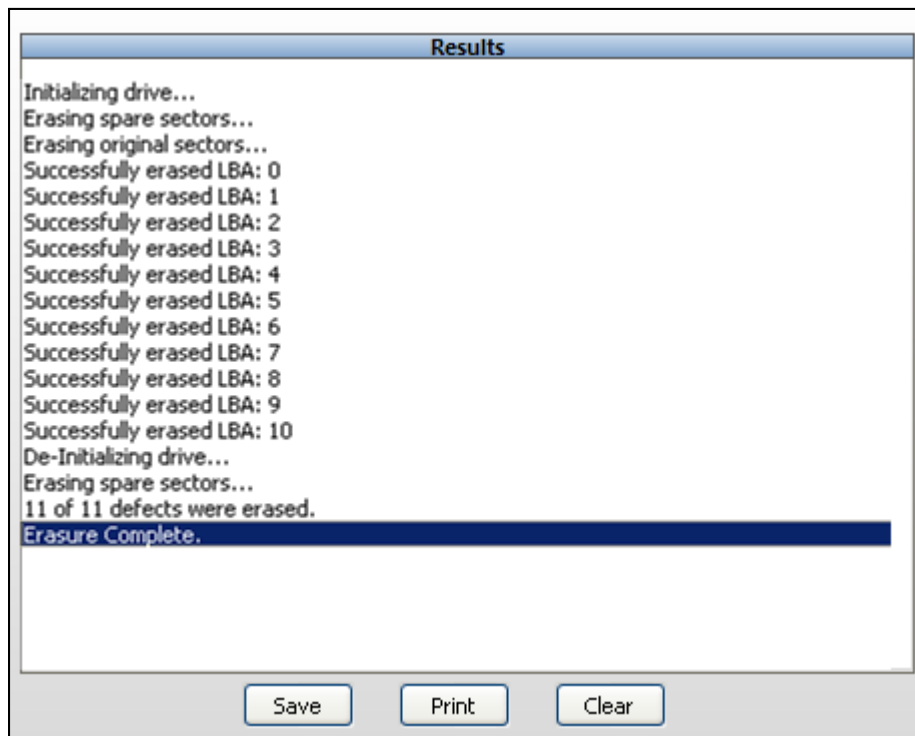


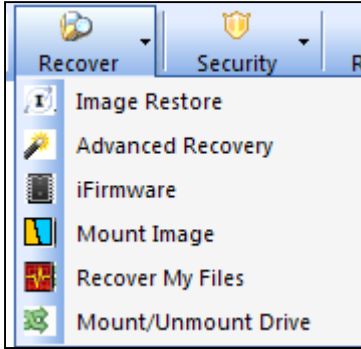
Figure 43 - gRase™ has successfully processed a defect list

Users may click 'Save' to save the output to a file. Clicking 'Print' will print the contents of the 'Results' window; 'Clear' will clear the 'Results' window.



Recover

Clicking the Recover toolbar button will reveal six (6) submenu items. This toolbar button is primarily for use with CPR Tools' PSIClone™ device; when working with Hammer™ only the first item, 'Image Restore' is functional.



The Image Restore menu item will launch the CPR Toolbox™ Image Restore module. This module is used with image filesets generated by CPR Tools' PSIClone™ data recovery device. For more information on PSIClone™ and Image Restore, please refer to the PSIClone™ User's Guide available for download at <http://downloads.cprtools.net>.



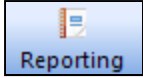
Security

Clicking the Security toolbar button will reveal one (1) option:



The Security menu, including DriveKey™, is used with CPR Tools' PSIClone™ data recovery device.

The DriveKey™ module is made available to qualifying Law Enforcement and Government officials who have purchased PSIClone™ and have requested access to this module.



Reporting

Clicking the Reporting toolbar button will cause CPR Toolbox to open the Reporting module. The Reporting module consists of five (5) tabs. These are:

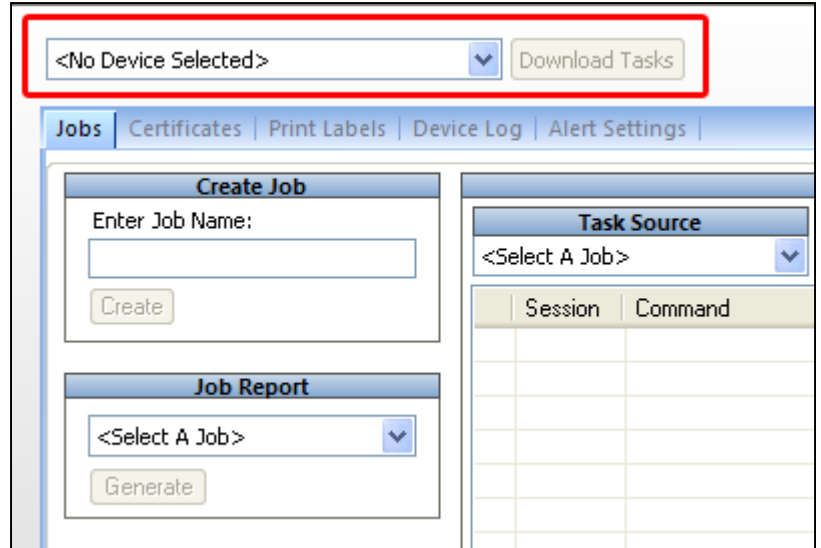
- Jobs
- Certificates
- Print Labels
- Device Log
- Alert Settings

Selecting a Device

At the top of the reporting module, users will find a drop-down menu which allows for:

- The selection of an attached device
- The user to manually enter a device which is not connected for which Alerts may be customized

Customizing alert settings is discussed in the section titled The “Alert Settings” Tab – CPR Toolbox™ , on page 87.



The screenshot shows a software interface with a navigation bar at the top containing tabs for 'Jobs', 'Certificates', 'Print Labels', 'Device Log', and 'Alert Settings'. Below the navigation bar, there are three main sections: 'Create Job', 'Job Report', and 'Task Source'. The 'Create Job' section has a text input field for 'Enter Job Name:' and a 'Create' button. The 'Job Report' section has a dropdown menu for '<Select A Job>' and a 'Generate' button. The 'Task Source' section has a dropdown menu for '<Select A Job>' and a table with columns for 'Session' and 'Command'. A red box highlights the '<No Device Selected>' dropdown menu and the 'Download Tasks' button.

Hammer™ ‘Jobs’ – An Organizing Method For Audit Trails

Hammer™ keeps track of actions performed. These are stored on the device in built-in Flash Memory. Each time Hammer™ performs an action, a history of that action is stored; each action is associated with a Hammer™ generated sequence number. Each of these actions is stored as a ‘Session’ in the device’s internal memory.

If Hammer™ is used to perform an erasure on a single attached drive, the entry in Flash will reflect that action, associated with the single attached drive. If Hammer™ is used to perform an erasure on more drives (up to four, one per port provided), the entry in Flash will reflect that action, associated with each of the drives attached.

These activity logs are stored without regard for how Hammer™ is used, e.g. Stand-alone mode, or in conjunction with CPR Toolbox™.

Once Hammer™ has performed actions, CPR Toolbox™ provides a way to organize these logs into ‘jobs’ which may be associated with a user-friendly name, such as a client name or location at which the tasks were performed.

Why use Jobs to organize audit trails?

Example 1:

A technician travels to different clients to eradicate data.

Logs from actions taken at the client location may be grouped into a Job specific to the client.

Example 2:

A technical support depot eradicates data from many drives daily.

Each day’s work can be organized into a Job named for the date on which the erasures were performed.

The “Jobs” Tab – CPR Toolbox™ Reporting

The ‘Jobs’ tab allows users to organize actions performed into groups of actions, called ‘Jobs’.

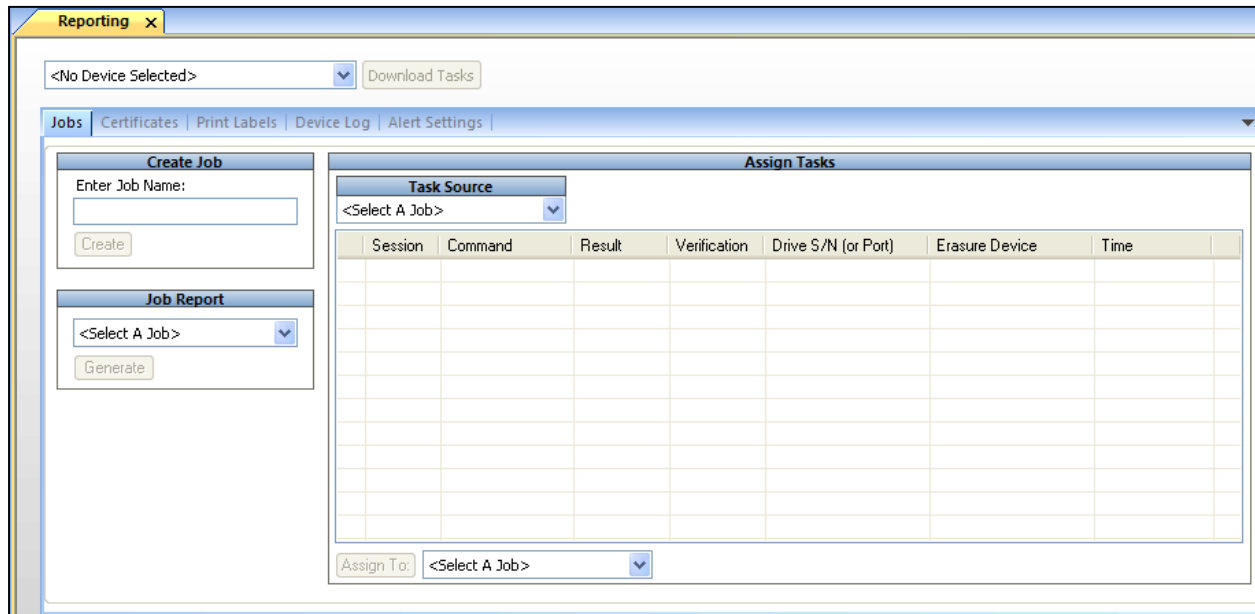
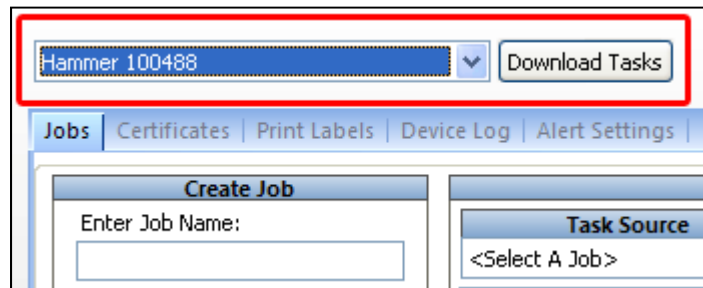
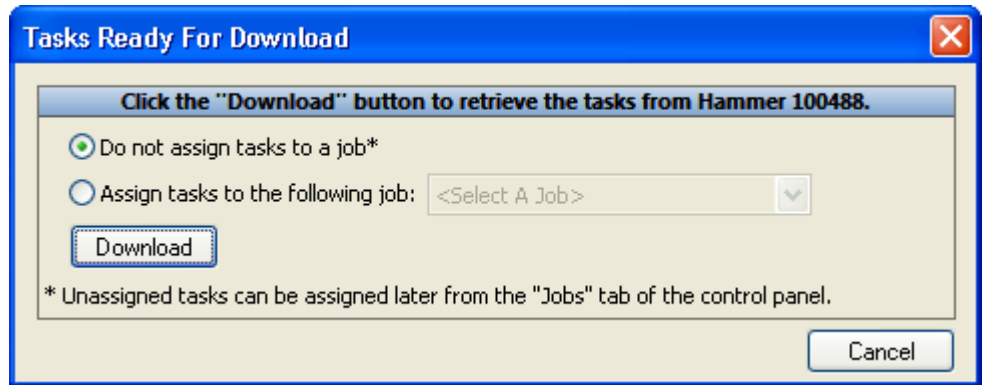


Figure 44 - Jobs Tab - Initial View

To begin with an attached Hammer™, select the device from the device selection drop-down list.

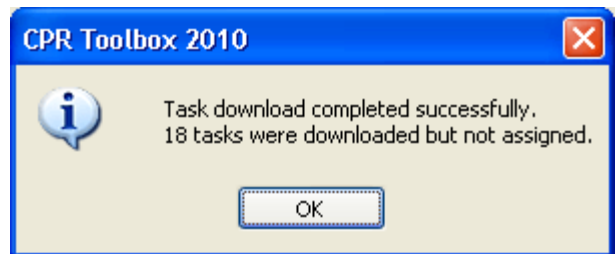


If Hammer™ has activities stored in Flash Memory, clicking the Download Tasks button will cause Hammer™ to display a 'Tasks ready for download' dialog box. Users may choose to download tasks into a 'Job' or to leave them unassigned.

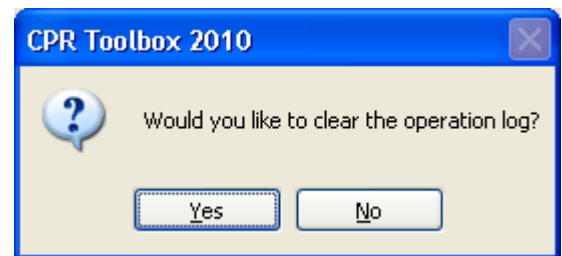


To download tasks without assigning them to a job, simply click the button labeled 'Download'. To assign tasks to a job, select the radio button labeled 'Assign tasks to the following job', select a job from the drop-down list, then click the button labeled 'Download'.

CPR Toolbox displays a message indicating how many tasks were successfully downloaded and indicates that these were not assigned.



Once tasks have been downloaded, CPR Toolbox will present the opportunity to clear the device's internal operations log. Select Yes to clear the log; select No to instruct Hammer™ to retain the log.



To view downloaded tasks, select the appropriate 'Task Source' from the drop down menu. All existing 'Jobs' are listed in this drop-down list. Unassigned tasks may be viewed by selecting 'unassigned' from the drop-down list.

The screenshot shows the 'Assign Tasks' window in the Hammer software. On the left, there are two panels: 'Create Job' with an 'Enter Job Name:' field and a 'Create' button, and 'Job Report' with a '<Select A Job>' dropdown and a 'Generate' button. The main area is a table of tasks. The 'Task Source' dropdown is set to 'unassigned'. The table has the following data:

Session	Command	Result	Verification	Drive S/N (or Port)	Erasure Device	Time
18	BANG	PASSED	N/A	WD-WMACK1027374	ATA Log 100488	10\15\10 16:39
17	BANG	CANCELLED	N/A	Y369P4HE	ATA Log 100488	10\15\10 13:58
17	BANG	CANCELLED	N/A	WD-WMACK1027374	ATA Log 100488	10\15\10 13:58
17	BANG	CANCELLED	N/A	3NF03TPP	ATA Log 100488	10\15\10 13:58
16	BANG	CANCELLED	N/A	Y369P4HE	ATA Log 100488	10\15\10 13:49
16	BANG	CANCELLED	N/A	WD-WMACK1027374	ATA Log 100488	10\15\10 13:49
16	BANG	CANCELLED	N/A	3NF03TPP	ATA Log 100488	10\15\10 13:49
9	BANG	CANCELLED	N/A	Y369P4HE	Hammer 100488	10\04\10 08:35
9	BANG	CANCELLED	N/A	WD-WMA6Z2710819	Hammer 100488	10\04\10 08:35
8	BANG	PASSED	N/A	WD-WMA6Z2710819	Hammer 100488	10\01\10 19:25
8	BANG	PASSED	N/A	B611752H	Hammer 100488	10\01\10 19:25
7	SECURITY ERASE	PASSED	N/A	WD-WMA6Z2710819	Hammer 100488	10\01\10 18:38

At the bottom of the table, there is an 'Assign To:' dropdown menu set to '<Select A Job>'.

Figure 45 - Downloaded tasks are not currently assigned to a 'Job'

Users may assign tasks to an existing job by using the drop-down list provided. First, select the tasks to be assigned, then select the appropriate job from the list. Once selected, click the button labeled 'Assign To'.

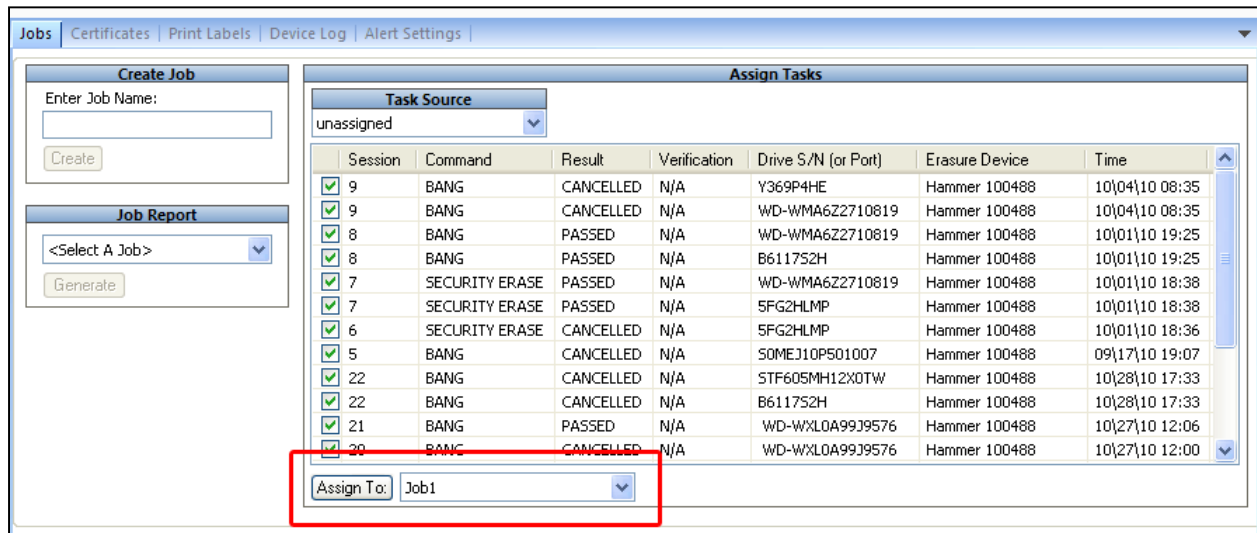
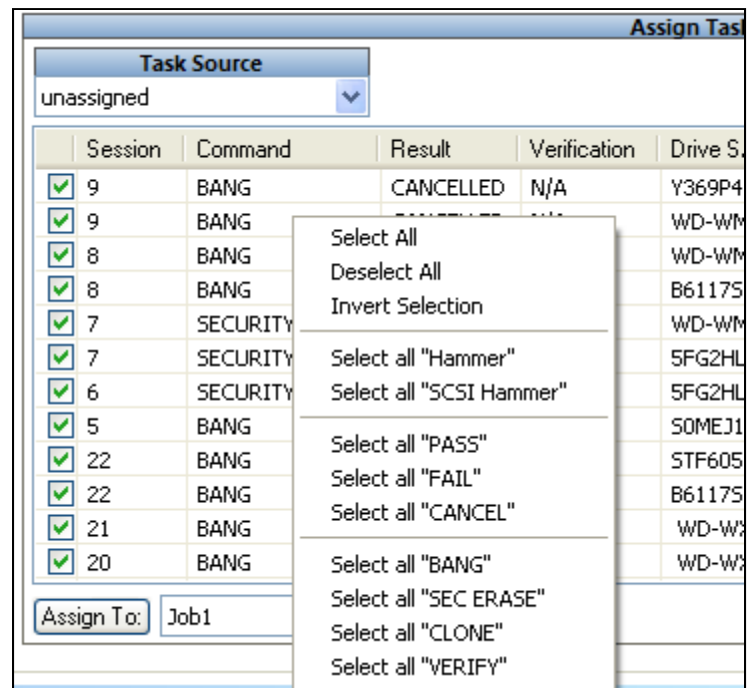


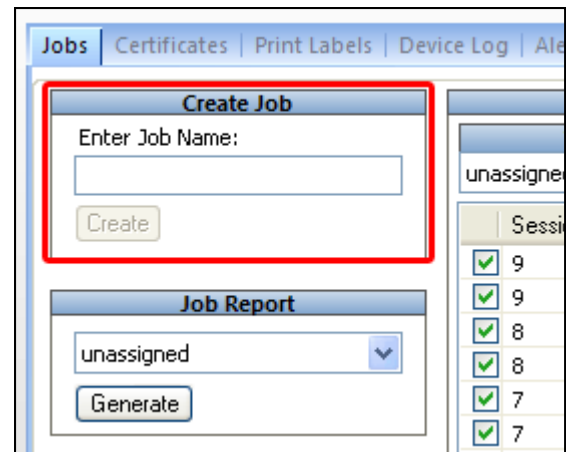
Figure 46 - Assigning tasks to an existing job

CPR Toolbox provides a mechanism for making task selections based on predefined criteria. Right-click in the jobs list to reveal a context menu which includes the following select filters:

- Select All
- Deselect All
- Invert Selection
- Select all 'Hammer'
- Select all 'SCSI Hammer'
- Select all 'Pass'
- Select all 'Fail'
- Select all 'Cancel'
- Select all 'Bang'
- Select all 'Sec Erase'
- Select all 'Clone'
- Select all 'Verify'



To create a Job, simply type the new job name in the text box labeled 'Enter Job Name', then click the button labeled 'Create'.



Hammer™ Tips:

The default location for user created Jobs is:

C:\Documents and Settings\

Each job created will be a folder under this location.

A job report may be generated for any existing job or for tasks which remain unassigned. Select the appropriate entry from the drop-down list provided, then click the button labeled 'Generate'.

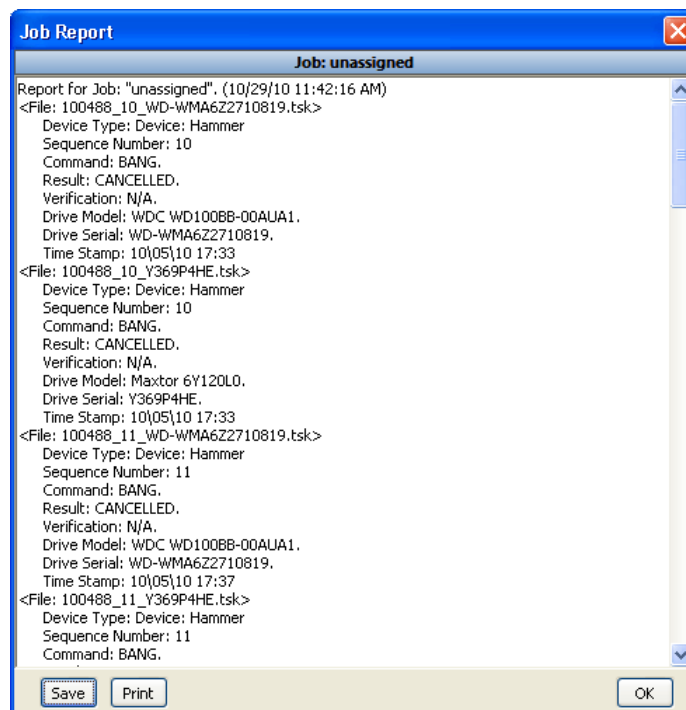


Figure 47 - A Job Report

The Job Report window provides the facility to Save or Print the current report. Clicking the button labeled 'Save' will cause CPR Toolbox to present a 'Save Job' dialog box in which the user may select from three (3) available file formats: Plain Text (.txt), Comma Separated Values (.csv) or eXtensible Markup Language (.xml).

Hammer™ Tips:

Saved Jobs may be selected on the Cert Tab to produce a series of Certificates of Compliance after the fact. This is an important audit trail feature of Hammer™.

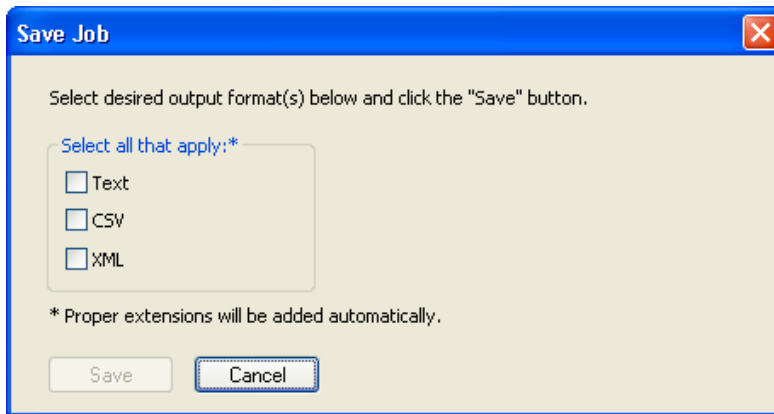


Figure 48 - Saving a job as a file

The “Certificates” Tab – CPR Toolbox™ Reporting

Hammer 100488 [Download Tasks]

Jobs | **Certificates** | Print Labels | Device Log | Alert Settings

Cert Data Source

Attached Drive(s)

Device Memory

From File

From Job

<Select A Job>

Include Passed Tasks

Include Failed Tasks

Include Cancelled Tasks

[Generate] [Display Existing]

Certificate Info

Erasure Performed By: Phone: Organization

Certificate Issued To:

Backup Made Backup Location

Final Media Disposition:

Notes

Figure 49 - Cert Tab

The ‘Cert’ tab provides an interface through which a ‘Certificate of Compliance’ may be printed to document erasure actions performed by Hammer™. Certificates generated by CPR Toolbox™ and Hammer™ listed here fully comply with recommendations specified in NIST 800-88.

Sources for Certificates of Compliance

Begin by selecting the source data for the certificate to be generated. This is done in the ‘Cert Data Source’ section which presents three options, ‘Attached Drives’, ‘Hammer Memory’ or ‘From File’. Selecting ‘Hammer Memory’ will instruct Hammer™ to use the last action stored in NVRAM as a source for the certificate to be generated. Selecting ‘Attached Drives’ will instruct Hammer™ to read log data which was previously stored on each attached drive. Selecting ‘From File’ will enable the selection box and ‘Browse’ button. This allows the user to print specific tasks from ‘job’ (.tsk) files, located in the Job folder.

To generate a Certificate of Compliance, click the ‘Generate’ button. Users may choose to complete the available form fields which help in identifying the person(s) involved in the erasure of data from drives attached to Hammer™. Figure 50 depicts the ‘Cert’ tab with form fields completed.

Hammer™ Tips:

Fully completing the form fields prior to generating a Certificate of Compliance ensure certifiers will meet guidelines established by NIST 800-88.

Hammer 100488 Download Tasks

Jobs | **Certificates** | Print Labels | Device Log | Alert Settings

Cert Data Source	Certificate Info
<input type="radio"/> Attached Drive(s) <input checked="" type="radio"/> Device Memory <input type="radio"/> From File <input type="text"/> <input type="button" value="Browse"/> <input type="radio"/> From Job <input type="text" value="<Select A Job>"/> <input checked="" type="checkbox"/> Include Passed Tasks <input type="checkbox"/> Include Failed Tasks <input type="checkbox"/> Include Cancelled Tasks	Erasure Performed By: <input type="text" value="Technician Dan"/> Phone: <input type="text" value="555-5555"/> Organization: <input type="text" value="IT Department"/> Certificate Issued To: <input type="text" value="Anycompany, Inc."/> Backup Made: <input checked="" type="checkbox"/> Backup Location: <input type="text" value="Storage Server Partition 1"/> Final Media Disposition: <input type="text" value="Redeployed internally"/> Notes: <input type="text" value="These drives originated in the Accounts Payable department"/>

Figure 50 - Cert Tab - Form fields completed in preparation of generating a Certificate of Compliance.

A sample Certificate of Compliance is shown in Figure 51. Each generated certificate may list up to four (4) drives upon which Hammer™ has taken action.

Certificate of Compliance NIST-800-88

Certificate Number:	100174_1208081036	Date:	Dec 08, 2008	Time:	10:36 AM
Device ID:	100174	Revision:	v4.00:5B2D		
Organization:	IT Department				
Performed By:	Technician Dan	Phone:	555 5555		
Signature:					
Issued To:	Anycompany, Inc.				
Data Backed Up:	Yes	Location:	Backup Storage Server, partition 1		
Final Disposition of Media:	Redeployed Internally				
Additional Notes:	This drive originated in the Accounts Payable Department				

Drives annotated with PURGE have been erased with a Hammer™ SECURITY ERASE COMMAND which complies with NIST-800-88 data "PURGING" guidelines, the strictest erasure method defined by NIST.

Drives annotated with CLEAR have been erased with a Hammer™ ERASE COMMAND which complies with NIST-800-88 data "CLEARING" guidelines.

Model	Serial Number	Method	Result	Verification	Checksum
ST310215A	3HG032AF	CLEARED	PASS	N/A	N/A
ST310215A	3HG032D2	CLEARED	PASS	N/A	N/A
ST310215A	3HG048D4	PURGED	PASS	N/A	N/A
Hitachi HDT725050VLAT80	VF4400R4D4HTUH	PURGED	PASS	N/A	N/A

This certificate will serve as record of compliant data eradication having been performed on the drives listed above.

Figure 51 - Sample 'Certificate of Compliance'

Customizing Certificates of Compliance

To customize certificates of compliance, printed from the 'Cert' Tab, users may:

- Create a custom Bitmap Image file (.bmp) to be used as the custom logo for Certificates of Compliance.
 - This should be placed in C:\Documents and Settings\\My Documents\CPR Tools Utilities Suite\Images\
 - Name this bitmap image file certlogo.bmp.

The “Print Labels” Tab – CPR Toolbox™ Reporting

(Requires: Optional Bluetooth Printer)

NOTE: This release of CPR Tools Utilities Suite and related Hammer™ / SCSI Hammer™ firmware represents the last release which will support the optional Bluetooth Printer and related label printing functions.

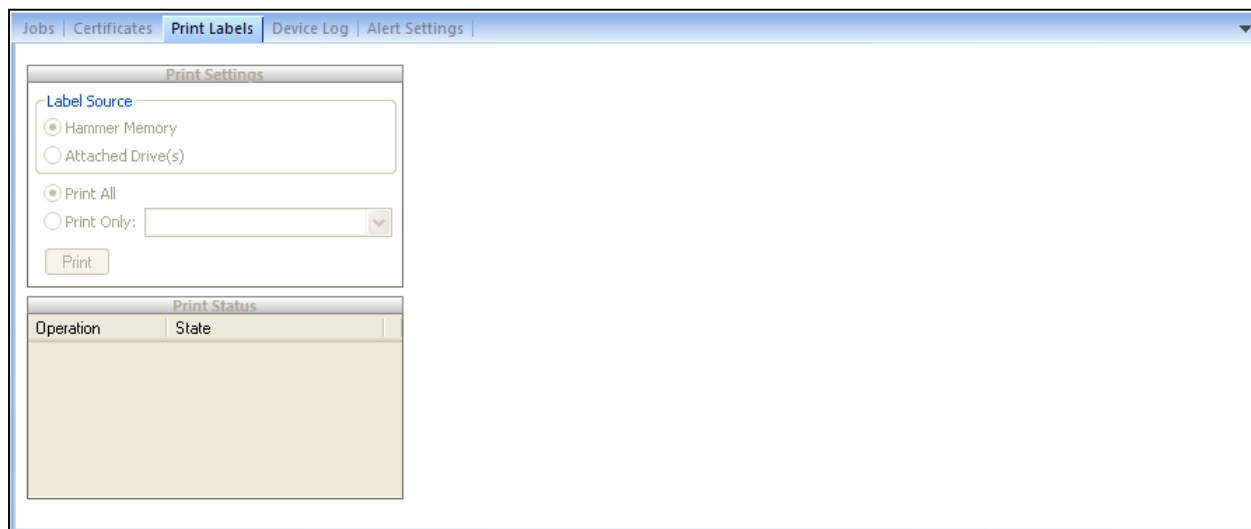


Figure 52 - Print Labels tab

If the optional Bluetooth printer is present, this tab may be used to generate labels for drives erased or cloned with Hammer™.

Bluetooth Printer – Compliance and Audit Trails:

Compliance with regulations, rules and laws generally call for an audit trail of some type. Hammer™ and CPR Toolbox™ facilitate this through the use of generated ‘Certificates of Compliance’.

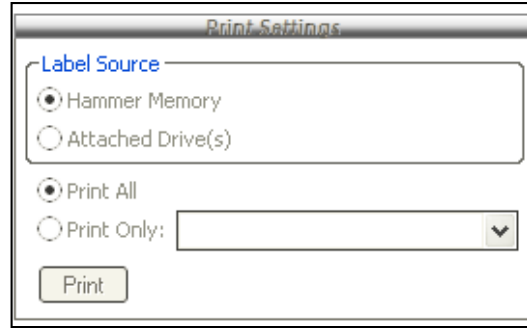
Hammer™ and CPR Toolbox™ generate ‘Certificates of Compliance’ which conform to NIST 800-88 recommendations.

The optional Bluetooth Printer makes asset tracking and keeping audit trails even easier. As drives are erased – with or without CPR Toolbox™ – labels may be printed which detail the erasure process. These may then be affixed to the processed drive, providing anyone with physical access to them with the information needed to track their further use. Choosing to store log information on the drive allows administrators to print *Certificates of Compliance* after the fact. Labels affixed to the drives themselves clearly identify drive status.

Hammer™ provides this functionality to help companies, organizations and agencies with the tools to keep records of compliance.

The Print Labels tab allows the user to select the data source from which labels will be printed.

- Selecting 'Hammer Memory' will instruct CPR Toolbox™ to use the device's internal memory as a source of data from which labels are to be printed.
- Selecting 'Attached Drive(s)' will instruct CPR Toolbox™ to use the logs stored on the drive(s) attached to Hammer™ as a source of data from which labels are to be printed.
 - This assumes that 'Save Log to Drives' is enabled.



If 'Attached Drive(s)' is selected (default), users may choose 'Print All' which will print labels from all drive sources found or, if 'Print Only' is enabled, select from a specific drive from which source data will be used to print labels.

If 'Hammer Memory' is selected, user may select 'Print All' which will print labels from all drive ports for which Hammer™ has maintained a log or, if 'Print Only' enabled, select from a specific Hammer™ Port from which source data will be used to print labels. Hammer™ ports are:

- A PATA
- A SATA
- B SATA
- B PATA

The “Device Log” Tab – CPR Toolbox™ Reporting

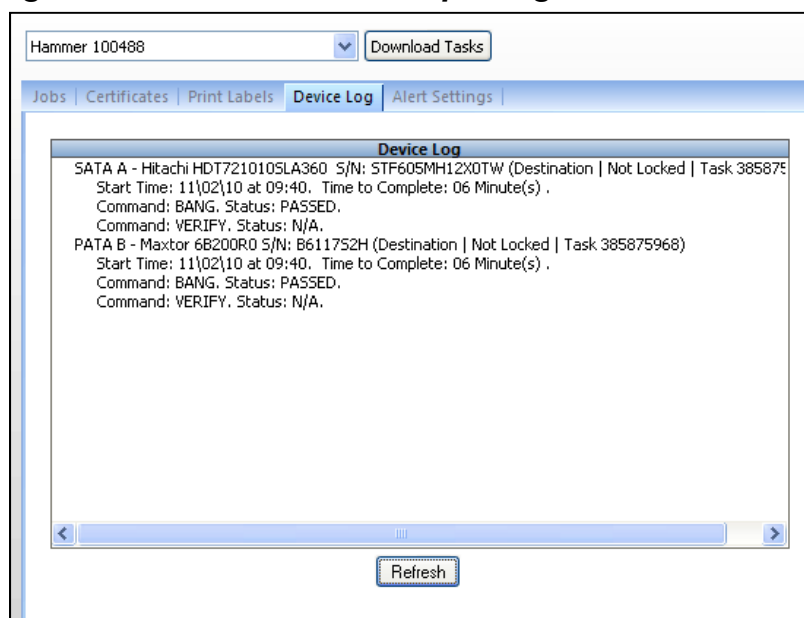


Figure 53 - Log Tab

The ‘Log’ tab displays a log of the most recent action Hammer™ has completed.

In the example shown in Figure 53, two (2) drives have been subjected to eradication using NIST 800-00 ‘Clear’. The information shown in the Device Log screen includes information about each drive as well as the start time and elapsed time:

```
SATA A - Hitachi HDT721010SLA360 S/N: STF605MH12X0TW (Destination | Not Locked | Task 385875968)
Start Time: 11\02\10 at 09:40. Time to Complete: 06 Minute(s) .
Command: BANG. Status: PASSED.
Command: VERIFY. Status: N/A.
PATA B - Maxtor 6B200R0 S/N: B611752H (Destination | Not Locked | Task 385875968)
Start Time: 11\02\10 at 09:40. Time to Complete: 06 Minute(s) .
Command: BANG. Status: PASSED.
Command: VERIFY. Status: N/A.
```

The “Alert Settings” Tab – CPR Toolbox™ Reporting

Figure 54 - Alert Settings Tab

The Alert Settings tab provides a method for email alerts to be issued at pre-defined periods during a an action performed by any CPR Tools’ device (PSIClone™, Hammer™, SCSI Hammer™, etc..).

This version of CPR Toolbox™ allows for the configuration of alert settings for devices not currently attached to the host PC.

Begin by either selecting a currently connected device from the ‘Selected Device’ drop-down list or by clicking the ‘Add Device’ button to configure Alert Settings for a device not currently connected. This is discussed in the section titled Alert Settings for Devices not currently connected beginning on page 91 of this guide.

CPR Toolbox™ Notes:

The ability to send email alerts requires an underlying connection to the internet, usually through a network to which the host PC running CPR Toolbox™ is connected. If no internet connection is present, sending of alert emails will fail.

Figure 55 - Working with a connected CPR Tools' device

Figure 55 depicts the currently connected Hammer™ as the selected device.

To instruct CPR Toolbox™ to send alert emails, check the box labeled 'Enable Email Alerts' and provide information in the fields named:

- Sender
 - A valid email address which will serve as the 'from' address for the alert being sent.
- Recipient
 - A valid email address to which the alerts will be sent.
- Server Name
 - The mail server to be used for sending (SMTP).

Figure 56 shows the Email Configuration section of the Alert Settings tab.

The screenshot displays the 'Alert Settings' tab in the software interface. At the top, there are navigation tabs: 'Jobs', 'Certificates', 'Print Labels', 'Device Log', and 'Alert Settings'. Below these, a 'Selected Device' dropdown menu shows 'Hammer 100488 (Connected)' with an 'Add Device' button next to it. The main content area is divided into two panels. The left panel, titled 'Email Settings: Hammer 100488', is highlighted with a red border and contains the following elements: an unchecked checkbox for 'Enable Email Alerts', three text input fields for 'Sender', 'Recipient', and 'Server Name', an unchecked checkbox for 'Authentication Required', and a 'Test Settings' button. The right panel, titled 'Alert Settings', contains several options: an unchecked checkbox for 'Alert On Start', an unchecked checkbox for 'Alert Every: 15 Minutes' (with a dropdown arrow), an unchecked checkbox for 'Alert Every: 10 Percent' (with a dropdown arrow), an unchecked checkbox for 'Alert On Error' with radio buttons for 'First' (selected), 'All', and 'Every' (with a dropdown arrow set to '10'), and an unchecked checkbox for 'Alert On End'. At the bottom of the interface are three buttons: 'Save', 'Restore Defaults', and 'Refresh'.

Figure 56 - Email Configuration

Figure 57 shows the Email Configuration section filled out with sample data.

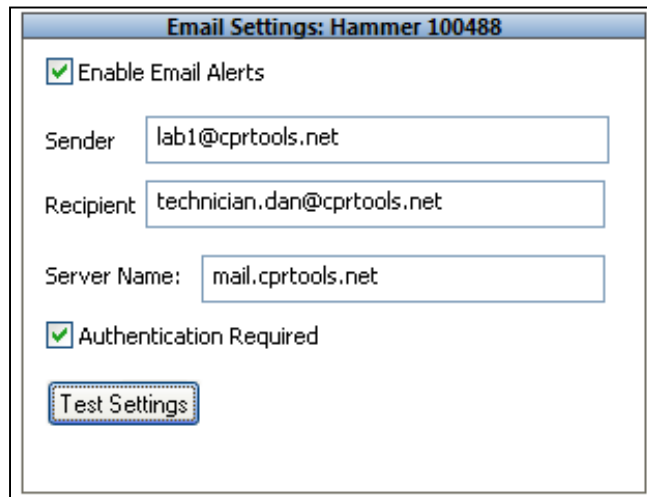


Figure 57 - Email Configuration, sample data shown

If the outbound server requires authentication, check the box marked 'Authentication Required' which will cause CPR Toolbox™ to request the required login credentials as shown in Figure 58.

CPR Tools recommends testing all new email alert configurations. This may be accomplished by clicking the 'Test Settings' button after completing the fields above. Clicking 'Test Settings' will attempt to send a test email using the information provided. If the information entered is sufficient to send an email successfully, CPR Toolbox™ provides a confirmation dialog and sends a test email to the recipient.

The confirmation dialog is displayed in Figure 59.



Figure 58 - Enter Login Credentials, if required

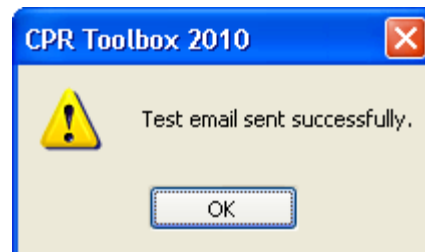


Figure 59 - Email Test is Successful

Successful sending of the test email should result in the destination/recipient address' receipt of an email similar to the one depicted here:

```
Email settings test email.  
Sender: lab1@cprtools.net  
Recipient: technician.dan@cprtools.net  
Server: mail.cprtools.net  
Authentication Required: No
```

The right side of the Alert Settings tab provides configuration options which are used to determine when Email Alerts are sent by CPR Toolbox™. This is shown in Figure 60.

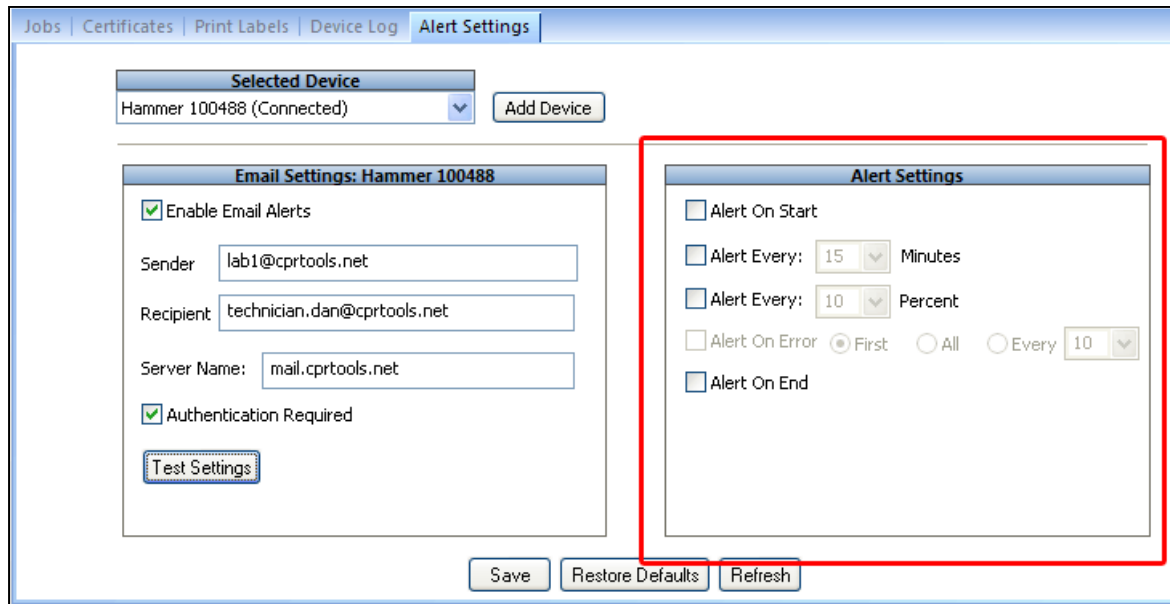


Figure 60 - Alert Settings Configuration

To be alerted by email upon the 'start' of a Hammer™/CPR Toolbox™ operation, check the box marked 'Alert on Start'

To instruct CPR Toolbox™ to send email alerts at regular intervals during a Hammer™/CPR Toolbox™ operation, check the box marked 'Incremental Alerts' and set either a value in minutes or percentage complete for the period at which email alerts will be sent.

To receive email alerts when Hammer™/CPR Toolbox™ receive errors during an operation, check the box marked 'Alert on Error' and select from 'First', 'All' or select a value for how many errors should be encountered before Hammer™/CPR Toolbox™ sends an alert.

To be alerted when the operation is complete, check the box marked 'Alert on End'.

The alert settings created are tied to the device listed in the 'Selected Device' list. This version of CPR Toolbox™ allows for the creation of custom alert settings for CPR Tools' devices which are not currently connected to the host PC running CPR Toolbox™.

Alert Settings for Devices not currently connected

To begin configuring custom alert settings for a CPR Tools device not currently connected to the host PC running CPR Toolbox, click the 'Add Device' button.



Figure 61 - The 'Add Device' button

CPR Toolbox™ will respond by presenting the 'Enter Device Information' dialog box, as depicted in Figure 62.

Select a CPR Tools' device type from the drop-down list. Types of devices include:

- PSIClone
- Hammer
- SCSI Hammer
- Sledge Hammer Control Box

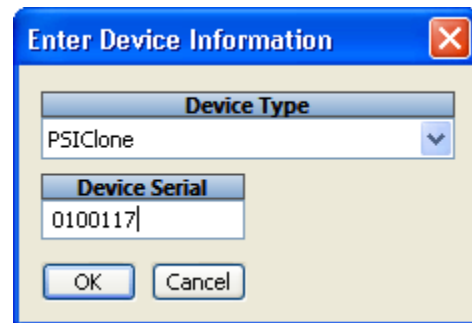


Figure 62 - Enter Device Information

Once a device type has been selected, enter the device serial number in the field labeled 'Device Serial'. Once this information has been added, click the button marked 'OK' to save the manually added device in CPR Toolbox™.

Users may now configure alert settings by following the steps shown, beginning on page 89 of this guide.

When the described device is connected, the settings created will automatically be enabled.



Best Practice Recommendations

Organizations using CPR Tools' data eradication devices should adhere to any regulations, laws or rule sets which apply to their handling of end-of-life data.

By understanding the result codes and how they should be interpreted, IT managers and those responsible for eradication management may make informed decisions in the physical handling of these hard drives.

Figure 63 offers a matrix of operations, results and recommended actions which CPR Tools considers 'Best Practice' handling of drives subjected to data eradication using the Hammer™ line of data eradication products. These guidelines are a direct result of the data recovery expertise gained over decades and the wealth of knowledge of hard drives and their inner workings developed by CPR Tools engineers and technicians.

Operation(s) Performed	Erasure Result	Verify Result	Recommendation	NIST-800-88 Compliance
SECURITY ERASE WITH FULL VERIFY	PASS	PASS	Safe for disposal.	PURGE
	PASS	FAIL	Retry operation or degauss and physically destroy.	N/A
	FAIL	N/A	Retry operation or degauss and physically destroy.	N/A
SECURITY ERASE WITH QUICK VERIFY	PASS	PASS	Not fully verified, sensitivity of data must be considered before disposal.	PURGE
	PASS	FAIL	Retry operation or degauss and physically destroy.	N/A
	FAIL	N/A	Retry operation or degauss and physically destroy.	N/A
SECURITY ERASE WITH NO VERIFY	PASS	N/A	Not verified, sensitivity of data must be considered before disposal.	PURGE
	FAIL	N/A	Retry operation or degauss and physically destroy.	N/A
BANG WITH FULL VERIFY	PASS	PASS	Safe for disposal.	CLEAR
	PASS	FAIL	Retry verify or degauss and physically destroy.	N/A
	FAIL	N/A	Retry operation or degauss and physically destroy.	N/A
BANG WITH QUICK VERIFY	PASS	PASS	Not fully verified, sensitivity of data must be considered before disposal.	CLEAR
	PASS	FAIL	Retry verify or degauss and physically destroy.	N/A
	FAIL	N/A	Retry operation or degauss and physically destroy.	N/A
BANG WITH NO VERIFY	PASS	N/A	Not verified, sensitivity of data must be considered before disposal.	CLEAR
	FAIL	N/A	Retry operation or degauss and physically destroy.	N/A

Figure 63 - CPR Tools 'Best Practice' recommendations

Customization

Customizing the Look and Feel of CPR Toolbox™

The default logo presented in the main CPR Toolbox window can be customized. To add a custom logo to CPR Toolbox:

1. Create a Bitmap Image file (.bmp) to be used as the custom logo/background image
2. Place your image in **C:\Documents and Settings\\My Documents\CPR Tools Utilities Suite\Images**
3. Name this file **backlogo.bmp**
4. Close and restart CPR Toolbox. Your new logo will appear as the main window background.

Using CPR Toolbox™ with Multiple CPR Devices

CPR Toolbox™ was designed to simplify working with CPR Devices (PSIClone™, Hammer™, etc...). One key feature of CPR Toolbox™ is the ability to work with multiple CPR Devices at the same time.

CPR Toolbox™ displays all connected devices (and the drives connected to them) in the horizontal pane at the left of the screen, as shown below.

CPR Toolbox™ Tips:

Use CPR Toolbox™ to manage and control multiple CPR Devices. Commands issued run concurrently; this saves time and increases productivity.

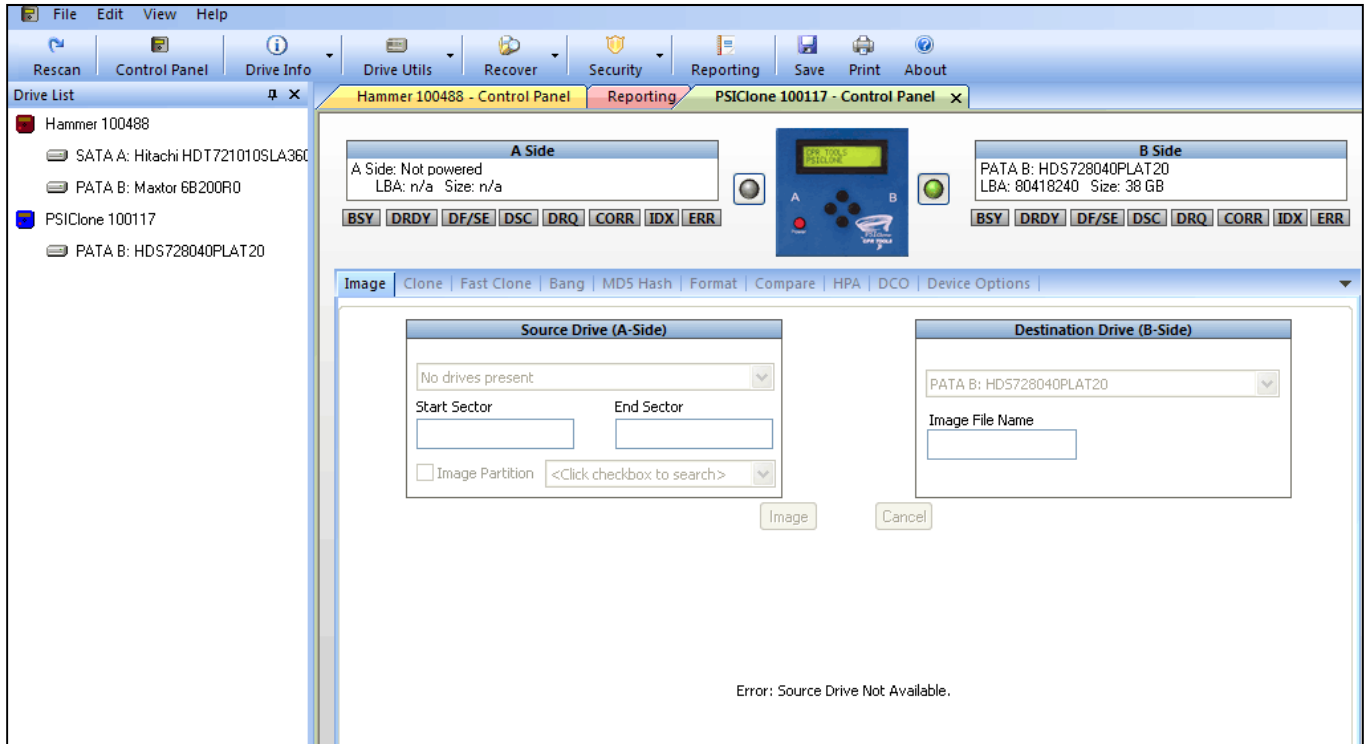
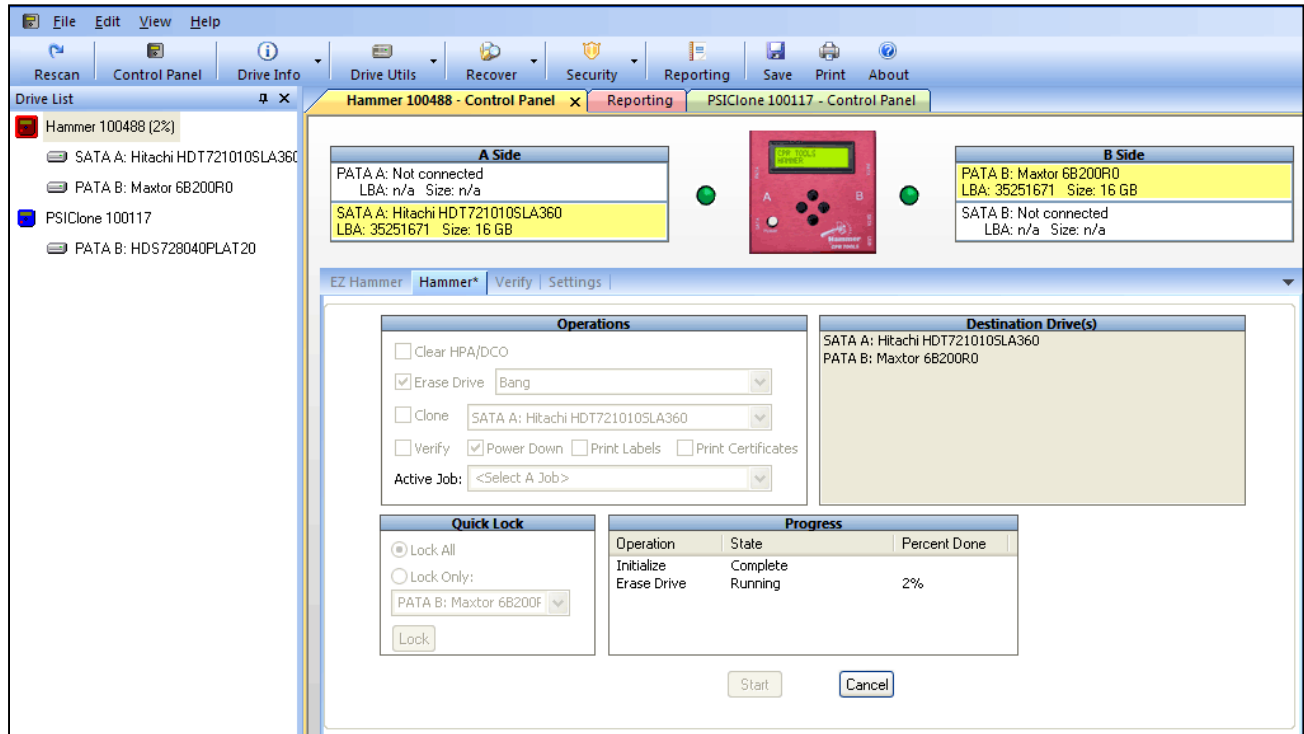


Figure 64 - CPR Toolbox™ controlling multiple CPR Devices

A key feature of using CPR Toolbox™ to control multiple devices is the ability to perform actions simultaneously.

Figure 64 and Figure 65 depict CPR Toolbox™ with two (2) CPR Devices attached. Hammer™ Device (S/N 100488) is displayed performing an erasure.



**Figure 65 - CPR Toolbox™ with multiple CPR Devices
Hammer (S/N 100488) shown performing an erasure**

Figure 65 clearly shows an erasure being performed by the Hammer™ device shown in the middle of the left horizontal pane. This is able to be determined by the red circle which highlights the Hammer™ icon in the left vertical pane.

CPR Toolbox™ Tips:

When selecting a CPR Tools device (PSIClone™, Hammer™, etc...) using CPR Toolbox™, the backlit LCD of the device will become illuminated to assist in identifying which device is the foreground device in the CPR Toolbox™ view.

FAQ / Troubleshooting

1. After starting Hammer™, not all attached hard drives are recognized.
 - Power off Hammer™. Ensure power cables, splitters and data cables are well-seated.
 - Ensure all attached PATA drives are set to 'Master'.
2. CPR Toolbox™ does not display any attached CPR Tools devices.
 - Ensure USB Cable is attached to both Hammer™ and the host PC.
3. Windows® asks for a driver when I plug in Hammer™ to a USB port on my PC.
 - This typically means that Hammer™ has been connected to a USB 1.0 or USB 1.1 port. USB 2.0 is required when using Hammer™ with CPR Toolbox™ and a host PC.
4. Why is the Security Erase procedure taking a relatively long time for a drive that Identified as being only a few GB?
 - The drive may have had an HPA/DCO set, making the drive appear smaller than it is. Security Erase will typically ignore drive size limitations set by HPA or DCO.
To ensure that Hammer™ will erase all data, be certain to enable "Clear HPA/DCO".
 - If using Hammer™ in stand-alone mode (without CPR Toolbox™), this is done within the 'Operations' menu under 'Clear HPA/DCO'.
 - If using Hammer™ with CPR Toolbox™, this may be accomplished by checking the box marked 'Clear HPA/DCO' on the 'Hammer' tab (run time settings) or on the 'Settings' tab (user default settings).

Product Specifications

CHARACTERISTIC	SPECIFICATION
Drive Interfaces:	Parallel ATA (PATA) & Serial ATA (SATA)
Host Interface:	USB 2.0
Max Transfer Rate:	Up to 4.0 Gigabytes per minute
Input Voltage:	Max: 3.5 A / Typical: 1.6 A
Input Current:	+12 VDC
Voltage Supplied to Drives:	+12VDC, +5VDC
Operating Temperature Range:	0° to 50° Celsius
Storage Temperature Range:	-20° to 60° Celsius
Operating/Storage Humidity Range:	5% to 95% (non-condensing)
Device Addressing Support:	28 bit and 48 bit supported
Max Transfer Mode:	UDMA Mode 4
Supported Protocols:	ATA 4 through ATA 7
Dimensions:	4.15" L x 1.41" H x 4.16 " W
Approx. Device Weight:	11 oz.

Glossary of Terms

ATA

AT Attachment defines the physical, electrical, and command protocols for the internal attachments of storage devices to a host. Hammer™ supports devices that conform to ATA specification 4, 5, 6, or 7. Also See PATA and SATA.

ATA Device

Any device that conforms to the ATA specification⁴.

Bang

'Bang' is CPR Tools' term for writing a pre-defined pattern to a drive. This function is used for erasing (overwriting data on) a drive. This term is derived from CPR Tools' BangDisk™ line of data erasure utilities. An embedded version of BangDisk™ is included with Hammer™ for use when attached drives do not support the ATA Security Erase command.

Clone

To copy all data from one drive and write it to another, creating an exact copy of the source drive. The cloning process copies data on a sector-by-sector basis. Hammer™ copies from a source drive attached to side A to as many as three (3) other attached drives.

DCO

Device Configuration Overlay - A hidden area on many of today's HDDs is the Device Configuration Overlay (DCO). The DCO allows system vendors to purchase HDDs from different manufacturers with potentially different sizes, and then configure all HDDs to have the same number of sectors. An example of this would be using DCO to make an 80 Gigabyte HDD appear as a 60 Gigabyte HDD to both the OS and the BIOS.

Hammer™ is capable of detecting and clearing DCO.

HPA

Host Protected Area – Host Protected Area sometimes referred to as Hidden Protected Area is an area of a hard drive that is not normally visible to an operating system.

Hammer™ is capable of detecting and clearing HPA.

PATA

Parallel ATA, describes the physical and electrical hard drive interface that uses a 40 pin connector to interface with host and device. Hammer™ incorporates a PATA interface on side A and another on side B.

PIO

Programmed Input/Output, transferring data between device and host one sector at a time. Also PIO mode is used to send commands to an ATA device. PIO mode is the slowest means of transferring data between a host and a device.

Power Cycle

Involves powering off a drive, waiting for a short delay, then powering the drive on and waiting for the duration set by 'Power on Timeout' before proceeding.

SATA

Serial ATA, describes the physical and electrical hard drive interface that uses a 7 pin connector to interface with host and device. Hammer™ incorporates a SATA interface on side A and another on side B.

Sector

A group of 512 bytes that has a unique address (LBA). This is the smallest amount of data that can be addressed at a time from the ATA interface.

S.M.A.R.T.

Self-Monitoring, Analysis, and Reporting Technology, or S.M.A.R.T., is a monitoring system for computer hard disks to detect and report on various indicators of reliability, in the hope of anticipating failures.

The technical documentation for S.M.A.R.T. is in the AT Attachment standard.⁷

UDMA

Ultra Direct Memory Access, transferring data between device and host in bursts of multiple sectors at a time. There are seven UDMA modes with mode 6 yielding the fastest transfer rate and mode 0 yielding the slowest transfer rate. Hammer™ currently supports UDMA modes up to and including mode 4.

⁷ <http://www.t13.org/Documents/UploadedDocuments/docs2006/D1699r3f-ATA8-ACS.pdf>

Customer Support

For more information, please visit us on the World Wide Web at <http://www.cprtools.net/>.

Technical support requests for the Hammer™ should be sent via CPR Tools' online support ticket system located at <http://tickets.cprtools.net/>

Visit <http://www.cprtools.net> for our complete offering of hardware and software for data recovery and data security including:

- **PSIClone™**
 - CPR Tools' flagship hardware product. A fully functional, hand-held data recovery lab.
- **HDD Adapters**
 - A full suite of sturdy adapters to simplify working with a variety of form factors.
- **Head Combs**
 - Pre-fabricated head loaders; a must for hardware based data recovery efforts.
- **BangDisk32™**
 - HDD Sanitizing utility for Microsoft Windows.
- **AlarmDisk™**
 - Windows based system monitor, provides alerts to unauthorized HDD access.

Product specifications, User's Guides, Instructional Videos and more are available at <http://downloads.cprtools.net>