



Serial ATA International Organization

Version 1.0
16-November 2006

Serial ATA Interoperability Program Revision 1.1 System Interoperability MS-DOS MOI

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SATA-IO Logo Interoperability Program

Revision History

Revision	Date	Comments
0.01	01/22/06	Initial release – all text in aqua is pending replacement
0.90	02/04/06	Added bootable CD, bootable floppy
1.0RC	02/20/06	Updated cd-rom boot instruction
1.0RC2	03/03/06	Updated references section and added a test measurement accuracy section
1.0	06/19/06	RC 30-day review complete, removed RC2, added front page disclaimer
1.0.7	09/29/06	Introduction: Added support for hosts HDD tests: Can now be used for both HDD PUTs and HOST PUTs when testing with a HDD. ODD tests: Can now be used for both ODD PUTs and HOST PUTs when testing with a ODD Appendix A – procedure the same, added several missing fdisk prompts Appendix B – added missing config.sys edit Appendix C – procedure the same, added several missing fdisk prompts Appendix D – Inserted new appendix D to cover creating bootable HDD Appendix E – procedure the same, added several missing fdisk and format prompts Appendix F – Added description of environment variables used. Added creation of a bootable HDD
1.0.71	10/09/06	Added feedback from IW#2 Run.bat – rev 1.5 + No data files or data layout changes + Improved automation (copy/rename log files back to writeable media) + Separated boot drive from writeable drive (only needed for boot cd) Added note about EMM386 Combined bootable description under USB Bootable flash disk Appendix F – Inserted description of how to make the data cd Appendix G – same as previous Appendix F
0.72	11/13/06	Updated to new revision 1.1 and version 0.72 scheme
1.0RC	11/16/06	Approved for 30-day review

ACKNOWLEDGMENTS

The SATA-IO would like to acknowledge the efforts of the following individuals in the development of this test suite.

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INTRODUCTION

The test definitions themselves are intended to provide a high-level description of the motivation, resources, procedures, and methodologies specific to each test. Formally, each test description contains the following sections:

Purpose

The purpose of the System Interoperability test is to ensure at a high level that when listed drives, cables and hosts are connected they actually operate.

References / Definitions:

HDD – SATA Hard disk drive, name given to a dos level block mode write / read device that uses the ATA command set. Examples would be a 3.5” ATA HDD and a 2.5” ATA HDD.

ODD – SATA Optical Disk drive, name given to any dos level device that uses the ATAPI command set. Examples would be read only devices like CD-ROM and DVD-ROM and read / write type devices like CD-RW, DVD-RW, DVD+RW, CD-RW/DVD combo drives tested in read only mode.

USB Key – USB flash disk type device

PUT – Product Under Test – Can be a SATA Host, HDD or ODD device

Resource Requirements

Host requirements: Host Systems being used to test Device PUTs must provide the following:

- INT 13 BIOS services for SATA ATA and SATA ATAPI devices connected to any and all SATA ports.
- For ODD devices, one of the following:
 - Provide a way to configure the SATA ports to be addressed in a legacy address (1Fx/3Fx, 17x/37x) and interrupt mode (edge triggered IRQ 14 and IRQ 15).
 - Bootable CD in Hard Drive emulation mode
- For test source and data logging, one of the following must be provided (in priority order):
 1. Boot a USB flash key, in HDD emulation mode
 2. Boot a floppy disk (slow)
 3. Boot a SATA FAT32/FAT16 DOS formatted HDD with multiple drive (HDD and ODD) boot order selection. This option is not desirable as it requires an additional step and system to retrieve the results).

Device requirements: SATA ODD / HDD devices being used to test HOST PUTs must provide the following:

- HDDs must be formatted with a 2 GB FAT16/FAT32 partition and loaded with the required System Interop files

- ODDs must contain a System Interop data CD

Host PUT requirements: Host systems being used as PUTs must provide **ALL** of the following:

- INT 13 BIOS services for ATA and ATAPI devices connected to any and all SATA ports.
- For ODD devices, additionally one of the following:
 - Provide a way to configure the SATA ports to be addressed in a legacy address (1Fx/3Fx, 17x/37x) and interrupt mode (edge triggered IRQ 14 and IRQ 15).
 - Bootable CD Hard Drive emulation mode
- For test source and data logging, one of the following must be provided (in priority order):
 1. Boot a USB flash key, in HDD emulation mode
 2. Boot a floppy disk (slow)
 3. Boot a SATA FAT32/FAT16 DOS formatted HDD with multiple drive (HDD and ODD) boot order selection. This option is not desirable as it requires an additional step and system to retrieve the results).

HDD PUT requirements:

HDD type PUTs must be formatted with a 2GB (2047 MB under fdisk) FAT16/FAT32 file system (See appendix for detailed instructions)

ODD PUT requirements:

Be able to read CD-R media.

HDD / ODD PUT Test Setup

Connect the HDD or ODD PUT to SATA Port 0 (The first primary port) with no other SATA devices connected to the system. The BIOS must configure the SATA host controller to be in either Native SFF-8038 or Legacy addressing mode.

For ODD type devices, the System Interoperability data or boot media shall be required. If the data media is being used, the host BIOS must configure the SATA host controller to be in Legacy Address mode. If the boot media is being used, either legacy or native addressing mode may be used, which ever the BIOS supports booting to.

Preparation

The procedures consist of preparing the boot media and either drive preparation (for a HDD), or media preparation (for an ODD). See the individual test descriptions for details

Observable Results

Once each test is started, intermediate test results are displayed, and log to a file: **file.log** located on the ram drive. Each test will pause on an error if the DOS environment variable EPAUSE is set to one (set EPAUSE 1). A summary of how many tests, how long and how much data has been transferred, when the test is complete.

Possible Problems

If multiple bootable device/media combinations are available on the system at the same time, and it is easy to boot the wrong device, and have unexpected drive letter assignments.

If the host does not support either bootable hard drive emulation media or does not have a legacy mode, the ODD tests will not be able to be run.

Some BIOS only support PIO type transfers, and so a reduced transfer rate and total amount of data transferred will be observed.

REFERENCES

The following document is referenced in this text:

- [1] Serial ATA Revision 2.5, Revision 1.0, October 27, 2006
- [2] Serial ATA Interoperability Program Unified Test Document, Revision 1.1
- [3] Serial ATA Interoperability Policy Document, Revision 1.1

Test Title: System Interoperability HDD tests

Purpose: To test the interoperability between a HDD and the host system. Used to test HDD PUTs and HOST PUTs when connected to a HDD.

References: See main reference section

Resource Requirements:

1. A HOST PUT or a SATA gold suite host that meets the previously described requirements
2. A SATA HDD PUT or a SATA HDD that meets the previous described requirements.
3. Serial ATA cable
4. MS-DOS bootable device (USB flash drive, Floppy, CD or HDD) loaded with the System Interoperability Test software
5. A writeable media (USB flash drive or floppy) to save the results to

Last Modification: 09/29/06

Discussion:

Depending on which type of bootable media you are using the default drive letter assignments will be slightly different.

WARNING: If you are using a ODD bootable media, you **MUST** also have an additional media (USB flash or floppy), if you wish to save the results.

Default drive letter assignments when using a floppy boot disk:

BOOTDRV=A:
SRCDRV=D:
RAMDRV=D:
SATA HDD=C:
ODD ROM drive = X: // Optional, only if one is attached to legacy port

Default drive letter assignments when using a USB or HDD boot disk

BOOTDRV=C:
SRCDRV=E:
RAMDRV=E:
SATA_HDD=D:
ODD ROM drive = X: // Optional, only if one is attached to legacy port

Default drive letter assignments when using a bootable ODD disk drive, and floppy to save results

Floppy=a:
BOOTDRV=C:

SRCDRV=E:
RAMDRV=E:
SATA_HDD=D:
ODD ROM drive = X: // Optional, only if one is attached to legacy port

Default drive letter assignments when using a bootable ODD disk, and USB key to save results

BOOTDRV=C:
SRCDRV=F:
RAMDRV=F:
SATA_HDD=D:
USB key=E:
ODD ROM drive = X: // Optional, only if the ODD is connected to a legacy port

Test Setup:

1. Follow the test procedure to hook up the resources listed above.

Test Procedure:

1. Do one of the following:
 - If the PUT is a HDD, connect to SATA Port 0 using a SATA signal cable
 - If the PUT is a Host, connect the SATA HDD to the worst case port using a SATA signal cable
2. Connect the Serial ATA HDD to a host system SATA power cable
3. Insert the MS-DOS bootable media into the Floppy drive or USB port. If using a ODD, must wait until power on.
4. Turn on the host system.
5. At the MS-DOS prompt, select the drive letter for the SATA HDD (see above for default drive letter)
6. At the MS-DOS prompt type: **run drive_id system_id h** where drive_id and system_id are 8 legal MS-DOS characters or less text identifier. H is only used when testing hosts (one directory for each host), and not used when validating drives.
7. After 9 to 10 minutes the test will complete with pass / fail results

Observable Results:

1. Each iteration of the test is targeted to take about 60 seconds.
2. The results are logged to the screen and to the file file.log located on the RAMDRV (see above for the default drive letter) in the directory interop)

If the results are desired to be kept, they **MUST** be copied from the RAMDRIVE back to the USB flash or floppy disk.

Measurement tolerance:

Data transferred: +- 0 bytes

Test duration: +- 1 seconds, with a minimum of 540 second execution time, equates to a +- 0.2% error

Possible Problems:

If no ODD drive is attached (which is HIGHLY suggested unless the Bootable ODD option is being used), normal execution of the config.sys and autoexec.bat during normal boot will produce two error messages saying an ODD could not be found and the driver will not be loaded (oakcdrom.sys or mscdex.com)

EMM386 has been shown to cause performance degradation problems with some BIOS HDD ODD boot emulation solutions.

Some ODD cache solutions show very poor performance when used under HDD ODD boot emulation mode.

Test Title: System Interoperability ODD tests

Purpose: To test the interoperability between an ODD drive and the host system. Used to test ODD PUTs and HOST PUTs when connected to a ODD.

References: See main reference section

Resource Requirements:

1. A HOST PUT or a SATA gold suite host that meets the previously described requirements
2. A SATA ODD PUT or a SATA ODD that meets the previously described requirements.
3. Serial ATA cable
4. Serial ATA System Interoperability CD or DVD Media
5. MS-DOS bootable device (USB flash drive, Floppy, CD or HDD) loaded with the System Interoperability Test software
6. A writeable media (USB flash drive or floppy) to save the results to

Last Modification: 09/29/06

Discussion:

Depending on which type of bootable media you are using the default drive letter assignments will be slightly different.

WARNING: If you are using a ODD bootable media, you **MUST** also have an additional media (USB flash or floppy), if you wish to save the results.

Default drive letter assignments when using a floppy boot disk (system must support legacy addressing mode):

BOOTDRV=A:
SRCDRV=C:
RAMDRV=C:
ODD ROM drive = X:

Default drive letter assignments when using a USB boot disk (system must support legacy addressing mode)

BOOTDRV=C:
SRCDRV=D:
RAMDRV=D:
ODD ROM drive = X:

Default drive letter assignments when using a bootable ODD disk drive, and floppy to save results

Floppy=a:

```
BOOTDRV=C:
SRCDRV=D:
RAMDRV=D:
ODD ROM drive = X:      // Optional, only if the ODD is attached to a legacy
port
```

Be sure to use C: as the test drive

Default drive letter assignments when using a bootable ODD disk, and USB key to save results

```
BOOTDRV=C:
SRCDRV=E:
RAMDRV=E:
USB key=D:
ODD ROM drive = X:      // Optional, only if the ODD is attached to a legacy
port
```

Be sure to use drive C: to run the tests on

Test Setup:

1. If using Floppy or USB bootable media, configure the SATA Host to be in Legacy Addressing mode
2. Follow the test procedure to hook up the resources listed above.

Test Procedure:

1. Do one of the following:
 - a. If the PUT is a ODD, connect to SATA Port 0 using a SATA signal cable
 - b. If the PUT is a Host, connect the SATA ODD to the worst case port using a SATA signal cable
2. Connect the SATA ODD to a host system SATA power cable
3. Insert the MS-DOS bootable USB flash drive into an appropriate USB port
4. Turn on the host system.
5. At the MS-DOS prompt, select the drive letter for the SATA ATAPI drive (usually X: or C:)
6. If bootable CD is being used, redirect log page to writeable media (floppy or USB key) by doing the following:
 - a. Set BOOTDRV=a: // Or use d: USB key is writeable media
7. At the MS-DOS prompt type: **run drive_id system_id cd h** where drive_id and system_id is 8 legal MS-DOS characters or less text identifier and cd says to run the cd tests. H is included when running host tests to cause all the log files to be grouped in the same system_id directory.
8. After 9 to 10 minutes the test will complete with pass / fail results

Observable Results:The results are logged to the screen and to the file **file.log** located on in the directory **interop** on the ramdrive (see above for the default drive letter)

If the results are desired to be kept, they **MUST** be copied from the RAMDRIVE back to a floppy or USB flash drive.

Measurement tolerance:

Data transferred: +- 0 bytes

Test duration: +- 1 seconds, with a minimum of 540 second execution time, equates to a +- 0.2% error

Possible Problems:

If the host system is not configured in Legacy mode the DOS CD-ROM driver will not load. If legacy mode is not offered, then try using a bootable ODD test procedure.

Appendix A: Configuration of USB Bootable flash disk

How to create and configure a USB flash disk to be bootable and contain the System Interoperability tests

Creating and configuring a USB flash disk to run the System Interoperability tests consists of the following high level operations:

1. Make the USB flash disk bootable
2. Load the required MS-DOS tools
3. Load the System Interoperability Tests

How to make the USB flash disk bootable:

To make your USB flash disk bootable, you will need the following:

1. PC system capable of booting USB devices, with NO HDD or ODD devices attached to the system
2. DOS bootable floppy (command.com, io.sys, etc) with the format, fdisk and programs

Procedure:

1. Insert the USB flash disk into an appropriate USB slot
2. Insert the MS-DOS bootable floppy into the floppy drive
3. While booting the system, enter the BIOS configuration menu and validate the boot order as floppy drives before USB devices
4. Save and exit the BIOS setup and continue the DOS boot
5. If the USB drive is already formatted, skip the next two steps
6. At the DOS prompt type **fdisk**
 - a. Y – Choose large drive support (N if building USB key for boot CD)
 - b. 1 – Create a partition
 - c. 1 – Create a primary partition
 - d. Y – Create a partition to span the entire disk (N if building USB key for boot CD – use 598MB)
 - e. ESC – To escape from creating a primary partition
 - f. ESC – To exit from fdisk
 - g. ESC – To exit from the fdisk reboot prompt
7. reboot if requested
8. Execute either: **format c: /s** or a **sys c:**
 - a. Y – To proceed with format
 - b. <CR> - Volume label
9. At the DOS prompt type fdisk:
 - a. Y – Large drive support (N if building USB key for boot CD)
 - b. 2 – Set active
 - c. 1 – pick first partition
 - d. ESC – To escape from marking a partition active
 - e. ESC – To exist from fdisk

- f. ESC – To exit from fdisk reboot prompt
10. Remove the bootable floppy
11. Reboot the system using the USB flash disk

Loading the required MS-DOS tools:

To use your USB flash disk bootable, you will need to

1. Boot your system with a bootable USB flash disk
2. Insert a your Windows 98se recovery disk that contains the required files
3. Copy the following files from the floppy into c:\bin:
 - a. Himem.sys
 - b. Ramdrive.sys
 - c. Oakcdrom.sys
 - d. Mscdex.exe
 - e. Chkdsk.exe
 - f. Format.com
 - g. Fdisk.exe
 - h. Sys.com
4. Copy the following additional NON MS-DOS utilities into c:\bin
 - a. Pkunzip.exe

Loading the System Interoperability Tests:

Download comp.zip and interop_MMDDYY.zip file from the SATA-IO members only Logo website (where MMDDYY is the digits for the Monday Day and Year of the test release).

To load the System Interoperability tests, perform the following tasks to configured / bootable USB flash disk drive:

1. mkdir c:\interop
2. copy comp.zip c:\interop REM – Do NOT unarchive – files are very large
3. Unarchive Interop_MMDDYY.zip into c:\interop
4. copy c:\interop\config.sys c:\
5. copy c:\interop\autoexec.bat c:\

Appendix B: Configuration of Bootable floppy disk

How to create and configure a floppy disk to be bootable and contain the System Interoperability tests

NOTE: Booting a floppy disk is MUCH slower and so usage of a USB key is highly suggested

Creating and configuring a floppy disk to run the System Interoperability tests consists of the following high level operations:

1. Make the floppy disk bootable
2. Load the required MS-DOS tools
3. Load the System Interoperability Tests

How to make the floppy disk bootable:

To make your floppy disk bootable, you will need to do ONE of the following:

1. A utility to make a bootable floppy disk (follow utilities instruction)
2. A windows 98se system (Generate a windows recovery floppy, and remove all the program except the ones listed below)

Loading the required MS-DOS tools:

To use your bootable floppy, you will need to

1. Copy over the following files from a Windows 98se recovery disk into the `\bin` directory:
 - b. Himem.sys
 - c. Ramdrive.sys
 - d. Oakcdrom.sys
 - e. Mscdex.exe
 - f. Chkdsk.exe
 - g. Format.com
 - h. Fdisk.exe
 - i. Sys.com
2. Copy the following additional NON MS-DOS utilities into `c:\bin`
 - j. Pkunzip.exe

Loading the System Interoperability Tests:

Download `comp.zip` and `interop_MMDDYY.zip` file from the SATA-IO members only Logo website (where MMDDYY is the digits for the Monday Day and Year of the test release).

To load the System Interoperability tests, perform the following tasks to configured / bootable USB flash disk drive:

1. `mkdir c:\interop`
2. `copy comp.zip c:\interop` REM – Do NOT unarchive – files are very large

3. Unarchive Interop_MMDDYY.zip into c:\interop
4. copy c:\interop\config.sys c:\
 - a. Edit c:\config.sys and replace all c: with a:
5. copy c:\interop\autoexec.bat c:\
 - a. No edits needed

Appendix C: Configuration of Bootable CD

How to create and configure a CD to be bootable and contain the System Interoperability tests

This procedure is FAIRLY complex and should ONLY be done if no other option is available.

WARNING: You must copy the files to a USB flash disk to the order described or the test data will not reside on the desired location on the CD.

Creating and configuring a Bootable CD to run the System Interoperability tests consists of the following high level operations:

1. Configuring a USB flash disk to be the RIGHT size
2. Making a the USB flash disk bootable
3. Loading the required MS-DOS utilities
4. Loading the System Interoperability tests onto the USB flash disk
5. Loading filler data to take up space so that the test and data are on the outside diameter of the CD
6. Loading the System Interoperability test data onto the USB flash disk
7. Using a system that contains a CD burning utility that can make Hard Drive Emulation bootable CDs

Configure a USB flash disk to be the right size and bootable

To make your USB flash disk bootable, you will need the following:

1. A 1 GB flash disk capable of booting in the system (Anything less than 700MB will not be able to hold a CD image, and anything more than 1GB will be waisted)
2. PC system capable of booting USB devices, with NO HDD or ODD devices attached to the system
3. DOS bootable floppy (command.com, io.sys, etc) with the format, fdisk and programs
4. A system with CD burning software that is capable to generate a bootable CD (I use Nero).

Overall Procedure

1. Follow USB Bootable flash disk procedure, except follow USB key for boot CD directions (N to FAT32 support, N to create a partition to span entire disk, and choose a size of 598MB)
2. Load the filler data as described below
3. Load the System Interoperability Test data as described below
4. Follow the burning bootable CD procedure as described below

Loading filler data

The filler data is loaded to take up space on the CD so that the rest of the test data and tests reside on the OD (Outside Diameter) of the CD where the maximum media transfer rate occurs.

To load the “filler data”, perform the following tasks

1. Download the cd_image_MMDDYY.zip file from the SATA-IO members only Logo website (where MMDDYY is the digits for the Month, Day and Year of the image release).
2. Uncompress the boot_image archive and either burn a CD using that image or use a image access utility to extract the files from the image archive.
3. make a directory dir_100 on the USB flash disk, and copy the first 5 files from the dir_100 directory in the image (ZERO1001.BIN through ZERO1005) into the dir_100 directory on the USB flash disk (This takes up 500MB of space)
4. Copy dir_10 through dir_70 to the USB flash disk (7 directories)
5. Copy dir_1 to the USB flash disk

Loading the System Interoperability Test data:

To load the System Interoperability data tests, extract the following files from \interop\comp.zip

1. [cd to the \ directory on the USB flash disk](#)
2. pkunzip \interop\comp.zip md5sum.md5
3. pkunzip \interop\comp.zip comp2048.bin
4. pkunzip \interop\comp.zip comp64k.bin
5. pkunzip \interop\comp.zip comp256k.bin
6. pkunzip \interop\comp.zip comp1mb.bin
7. pkunzip \interop\comp.zip comp16mb.bin

Burning the bootable CD:

Using a system that contains a CD burning utility that can make Hard Drive Emulation bootable CDs

Requires access to the files from “filler” data CD. Make sure you have a copy of the filler data on the HDD.

Access to the

1. In your burning software select making a bootable CD.
2. Select the 598MB USB key as the boot image
3. There should be about 100MB left for the data portion of the CD

4. At the top level of the data portion of the CD, add the following directories and files:
 - a. dir_10 through dir_70 from the cd_boot_image filler data (takes up 70 more MB)
 - b. md5sum.md5
 - c. comp2048.bin
 - d. comp64k.bin
 - e. comp256k.bin
 - f. comp1mb.bin
 - g. comp16mb.bin
5. Commence with burning the CD.

Appendix D: Configuration of Bootable HDD

How to create and configure a SATA HDD to be bootable and contain the System Interoperability tests.

Creating and configuring a SATA HDD to run the System Interoperability tests consists of the following high level operations:

1. Make the HDD bootable
2. Load the required MS-DOS tools
3. Load the System Interoperability Tests

How to make the SATA HDD bootable:

To make your HDD bootable, you will need the following:

1. PC system capable of booting a SATA HDD, with NO additional HDD or ODD devices attached to the system
2. DOS bootable floppy (command.com, io.sys, etc) with the format, fdisk and programs

Procedure:

1. Follow USB Bootable flash disk procedure, except follow answer N to create a partition to span entire disk, and choose a size of 2047 MB)

Appendix E: Creating a formatted HDD

To create a formatted HDD for System Interoperability testing, you will need the following:

1. A PC system with the HDD connected to Primary SATA port 0
2. DOS bootable floppy (command.com, io.sys, etc) with format and fdisk

Procedure

1. Boot a MS-DOS bootable floppy
2. Execute **fdisk**,
 - a. Y –Choose large drive support (uses FAT32, not FAT16)
 - b. 1 - Create a partition
 - c. 1 - Create a primary partition
 - d. N – Do NOT create a partition to span the entire disk
 - e. **2047** – Create a partition that is 2047 MB in size
 - f. ESC – To escape from creating a primary partition
 - g. ESC – To exit from fdisk
 - h. ESC – To exit from fdisk reboot prompt
 - i. Reboot
3. format c: REM – Do not include a “/s” so no boot order conflict is created
 - a. Y – proceed with format
 - b. <CR> - volume label

Appendix F: Configuration of Interop Data CD

Download the ISO image file (Interop_cd_MMDDYY.zip) from the SATA-IO Logo WG members only website or perform the following steps:

1. Create a 1 mega byte (1024 x 1024) file of zeros
2. Create a 100 Mega byte (100 x 1024 x 1024) file of zeros
3. Create a directory dir_10, dir_20, dir_30, dir_40, dir_50, dir_60, and dir_70 filled with ten 1MB zero files.
4. Create a directory dir_100, with six 100 MB zero files
5. Place all the .bin files from comp.zip at the top level
6. Place md5sum.md5 from comp.zip at the top level

Appendix G: Inside the System Interoperability tests

Source of the files:

The System Interoperability tests consist of source binary files that are created from the SATA-IO composite pattern that has been reverse scrambled and reverse encoded so that it matches the SATA-IO composite 2K Dword (8,192 bytes) pattern out on the SATA-IO bus, if the pattern is not split between data FIS on a non-8K alignment. The size of the source binary files was varied to strike a balance between guaranteed being 8K aligned and increased data throughput that is gained with larger file sizes. In addition the smaller file sizes have a high likelihood of being cached, and thus achieving higher burst transfer rates, whereas the larger files increase the devices media access interactions.

Current file sizes are: 8KB, 64KB, 256KB, 1MB, and 16MB

Error detection and validation:

The System Interoperability tests use the industry standard MD5 128-bit checksum generator that has proven to be very capable at detecting single bit errors (even in very large files). There are a number of MD5 checksum tools available in the public domain and for a large number of different platforms. The current test uses the tool md5dos.exe to perform these checks.

The MD5 signatures for each of the data files has already been generated and is stored in the file comp.lst

For the HDD test, each of the source binary files is copied to the HDD, and then copied using the copy command 39 more times generationally, so that only the last file needs to be validated to verify all 40 copies were correct. The last copy is verified with its stored md5 signature.

For the ODD test, only read tests are performed, and each of the source binary files is read and validated using the md5 signature tool multiple times

If an error is detected, the test will pause (controlled by EPAUSE environment variable).

Each test is re-executed until the time allocated is consumed.

Script setup:

The autoexec.bat and config.sys files will setup the following environment variables:

BOOTDRV	Is set to the drive letter of the boot drive (A: or C: are typical)
RAMDRV	Is set to the drive letter of the RAM drive
PATH	Is set to include path to the DOS and System Interop tools
CDROM	Is set to the drive letter of the ODD (if one is present, usually X:)
EPAUSE	Is set to 1 so the test pauses if an error occurs

Script control:

Each test is performed / controlled by the DOS batch file **run.bat**. In addition to the internal copy command, the script also uses the following utilities and batch files:

1. **md5dos.exe** – Used to compute the md5 signatures for the data files
2. **aset.exe** – Gather start / end times to run the test for a specific amount of time
3. **delta.bat** – Script to compute the elapse time between the start time and the end time and detect if it has been greater than 9 minutes (540 seconds)
4. **copyfile.bat** – Used when testing HDDs to do the 40 generational copies
5. **copy_cd.bat** – Used when testing ODD drives to compute multiple MD5 signatures

Support files:

6. **comp2048.bin** – 8KB binary SATA-IO comp data file
7. **comp64k.bin** – 64KB binary SATA-IO comp data file (comp2048.bin repeated 8 times)
8. **comp256k.bin** – 256KB binary SATA-IO comp data file (comp2048.bin repeated 32 times)
9. **comp1mb.bin** – 1MB binary SATA-IO comp data file (comp2048.bin repeated 128 times)
10. **comp16mb.bin** – 16MB binary SATA-IO comp data file (comp2048.bin repeated 2048 times)
11. **comp.lst** – md5 signature file used to validate all of the above SATA-IO comp data files
12. **comp_cd.lst** – md5 signature file used to validate one loop of the ODD test
13. **comp2048.lst** – md5 signature for just the file comp2048.bin
14. **comp64k.lst** – md5 signature for just the file comp64k.bin
15. **comp256k.lst** – md5 signature for just the file comp256k.bin
16. **comp1mb.lst** – md5 signature for just the file comp1mb.bin
17. **comp16mb.lst** – md5 signature for just the file comp16mb.bin

All of these files are distributed in the file: **Interop_mmddyy.zip** mm is the month, dd is the day and yy is the last two digits of the year of the release.

Script variables available on completion:

REV	Is set to the revision of the System Interop run script
SRCDRV	Is set to the drive letter the script used to find the source test files
DEVNAME	Is set to the Device Name that was provide as a parameter to run.bat
TESTDRV	Is set to the drive letter the run script ran on
LOGFILE	Is set to the location and file name of the test log
STIME	Is set to the starting time HH:MM:SS
ETIME	Is set to the ending time HH:MM:SS
DTIME	Is set to the execution time (ETIME – STIME)

COUNT	Is set to the number of loops executed
FINISH	Is set to 1 if no errors have occurred
MB	Is set to the number of mega bytes transfered