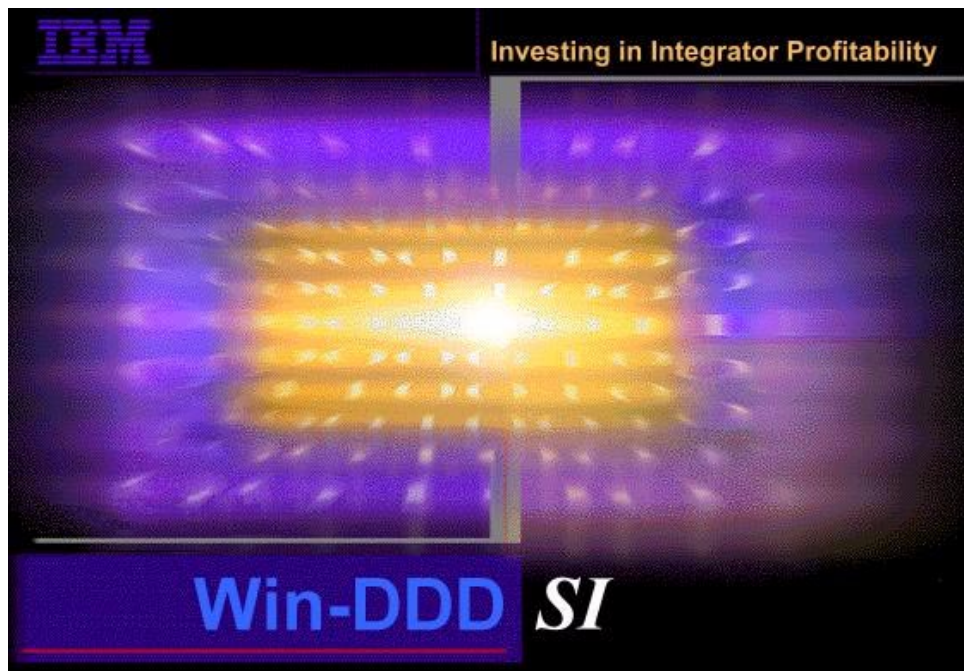


# IBM

*Storage Technology Division*

## **DDD for System Integrators**

**Release to support version 5.0 Feb 2001**



This document is intended to explain about Windows 32-bit Disk **D**rive **D**iagnostics and **D**isposition, System Integrators version (DDD-SI), how it is used, and how it is being installed by IBM SSD to system integrators using IBM hard disk drives (HDD) products.

Win32 DDD SI was introduced at version 4.1

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Doc Ver 3.0

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DDD SI has been written in IBM Mainz, Germany and has been qualified in the IBM European SIT Lab, North Harbour, United Kingdom.

This software uses

b+m Print-Part for VisualAge C++ for Windows 95/NT from  
 becker & mohnberg Softwaregesellschaft mbH  
<http://www.bmsg.de/us/frames/product.htm>  
 WinDriver from KRFTech Ltd. <http://www.krftech.com/>

## 1.0 - What is DDD SI?

DDD SI is an easy-to-use Windows software package developed by IBM for System Integrators. This tool allows you to modify, optimise, initialise or test industry leading IBM hard disk drives for integration.

- Once configured, DDD SI is easily usable through a GUI interface.
- Can be used to
  - Optimise a Disk Drive
  - Analyse/ Repair a Disk Drive
  - Initialise a Disk Drive
  - Assist with Disk Drive Integration
  - Provide Production Line Support
- DDD SI will be able to perform various tasks through the availability of different **.PID** files which can be prepared by and will be made available from your supplier or distributor. This will include testing of returned drives, and the capability to perform other tests and upgrades. The **.PID** files can be selected from the DDD SI Control Center.

As well as the standard PID files that are shipped with the DDD SI version, suppliers can provide their customers with tailored .PID files which package test sequences and product files not normally available to the System Integrator.

### Integration

- to provide a mass screen of all drives and produce a positive yield of good drives for return for second integration, using marking / tracking procedures
- to provide symptoms for failing drives, generally divided between IBM defective drives and drives which have recognised symptoms of handling damage such as disk shift or scratches.

### Field

DDD SI can also be used to analyse field drives, with disposition in the same way as managed for drives in integration.

## 1.1 - What is Windows 32?

This is the generic term used to describe a piece of software which will run on Microsoft Windows 95, 98 or NT 4.0 which are examples of 32 bit Windows operating systems.

**Windows 2000:** DDD SI should be able to run on Windows 2000. However, no testing at this release has yet been attempted, and this should not be attempted until a release is made which clearly supports this future offering(s) from Microsoft.

Please contact your IBM technical support representative for further discussion of this item.

## **2.0- Introduction to DDD SI**

Over the past three years, IBM SSD has assisted its OEM customers and distributors in the prompt and accurate analysis of disk drives using a software application and recognised mechanically qualified hardware platforms. The drives analysed have typically been rejected from manufacturing integration processes or customer field.

IBM is investing in integrator value with the launch of DDD-SI, an easy-to-use, Windows 95 software tool. Some examples of the typical use for DDD-SI are listed below.

### **2.1 - When to use DDD-SI**

#### **2.1.1 - Optimise a disk drive**

- AV Applications
- Power management
- RAID system integration
- Quiet seek mode

#### **2.1.2 - Analyse / repair a disk drive**

- Run diagnostics
- Virtual repair (write aborts, off-track writes)
- Clear format degraded condition
- Rearrange data order

#### **2.1.3 - Initialise a disk drive**

- Wipe disk
- Clear boot / partition information

#### **2.1.4 - Assist with disk drive integration**

- Downgrade UDMA/66 to UDMA/33
- Update microcode
- Change blocksize
- Change capacity
- Change any mode page

#### **2.1.5 - Provide production line support**

- Production line monitoring
- Analyse disk drive handling

## **2.2 - Drive failure mechanisms**

It is apparent that drives fit into three areas of failure;

- IBM responsibility - which will lead to analysis of failure modes as part of contribution to continuous product improvement
- NDF / NTF (No Defect Found) / (No Trouble Found) - while intermittent failures are possible, the disk drive industry has found that between 40 to 80% of returns are in this category. Disk drive manufacturers provide a means of storing data, according to a directory structure (example: FAT32), defined by an operating system (example: Microsoft Windows). The data, directory and operating system are all just data recorded on the drive.

However, several failure mechanisms cause problems with the directory and operating system relationship, rather than the data on the drive, including incorrect operation during shutdown procedures. Many utilities and diagnosis systems cannot determine this, and this results in drives being rejected which are operationally good. DDD SI will identify these drives to a high confidence level, and will allow them to remain in the system rather than returned to IBM.

The IBM Drive Fitness Test (DFT) also addresses these failure modes for ATA drives, with the advantage of the drive remaining inside in the end-user PC without being disturbed.

- Handling damage - although they appear sturdy on the outside, disk drives contain extremely sensitive internal mechanisms, which are vulnerable to drop and shock damage. From the outside of the disk drive it will be impossible to determine if a drive has been subjected to bad handling. However, by analysis of the servo and the media surfaces, it can be determined if the disk platters have moved position or if there has been head/disk contact.

### **The DDD solution and move to Win32**

DDD is designed to diagnose symptoms in the drive which will categorise a drive failure and determine if the drive should be returned under warranty.

The DDD project was originally started in the 1996 period and has demonstrated the usefulness of this technology and its benefits for rapid drive diagnosis. DDD has now been designed to work on the Windows 32 platform. This means that the DDD package will run on Microsoft Windows 95, 98 and NT4.0 platforms, which are commonly used on PC platforms at most OEM customers and distributors, and for which there is now more general user experience than with the OS/2 platform.

DDD for Windows 32 also introduces support for PCI attached ATA adapters, while maintaining support for the 6 way ISA attached ATA adapter used in the existing systems. The

PCI attached ATA adapters offer hardware capability for data transfer speed improvements, which are more significant as test times would otherwise continue to increase as disk drive capacities increase. The speed improvements will be supported by DDD software in a forthcoming release.

### **3.0 - DDD SI distribution and installation**

#### **DDD SI**

Normal DDD SI updates will be distributed to you by your IBM technical support representative using CD-ROM or a set of floppy diskettes (see page 10). Your technical support representative will advise when DDD SI updates are needed, both to support new models of HDD and to update and enhance the DDD SI function. Your technical support representative can also participate within IBM internal forums to discuss any issues, comments and feedback you may have.

Installation of DDD SI can only be achieved by registering the software with IBM hard disk drive call center (see page 12), who will provide a license number which will enable the software to function.

#### **3.1 - System requirements**

The DDD SI development team recommends the following minimum platform, using an industry standard PC. It is possible to run DDD SI on lower specification platforms, but problems may be encountered which are not supported.

##### Hardware

Pentium 233MHz or faster processor

64MB memory (or 96MB if system is network connected)

40MB empty hard disk space

PCI - a motherboard with a minimum of 4 PCI slots is recommended - the maximum PCI configuration. This is required to support up to 3 PCI-IDE controllers + a graphics card on a typical PC.

Monitor / graphics - 800 x 600 minimum, 1024 x 768 suggested, 64K colours

##### Operating System

#### **Windows 95 OSR2**

#### **Windows 98**

**Windows NT 4.0** (Service Pack 4 minimum, or Service Pack 6B must be installed). These can be obtained from Microsoft at <http://www.microsoft.com/support/winnt/default.htm>. Be careful to download versions which are approved in your geography for USA export control for cryptographic materials.



## DDD SI System Requirements

Install the Windows Operating System with drive attachment hardware installed before proceeding to the installation of DDD SI(except for the PCI attached IDE cards, which should not be installed, see page 8 for instructions).

### **Windows 2000.**

It is your responsibility to ensure that your copy of Windows is properly licensed.

### **3.2 - Unresolved Problems With Version 5.0 Build Level 184**

1...ATA adapters should not be mixed if this can be avoided as unpredictable results may occur. Mixing Promise UDMA 66 adapters with other Promise adapter and/or Centos adapters seems to be particularly problematic for Windows. If multiple ATA adapters are required, it is recommended that they are the same brand and type i.e. All Promise 100 or all Centos CI-1500.

2...At this point in time, only Centos 6 channel ATA adapters, Centos CI 1500, Promise UDMA 33 and Promise UDMA 100 are supported. Centos 66 and 100 cards will be supported at a later date.

### **3.3 - Drive Adapters**

#### **ATA**

Centos CI-1500 2 way (1@E-IDE configuration) PCI attached IDE adapter (based upon the CMD PCI-0646U chip) (CI-1500). Remove the “Enhanced BIOS” chip and store it carefully in an ESD bag, preferably inside the host PC). Three of these cards are required to support 6 drives under test in a Xyratex **M**ulti **D**rive **T**ester (MDT) tower.

Installation Note: Please read the installation notes supplied with this adapter card carefully. The Windows 9x driver installation .exe on the floppy diskette provided with the card must be executed before the hardware is installed in the PCI. The normal Win 9x driver installation will not work.

Promise 2 way Ultra 33 E-IDE PCI adapter using their own PDC2024X chip set.

Promise DMA 33 and DMA 100 cards are now supported. The bios on Promise UDMA 66 cards seems to be incompatible with DDD and installation of these cards should be avoided.

PCMCIA IDE support - DDD SI can be installed on a laptop with PCMCIA IDE support using a standard driver.

**Note:** In most cases testing will only be performed on a MASTER configured drive, so there is one ATA drive per IDE cable.

It is also possible to support ATA HDDs using a standard mother board as described in the appendix 2.

#### **SCSI**

ASPI compliant controller: for example, Adaptec 2940UW (and similar 2940xx cards, including U2W with LVDS support). Up to 6 of these cards can be supported, although this is normally bounded by PCI implementation constraints.

Adaptec “SlimSCSI” PCMCIA

Other ASPI compliant controllers may be compatible, but have not been tested. ASPI will require to be installed manually as DDD installer only supports Adaptec cards.

#### **FC-AL**

The following ASPI compliant controllers and firmware levels have been tested with DDD CV, Build 146 onwards;

ATTO ECPI-FC64-00, bios levels 1.12, 1.13 and 1.14

<http://www.attotech.com>

Emulex Light Pulse 7000, bios SB130

Qlogic QLA2100, bios 1.37, firmware 1.15.37

2Gbit/s FCAL adapters will be advised at a later date.

## DDD SI System Requirements

### SSA

ASPI compliant controllers for example: Pathlight Streamline SSA Adapter

## DDD SI System Requirements

### - Where To Purchase The Required Adapters

Adaptec SCSI controllers are widely available through various component and PC retailers and distributors.

The Centos AT adapters can be purchased directly from Centos in Taiwan. The contact details are;

Company: Centos

Address : 6F-1 No 15  
Lane 360  
Nei Hu Rd  
Sec 1  
Taipei  
Taiwan  
R.O.C.

Contact : Steve Chang  
Email : [Steve@Centos.Com.tw](mailto:Steve@Centos.Com.tw)  
Website : [Centos.Com.Tw](http://Centos.Com.Tw)  
Part No : CI-1500

## 4.0- Installation

The typical downloadable will be an executable file SISetup.exe. This will typically be 10 to 15 MB in size and is ready for installation using InstallShield protocols.

Many target PCs for DDD SI will only have a floppy disk drive, which is limited to 1.4MB per floppy diskette. The best way of working around this problem is to create a set of spanned .zip format floppy diskettes. There are a number of packages which can do this. External packages are available to non-IBM parties from

<http://www.cdrom.com/pub/infozip/> Freeware

<http://www.pkware.com/> Commercial

<http://www.winzip.com/> Commercial

A suitable package will also need to be placed on the target system to unzip the image of the single file which should be created in a suitable temporary folder such as c:\temp\SISetup.exe.

Now run SISetup.exe - typically using Windows Explore or from the Run option in the Windows start dialog



*Note:* If DDD is removed using the 'remove software' option in the Windows control panel, the installation process will require the license details to be re-entered. If you are installing an update of a DDD version already installed on your system, the install program will automatically check whether DDD has been previously installed. If it has, the follow screens will not appear and you will not need to re-enter the license information. In this case, the next screen to appear will be the Win-DDD Setup window on page 14. However, you will need to re-enter the IDE command line switches in the properties of the desktop icons. These are described on page 18.

## Installation

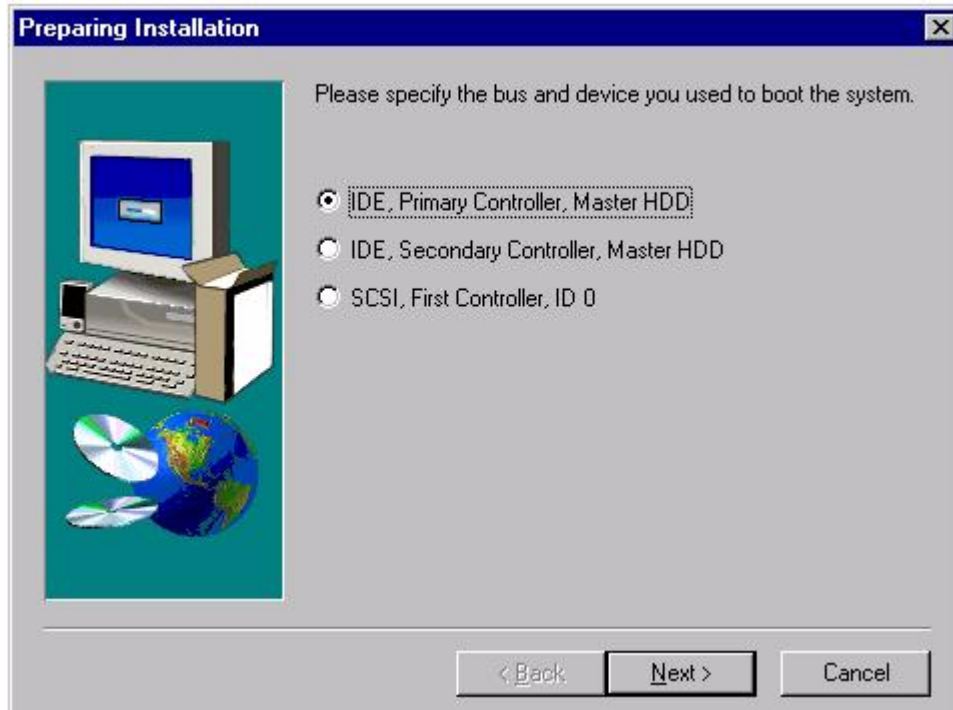
The 'Input' and 'Output' folders required by DDD will automatically be added. If a previous installation of DDD still exists on the system, the data within the 'output' folder will remain intact.

When SISetup is started, the first screen will be similar to;



This screen shows the version of DDD that will be installed. Press continue and the installation screens will progress as unpacking commences. You will next be asked to define where the system boot drive is located.

## Installation



The next screen will provide a registration ID.

### 4.1 - Registration

During installation a Registration ID will be generated by installation program. This will be of the format 1234-ABCD-1234-ABCD-1234-ABCD. This needs to be noted down in order to determine a serial number which will be needed to complete the installation.

## Installation



b

To determine the License Key (serial number) please communicate with your IBM technical support representative who will take your registration ID and respond with a License Key for your installation to be entered as the serial number on the following screen.

To register your copy of DDD-SI, please contact the IBM hard disk drive call center at the following numbers:

Germany	07302-153050
United Kingdom	01475-898 125
France	02.38.55.74.90
Italy	02-5962 2122

Remainder of Europe, Middle East

and Africa	44-1475-898 125
Fax:	44-1475-898 684

Once you have provided the call center with the required information, a registration key will be e-mailed directly to you. Simply install this key in the 'Serial' window as described on the next page, to ensure the continued operation of your copy of DDD-SI.

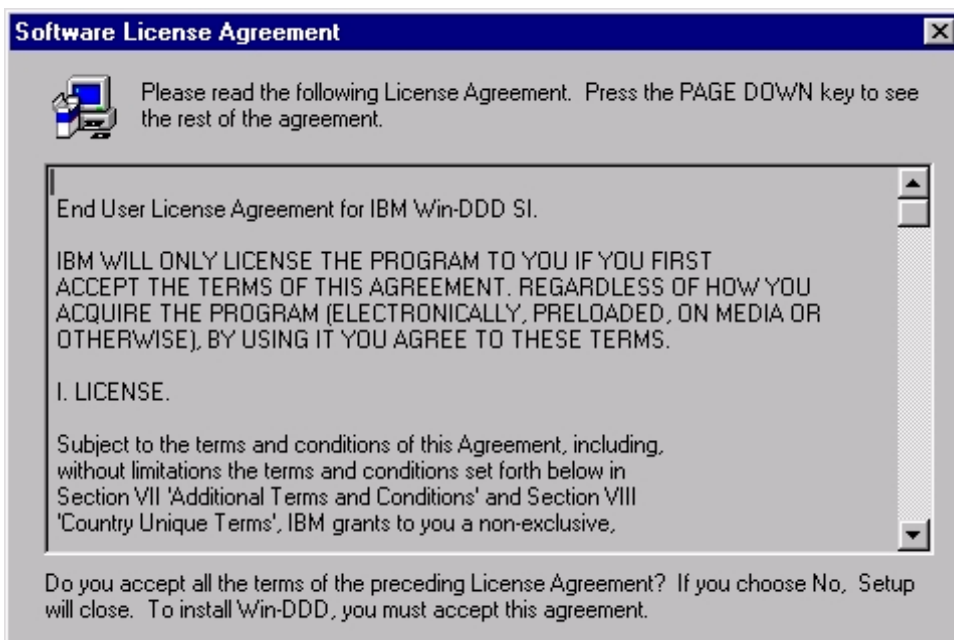
A new registration key is required for each machine with DDD-SI installed.



## Installation

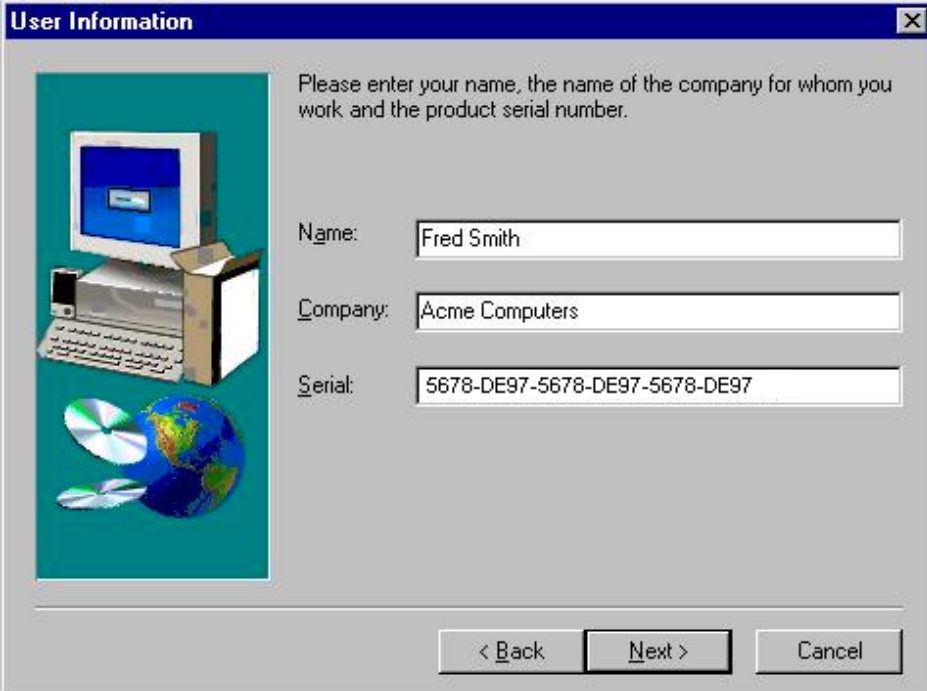


The next screen to appear will be the DDD license agreement window. To successfully install DDD-SI, the user must agree with the terms and conditions.



Once you have obtained the DDD Serial number from your IBM support center, enter the details into the following window. This number can be entered with or without the dashes(-) but there must be no blank spaces between the digits.

## Installation



The image shows a Windows-style dialog box titled "User Information". On the left is a graphic of a computer monitor, keyboard, and CD-ROMs. The main text area contains the instruction: "Please enter your name, the name of the company for whom you work and the product serial number." Below this are three text input fields. The first field, labeled "Name:", contains the text "Fred Smith". The second field, labeled "Company:", contains the text "Acme Computers". The third field, labeled "Serial:", contains the text "5678-DE97-5678-DE97-5678-DE97". At the bottom right are three buttons: "< Back", "Next >", and "Cancel".

**User Information**

Please enter your name, the name of the company for whom you work and the product serial number.

Name: Fred Smith

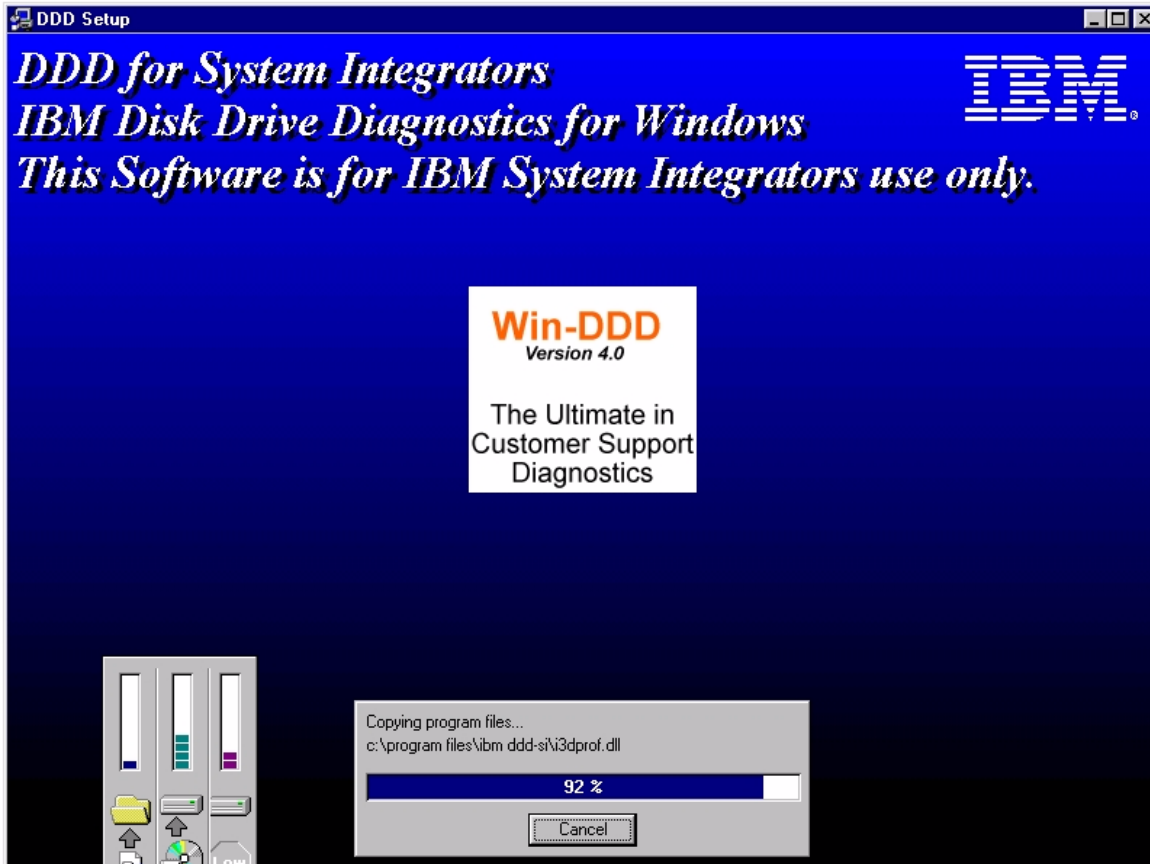
Company: Acme Computers

Serial: 5678-DE97-5678-DE97-5678-DE97

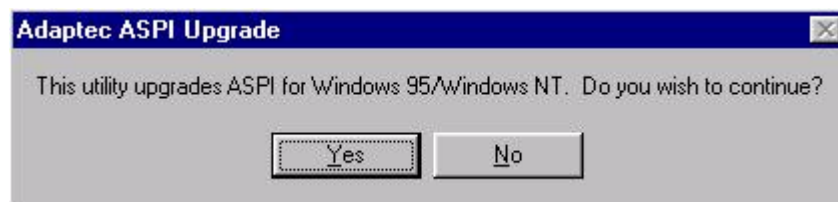
< Back   Next >   Cancel

Choose a destination folder, normally the suggested c:\Program Files\IBM DDD-SI. Agree or change the Program Folder Name. Setup will then progress as shown in the next picture. This will install the files into the chosen directory as well as creating the 'input' and 'output' sub directories.

## Installation



At the end of the install, a window will appear which provides the ASPI layer upgrade.



This will proceed to a box to Finish installation and optionally to start Win-DDD.

Normally, three shortcuts to I3DMAIN.EXE will appear on the desktop. If not, ensure that these are created using normal Windows methods. You have the further option to create a further shortcut in

c:\windows\start menu\programs\startup if the target system is dedicated to supporting DDD.

The Install Shield utilities will install suitable ASPI and IDE drivers. For reference these are;

IDE

Win 95/98

## Installation

WINDRVR.VXD will be present in c:\win95\system\mmm32 and will have been updated in the registry.

Win NT

WINDRVR.SYS will be present in c:\winnt\system32\drivers and will have been updated in the registry.

## SCSI

Win 95/98

ASPI32 Windows 9x files: ASPIENUM.VXD (system directory), APIX.VXD (iosubsys directory), WNASPI32.DLL (system directory) and WINASPI.DLL (system directory)

Win NT

ASPI32 Windows NT files: ASPI32.SYS (drivers directory), WNASPI32.DLL (system32 directory), WINASPI.DLL (system directory), WOWPOST.EXE (system directory).

Tip: If Windows has problems initialising the ASPI layer:

- Verify the file WNASPI32.DLL is not located in the DDD SI Working Directory

## **4.2 - Uninstall**

Uninstall of DDD SI can be performed using Control Panel->Add/Remove Programs. This will remove the program. Certain drivers will be left on the system, but they will not be reloaded upon subsequent boots.

## Starting DDD

### 5.0- Starting DDD

DDD can be started in a number of ways, generally either

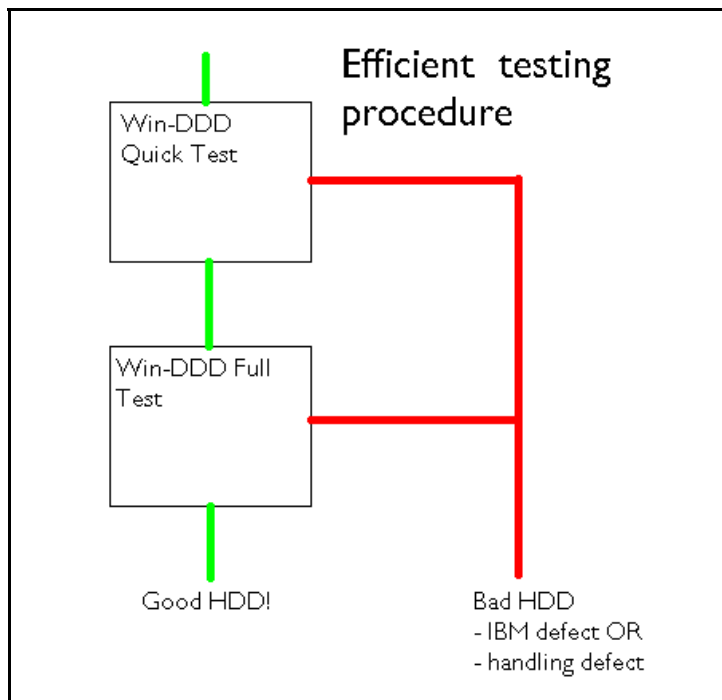
- Using one of the three standard icons that are automatically created on your desktop when DDD is installed. Each one of these icons will load the associated ini file.



- or, if you wish to DDD to start automatically at Windows boot time then create a shortcut which is placed in the c:\Windows\Start Menu\Programs\StartUp folder

### 5.1 -Standard DDD test icons for Normal Return Authorisation

When DDD SI has been installed using a standard installation process, three icons will be placed upon the desktop, each with a pre configured function for normal drive test and return authorisation.



## Starting DDD

### **Win-DDD Quick Test**

This test will save time by sorting out drives which have difficulties at start-up, and will be useful when working with multiple drives. Passing this test does not mean that a drive is good - a pass of Full Test is required as shown in the diagram.

- Check the Servo Function
- Analyse Scratches
- Check the S.M.A.R.T. status
- Error Log Analysis
- Check the Defect Data within the drive
- Check the DFT records which may have been recorded in an end-user environment
- Set MAX Lba (no format)
- Perform 300 read - write - read operations
- Read sequential 10% of the data area at the outer diameter
- Read sequential 10% of the data area at the inner diameter
- Check the Defect Data within the drive
- Erase the Master Boot Record

This test should be applied to all drives which can be detected satisfactorily by DDD SI.

### **Win-DDD Full Test**

A Full Media scan is required before DDD SI can be used to determine that a drive is declared as being good as shown in the diagram. However Quick Test may assist in saving time as shown in the diagram on the previous page.

- Check the Servo Function
- Analyse Scratches
- Check the S.M.A.R.T. status
- Error Log Analysis
- Check the Defect Data within the drive
- Check the DFT records which may have been recorded in an end-user environment
- Set MAX Lba (no format)
- Perform 300 read - write - read operations
- Read sequential all of the data area
- Check the Defect Data within the drive
- Erase the Master Boot Record

The test content is the same, except that 100% of the data area is tested, taking a longer execution time.

### **Win-DDD Drive Exerciser**

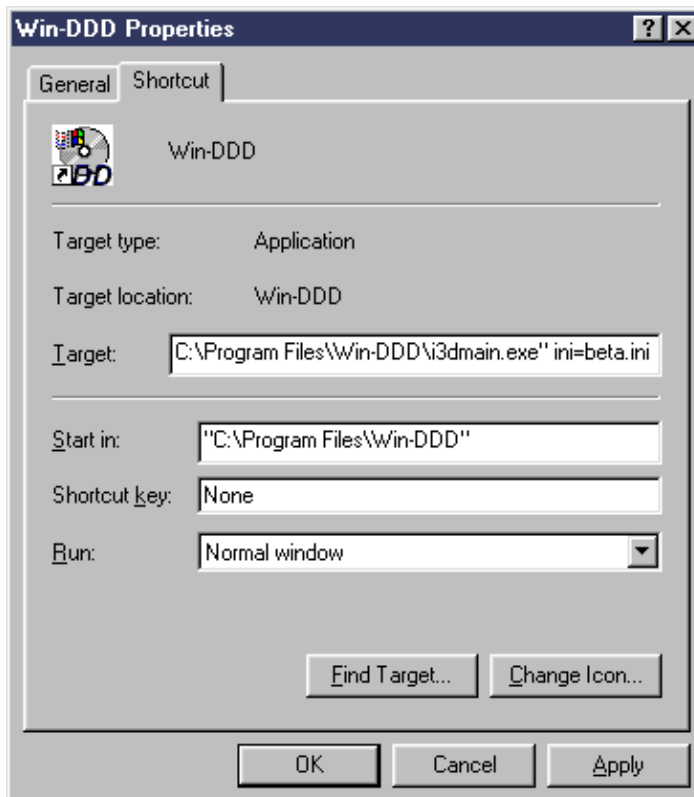
This offers a long term exercise of the drive

- Check the S.M.A.R.T. status
- Check the Defect Data within the drive
- Perform 500 read - write - read operations
- Perform 1000 seek butterfly operations
- Repeat from beginning 10000 times

## Starting DDD

### 5.2 - Command Line Switches

The command line switches can be entered in the **right click / Properties** box for each of the DDD icons as illustrated here;



Turn off the ISA attached IDE (saves time if not attached) `ide=!isa`

Turn on PCI attached IDE (1st) `ide=pci1` (**mandatory to enable**)

Turn on PCI attached IDE (nth) `ide=pcin (n=1,2,3)` (**mandatory to enable**)

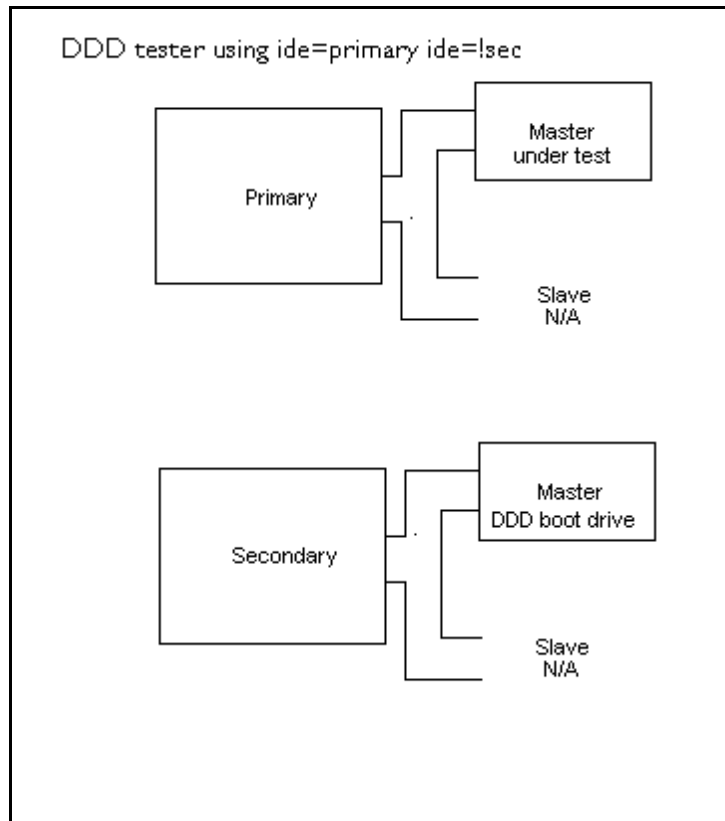
Load ini file from the command line `ini=filename.ext` for example testhdd.ini.  
INI files are provided by your IBM technical support representative to support different DDD tasks.

Prevent testing of the secondary port `ide=!sec` is useful where the boot drive is on the Secondary port of IDE and the drive under test is attached to the Primary.

Test drive attached to the primary port `ide=primary` is useful where testing drives on a standard PC without additional IDE support hardware. Normally the primary IDE is reserved for the boot drive, but this switch can be used to override this.

## Starting DDD

Drive test built on single E-IDE using `ide=primary ide=!sec` switches



Restrict number of addresses in SCSI scan `id=maxn` ( $n=1, 2, 3, 4$ ) limits the number of drives scanned to a addresses between 0 and 3. This is useful when it is noted that serial attachments (FC-AL and SSA) can have address ranges up to 128 drives and searching for drives will take an extended amount of time, not required in a test-bench configuration.

### Examples:

```
i3dmain.exe ide=pci1 ide=pci2 ide=pci3 ini=startup.ini
```

This will run the executable file supporting three PCI attached IDE adapters and will look for an ISA attached IDE adapter as well.

```
i3dmain.exe ide=pci1 model=DTTA
```

This will run the executable file supporting one PCI attached IDE adapters, will look for an ISA attached IDE adapter as well, and will treat all attached drives as model DTTA.

```
i3dmain.exe list=bysn ide=pci1 model=DTTA
```

This will run the same options as the previous example. However, when the attached drives appear in the Control Center windows after a rescan has been initiated, the drives will be listed by their serial numbers rather than the device model type.



## Starting DDD

### 6.0 - The DDD SI Device Control Center

When DDD SI is launched, the following screen will appear;



This is the primary Navigation utility which is used within DDD SI to select drives to be tested and the tests which will be executed. Certain grey, non-functional options reflect features only available to IBM technical support engineers.

The `Controllers detected: 2` line is a count of the active drivers related to controllers. There is no driver for the ISA attached card already used for DDD. In this example the system was configured with one SCSI card and one PCI E-IDE card, with the primary and secondary IDE attachments each counting as one controller. This number can be confusing and can give unexpected results which should not be of concern.

When the tick is cancelled against one of SCSI or IDE, DDD SI does not search for these types of controller when it starts. The chosen settings are maintained across power-cycles in configuration settings kept in the Windows registry.

## Starting DDD

### 6.1 - Release information

Firstly, since this will be important for support, let's look at the release information. This is the function of the **About** pull-down line.

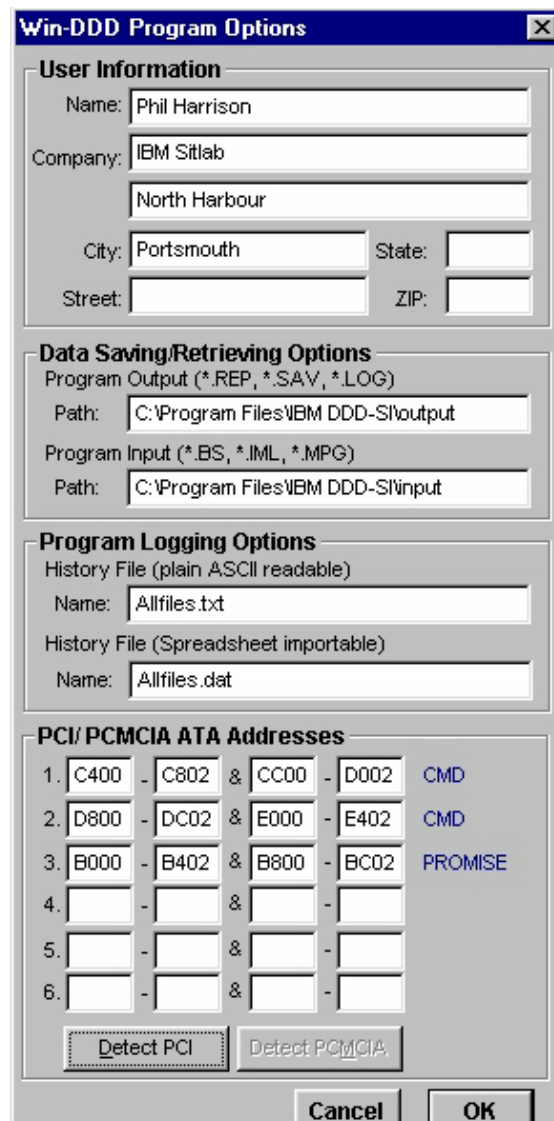


It is important that you know how to access this screen as it may be required for effective fast support from IBM.

## Starting DDD

### 6.2 - Configuration

Firstly complete the registration and configuration data using **File** pull-down followed by **Program Settings**.



The image shows the 'Win-DDD Program Options' dialog box. It is divided into four main sections: 'User Information', 'Data Saving/Retrieving Options', 'Program Logging Options', and 'PCI/PCMCIA ATA Addresses'. The 'User Information' section contains fields for Name, Company, Address, City, State, and ZIP. The 'Data Saving/Retrieving Options' section contains fields for Program Output and Program Input paths. The 'Program Logging Options' section contains fields for History File (plain ASCII readable) and History File (Spreadsheet importable). The 'PCI/PCMCIA ATA Addresses' section contains a table of addresses and two buttons: 'Detect PCI' and 'Detect PCMCIA'.

Win-DDD Program Options					
<b>User Information</b>					
Name:	Phil Harrison				
Company:	IBM Sitalab				
	North Harbour				
City:	Portsmouth	State:			
Street:		ZIP:			
<b>Data Saving/Retrieving Options</b>					
Program Output (*.REP, *.SAV, *.LOG)					
Path:	C:\Program Files\IBM DDD-SI\output				
Program Input (*.BS, *.JML, *.MPG)					
Path:	C:\Program Files\IBM DDD-SI\input				
<b>Program Logging Options</b>					
History File (plain ASCII readable)					
Name:	Allfiles.txt				
History File (Spreadsheet importable)					
Name:	Allfiles.dat				
<b>PCI/PCMCIA ATA Addresses</b>					
1.	C400	-	C802	&	CC00 - D002 CMD
2.	D800	-	DC02	&	E000 - E402 CMD
3.	B000	-	B402	&	B800 - BC02 PROMISE
4.		-		&	
5.		-		&	
6.		-		&	
<input type="button" value="Detect PCI"/> <input type="button" value="Detect PCMCIA"/>					
<input type="button" value="Cancel"/> <input type="button" value="OK"/>					

- User Information - enter your name, company and location data. We are aware that this is presented in a USA format and request that you adjust appropriately according to local addressing.
- Data Saving/Retrieving Options - enter folders for input and output from DDD SI. Ensure that these folders exist in your directory and create suitable directories if appropriate to avoid errors being flagged by DDD SI. Logging for each drive tested will be accumulated in the directory chosen for program output, and it may be suitable to change this on a monthly basis or at the similar time when you either analyse the logging or return it for analysis within IBM.

## Starting DDD

- Program Logging Options - the files showing all files tested are stored in two formats, one plain text and the other ready for importation in comma separated text format. Note that the program logging options should be entered as file names only without DOS path definition. These will be saved in the same path as defined in the Data Saving/Retrieving Options. The two files defined, shown as *allfiles.txt* and *allfiles.dat* are cumulative logging files.

PCI ATA addresses - this is now an automated process. If a manual override is required, see Appendix 2.

- Please see separate instructions regarding installation of PCMCIA ATA devices - these will normally be configured in the first pair of boxes as 160 and 16E.
- Press OK to complete

The tick marks can be used to turn off support for the ATA and SCSI controllers when these are not installed - this is a user option and the results are maintained across boots through the registry.

### **6.3 - Step 2...Preparing for test**


#### **Loading the tests or task sequence**

The test or task sequence now needs to be loaded. For DDD SI, these are a pre-prepared and available set of *.PID* files. The PID file should be loaded by selecting the Configure>Profiler>select desired PID>Apply. This will load the PID profile and the necessary INI file and any required Mode page or microcode files.

.

## Starting DDD



### 6.4 - Step 3...Scan the bus

To see the drives attached and which are available for test press the  button. After an appropriate wait of about 20 seconds, the drives will be seen in the appropriate columns for ATA (IDE) or SCSI. The SCSI column will also show drive attached via FC-AL or SSA interface adapters as these are also in the SCSI family attached by their respective ASPI drivers.

After this, a typical control center panel will look like this;



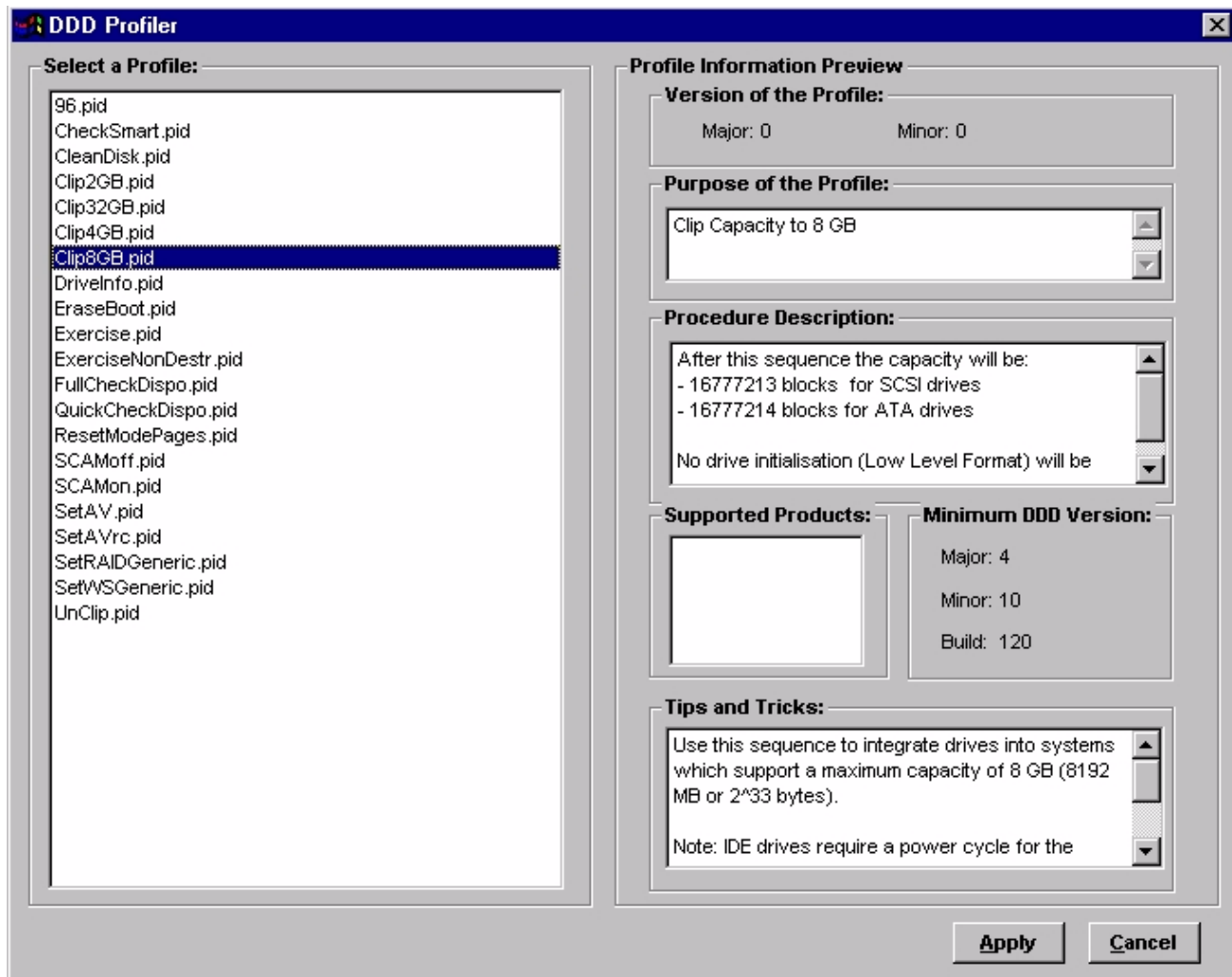
### 6.5 - Step 4...Start the Test

Having determined the drives available, the next step is to select the drives for test. This can be accomplished by using the mouse. Alternatively the  key can be used to select all drives. The test can be started either by selecting Actions > Explore or by pressing the  key.

## 7.0 - The DDD SI Profiler

To load a specially prepared .PID file from your supplier/distributor/IBM Technical representative, press the Configure>Profiler pull down menu on the Control Center. The following screen will appear.

To load the PID file, click on the required profile in the 'Select a Profile' window. Text may or may not appear in the 'Profile Information Preview' windows. This will describe the purpose of the selected profile, the procedure sequence together with other relevant data to this particular test sequence.



There are 6 separate windows within the profiler window that describe attributes of the PID file. These are;

- **Version of the Profile**  
This is an optional field that provides a means of knowing which version of DDD a particular PID was created on. There is no version checking carried out by DDD.
- **Purpose of the PID**  
Used to describe the purpose of the PID file. In the above example, the test will erase all data from the selected drive(s) under test.
- **Procedure Description**  
This would be used to describe the test sequence that the saved INI file will run. It can also provide information on why you may want to run this test.
- **Supported Products**  
Supported model types can be added or removed when creating the PID file.  
To date, this is only a text window and no functional checking is carried out. In future releases, this function will be used as a means of controlling the drive types under test.
- **Minimum DDD-Version Required**  
These windows are used to specify a specific level of DDD SI required for the testing. If the criteria is not met, the ini file will not be loaded.
- **Tips and Tricks**  
Any hints or tips that may be useful to the end user. e.g. 'Please ensure that the jumper settings are set to Master and Device 0'

These should be used as an aid and reference for the end user.

Once the PID is loaded, press the Apply button. From the control panel, select the drive(s) to be tested and press the 'Go' button to initiate the test

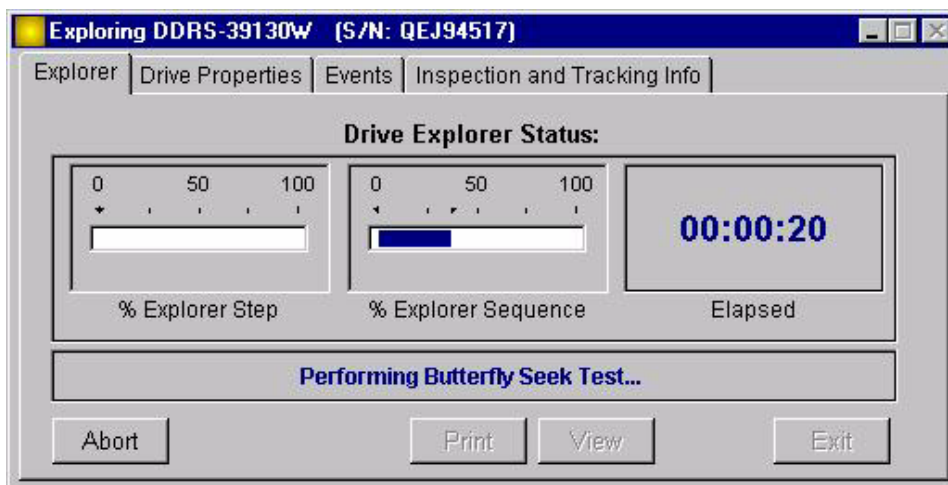
*Note: PID's Pre Loaded on DDD SI 4.10 can be loaded onto later releases of DDD SI. When DDD SI 4.10 is upgraded with a later version, the old PID files in the Input folder will be over written with the latest 4.20 PID's. However, PID's created on V4.20 cannot be loaded and run on earlier versions of DDD SI.*

## 8.0 - Testing

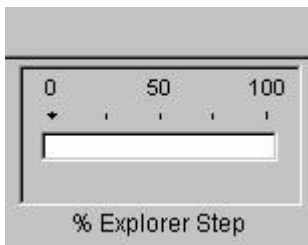
To start testing, press the 'GO' button or alternatively, go to the **Actions** pull-down and select Explore. Testing will start. For each drive an execution box will appear. This shows a progression and status of testing. Note that there are four tab marked functions in this box.

Each drive under test has a separate information window which has a traffic light to allow you to follow DDD-SI's progress:

- Yellow = DDD-SI is working on the requested task
- Green = DDD-SI has completed the configurations or analysis successfully
- Red = The disk drive has failed the analysis
- Blue = You have chosen to abort the configuration or testing

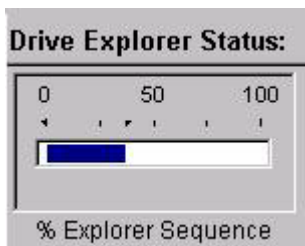


The Explorer Step progress box



This shows the progress through the current test which is named in the box below. In some tests this will be over very quickly - in less than a second, but in others progress will be slow, for example in read or write sequential testing.

The Explorer Sequence progress box



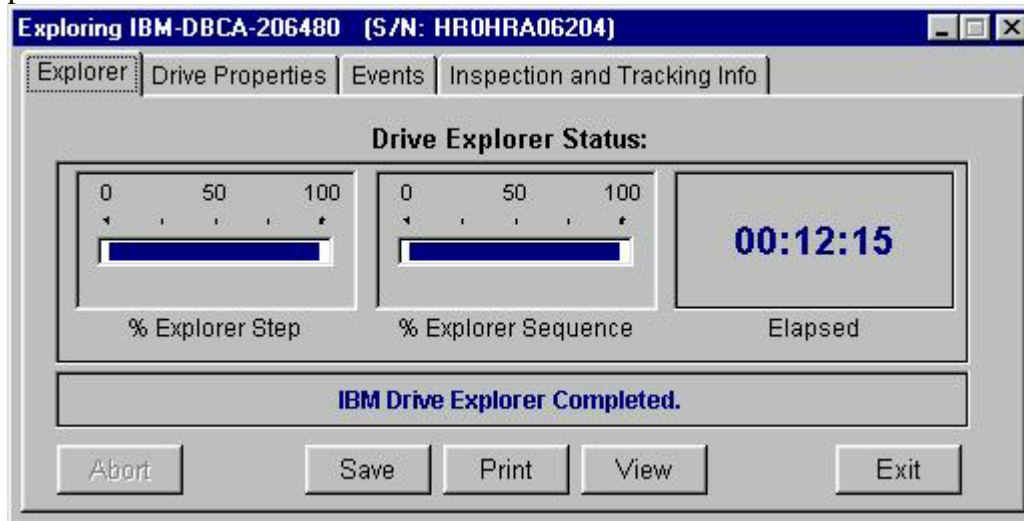


## Testing

This shows the test by test progress. In this case, the test at about 33% complete, suggesting a 3 stage test, with one stage complete.

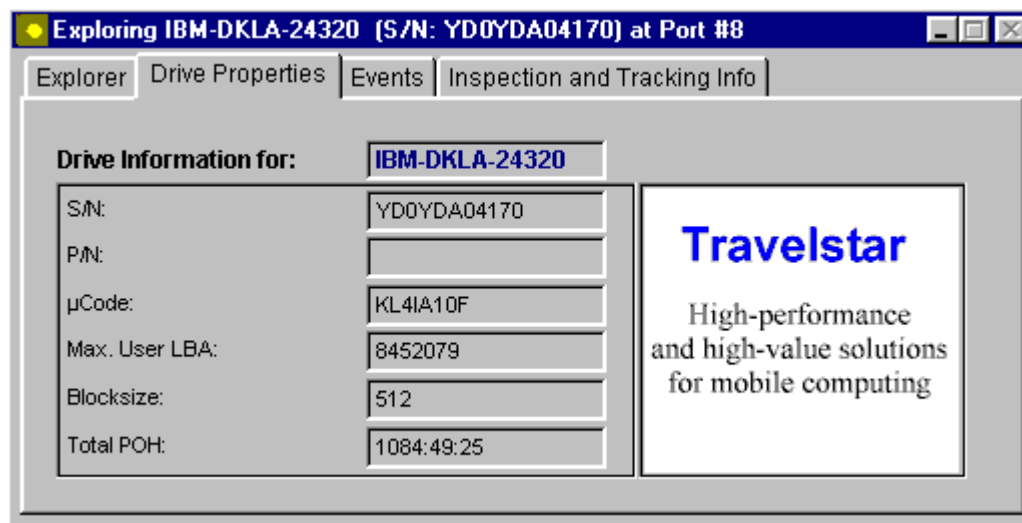
The Elapsed Time box is a measure of the elapsed time.

Completion of test - both bars are at 100% and the **IBM Drive Explorer Completed** status is present. Note that the **Print** and **View** buttons are now available.



The **Print** and **View** allow completed tests to be reviewed. Drive by drive records are kept for each test.

Looking at the **Drive Properties** box;



The amount of data returned will vary by drive interface and model. Therefore it's important that blank data is not considered as being a problem. The source of the data shown above is the standard ATA **Identify** command defined in each of the drive OEM specifications and available on the IBM website. The accuracy of the information in this box cannot be guaranteed, as seen in the part number (P/N) field above.

## Testing

It's possible to update the fields manually where these need to be overridden or where supplemental information is available, in particular part number information.

The Events tab provides status during test. The event log can be saved as a separate .EVT log in the output folder by pressing the 'Dump to File' button. This can be useful if the drive failure information is reported in the event log.



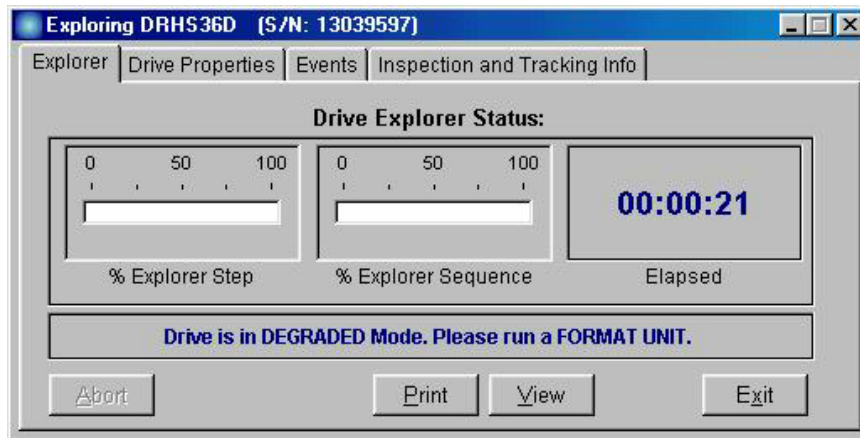
When a drive will not identify for testing, it is necessary to perform manual entry. This will be the case when a drive fails to spin-up for example. Manual entry is required - results are needed for statistical failure analysis and potentially for business procedures in the forthcoming period. Also see page 32 for more related information.

A screenshot of a software window titled "Win-DDD Dead Drive Record Generator". The window has two tabs: "Drive Properties" and "Inspection and Tracking Info". The "Inspection and Tracking Info" tab is selected, showing a form for manual entry. The form is divided into two main sections: "Visual Inspection Findings" and "Additional Information". Under "Visual Inspection Findings", there are five checkboxes: "Circuit Board Damage", "Motor Not Starting", "Noise Level Exceeds Average", "IBM drive not correctly identified", and "Other:". Below these checkboxes is a text area labeled "Please type your findings here". Under "Additional Information", there are three text input fields: "Customer Part Number:", "Tracking Number:", and "More:". At the bottom of the form, there is a checkbox labeled "Force Disposition 'Return To IBM'".

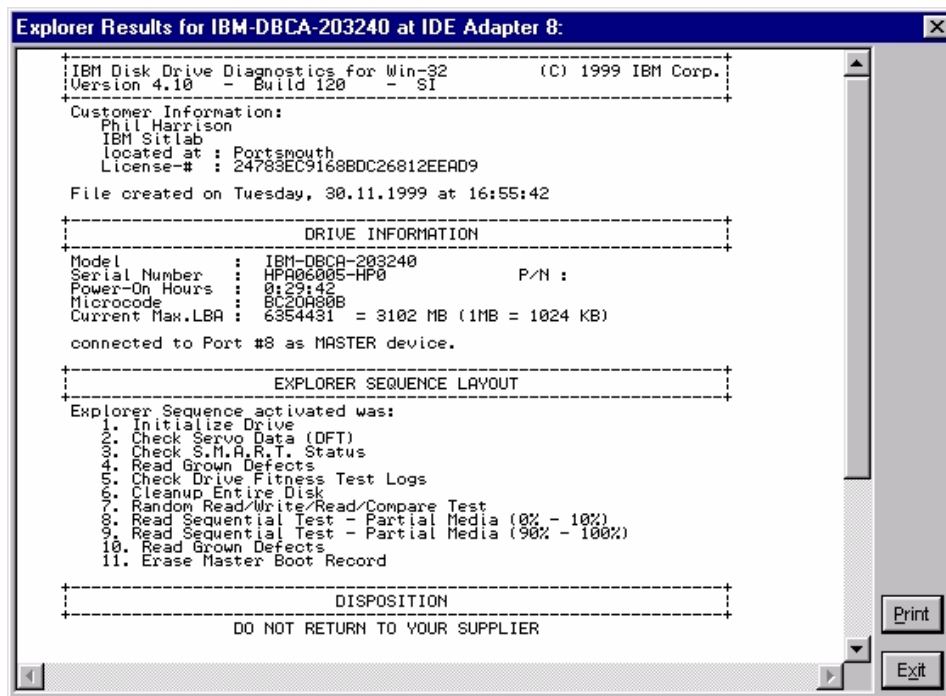
In this screen it is required that manual analysis is used to determine reasons for rejection.

## Testing

Here is an example of a failure - for a recognised symptom where a SCSI drive has been partially formatted and interrupted by a RESET or power interruption. This is not a defect if a reformat of the drive clears the symptom, which is caused by an internal logical protection mechanism. A suitable .ini and DDD SI icon has been provided as part of the installation to allow you to perform this reformat. If you have any further queries, please discuss them with your supplier/ IBM technical support engineer.




Pressing the View key gives the following insight into the DDD SI internal logging - also saved on disk. The pass / fail result will be found by scrolling down this window.



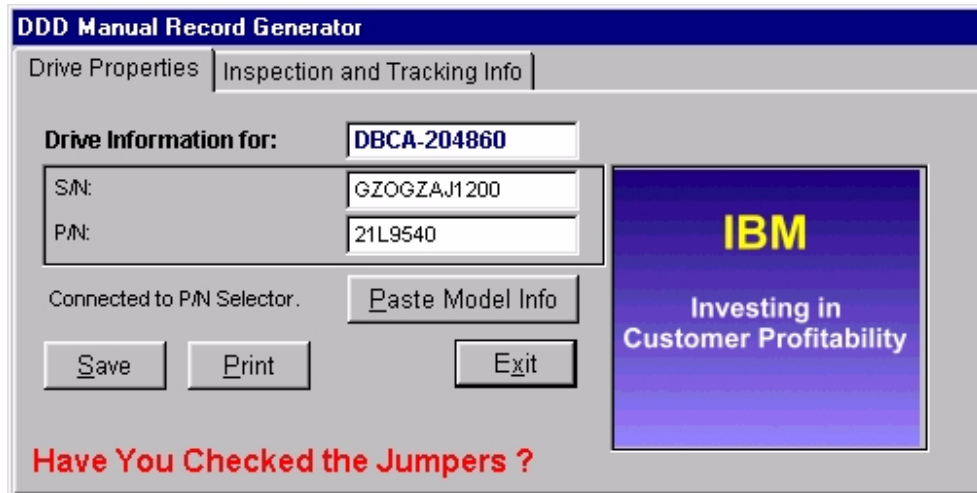
When the test is completed, the explorer window can be closed and another test can then be selected. If the same drive model type is being tested, a rescan of the bus is not necessary. However, when a different model type is detected on the bus since the last rescan, a message will appear

## Testing

instructing the user to press the rescan button. The drives being tested will then require selection prior to any test being run. Pressing the  button will rescan the bus.

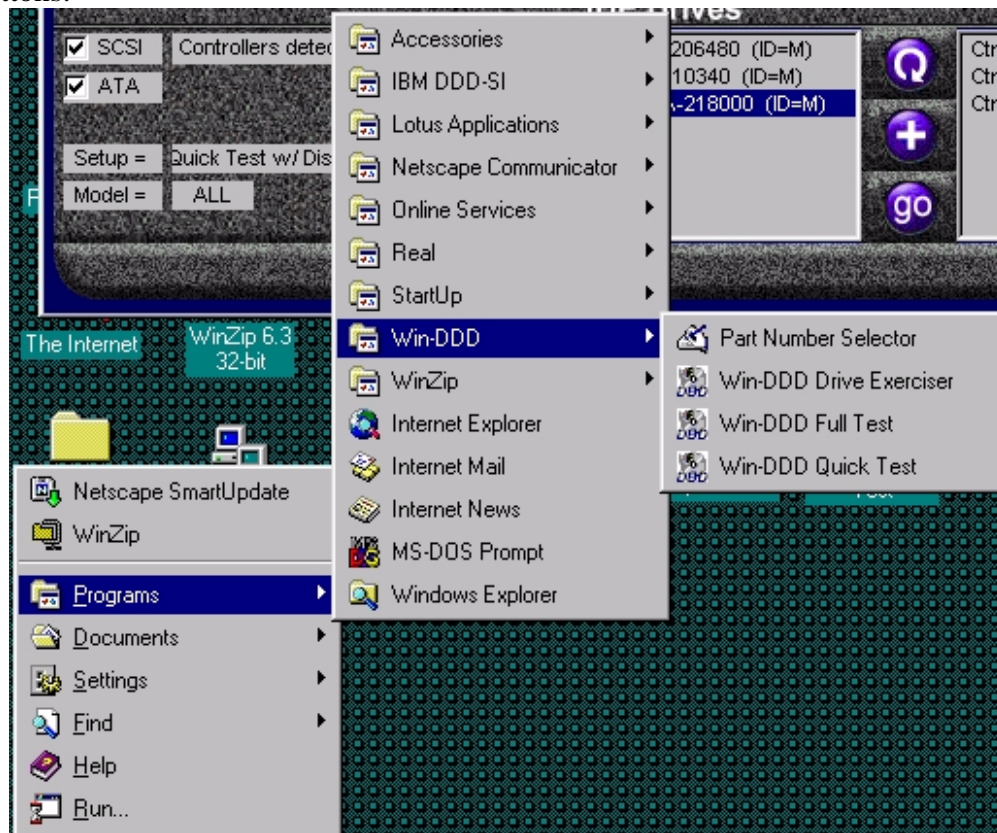
### 8.1 - Defective Drives

special pull-down is provided under **Actions-Explore Dead Drive** which leads to the following menu which has two tabbed pages.



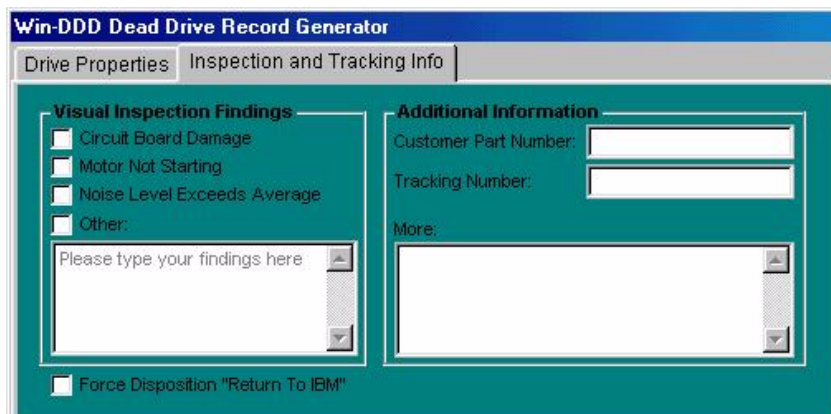
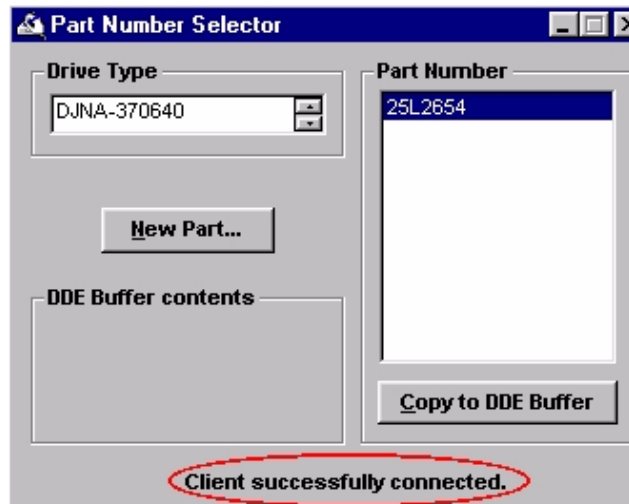
The part number selector can be used to paste the Model and Part Number info into the relevant fields. *Note* - The part number generator should be activated before opening the 'Manual Record Generator' window. If it isn't, the 'Paste Model Info' button is not enabled.

To start the Part Number Selector, press the Windows **Start>Programs>Win-DDD>Part Number** Selector buttons.



## Testing

Select the correct drive using the scroll buttons in the Drive Type window. Select the correct part number from the list and then press the **Copy to DDE Buffer** button. Now open the Manual record Generator window. The 'Client Successfully Connected' message will appear at the bottom of the Part Number window, confirming that Manual Record Generator window has been opened. The **Paste Model Info** button can now be pressed and the selected information will automatically be entered.



Fill these in for defective drives that fail to provide any information. Manual entry is required - results are needed for statistical failure analysis today, and potentially for business procedures in the forthcoming period.

The **IBM drive not correctly identified** box is provided to cover the case where an IBM drive does not return correct IDENTIFY or INQUIRY data to the tester. However, you should always ensure that this is not related to the tester platform itself.

There will be situations when the "Defective Drive" path needs to be used to enter **Other** symptoms - for example

- when a drive has an intermittent problem clearly seen in extended running at a customer but not replicated in DDD SI
- when a drive is a repeated NTF failure (returned twice) for a clearly documented and justified technical cause.

## Testing

Your IBM technical support representative may ask customers to share the logging files created by DDD SI as part of ongoing customer quality engineering analysis. A statistical exercise can then be used to look for trends in failure rates.



## 9.0- Failure Mechanisms

Our analysis working with large distributors suggests that the most common problems seen with return drives are in the following categories. Similar symptoms are often seen in the OEM environment.

### Mainly Handling

1. Data defects seen during a scan of the disk surfaces - these commonly will be handling related. This should be further analysed by scratch detection and disk shift analysis which is measured in the first test during normal HDD disposition testing. Small defects in the data areas can be repaired by reassignment of the defective sectors as explained below, assuming that disk shift is not significant.
2. Disk shift - a recognised symptom of handling damage. An external shock event causes the individual disks to shift under the retaining clamp inside the HDD enclosure. This is usually a one-time event which causes a permanent change, affecting the positioning system of the disk drive and creating imbalance.

### Other mechanisms, some related to Handling

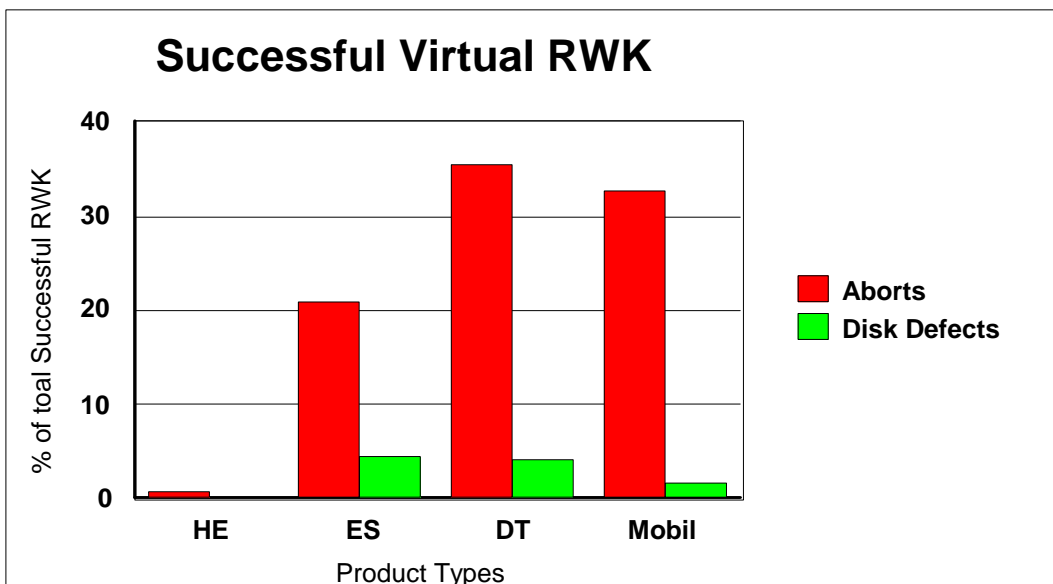
3. Dead drives / unable to communicate - these should be addressed using the Dead Drives procedures, with suitable information entered in the box.
4. Failure in basic read / write test.
5. S.M.A.R.T. thresholds exceeded.

If you need further information and explanation about these failure mechanisms then this can be obtained from your IBM technical support representative.

## 9.1 - Write aborts and rework of the related sectors.

The chart below shows that the majority of repaired defects on drives relate to aborted writes rather than physical media defects. This justifies the action of making repairs to data error sectors in DDD SI, as aborted writes are usually caused by external events.

These can only be repaired if the disk shift characteristic of the drive remains within criteria.





## Failure Mechanisms

HE = High End Work Station SCSI Products

ES = Server Products

DT = Desk Top Products

Mobil = Laptops

### 9.2 - How some errors are recovered

What is an error?



In this example, a defect within the normal data area has occurred. Two scenarios are possible

1. The defect is correctable using the ECC bytes
2. The defect is not correctable using the ECC bytes.

The defect may not always be a physical problem inside the disk enclosure. The same effects can occur when power is removed during a write, or a mechanical event occurs, causing a “write abort” although drive designers do their utmost to prevent these partially written sectors.

#### 1. When the data is correctable

When a “soft error” occurs, the error recovery will be logged internally inside the drive. In an ATA drive if this recovery has scored to a threshold then an automatic reassign will occur on a following write operation, thus managing away from any possible media related problem. This will cause a defect list entry in the internal RDM (reassign defect map) which is analysed by DDD SI, firstly as a candidate, then as a reassigned sector.

In SCSI drives automatic reassign is normally enabled, but could have been changed in the Mode Select / Sense settings. The grown defect list entries are visible in the public domain. These have been managed and the existence of a small number of grown defects does not make a drive unacceptable to a customer application. Even the most sophisticated high-end storage subsystem companies accept a number of grown defects on their hard drives, including in their manufacturing before shipment to a customer.

#### 2. When data is not correctable

When a “hard error” occurs, the error cannot be recovered internally by the drive, so customer data will be lost. There are many reasons for this, including the partial write scenarios discussed above.

Please understand that Microsoft operating systems are not particularly intelligent in managing disk defects, and the ScanDisk and similar tools will manage defective data by marking several sectors as “bad” at one time. DDD SI testing and Microsoft OS analysis should not be considered to be similar.

DDD SI can force a reassign of single sectors with hard errors, when suitably configured, and will disposition such drives back to the field subject to the threshold configuration controlled by the .ini file supplied by your IBM technical support representative. However, if a customer reformats a SCSI drive he will remove the protection of the “G-list” created for these limited defect locations.

## Failure Mechanisms

DDD SI does not currently automatically move P-list entries to the G-list, although it is possible to achieve this on certain drive models using a vendor unique Mode Page selection.

For discussion of P-list and G-list concepts please refer to the OEM product manuals.

## 10.0 - Results Logging

It is important that the DDD SI user is aware that logging is present, and where the logging is kept, as on a periodic basis this will be requested by IBM for technical analysis.

### 10.1 - Drive by drive logging

A test result file is kept for each drive tested on each occasion that it is tested. These are kept in the location defined in the **File - Program Settings** dialog under Data Saving/Retrieving Options. The logging is kept in the Program Output.

**Win-DDD Program Options**

**User Information**

Name:

Company:

City:  State:

Street:  ZIP:

**Data Saving/Retrieving Options**

Program Output (\*.REP, \*.SAV, \*.LOG)

Path:

Program Input (\*.BS, \*.JML, \*.MPG)

Path:

**Program Logging Options**

History File (plain ASCII readable)

Name:

History File (Spreadsheet importable)

Name:

**PCI/PCMCIA ATA Addresses**

1.	<input type="text" value="C400"/>	-	<input type="text" value="C802"/>	&	<input type="text" value="CC00"/>	-	<input type="text" value="D002"/>	CMD
2.	<input type="text" value="D800"/>	-	<input type="text" value="DC02"/>	&	<input type="text" value="E000"/>	-	<input type="text" value="E402"/>	CMD
3.	<input type="text" value="B000"/>	-	<input type="text" value="B402"/>	&	<input type="text" value="B800"/>	-	<input type="text" value="BC02"/>	PROMISE
4.	<input type="text"/>	-	<input type="text"/>	&	<input type="text"/>	-	<input type="text"/>	
5.	<input type="text"/>	-	<input type="text"/>	&	<input type="text"/>	-	<input type="text"/>	
6.	<input type="text"/>	-	<input type="text"/>	&	<input type="text"/>	-	<input type="text"/>	

The naming convention is serial.model followed by the number *n* suffix if the drive has been tested multiple times. The file extension is .REP. For example

A01234567.AB1.REP

A01234567.AB1.001.REP

A01234567.AB1.002.REP

## Results Logging

is a drive of serial number A01234567 of IBM manufacturing model type (an internal code, not the product model) AB1, which has logging for 3 test events.

If the 'Dump To File' button is pressed, which is located in the explorer event log window, a .EVT file will appear in the output folder which contains the list of events as seen in the event log window.

### Example

```
+-----+
|IBM Disk Drive Diagnostics for Win-32          (C) 1999 IBM Corp.|
|Version 4.20 - Build 142 - SI                  |
+-----+
Customer Information:
  Phil Harrison
  IBM Sitlab
  located at : Portsmouth
  License-#  : 24783EC9168BDC26812EEAD9

File created on Wednesday, 01.12.1999 at 17:07:29

+-----+
|                               DRIVE INFORMATION                               |
+-----+
Model       : DRVS09D
Serial Number : 13007227HA          P/N : 08L8265
Power-On Hours : 667:47:18
Manufact. Date : 98/07/06
Microcode    : 0270
Current Max.LBA : 17928697 = 8754 MB (1MB = 1024 KB)

configured as SCSI Target-id #1 (on Ctrl.#1).

+-----+
|                               EXPLORER SEQUENCE LAYOUT                               |
+-----+
Explorer Sequence activated was:
  1. Initialize Drive
  2. Check Servo Data (DFT)
  3. Check S.M.A.R.T. Status
  4. Read Grown Defects
  5. Check Drive Fitness Test Logs
  6. Cleanup Entire Disk
  7. Random Read/Write/Read/Compare Test
  8. Read Sequential Test
  9. Read Grown Defects
  10. Erase Master Boot Record

+-----+
|                               DISPOSITION                               |
+-----+
DO NOT RETURN TO YOUR SUPPLIER

+-----+
|                               EXPLORER RESULTS                               |
+-----+
Explorer Start : 16:58:39 on Wednesday, 01.12.1999
End           : 17:07:17
Delta        : 00:08:38

Information    : Drive passed Explorer WITHOUT a problem.

+-----+
|                               INSPECTION AND TRACKING INFORMATION                               |
+-----+
```

## Results Logging

For comparison here is an example of a drive which exhibited a failure - it is known to have a significant disk shift.

```
+-----+
| IBM Disk Drive Diagnostics for Win-32          (C) 1999 IBM Corp. |
| Version 4.20 - Build 142 - SI                  |
+-----+
Customer Information:
  Phil Harrison
  IBM Sitlab
  located at : Portsmouth
  License-#  : 24783EC9168BDC26812EEAD9

File created on Tuesday, 30.11.1999 at 16:59:05

+-----+
|                               DRIVE INFORMATION                       |
+-----+
Model       : IBM-DBCA-206480
Serial Number : HRA09069-HR0          P/N :
Power-On Hours : 339:46:48
Manufact. Date : YYYY/YY/YY
Microcode    : BC40A81F
Current Max.LBA : 12685679 = 6194 MB (1MB = 1024 KB)

connected to Port #8 as MASTER device.

+-----+
|                               EXPLORER SEQUENCE LAYOUT                |
+-----+
Explorer Sequence activated was:
  1. Initialize Drive
  2. Check Servo Data (DFT)
  3. Check S.M.A.R.T. Status
  4. Read Grown Defects
  5. Check Drive Fitness Test Logs
  6. Cleanup Entire Disk
  7. Random Read/Write/Read/Compare Test
  8. Read Sequential Test - Partial Media (0% - 10%)
  9. Read Sequential Test - Partial Media (90% - 100%)
 10. Read Grown Defects
 11. Erase Master Boot Record

+-----+
|                               DISPOSITION                             |
+-----+
DO NOT RETURN TO YOUR SUPPLIER

+-----+
|                               EXPLORER RESULTS                         |
+-----+
Explorer Start : 16:58:22 on Tuesday, 30.11.1999
End           : 16:58:54
Delta        : 00:00:32

Failure Info   : UNRECOVERABLE DRIVE ERROR

+-----+
|                               INSPECTION AND TRACKING INFORMATION      |
+-----+
```

### 10.2- The Binary Log Object files

In addition to the drive by drive test files (.REP), DDD SI will create a further binary file record type *serial number*.blb.bz for each drive. These files are automatically created as a zipped up file and are only usable by the DDD development team. They contain binary information relating to both DDD and drive test progress. They are intended to assist in supporting problems encountered while using DDD and may be requested for problem investigation work.

*Note* - BLB and REP files will only appear in the output folder when certain types of PID's are selected. These are usually PID's that contain disposition information e.g FullCheckDispo.PID. The file is copied to the output folder when the explorer test window is closed.

### 10.3- Test logging

Each time a drive is tested, an entry is made in the allfiles.txt and allfiles.out files (or any other named files in the Program Logging Options boxes if set this way in the .ini file provided by your IBM technical support representative. As seen above, one is a plain text file, and the other is a comma separated text readable format for spreadsheet input. These are the files which your IBM technical support representative will ask to be sent periodically, an example of which follows on the next page.

## Results Logging

## Results Logging

HISTORY Filename: e:\bld78\output\alltests.txt

IBM Disk Drive Diagnostics Version 3.7b for Win-32

Customer Information:

Andrew Cameron

IBM

located at : Portsmouth

File created on Wednesday, 23.06.1999 at 10:00:40

S/N	P/N	Model	Mfg	µCode	Date	Time	Delta	Disposition	Result
(Inspection Data if available)									
HRA03187	UNKNOWN	IBM-DBCA-206480	HR0	BC40A80B	21.06.1999	13:57:50	06:07:09	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
VBA06084	UNKNOWN	IBM-DXIA-26480	VB1	YS0A20H	21.06.1999	13:57:50	02:53:19	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
GBA01422	UNKNOWN	IBM-DYIA-350510	G20	J520A30K	21.06.1999	13:57:50	12:42:46	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
59	UNKNOWN	DGHS-EMC	0350	0350	21.06.1999	13:57:50	06:11:35	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
QET94517	UNKNOWN	DDRS-39130W	S98H	S98H	21.06.1999	13:57:50	04:17:37	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
AKA01915	UNKNOWN	DNES-318350W	SA30	SA30	21.06.1999	13:57:50	05:15:12	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
WLO61702	UNKNOWN	IBM-DTTA-371010	WL7	T770A73A	23.06.1999	10:33:22	00:00:03	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
QET94517	UNKNOWN	DDRS-39130W	S98H	S98H	23.06.1999	13:32:20	00:24:54	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
59	UNKNOWN	DGHS-EMC	0350	0350	23.06.1999	16:14:03	00:00:00	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
13006159	UNKNOWN	DGHS-EMC	0350	0350	23.06.1999	16:18:33	00:00:45	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
13001498NC	05J7618	DGV509U	NC	0350	25.06.1999	16:47:08	00:00:17	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
PRA09141	UNKNOWN	IBM-DCXA-210000	PR0	CX60A81F	25.06.1999	16:49:09	00:22:18	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
PRA09141	UNKNOWN	IBM-DCXA-210000	PR0	CX60A81F	25.06.1999	17:29:51	00:00:06	DO NOT RETURN TO IBM	DRIVE TEST ABORTED BY USER
YDA04170	UNKNOWN	IBM-DXIA-24320	YD0	KL4IA10F	25.06.1999	17:43:57	00:13:26	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
1300D1D9GA	59H6594	DGHS09Y	GA	0300	25.06.1999	18:12:10	03:23:01	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
13001498NC	05J7618	DGV509U	NC	0350	25.06.1999	18:12:10	02:51:42	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
WFA03331	UNKNOWN	IBM-DTTA-351010	WF0	T560A60G	25.06.1999	18:12:09	06:45:52	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
YDA04170	UNKNOWN	IBM-DCXA-24320	YD0	KL4IA10F	25.06.1999	18:12:09	02:02:24	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
PRA09141	UNKNOWN	IBM-DCXA-210000	PR0	CX60A81F	25.06.1999	18:12:09	11:37:40	DO NOT RETURN TO IBM	ALL TESTS PASSED SUCCESSFULLY
HRA09069	UNKNOWN	IBM-DBCA-206480	HR0	BC40A81F	27.06.1999	13:59:30	00:00:08	DO NOT RETURN TO IBM	TOO MANY GROWN DEFECTS
HRA09069	UNKNOWN	IBM-DBCA-206480	HR0	BC40A81F	27.06.1999	15:32:35	00:00:09	DO NOT RETURN TO IBM	TOO MANY GROWN DEFECTS



## 11.0 - Utilities

### 11.1 - Using the Mode Sense and Select Utility

Mode Sense and Select operations only apply to SCSI drives.

To start this utility, use the **Actions - Utilities - Mode Page Tool** pull-down menu hierarchy. There will be a pause while DDD SI interrogates the current Mode Page settings using Mode Sense commands, after which the following screen will be seen.

**Mode Page Tool**

Page 00h | Page 01h | Page 02h | Page 03h | Page 04h | Page 07h | Page 08h | Page 09h | Page 0Ah | Page 0Ch | Page 0Dh | Page 0Eh | Page 0Fh

AVVRE  ARRE  TB  RC  EER  PER  DTE  DCR

Read Retry Count

Correction Span

Head Offset Count

Data Strobe Offset Count

RSVD

Write Retry Count

RSVD

Recovery Time Limit

Read Write Error Recovery Page Edit Hex...

**Value Type**

☒ Current ☐ Default ☐ Saved

**Save Mode**

☐ Save Permanently

Help Repeat Sense Write to File... Apply Changes Cancel

Each available mode page for IBM drives is listed across the top of the screen, with a scrolling facility at the top right. Where a bit is not supported by a drive type, you will see that it is in grey rather than black.

All input in this screen must be in decimal.

## Utilities

Hex input data can be achieved by pressing the Edit Hex.. button. (it's always a good idea to have a hexadecimal capable calculator available or to use the **View - Scientific** option in the Windows calculator accessory). When this button is pressed, the following screen will appear;

Page Code:	Page Saveable:	Page Length:
1	1	10
Byte 2:	Byte 3:	Byte 4:
C0	01	90
Byte 5:	Byte 6:	Byte 7:
00	00	00
Byte 8:	Byte 9:	Byte 10:
01	00	00
Byte 11:	Byte 12:	Byte 13:
00		
Byte 14:	Byte 15:	Byte 16:
Byte 17:	Byte 18:	Byte 19:
Byte 20:	Byte 21:	Byte 22:
Byte 23:	Byte 24:	Byte 25:

Apply Cancel

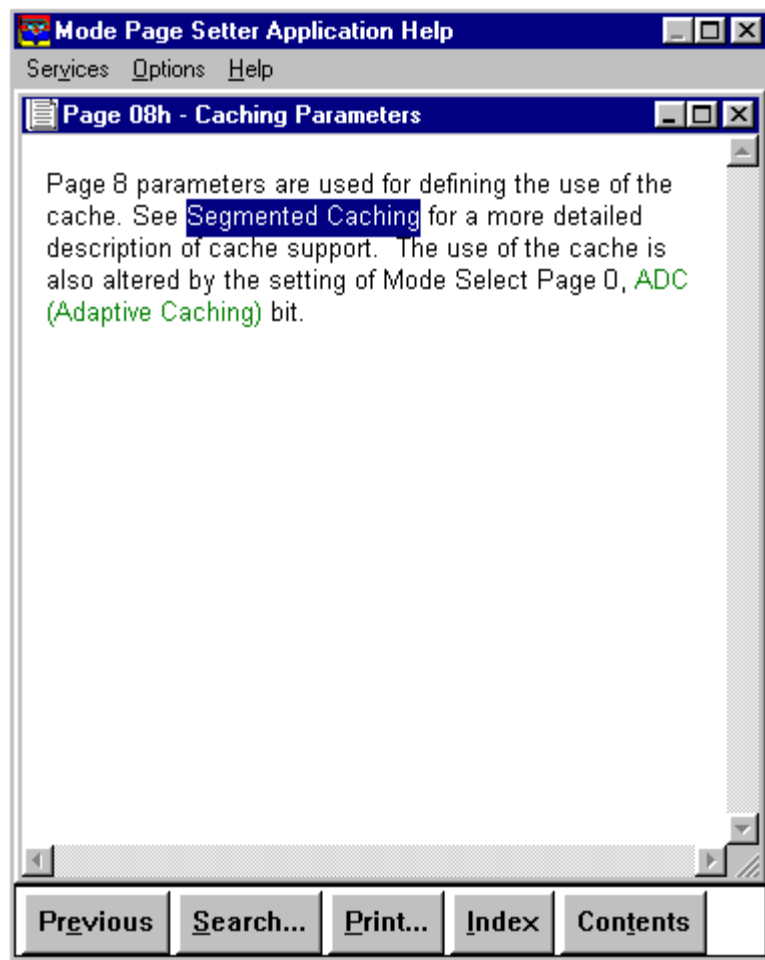
Buttons allow:

- Edit Hex - this allows the Mode Sense information to be edited in hexadecimal format.
- Repeat Sense - this repeats Mode Sense operation and is useful for confirming that an update has been made.
- Apply Changes - this performs a Mode Select operation. It is often good practice to follow this with a Repeat Sense to check that the intended change has been made.
- Write to File - this file will be useful for your supplier/ representative to create a Mode Page download PID. This can be set up to update the mode pages on multiple drives simultaneously.

The Current / Default / Saved values reflect the options in the Mode Sense command. In most cases, operations will be made to adjust current values.

## Utilities

Save Permanently: Mode Select changes can be made to a drive either for the current session, allowing the drive to return to its saved values upon a power cycle; or permanently. If reconfiguring a drive for a customer, then this box must be selected using the mouse.



Extensive Help information is provided, both by cursor positioning over the bit being adjusted, or by pressing the Help button. However, it is recommended that the product manuals are available in order to understand the full meanings of all the mode select / sense bits.

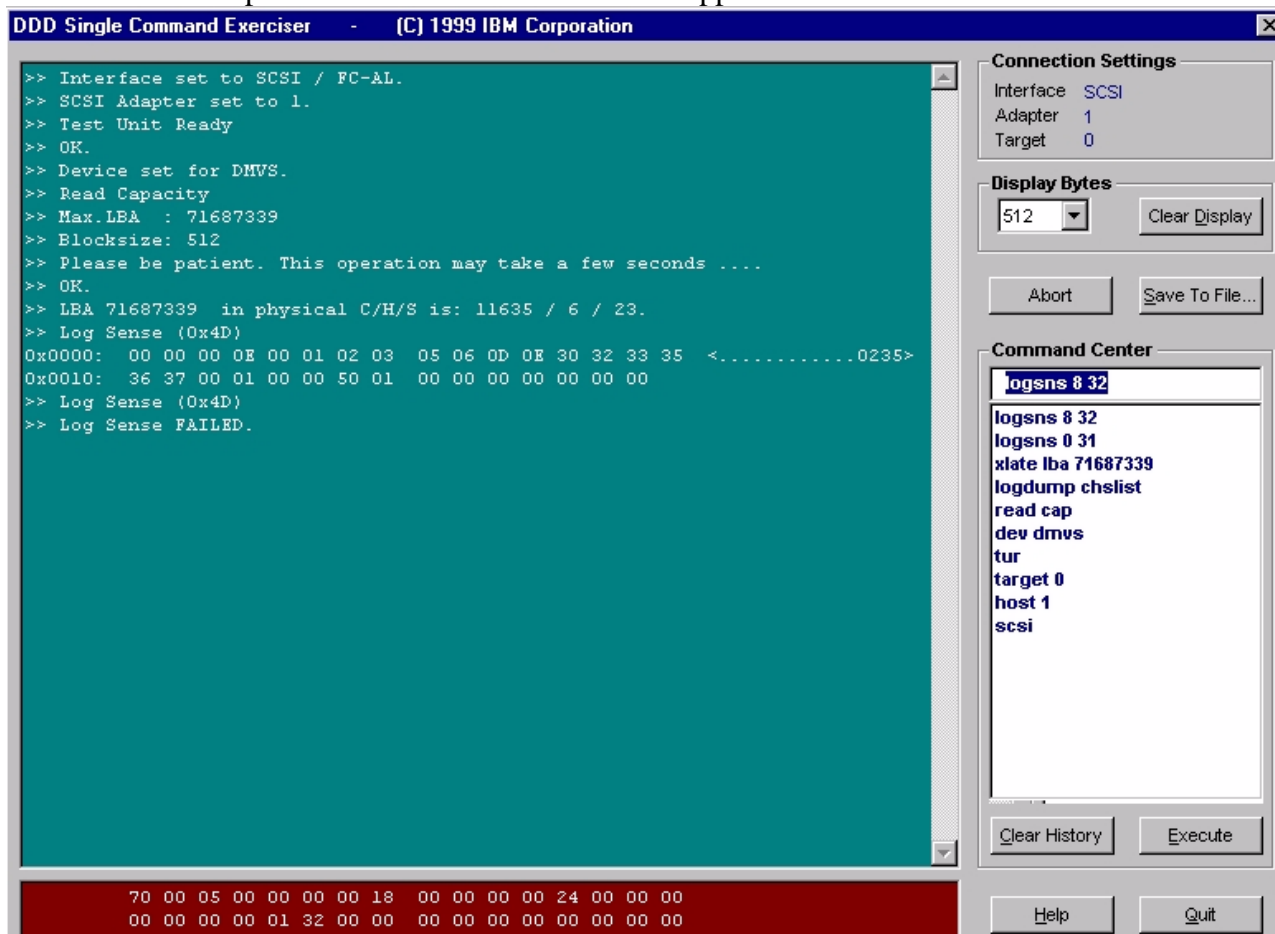
## Utilities

## 11.2 - Command Line Exerciser

This utility allows single commands to be executed on SCSI and AT drives. A quick reference guide is available on the Diagnostics forum.

The purpose of the command line exerciser is to allow the user to send single commands to a selected drive for analysis purposes. It also has the capability of viewing the contents of individual sectors and sense commands. This feature is still under construction and in its infancy.

To open the viewer from the DDD control center, press the Actions> Utilities>ATA+SCSI Command Line pull down bars. This window will appear.



To send commands to a drive, it does not have to been detected within the control center window. It is not a requirement to select the drive in the DDD control center. Drives can be selected within the command exerciser by the following method;

### SCSI

To initiate a test to SCSI drives, type the following commands in the command center window.

**SCSI** - This selects the SCSI sub-system

**Host (n)** - This selects the SCSI adapter card. This is the adapter card number, not the SCSI ID.

**Target (n)**- This selects the drive where (n) is the SCSI ID

## Utilities

**Init** - This scans the bus for all available drives

---

### ATA

To initiate a test to AT drives, type the following commands in the command center window.

**ATA** - This selects the AT sub-system

**Port (n)**- This selects the drive where (n) is the port number as displayed in the 'IDE Drives' window of the DDD Control Center.

---

Commands can be reselected from the command history window, as displayed in the above example.

The sense data window at the bottom of the viewer will have a green background when a command completes successfully. If there is an exception, the background will turn red and the sense data will be displayed.

Using the 'Save To File' button will save the contents of the output window to a file called Data.Txt in the output folder. This file will be overwritten each time this button is pressed.

## 11.3- Common Commands

### Program Control

**x | q | bye** quit single command exerciser

### Query Command

**qry** query current settings

**ver** query program version

### Environmental Commands

**ata** set interface to ATA

**scsi** set interface to SCSI

**cls** clear exerciser screen

**memsize** *n* set buffer size

*n* : number of bytes

**ecc** *n* set number of ecc- bytes

*n* : number of bytes (e. g. 34 )

**dev** *dxxx* set device type

*dxxx* : model type (e. g. DNES )

### C/ H/ S List Commands

The application maintains a sequential list of LBA/ CHS coordinates for device operations that access the Defect Lists and Error Logs.

#### chs

**clear** clear all entries in the list

**view** display the contents of the list

**plot** create a polar plot of the list.

Note: The plot function requires that the device type is set appropriately because the zone information will be

used to calculate the defect location in polar coordinates.

### Buffer Commands

The application maintains an internal buffer for data in/ out commands. For ATA and SCSI drives the data is kept in a separate buffer.

#### buffer

**view** display buffer in main window

**fill** *pattern* fill entire buffer

*pattern* : 4- byte pattern

(e. g. 0xAABBCCDD)

**fillto** *offset pattern* fill entire buffer up to offset

*offset* : offset in buffer

*pattern* : 4- byte pattern

**load** *fn* load buffer from file

*fn* : filename

(e. g. INBUF. BIN)

**save** *fn* save current buffer to file

*fn* : filename

(e. g. OUTBUF. BIN)

**fillfrom** *offset pattern* fill entire buffer starting offset

*offset* : offset in buffer

*pattern* : 4- byte pattern

**setbyte** *byte value* set byte to value

*byte* : byte number (e. g. 0x100)

*value* : value to set (e. g. 0xFF)

Note: buffer load and save will automatically append the extension “. BUF” to the filename provided.

## ATA Interface Commands

<b>port</b>	<i>number</i>	set ATA port <i>number</i> : 0 (primary 0x1F0) 1 (secondary 0x170) 2 – 7 (Centos 6- Channel Card) 8 – 15 (PCI & PCMCIA Cards)	<b>standby</b>	perform standby immediate
<b>reset</b>		perform soft reset		
<b>ident</b>		identify drive		
<b>execdiag</b>		execute diagnostic		
		<b>read   rd</b>		
		<b>sect   verify</b>	<i>addr num</i>	read sectors   read verify <i>addr</i> : LBA to read <i>num</i> : number of bks to read 0x00 reads 256 blocks.
<b>smart</b>				
enable		enable operations		
disable		disable operations		
attr		read attribute values	<b>long</b>	<i>addr</i> read long <i>addr</i> : LBA to read
thresh		read threshold values		The number of ECC bytes needs to be set appropriately for the device
Status		return Status		
vmon		switch on Vendor Mode		
vmoff		switch off Vendor Mode		
rdlog	<i>sec addr</i>	read SMART log sector raw (optional)	<b>maxlba</b>	read maximum native LBA
wrlog	<i>sec addr</i>	write SMART log sector	<b>Continuous</b>	<i>addr num</i> read LBA continuously <i>Addr</i> : LBA to read <i>Num</i> : No of repetitions (0xffffffff)
selftest		Execute SMART selftest		
<b>Selfseek   ssk</b>		performs auto seek operation		
<i>Cyl delay mode</i>		<i>Cyl</i> : Target cylinder <i>delay</i> : delay between seeks (in 100uS increments) <i>Mode</i> : Rnd   Fix		
<b>write   wr</b>				
<b>sect</b>	<i>addr num</i>	write sectors <i>addr</i> : LBA to read <i>num</i> : number of blocks to write 0x00 writes 256 blocks.	<b>set max</b>	
			<b>LBA</b>	<i>lba number</i> Set max LBA
			<b>Set Password</b>	<i>Password</i> Set max LBA password
			<b>Lock</b>	Lock Set Max lba pwd
			<b>Unlock</b>	Unlock Set max lba pwd
<b>long</b>	<i>addr</i>	write long <i>addr</i> : LBA to write The number of ECC bytes needs to be set appropriately for the device.	<b>set features</b>	*** <i>Parameter</i> Issues a set features
				*** Set features parameters are device dependent. Please read device spec for supported commands.
<b>Security   Sec</b>				
<b>Query</b>		Query security mode		
<b>setpw</b>		<i>master user max high password</i> <i>master</i> : Set master password <i>user</i> : Set user password <i>max</i> : Set maximum security mode <i>High</i> :Set high security mode <i>Password</i> : Required password		



**Disable** disable password  
**unlock** Unlock drive

## **SCSI Interface Commands**

**host** *number* set SCSI Controller  
*number* : 0 – m

**target** *id* set SCSI Target ID  
*id* : 0 – n

**init** re- initialize ASPI driver if new Targets have been connected to the SCSI bus

**inq** [ *page* ] inquiry  
*page* : optional specify the page code (EVPD= 1)

**start** start unit

**stop** stop unit

**logsns** *page num* Return Log Parameters (standard command)  
*page* : page code  
*num* : number of bytes to return from target

**vendor** *p1 p2 page num* logsense vendor unique  
*p1* : byte 0 of reserved field  
*p2* : byte 1 of reserved field  
*page* : page code  
*num* : number of bytes to return from target

**modesns** *page ctrl* Return Mode Parameters  
*page* : page code  
*ctrl* : page control (current, saved, default values)

**tur** Test Unit Ready

**reassign** *lba1* [ *lba2* | *lba3* | *lba4* ] Reassign Blocks  
*lbaN* : LBA to reassign. At least one LBA must be specified and a maximum of 4 is allowed.

**marklog** *text* for SJ Server Drives only: use Write Buffer in vendor mode to write a string into the media log.  
*text* : any text up to 16 bytes w/ o white space chars.

**xlate**

**lba** *addr* translate LBA to phys. C/ H/ S  
*addr* : LBA to translate

**chs** *cyl hd sect* translate phys. C/ H/ S to LBA  
*cyl* : phys. Cylinder Location  
*hd* : phys. Head Location  
*sect* : phys. Sector Location  
 Note: the results of the translation command are product specific.

**read** | **rd**

**ex** | **verify** *addr num* read extended | read verify  
*addr* : LBA to read  
*num* : number of blocks to read.

Note: The Read Ex command requires that a Read Capacity has been executed in order to acquaint the program with the device's blocksize.

**long** *addr* read long  
*addr* : LBA to read  
 The number of ECC bytes needs to be set appropriately for the device.

**cap** read capacity

**def** *mode* read defect data

## Utilities

**def12**      *mode* : plist | glist  
**buf**        *mode* read defect data (12 byte CDB)  
             *mod offs len* read buffer  
             *mod* : Mode  
             *offs* : Offset  
             *flen* : Allocation Length

**Continuous**      read LBA continuously  
*addr num*        *Addr* : LBA to read  
                    *Num*: No of repetitions (0xffffffff)

**write | wr**  
**ex**            *addr num* write extended  
                    *addr* : LBA to write  
                    *num* : number of blocks to write

Note: The Write Ex command requires that a Read Capacity has been executed in order to acquaint the program with the device's blocksize.

**long**          *addr* write long  
                    *addr* : LBA to write  
                    The number of ECC bytes needs to be set appropriately for the device.

**Selfseek | ssk**      performs auto seek operation  
*Cyl delay mode*  
                    *Cyl*: Target cylinder  
                    *delay*: delay between seeks (in 100uS increments)  
                    *Mode*: Rnd | Fix

## 12.0 - Year 2000 status

Please see the attached letter which confirms Y2K compliance.

p

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1st Nov 1999

From the IBM SSD European Systems Integration Test Laboratory

### **Year 2000 readiness of Disk Drive Diagnostics and Disposition System Integrator software version 4.1 for Windows 32 bit platforms**

This note advises that the IBM SSD Disk Drive Diagnostics and Disposition (DDD) software for Windows 32 bit platforms (Microsoft Windows 95, 98 and NT 4.0) is Year 2000 compliant.

This was tested on Microsoft Windows 95 (OSR2), Windows 98 (first release) and Windows NT4.0 (Service Pack 4) levels of the respective operating systems.

This means that the DDD application is Year 2000 compliant, but any full PC system compliance for Year 2000 will be dependent upon the BIOS and operating system maintained level. Support and updates for BIOS are available from system and motherboard manufacturers, and for the operating systems from Microsoft.

## **13.0 - Hints and Tips**

### **13.1- Installing Centos ATA CI-1500 adapters on Windows 95 Platform**

When installing the Centos 2 channel PCI ATA adapters on a Windows 95 platform, the adapter drivers should be installed before installing the hardware.

### **13.2 - No ATA Drives Appear In The Control Panel Window After a Rescan**

There are several reasons why this may happen. The first items to check are;

- 1...Has the detect PCI button been pressed in the File/Program Settings menu?
- 2...Do the adapter addresses look correct? (see appendix 3)
- 3...Have you set the IDE=PCI1 statements in the DDD icon properties? (See section 5.1)
- 4...Is the drive set to 'master'?
- 5...Is the drive powered on?
- 6...If using a 'Promise' ATA adapter, ensure that a drive is attached when the system is initially powered on. Check the Control Panel/ System/ Device manager has no yellow exclamation marks against the ATA adapter.

### **13.3 - The Test Doesn't Start Having Pressed The Go Button**

Select the drive(s) by pressing the + button or clicking the mouse on the desired drive.

### **13.4 - FC-AL Drive Doesn't Appear In The Control Panel Window After a Rescan**

One reason that a good drive may not appear after a rescan is because the 'disable Target Originated Loop Initialisation' (DTOLI) bit is set to 1 in mode page 19h, byte 3. The only options available to determine this are (a) use a different application such as 'code update' to check the mode page setting, or (b) reboot the system whilst the FC-AL drive is attached.

### **13.5 - Creating a PID File**

When creating a PID file, ensure that you create the INI file first of all. If this is not already in existence, all data in the profiler window will be lost when you attempt to save the PID file.

### **13.6 - Firmware Download Completes Without Successfully Loading Microcode**

Ensure that the firmware is resident in the 'input' folder.

### 13.7- Getting support for DDD SI

Please direct all queries, requests and suggestions to your IBM SSD technical support representative. They have access to further support documentation and internal IBM communications to provide the support you need for DDD SI.

Your IBM SSD technical support representative also has the capability to provide special .ini files to you to customise DDD SI to perform tasks, both as required to support IBM drive maintenance and to adjust DDD SI to meet local process requirements.

### 13.8- DDD SI Additional Comments

Apart from testing of drives to determine their state, DDD SI can also be set-up to perform other tasks, such as reconfiguration exercises, and also to assist in investigative activities.

Examples:

- Format unit only
- Change of block size or number of LBAs on a SCSI drive
- Change of number of LBAs on an ATA drive
- Unique Mode Select settings for a customer requirement
- Changing drives to and from nominal optimised AV settings / customer optimised AV settings
- Updating HDD firmware
- Adjustment of DDD SI parameters to match a unique process
- Recovery of a SCSI drive from degraded mode

In these cases, and as required your IBM technical support representative can create new sequences, which in turn can be passed to you to load into DDD SI using the File - Setup File menu as covered in the earlier Loading the tests or task sequence section, or loaded using an `ini=` line in a Properties box.

#### **A note on password protected drives**

A customer can set a password on a drive during a manufacturing process or in his laptop end-user application.

It is not possible for DDD SI to unlock a password protected drive. DDD SI will detect if a security mode is set and will report this in the Explorer Status.

The password protected data needs to be unlocked by the normal user to the data in his system.

## Appendices

### 14.0- Appendix 1 - List of modules for DDD SI installation

#### Main Modules:

ident.dll	ATA Identify Module for InstallShield Setup
i3dathlp.dll	IDE Port I/O functions
i3ddedio.dll	IDE & SCSI/FC-AL Device I/O (Low Level Kernel functions)
i3dresrc.dll	Win-DDD Application Resources (icons, bitmaps)
i3dservo.dll	Servo Calculations
i3dgrx.dll	Win-DDD Graphic Screens for Confidential Version
<a href="#">i3dtests.dll</a>	<b>Test Routines</b>
<a href="#">i3dutils.dll</a>	<b>Utility Classes</b>
i3dwins.dll	User Interface Classes
i3dxctrl.dll	Explorer Setup and Control Classes
i3dxctrl.hlp	Explorer Setup Online Help
i3dopts.dll	Program Settings and Registry I/O
<a href="#">i3dfiles.dll</a>	<b>File I/O routines</b>
i3drchld.dll	High End Server Error Log Decoder
i3dmpg.dll	Mode Page Tool
i3dmpg.hlp	Mode Page Tool Online Help
i3dprof.dll	Profiler
<a href="#">i3dcmDEX.dll</a>	<b>Single Command Exerciser</b>
i3dcmDEX.hlp	Single Command Exerciser Online Help
i3ddft.dll	DFT Log I/O and Scratch Detection
i3dlogview.dll	Log View Utility by F.W.
i3dchartservo.dll	SMTTModule load by i3dlogview.dll
ia3dlogabout.dll	About dialog load by i3dlogview.dll
i3derrorlogDecode.dll	Errorlog decoder for Blob's load by i3dlogview.dll
i3dlogprofiler.dll	Profiler for autoanalyses load by i3dlogview.dll
i3duvBlobdecoder.dll	Blob decoder routines based on ubv.blb file generated with Notes load by
i3dlogview.dll	
<a href="#">i3dbuildlevel.dll</a>	<b>Build Level Resource Library</b>
<a href="#">i3dmain.exe</a>	<b>Main Program</b>
d????.dll	Product Libraries (old naming convention)
ic25?????.dll	Product Libraries 2.5" HDDs
ic35?????.dll	Product Libraries 3.5" HDDs
mfc.dll	Microsoft Foundation Class Library used in i3ddft.dll
bexcept.dll	B+M Print Part
bgraphic.dll	B+M Print Part
bprint.dll	B+M Print Part
zlib.dll	ZIP Library (used to compress BLOB files)
ipf32.dll	Online Help Run-Time Library
libipf32.dll	Online Help Run-Time Library
cppwob3i.dll	CPP Run-Time Library
cppwov3.dll	CPP Run-Time Library
cppwv03.dll	CPP Run-Time Library
cppwor3u.dll	CPP Run-Time Library
cppwod3i.dll	CPP Run-Time Library
cppwou3i.dll	CPP Run-Time Library
cppwm35i.dll	CPP Run-Time Library

## Appendices

### Program Linkage:

i3d....dll	Load Time Dynamic Linking
d???.dll	Run-Time Dynamic Linking

### Note:

- 1) If the call to an "i3d....dll" fails the program cannot be started.  
If the call to a "d???.dll / ic..." fails then the requested operation/function fails (i.e. is not available), but the program  
will continue execution (without performing product specific functions)
- 2) Modules marked **blue** are version specific (confidential, non-cv, si)



## 15.0 - Appendix 2 - Finding the PCI addresses for an ATA controller

In most cases the PCI configuration of the controller should be automatic from the **File / Program Settings** pull-down. However, it is possible that the motherboard may have allocated the PCI addressing in an unusual way, as this is configured by Plug & Play and in rare cases a manual intervention may be required. The following information may then be useful in getting DDD SI running.

This only applies if you are going to be using the PCI attached ATA controller for DDD SI systems. This manual procedure only applies for Win95/98.

The same underlying PCI negotiation takes place in the system before NT boot, but the addressing cannot be readily accessed using the standard NT utilities.

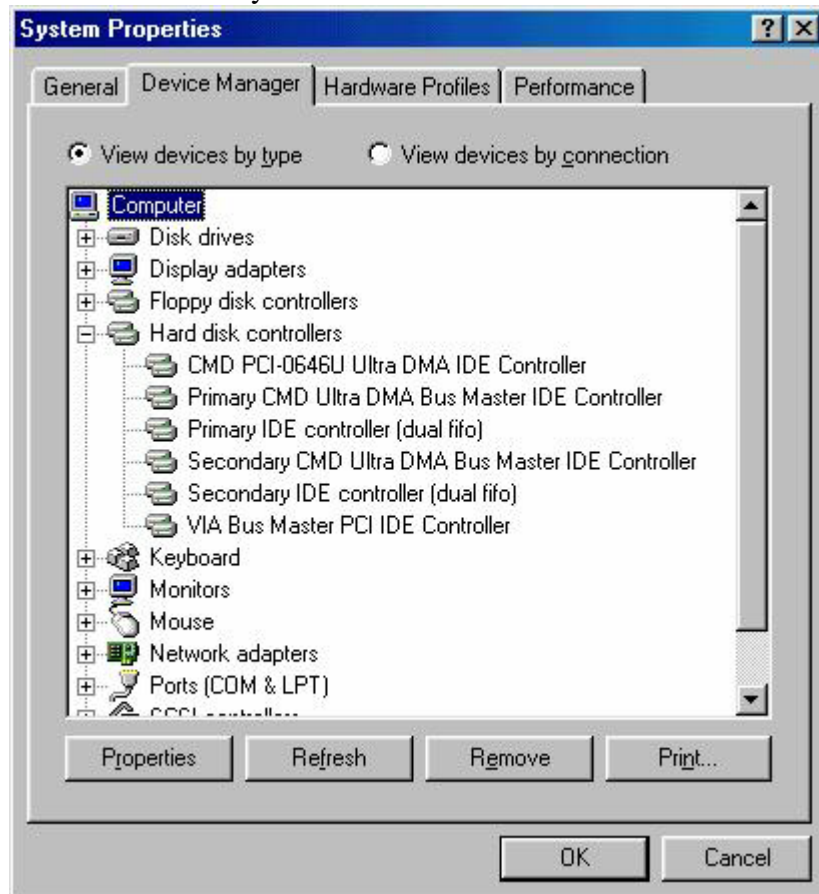
### Windows 95 and 98

Use the **Start Menu** and select **Control Panel**, followed by **System** as shown here.



## Appendices

Select the **Device Manager** tab and expand the **Hard Disk Controllers** as shown here. This installation has only one CMD controller.



The CMD PCI-0646U Ultra DMA IDE Controller is the IDE controller and has associated Primary CMD and Secondary CMD ports. The VIA Bus Master PCI IDE controller indicates that the chipset on the motherboard is VIA, and again the Primary and Secondary are seen - these are supporting the operating system HDD attached to the primary controller.

Looking at the example of the CMD controller, select the controller and then proceed to select the **Resources** tab. As an example the following was seen - this will vary from system to system;

Resource Type	Setting	
Interrupt Request	10	Primary & Secondary
Input/Output Range	6500 - 6507	Primary
Input/Output Range	6600 - 6603	Primary
Input/Output Range	6700 - 6707	Secondary
Input/Output Range	6800 - 6803	Secondary
Input/Output Range	6900 - 690F	Secondary

Looking at the primary and secondary IDE resources in a similar way it is found that the primary has the following resources;

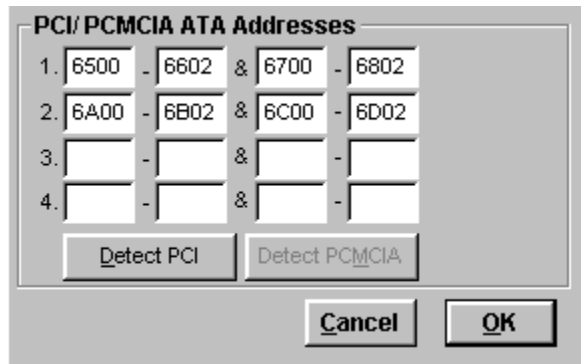
Interrupt Request	10	
Input/Output Range	6500 - 6507	select 6500
Input/Output Range	6600 - 6603	select 6602 (6603-1)

## Appendices

and the secondary;

Input/Output Range	6700 - 6707	<code>select 6700</code>
Input/Output Range	6800 - 6803	<code>select 6802 (6803-1)</code>
Input/Output Range	6900 - 690F	

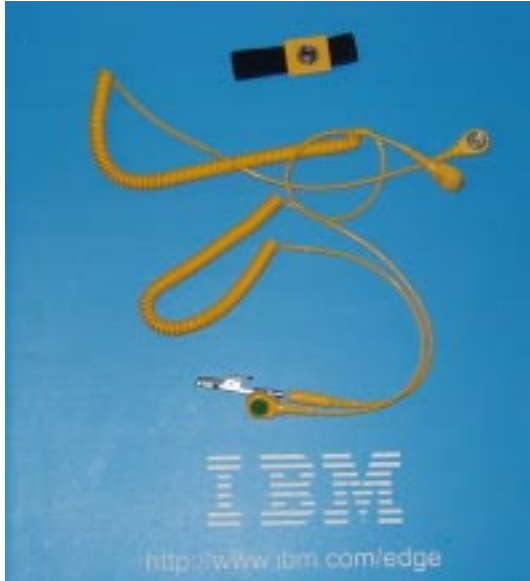
The Win-DDD Program Options in **File - Program Settings** should be set as follows:



Although in this example the address ranges appear to be set in ascending ranges, it is possible to see descending ranges and interleaved ranges. The above associations still apply even where the order does not seem “natural”.

## 16.0 - Appendix 3 - Hardware Information

### Anti Static Components



### RS Components Anti Static Straps

- 1 x Cord and clip
- 1 x Coiled lead stud/stud
- 1 x anti static wrist strap



### HDD Power Supply

### Selectronix Power Supply

Note: Component is supplied with Din connection plug. This requires replacing by the normal drive 4 pin plug

### **Distribution Cable Kit**



### **PTI Mobile Cable Kit**

- 1xPower switch box (dual drive attach).
- 1xTerminated SCSI Cable (PTINT68U/3M-AT)
- 1x68 to 50 way SCSI converter
- 1x68 to 80 way SCSI converter.
- 1xIDE cables (PTINT40/001)
- 1x2.5inch to 3.5inch IDE converter

Required by mobile CAE's/ CQE's and Distributors to test SCSI and IDE drives.

### **Mobile Users Cable Kit**



### **PTI SP11597 Cable Kit**

- 1 x 50 Pin to SCSI Centronics cable (Required for PCMCIA SCSI and ATA cards).
- 1 x 4" IDE cable
- 1 x 50 Pin to 69 Pin SCSI adapter

Cable kit required for CAE's / CQE's who use PCMCIA SCSI and ATA adapters in their thinkpads as a means of running DDD.

## Appendices



**HDD 2 Bay Test Bed**

**PTI 2 Bay Flat Bed**

Will accept 3.5" drives



**HDD 2 Bay Power Test Bed**

**PTI 2 Bay Test Bed 2**

Will accept 2.5" & 3.5" form factor drives

Built in cooling fans

Built in power supply

### **16.1- Contact Details**

#### **SST Manufacturing Ltd (formally PTI)**

Address : Unit 5 & 6, Station Rd, Guisley, Leeds, UK. LS20 8BX  
Email : Sales@PTI.CO.UK Web Page: WWW.PTI.CO.UK  
Phone : 44 (0)1943 871234 (0) not required if calling outside of the UK.

*North American Sales for SST Manufacturing products only;*

#### **Technical Cable Concepts Inc**

Address : 350 Lear Avenue, Costa Mesa, California 92626, USA  
Phone : 001 714 835 1081 Fax : 001 714 835 1595  
Email : sales@techcable.com  
Contacts : Pat Hope or Mark Butler

#### **Selectronix**

Address : Selectronix, Boyatt Wood, Eastleigh, Hampshire, England. SO50 4ZY  
Email : Sales@electrospeed.co.uk Web Page: WWW.Electrospeed.co.uk  
Phone : 44 (0)23 80641111 (0) not required if calling outside of the UK.

#### **RS Components Ltd**

Address : Birchington Rd, Corby, Northants, NN17 9RS, England.  
Email : Web Page: RSWWW.Com  
Phone : 44 (0)1536 201201 (0) not required if calling outside of the UK.

### **Price Details**

#### **SST Manufacturing Part No's:**

PTI 2 bay flat test bed	£57, (\$93.50)
PTI Test Bed 2 (Onboard power supply)	£182, (\$300)
PTI Test Bed 2 Spares	
- Power Supply - PT8024	£29.44, (\$48.58)
- Cooling Fan - PT2069-6	£4.28, (\$7.06)
- L.H. Device carrier (Black) - PT2137-6	£13.16, (\$21.72)

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- R.H. Device carrier (Red) - PT2137-7	£13.16, (\$21.72)
- DC Loom - PT2137-11	£9.20, (\$15.18)
PTI Distribution cable kit	£61, (\$102)
PTI SP11597 mobile cable kit	£14, (\$23)
<b>Selectronix</b> Power Supply , Stock No Pup55-31	£50

### **RS Components** Anti Static Components

- Adjustable fabric wrist band, stock No 253-6769	£7
- Adjustable metal wrist band, stock No 663-229	£13
- Coiled Cords, 10mm press stud/ 10mm press stud, stock No 552-905	£6
- Coiled Cords, 10mm press stud/ banana plug, stock No 273-6701	£6

Note: All prices are for one off orders in Pounds Sterling and do NOT include the mandatory 17.5% tax and shipping costs. US prices will require local/ State taxes plus shipping costs. Prices are only correct at the time this document was written.

## **European Component Distributors**

Below is a list of component distributors in Germany.

Note: These companies may supply SCSI components such as cables, terminators and adapters but they will NOT supply the components listed on the previous page.

### **eXtend Computer-Peripherie GmbH**

Fachhandel für SCSI-Produkte  
Friedenstraße 46  
D-74080 Heilbronn  
Tel.: +49-7131-38610-0  
Fax: +49-7131-38610-99 E-Mail: info@extend.de  
Internet : www.extend.de

### **Intracom GmbH**

Löhbacher Str. 7  
58553 Halver  
Vertrieb:  
Hr Petscheitis, 02353 / 700717  
Internet: www.ic-intracom.com

### **IntosElectronic Wolfgang Isenberg**

Hauptstrasse 9  
35625 Hüttenberg



Tel.: 06403-70330  
Fax.: 06403-703370  
Internet: [www.intos.de](http://www.intos.de)

## **17.0 - Appendix 3 - Frequently Asked Questions**

### **Disk Drive Diagnostics for Systems Integrators**

#### **Q. What is DDD-SI?**

DDD-SI is an easy-to-use, Windows 95 software tool that allows you to modify, optimise, initialise or test industry leading IBM hard disk drives for integration.

#### **Q. When would I use DDD-SI?**

Optimise a disk drive

- AV Applications
- Power management
- RAID system integration

Analyse / repair a disk drive

- Run diagnostics
- Virtual repair (write aborts, off-track writes)
- Clear format degraded condition
- Rearrange data order

Initialise a disk drive

- Wipe disk
- Clear boot / partition information

Assist with disk drive integration


- Downgrade UDMA/66 to UDMA/33
- Update microcode
- Change blocksize
- Change capacity
- Change any mode page

Provide production line support

- Production line monitoring
- Analyse disk drive handling

### **Q. How does DDD-SI Work?**

DDD-SI provides an easy-to-use interface that enables you to accomplish custom configuration in four easy steps.

1. Using the relevant interface controller, connect the disk drives you would like to configure or analyse to the testing station with DDD-SI installed. You will need a separate power supply for the disks, and you should ensure that they receive proper air flow.
2. Click the  on DDD-SI to allow the software to find the connected drives. A list of their serial numbers and part numbers will appear in the window corresponding to their interface.
3. Select the profile that best suits your needs from the Profiler menu under the Configuration title on the main toolbar.

### **Drive Health Verification**

<b>Name</b>	<b>Short Description</b>	<b>Comments</b>
FullCheckDispo	Complete drive health check with disposition	<ul style="list-style-type: none"> <li>• Highest confidence level</li> <li>• Includes handling damage check</li> <li>• Recover from user / system induced errors</li> <li>• Recover from previous installation errors</li> <li>• Destructive - data integrity not maintained</li> </ul>
QuickCheckDispo	Quick drive health check with disposition	<ul style="list-style-type: none"> <li>• Lower confidence level</li> <li>• Includes handling damage check</li> <li>• Recover from previous installation errors</li> <li>• Destructive - data integrity not maintained</li> </ul>
Full Check (DMDM)	Complete drive health check with disposition, especially designed for Microdrive	<ul style="list-style-type: none"> <li>• As FullCheckDispo, without SMART check and erase MBR</li> </ul>
Exercise	Drive Exerciser without disposition	<ul style="list-style-type: none"> <li>• Exercising tool with (almost) infinite run time</li> <li>• Destructive - data integrity not maintained</li> </ul>
ExerciseNonDestr	Non-destructive drive exerciser without disposition	<ul style="list-style-type: none"> <li>• Exercising tool with (almost) infinite run time</li> <li>• No writes - data integrity maintained</li> </ul>
CheckSmart	Check S.M.A.R.T. Status	

## Drive Integration Support

Name	Short Description	Comments
Clip32GB	Clip drive to 32 GB	<ul style="list-style-type: none"> <li>• overcome 32 GB limitation of some BIOSes</li> </ul>
Clip8GB	Clip drive to 8 GB	<ul style="list-style-type: none"> <li>• overcome 8 GB limitation of some BIOSes</li> </ul>
Clip4GB	Clip drive to 4 GB	<ul style="list-style-type: none"> <li>• overcome 4 GB limitation of some BIOSes</li> </ul>
Clip2GB	Clip drive to 2 GB	<ul style="list-style-type: none"> <li>• overcome 2 GB limitation of some BIOSes</li> </ul>
UnClip	Recover original drive capacity	
DriveInfo	Displays basic drive information	
SCAMoff	Disable SCAM	<ul style="list-style-type: none"> <li>• Overcome problems with SCSI controllers that don't support SCAM properly</li> </ul>
SCAMon	Enable SCAM	

## Drive Initialisation

Name	Short Description	Comments
CleanDisk	Clean up entire disk	<ul style="list-style-type: none"> <li>• Recover from user / system induced errors</li> <li>• Clear "Format Degraded" condition</li> <li>• Recover full capacity after clip</li> <li>• Secure privacy</li> <li>• Merge Glist to Plist where supported</li> </ul>
ClearBoot	Erase boot / partition information	<ul style="list-style-type: none"> <li>• Recover from previous installation errors</li> <li>• Remove operating system dependency</li> </ul>
ResetModePages	Reset SCSI Mode Pages to shipped values	<ul style="list-style-type: none"> <li>• INFORMATION ONLY - how to reset Mode Pages using the Mode Page Tool</li> </ul>

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### Drive Optimization

Name	Short Description	Comments
SetAV	Optimize for AV Applications	<ul style="list-style-type: none"> <li>• AV optimisation with support for “normal” operation</li> </ul>
SetAVrc	Optimise for AV Systems	<ul style="list-style-type: none"> <li>• For pure AV streaming systems only</li> <li>• Turns off read error correction</li> <li>• Read data integrity not guaranteed!</li> </ul>
SetRAIDgeneric	Generic optimisation for use in RAID system	<ul style="list-style-type: none"> <li>• Cache utilisation</li> <li>• Command Queuing</li> <li>• Hot plug support</li> </ul>
SetWSgeneric	Generic optimisation for use in single user workstation	<ul style="list-style-type: none"> <li>• Cache utilisation</li> <li>• Command Queuing</li> </ul>
DTLA Quiet Mode	Optimises Telesto drive for quiet acoustic mode	<ul style="list-style-type: none"> <li>• Seek profile optimised for quiet operation</li> <li>• Remains active across power cycles</li> </ul>
DTLA Normal Mode	Sets Telesto drives into normal seek profile	<ul style="list-style-type: none"> <li>• Remains active across power cycles</li> <li>• Seek profile optimised for normal operation</li> </ul>
ReadRepair	Performs a complete read scan of a drive and tries to repair corrupted sectors.	<ul style="list-style-type: none"> <li>• performs a complete read scan of a drive</li> <li>• tries to repair all corrupted sectors.</li> <li>• recover drives that saw aborted or off-track write operations</li> </ul>

1. To execute the work, press the Go button on the device control center or select Start Sequence from the Actions menu. While DDD-SI is working, it will generate a window for each drive. Each window has a traffic light to allow you to follow DDD-SI's progress:

Yellow DDD-SI is working on the requested task

Green DDD-SI has completed the configurations or analysis successfully

Red The disk drive has failed the analysis

Blue You have chosen to abort the configuration or testing

Full details of the configuration or analysis will appear in the Drive Properties section of each drive window once the work is complete.

**Q. What is an example of how DDD-SI would work to optimise hard disks?**

An example of using DDD-SI to optimise hard disks for AV Applications would be as follows:

1. Using the relevant interface controller, connect the disk drives you would like to configure for AV applications to the testing station with DDD-SI installed.
2. Click on the “?” on DDD-SI to allow the software to find the connected drives. A list of their serial numbers and part numbers will appear in the window corresponding to their interface.
3. Select the “SetAV” profile from the Profiler menu under the Configuration title on the main toolbar.
4. To execute the work, press the Go button on the device control center or select Start Sequence from the Actions menu. DDD-SI will execute the following tasks as necessary to optimise the drives for AV applications.
  - Turn write cache on / off
  - Optimise cache segments
  - Turn on / off adaptive caching
  - Enable “read continuous”
  - Turn auto reallocate off / on

Once the work is complete, you will have a full report in the individual drive windows.

**Q. How much does DDD-SI cost?**

Because IBM is dedicated to supporting the channel, DDD-SI is available free of charge to integrators and VARs. The only requirement for usage is to register your copy of DDD-SI as outlined below.

**How do I register my copy of DDD-SI?**

To register your copy of DDD-SI, please contact the IBM hard disk drive call center at the following numbers:

Germany	07302-153050
United Kingdom	01475-898 125
France	02.38.55.74.90
Italy	02-5962 2122
Remainder of Europe, Middle East and Africa	44-1475-898 125
Fax:	44-1475-898 684

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Once you have provided the call center with the required information, a registration key will be e-mailed directly to you. Simply install this key in the 'Serial' window as described on page 16 to ensure the continued operation of your copy of DDD-SI.

A new registration key is required for each machine with DDD-SI installed.

### **Q. Where can I get full technical documentation on DDD-SI?**

Full technical documentation on DDD-SI may be found on this CD. Additional copies may be obtained by contacting the IBM hard disk call center:

Germany	07302-153050
United Kingdom	01475-898 125
France	02.38.55.74.90
Italy	02-5962 2122
Remainder of Europe, Middle East and Africa	44-1475-898 125
Fax:	44-1475-898 684

### **Q. How can I get further training on the usage of DDD-SI?**

Integrators interested in receiving further training on DDD-SI should send a e-mail outlining their request to [EMEA\\_HDD\\_Marketing@uk.ibm.com](mailto:EMEA_HDD_Marketing@uk.ibm.com).

### **Q. What are the PC Requirements to run DDD-SI?**

Processor:	350 MHz Pentium II or better
Memory:	128 Mb RAM.
Graphics:	SVGA video 800x600@256 colours or better
Modem:	Windows NT compatible 33.6Kbps
Op. Sys.:	Windows 95/98 (or NT V4).
Internet:	Netscape Communicator 4 or I.E.4 Java V 1.1.2 or later
Spare Slots:	3 x PCI 2.1 compliant 1 x ISA