



Drive Fitness Test Usage Instructions

To support World Wide Web
Release of DFT v3.40

26 February 2003

Table Of Contents

What is Drive Fitness Test?	3
DFT System Fundamentals	4
Creating a DFT Test Diskette	4
Windows OS's	4
Linux	5
DFT hardware support and restrictions	6
SCSI Requirements:	7
Running DFT	7
Quick Test	12
Advanced Test	16
Advanced Topics	16
Advanced Topics	17
Menus	17
Utilities	19
Erase Boot Sector	21
Erase Disk	23
Sector Repair	26
ATA Functions	30
S.M.A.R.T Operations	30
Error Code and first aid for your drive	31
Testing of Non-Hitachi/IBM Hard Disk Drives	33
Supplied ASPI Managers	33
Supplied ASPI Managers	34
Troubleshooting	35
ASPI Manager Fails to Load	35
Drives Attached to PCI IDE Adapter not seen by DFT	35
Drives Attached to Extended ATA Ports not seen by DFT	35

What is Drive Fitness Test?

Hitachi offers a full line of 2.5 and 3.5-inch products with both high capacity and a diversity of interface options for high throughput operating environments, such as network and internet servers, multimedia production and digital video processing

The prime purpose of DFT is to test hard disk drives while they remain inside a personal computer, even when the primary operating system may no longer be bootable. This is suggested when it is suspected that there is a malfunction that could be related to the hard disk drive. This is helpful, as often problems occur with data content and management that are unrelated to the function of the disk drive itself. In these cases, a reload of the operating system, or similar recovery action, is all that would be required to recover the computer. The use of DFT avoids unnecessary disturbance of the disk drive and usually will preserve other existing data belonging to the user, which may not have been backed up. This latest version of DFT has been enhanced to provide support for drives with capacities larger than 137GB.

DFT is a DOS based utility and as such testing of the hard disk drive has no dependency on the original Partition Format or Operating System that is installed on the disk drive. The sector repair option however, currently only supports Sector (LBA) to File identification for the following partition formats, FAT16, FAT32 and NTFS. For unsupported partition formats i.e. ext2fs for Linux, HPFS or OS/2 DFT will now give the user the option of repairing corrupted sectors, however no information will be presented associating that sector with a filename.

The basic Drive Fitness Test (i.e. Quick, Advance and Exerciser) is non-destructive, which means that it will not perform any write operations in the user data area. This option was chosen to ensure the maximum integrity of user data.

When run, the Drive Fitness Test will provide a result, from which the condition of the drive - electronics and storage mechanism - can be determined. This can then be used to either choose to change a drive that is defective, or take other actions to restore the functionality of the PC. A further diagnosis may determine that the drive has been subjected to handling damage.

In the event that you have a Hitachi/IBM drive which is reported by DFT as defective, then you will be provided with a Technical Return Code (TRC) which will allow you to check and if appropriate generate a Returns Material Authorisation (RMA) via our web based warranty support process.

NOTE: DFT currently will **NOT** generate a TRC for failed drives that were not manufactured by IBM.

In addition to hard drive testing, DFT contains utilities, which allow the following: -

- S.M.A.R.T (Self-Monitoring, Analysis and Reporting Technology) to be enabled or disabled.
- Erasure of the disk Master Boot Sector
- Total Erasure of the data in the user area of the disk
- Initialise corrupted sectors
- View useful information about the drive, e.g. Microcode level, Specification Compliance.

More information and background about DFT is available from

<http://www.hgst.com/hdd/support/download.htm>

DFT System Fundamentals

The Drive Fitness Test currently provides for in-depth testing of IBM disk drives and basic testing of Other Manufacturers drives. This new version will support standard disk drives with the ATA/IDE and SCSI interfaces. The basic test will not overwrite customer data.

The Drive Fitness Test (DFT) application is designed to run under DOS and should have been received as a executable file *DFT32-Vxxx.exe* (where *xxx* may vary), over the Internet, or as a prepared floppy diskette. If the file has been received over the Internet you will need to follow the procedure below to prepare a suitable diskette.

If you have received a prepared floppy, proceed to the section below entitled **DFT Hardware Support and Restrictions**.

Creating a DFT Test Diskette

Windows OS's

The Drive Fitness Test set-up program (*DFT32-Vxxx.exe*) includes IBM PC DOS2000 and the Drive Fitness Test. In order to run the set-up program you will need to have a formatted 1.44-MB diskette and access to a system that is running one of the following operating systems, Windows'95, Windows'98, Windows Millennium, Windows NT, Windows 2000 or Windows XP. Running the set-up program creates an IBM PC DOS2000 bootable diskette that contains the Drive Fitness Test and all required supporting programs.

It is recommended that before starting the set-up program, all open Windows applications should be closed.

The following represents two examples of how the DFT diskette can be created.

Method A.

1. Insert a formatted diskette into the Floppy drive, (**A:** or **B:**).
2. Using Windows Explorer, locate the program *DFT32-Vxxx.exe* downloaded from the Internet.
3. To start diskette creation double-click on the program icon and follow the on screen instructions. **Note:** you have the option to select your country location and keyboard layout, the default for these options is United States.

Method B.

1. Click Start, then select Run.
2. Click the Browse button to locate the *DFT32-Vxxx.exe* set-up program.
3. Click on the filename, then click Open.
4. Click OK to run the *DFT32-Vxxx.exe* set-up program.
5. Insert a formatted 1.44-MB diskette into the required floppy drive (A or B if your system has 2 floppy drives), select the target floppy on the set-up screen then click next to continue.
6. Follow the on screen instructions.

Linux

The Drive Fitness Test image file (e.g. *DFT-v300img.bin*) includes IBM PC DOS2000 and the Drive Fitness Test. The name of the image file will change according to the release version of DFT.

Running the Linux Disk Dump (DD) utility creates an IBM PC DOS 2000 bootable diskette that contains the Drive Fitness Test Utility.

A formatted 1.44-MB diskette is required to create the DFT diskette.

To create the bootable DFT diskette under Linux:

1. Download the DFT image file (*DFT-v3XXimg.bin*) into a known directory on your PC.
2. Insert a formatted 1.44-MB diskette into your floppy disk drive.
3. Make sure that the floppy disk is un-mounted.
4. Change directory to where you saved the DFT image.
5. Run the Disk Dump (DD) utility with the following parameters:
DD if=dft-v300img.bin of=/dev/fd0 bs=8k
6. The bootable DFT diskette will now be created, Note this could take a couple of minutes.

DFT hardware support and restrictions

DFT is designed to run on ATA and SCSI attached disk drives. From version 2.1 onwards DFT also supports testing of disk drives that have been manufactured by OEM manufactures (i.e. non-Hitachi/IBM) in addition to Hitachi/IBM. However the depth of testing that is carried out on the non-IBM/Hitachi drives will be less than that performed on the Hitachi/IBM drives. Sector Repair, Disk Erasure and Erase Master Boot Sector functions are not supported on non-Hitachi/IBM drives.

DFT will run on SCSI drives if these drives are attached to SCSI controllers that have a DOS ASPI layer, which supports hard disk drives. Some SCSI controllers have ASPI layers that offer support only for removable media devices e.g. CD-ROM's, Tape etc. if you have this type of controller a ASPI Manager that allows hard disk support will be required in order to test your SCSI hard disk drives using DFT. DFT is supplied with a small number of DOS ASPI Managers supporting the most popular SCSI controllers.

DFT supports UDMA/33, UDMA/66, and UDMA/100 plug-in PCI-to-ATA adapters from

- ◆ Promise Technologies, CMD, I'Will, Silicon Image and Highpoint.
- ◆ ATA motherboard controllers based on the Highpoint HPT366, HPT370 and HPT372 chipset, the Promise Ultra 100 and Ultra100TX2 chipsets.

Windows sees these adapters as SCSI controllers through a non-standard architecture and drives attached to these adapters will be reported as being attached via PCI adapters.

Drive configurations **NOT** supported: drives attached using ATA RAID controllers where direct access to the attached devices is blocked by the controller also not supported are Multi-Channel SCSI RAID controllers.

Motherboards with Serial-ATA onboard, testing of drives attached the extended ATA ports are not currently supported – these extended ports are controlled by the same chip that also controls the Serial-ATA ports.

The references made in this document to Hitachi drives, refers to drives that were manufactured by the newly formed Hitachi Global Storage Technologies Company. Drives, which were manufactured by the Hitachi Drive Company prior to January 2003, will be treaded as OEM drives by DFT.

Note:

This new release of DFT now has DOS ASPI Manager support for the Adaptec and Atto Ultra320 SCSI Host Bus Adapters.

SCSI Requirements:

To test SCSI drives DFT requires a DOS loadable ASPI manager for the SCSI Controller that the drives are attached to. **Note:** Some ASPI managers offer support only for removable media devices e.g. CD-ROM's, Tape etc. check the documentation that was supplied with your SCSI controllers or contact your SCSI controller supplier to see if this is the type of ASPI managers you have.

DFT is supplied with ASPI managers that support several different types of SCSI controllers, see the section '*Supplied ASPI Managers*' at the end of this document. If your SCSI controller is not listed you will need to obtain a DOS ASPI manager that supports your controller. Check the software supplied with your controller or visit the web page of your controller manufacturer.

Having obtained a DOS loadable ASPI manager you will need to update the DFT diskette as follows,

1. Copy the ASPI manager program(s) to the **ASPI** sub-directory on the diskette.
2. Using a text editor (e.g. Notepad, Wordpad etc.) edit the file *Config.sys* on the diskette to include the ASPI manager under the **SCSI** heading.

e.g. *DEVICE=A:\ASPI\abcdef.sys* where *abcdef.sys* is the name of your ASPI manager.

(Your controller documentation should detail how to add an ASPI manager to a configuration file).

Running DFT

Place the prepared floppy disk in the system to be tested and boot the system either by powering off then on or pressing the reset button or by pressing the <Ctrl><Alt><Delete> keys.

When the system restarts you will be offered a menu with two options

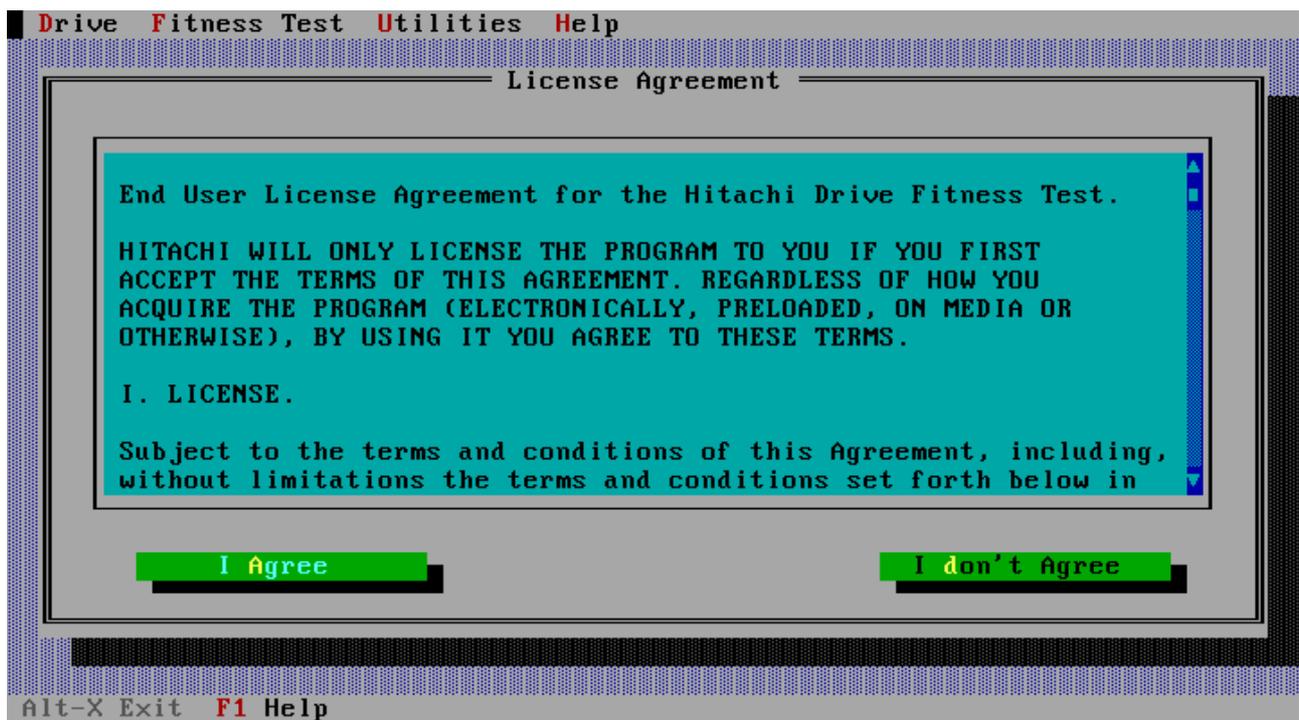
1. SCSI and ATA support
2. ATA support only

Select option **2** if you have only or wish to test only ATA drives.

Select option **1** if you have only SCSI or a mix of SCSI and ATA drives.

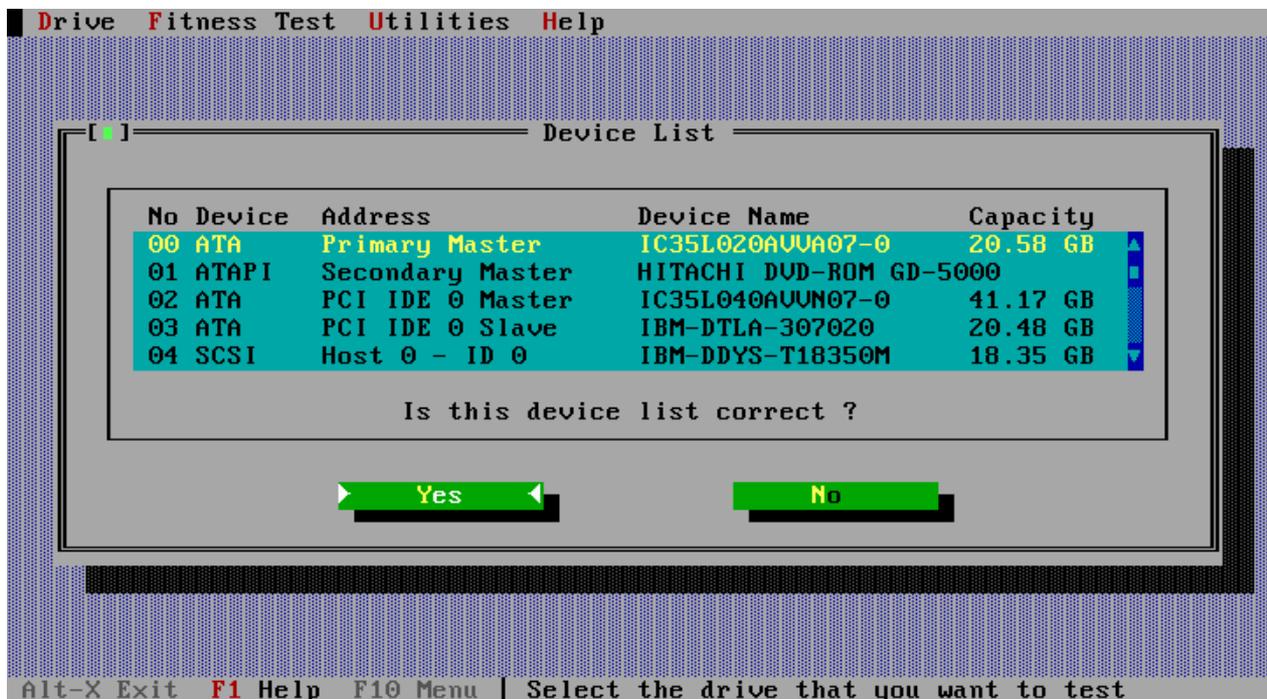
Note: the system will attempt to load all the ASPI files listed in the *config.sys* file, if the relevant SCSI controller is not installed in the system an error message may be displayed on the screen. This is normal and isn't a problem.

DFT will load automatically and present you with the License Agreement as shown below.



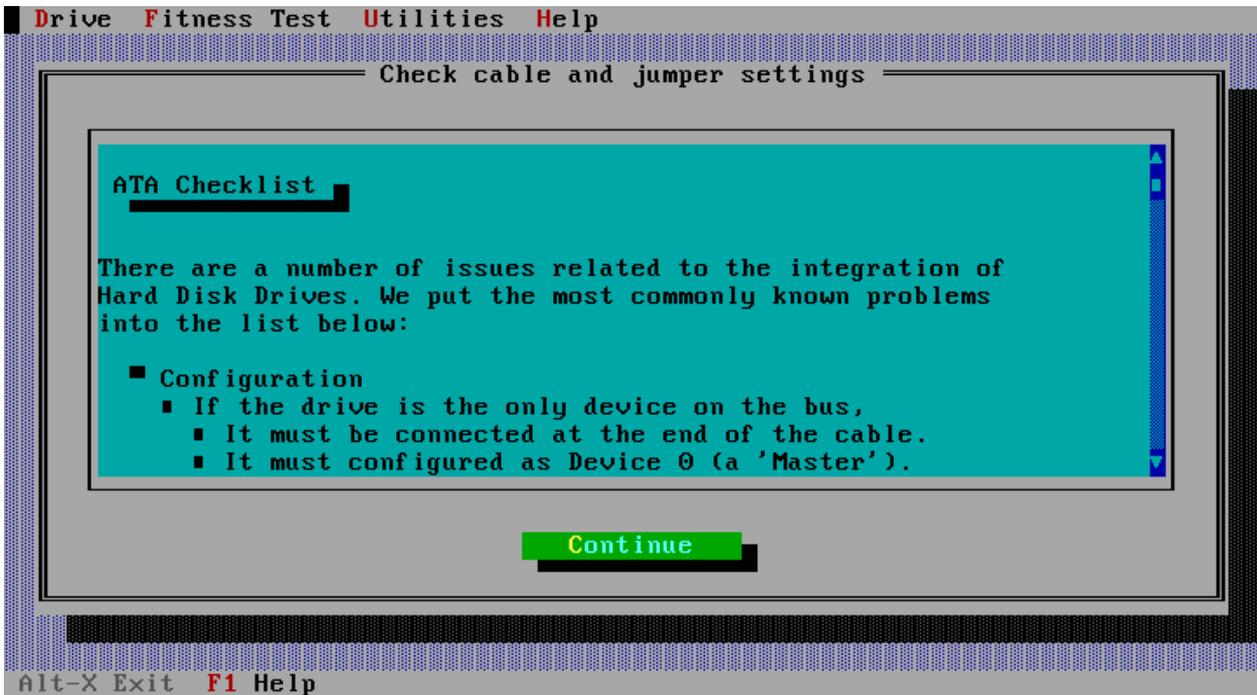
This is a license agreement, which you should review prior to accepting using the "I Agree" button. The positioning and tab keys can be used to navigate through the license agreement and also the button selection.

The program will progress only if you accept the license agreement by selecting the 'I agree' button. DFT will then analyse the connected drives and display to the screen below



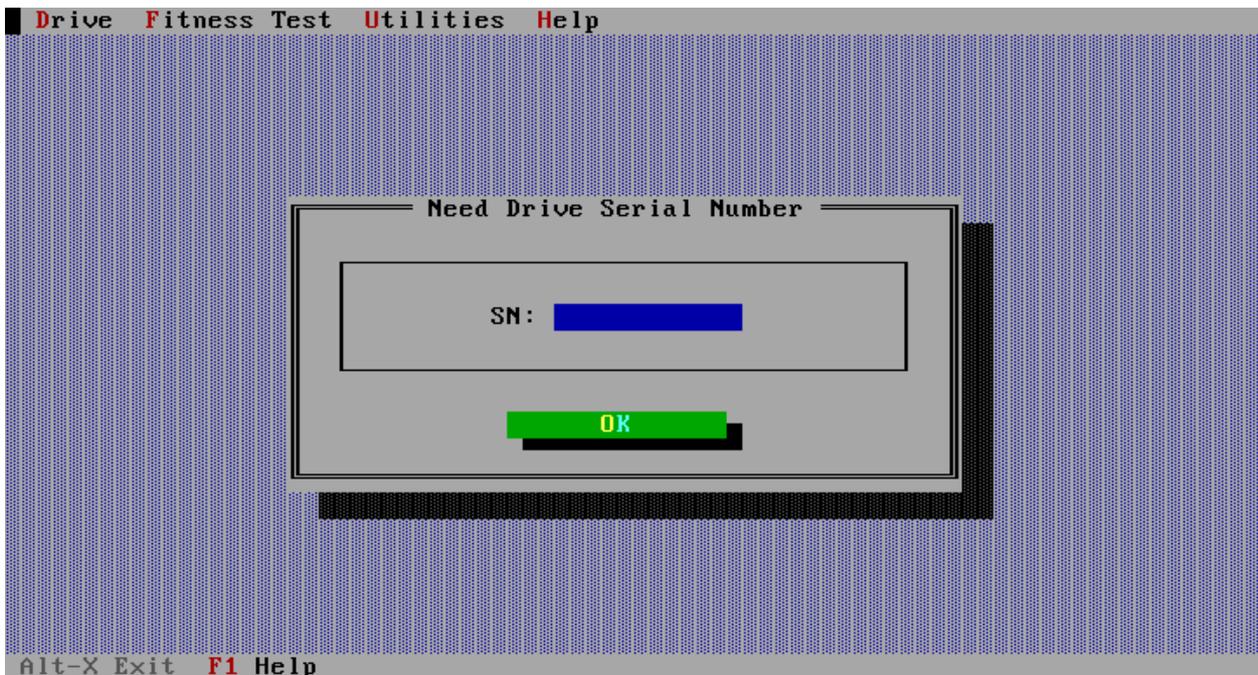
If the drives in the list represents what you know to be installed in your system then you should press the Yes button, after which you will be presented with the main DFT Test Menu, see page 11.

If the list doesn't contain the drive(s) that you wish to test then select **No**, you will be presented with the screen below. This window provides information about cabling and jumper settings, which could have prevented your drive from being detected, please power-off your system and check that your drive is correctly installed and re-start the DFT test.

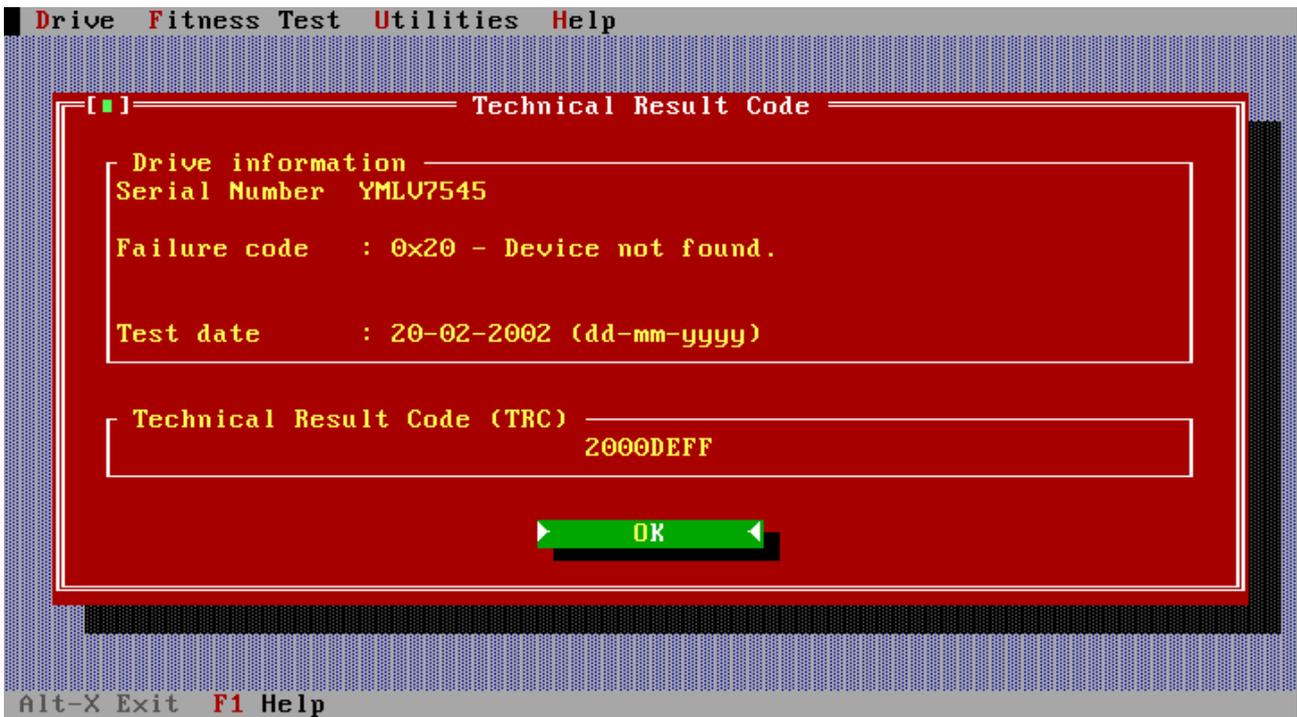


NOTE: the following applies for non-detected **Hitachi/IBM** drives only

If you have made all the checks and your drive is still not detected then press the continue button, after which you will be presented with the following screen, type in the serial number of the drive that DFT failed to detect and press OK to continue.



The following screen shows the Technical Result Code window, this window contains information which you will require in order to use the Hitachi web based warranty process or when calling the Technical Support Centre. Please make record this information and press OK when finished.



If this is the only IBM drive in your system or the only drive you wished to test when the screen on the following page is displayed you can exit the program and shutdown your machine.

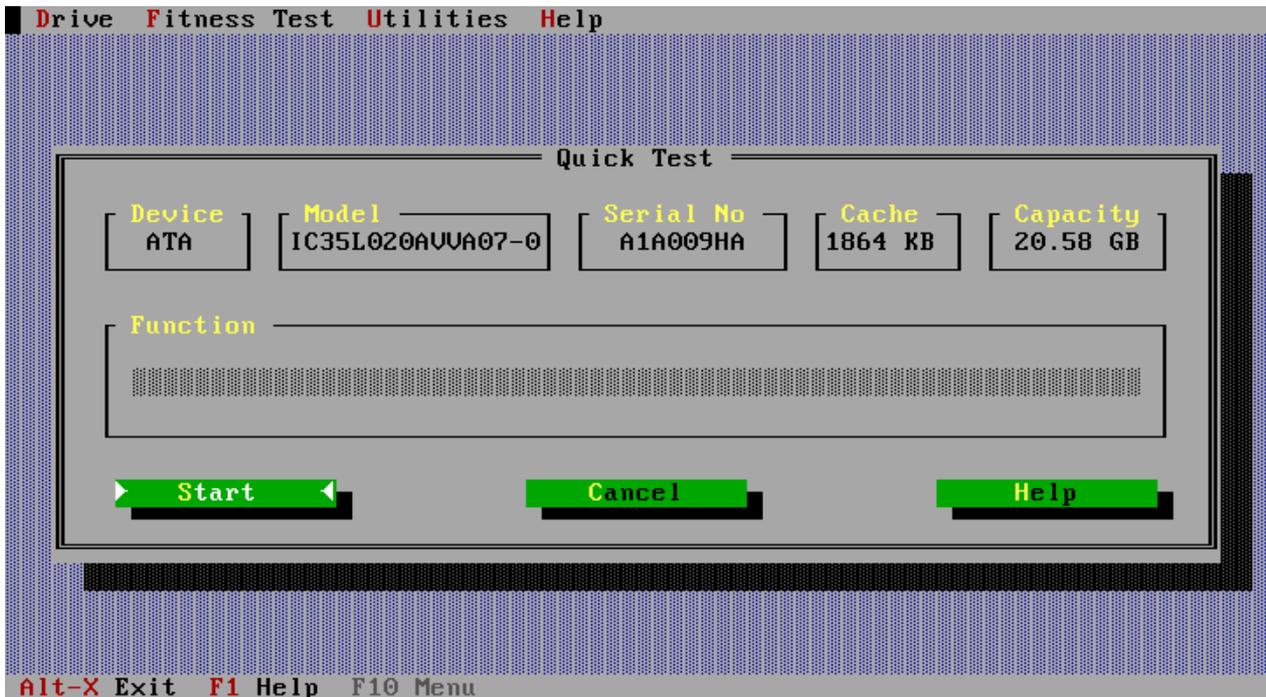
The following shows the main DFT Test Menu screen,



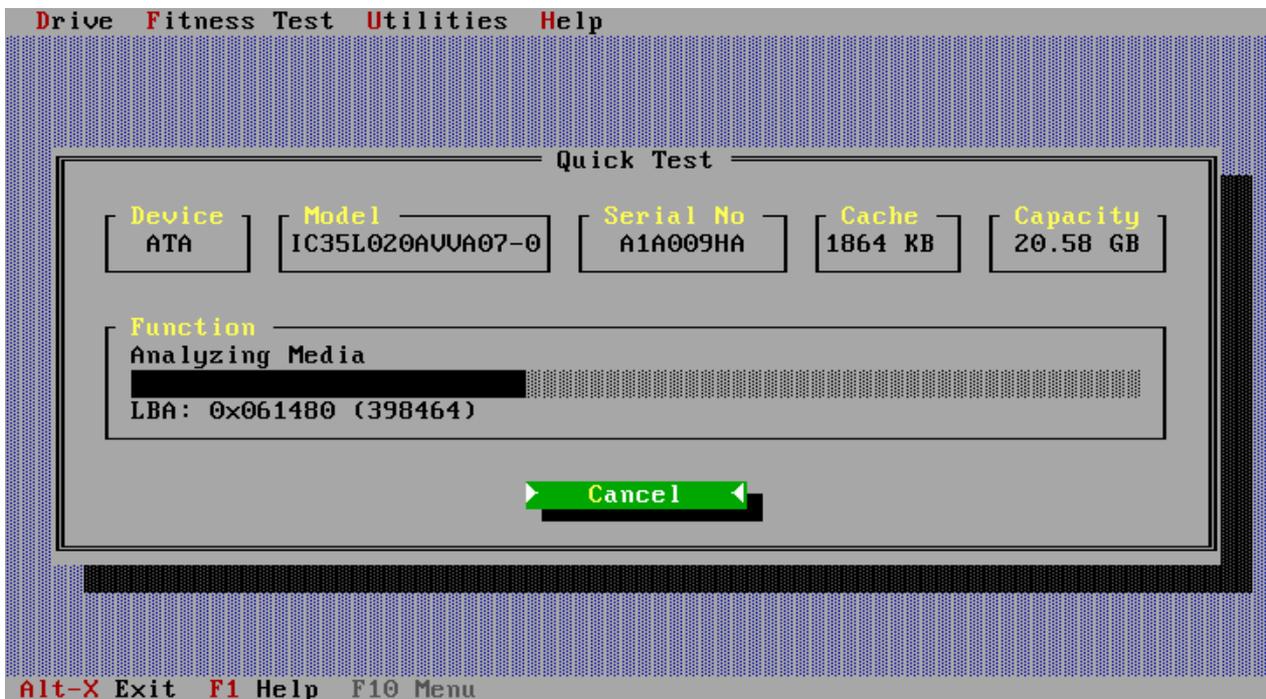
In this example, there are four drives visible in the Device List menu. One ATA hard disk is attached to the primary ATA port on the motherboard, one ATAPI DVD-ROM attached to the secondary ATA port on the motherboard and two other ATA hard disk attached to either a on motherboard or plug-in PCI ATA adapter. If more that 4 devices are installed then the side scroll bar can be used to view the additional drives. In the current menu screen above the primary master ATA drive has been selected. The test path generally to be taken is to run the **Quick Test** simply by pressing the **Enter** key.

Quick Test

This leads to the next screen. Here the test is ready to start on the selected drive.

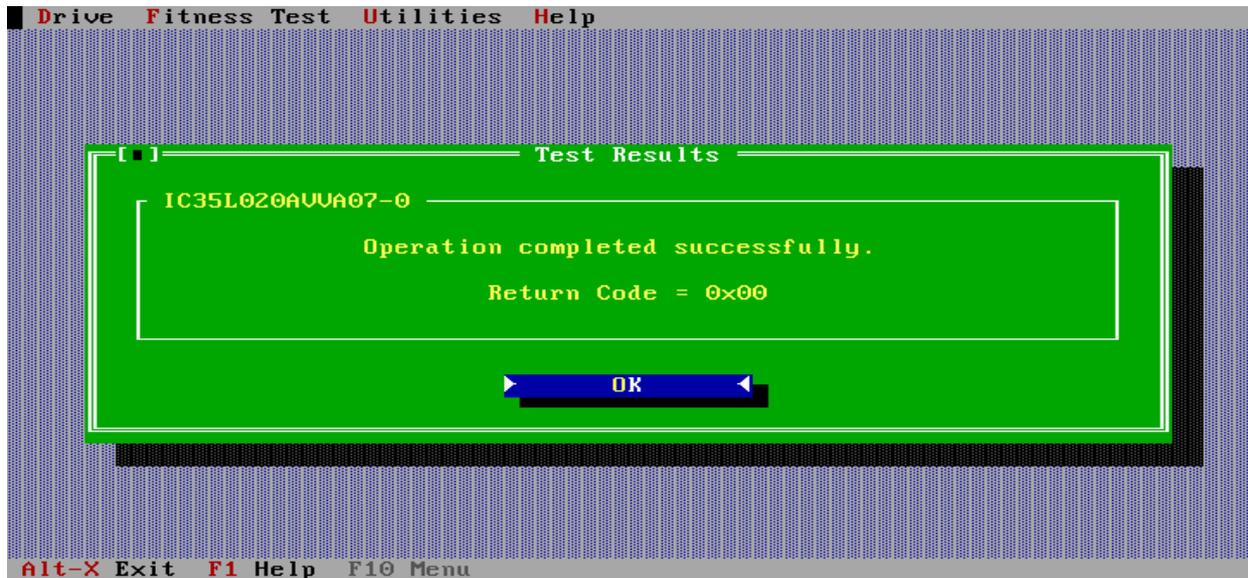


All that needs to be done is to press enter again to **Start** the test, which is seen running in the next screen.



In the screen above, the DFT test is running. The active part of the test is seen to be named (Analysing Media), and the progress bar illustrates progress through the active stage. DFT execution for the Quick Test should be less than 3 minutes in most circumstances.

During testing DFT only performs read operations in the user data area, so your data files will not be overwritten. Write operations will ONLY be performed if you select the options to erase disk, erase MBR or perform sector repair operation from the Utility Menu or by selecting these options when offered after a media error has been detected.



The next screen shows the conclusion of a test. In this case, the drive passed the DFT testing.

What does passing Quick Test mean if my system is not starting up correctly?

If the system is failing to boot (start up), then your next steps may be to

- proceed to check all of the data on the drive using Advanced Test (described below)
- or analyse the PC in other ways, in particular with respect to rebuilding the operating system (usually Windows 95, 98 or NT). Please review the PC and operating system manuals and use PC manufacturers support lines if appropriate.

If the test should fail and the cause of failure is due to a media error (for example a bad write) then you will be presented with a screen similar to that shown below.



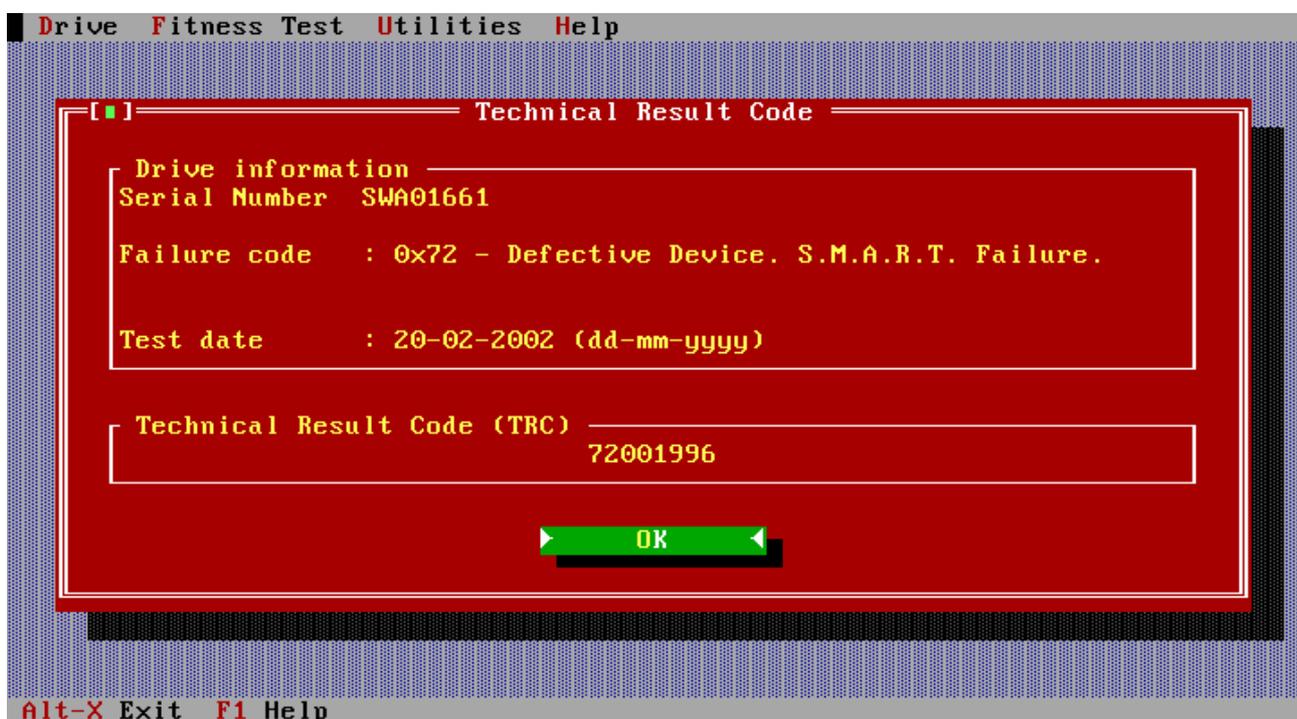
In most cases when DFT reports a media error this is because the data in a sector cannot be read due to corruption. These corrupted sectors can be recovered by being re-written, see options below.

1. Attempt to repair the corrupted sector(s)
2. Run Erase Disk, or
3. Return

For more information on Sector Repair and Erase Disk see the relevant sections of this document.

NOTE – Sector repair and Erase Disk WILL result in data being delete from your disk drive, only perform these activity if your data has been backed-up or you can afford to lose the data on your drive. For more details of what sector repair and erase disk do see the relevant sections in this user guide.

If you choose not to repair the drive by selecting the Return option above, or if the cause of failure wasn't due to a media defect you will be presented with a screen as shown below. In this example the screen shows a non-media test failure.

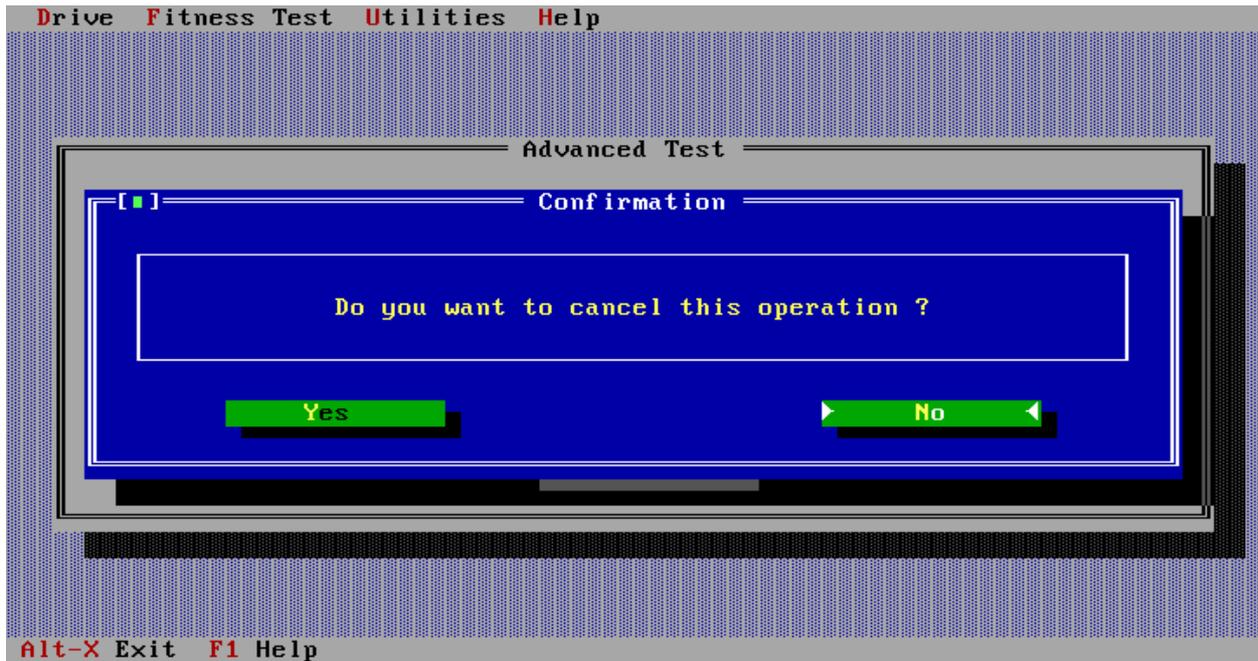


The failing return code 0x72 represents a S.M.A.R.T. error. The S.M.A.R.T. system is a disk drive's way of notifying of possible failure in the future (see Utilities Section of this document for more information on S.M.A.R.T).

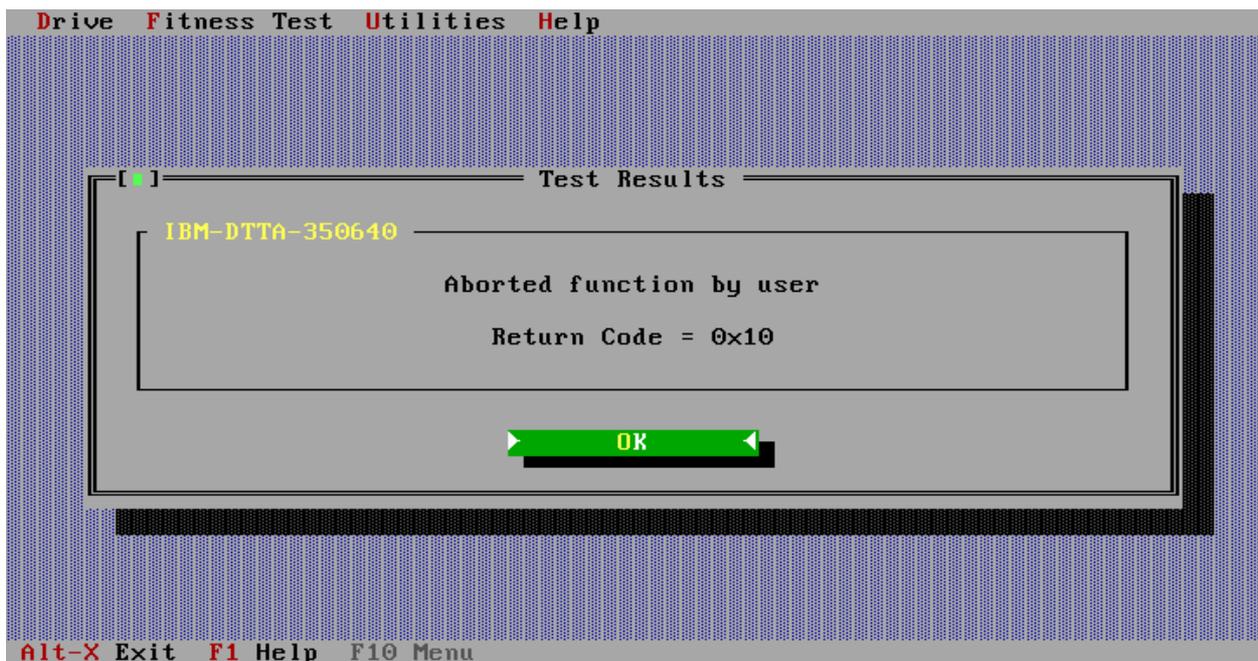
In all cases of test failure a screen displaying a Technical Result Code (TRC) similar to that shown above will be displayed.

The test result should be noted. It may be required in discussion with your supplier or support centre in order to take steps to replace the hard drive or to obtain a RMA (return materials authorisation) through the Hitachi web based warranty process.

If a test is stopped, for example by pressing the **cancel** button, the following screen will appear.



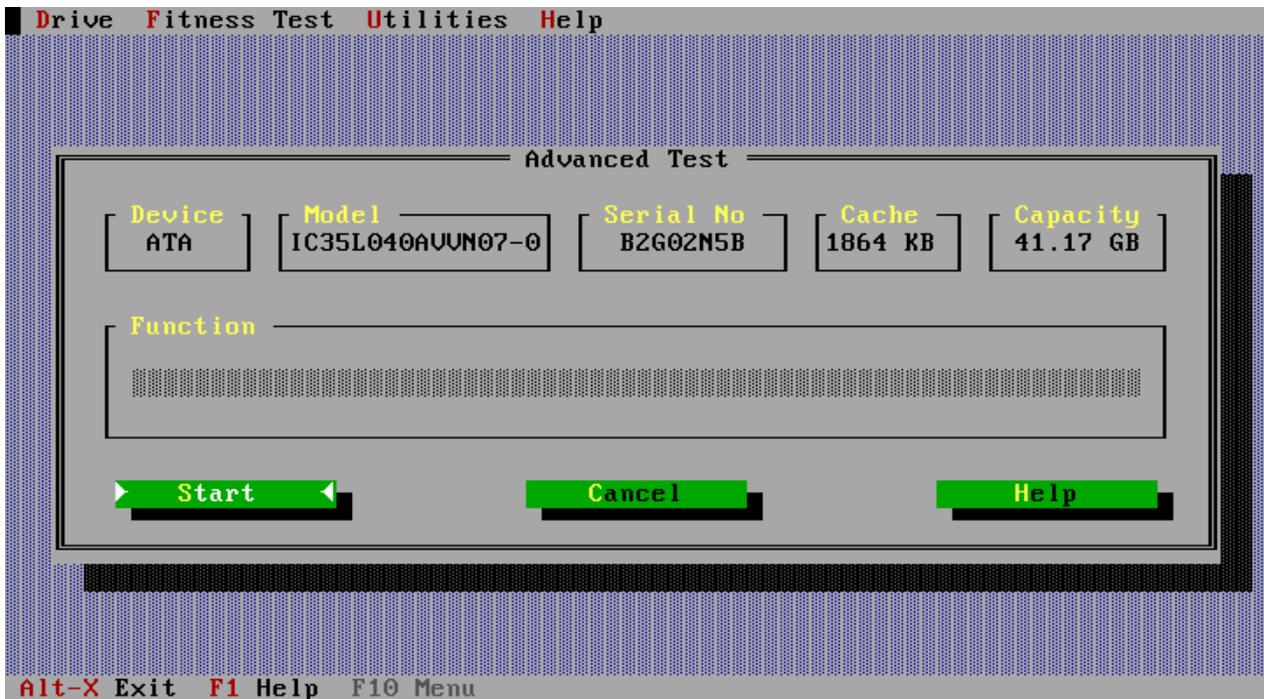
Selecting **Yes** will cause the test to be stopped as shown in the following screen.



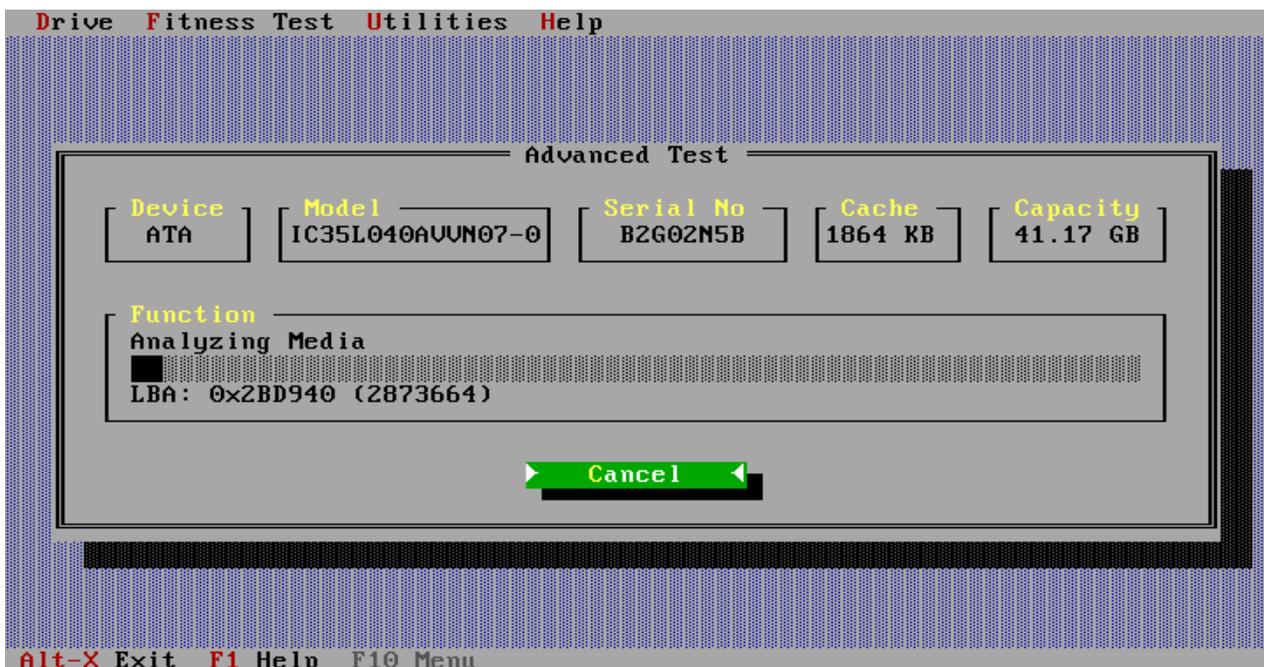
This says that testing has **not** been completed, and is not a statement of either pass or fail. Testing must be restarted and run to completion in order to assess if there is a problem with the drive. The return code 0x10 is not an error.

Advanced Test

If the **Advanced Test** option is selected, testing is similar to Quick Test, but all of the data area of the selected disk drive will be tested.



DFT only performs a read test in the user data area, so your data will not be overwritten. Execution time will normally be up to about 40 minutes, but this can be longer for very large capacity drives. Test progress will be illustrated as shown below.



Advanced Topics

Menus

Use the F10 key or the mouse to access menu items at the top of the main test screen, as illustrated below. These are generally a repeat of functions already displayed but also allow access to additional tests and utilities.

No	Device	Address	Device Name
01	ATAPI	Secondary Master	HITACHI DVD-ROM
02	ATA	PCI IDE 0 Master	IC35L040AUUN07-0
03	ATA	PCI IDE 0 Slave	IBM-DTLA-307020
04	SCSI	Host 0 - ID 0	IBM-DDYS-T18350M

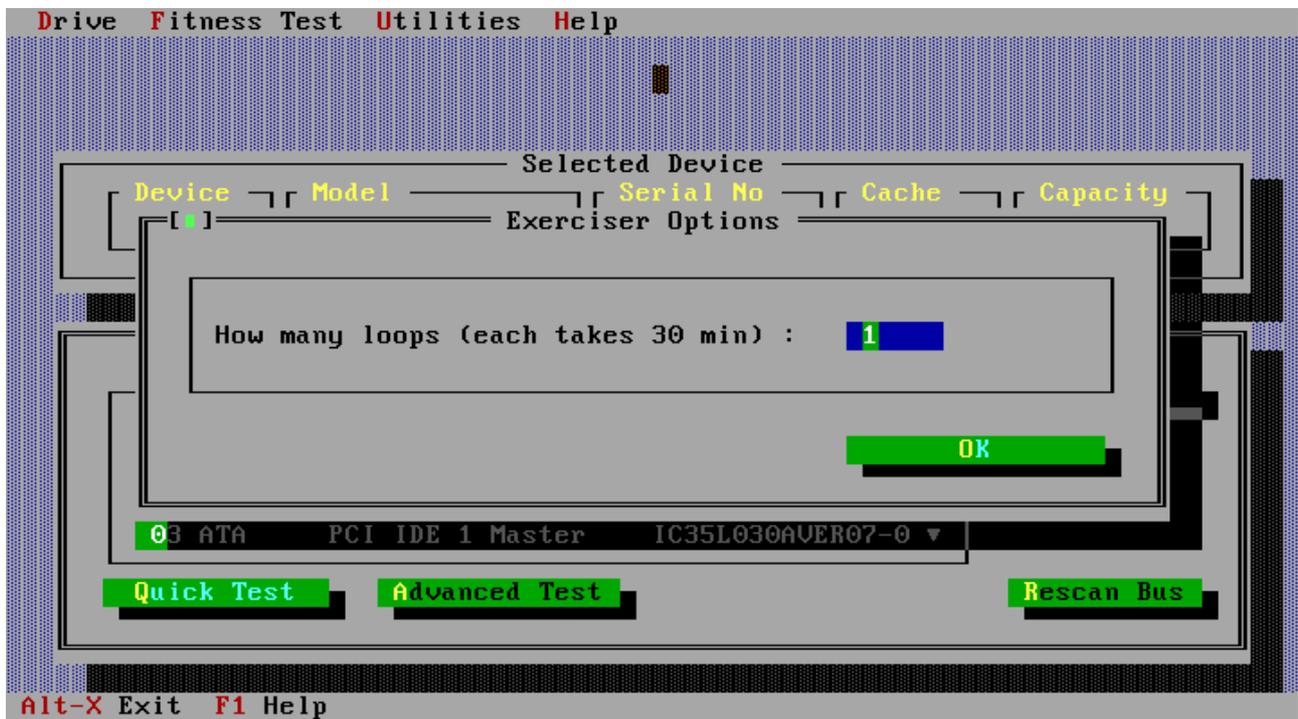
Alt-X Exit F1 Help | Locate and select a drive for testing

The **Exerciser test**, as shown in the next screen, can be accessed from the menu or by using the hot key combination Alt+E.

No	Device	Address	Device Name
00	ATA	Primary Master	IC35L020AUUA07-0
01	ATAPI	Secondary Master	HITACHI DVD-ROM
02	ATA	PCI IDE 0 Master	IBM-DTLA-307020
03	ATA	PCI IDE 1 Master	IC35L030AVER07-0

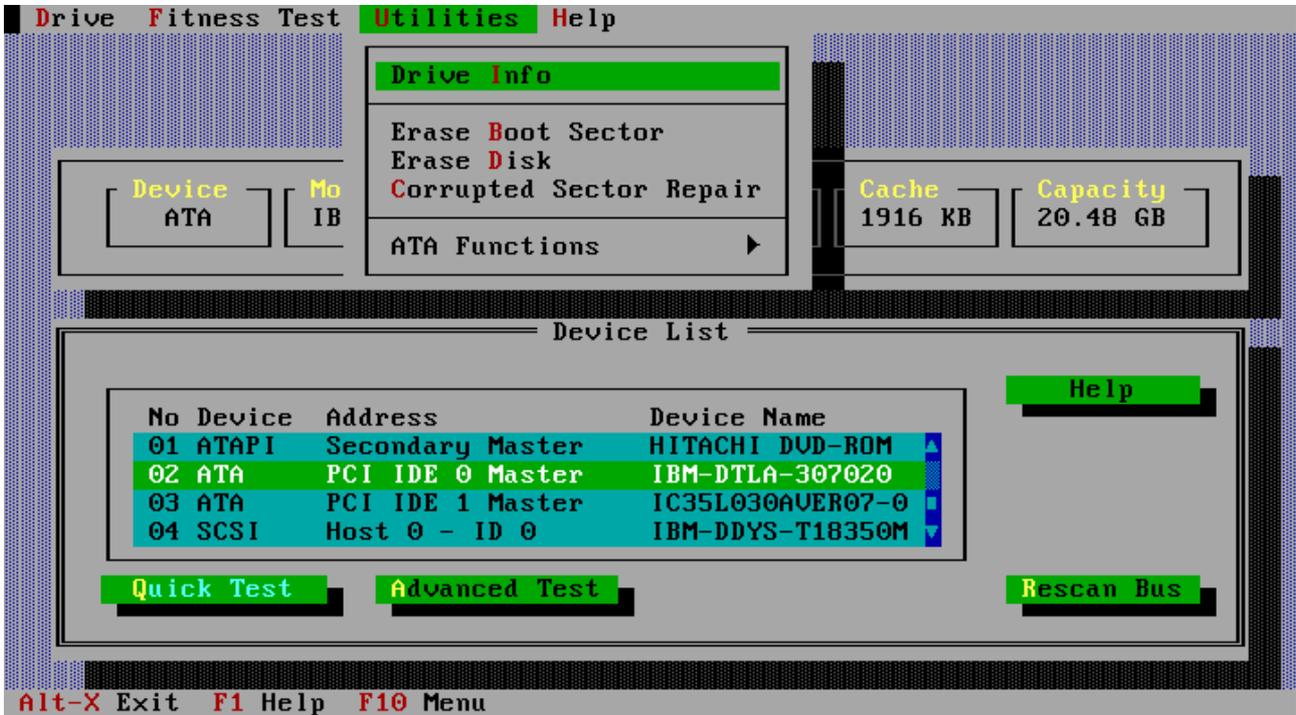
Alt-X Exit F1 Help | Perform a Exerciser

The Exerciser is basically the **Advanced Test** with the addition of a number of 30-minute drive tests. The number of 30-minute periods is set in the following screen. The pass / fail / abort mechanism are similar to that of Quick Test.

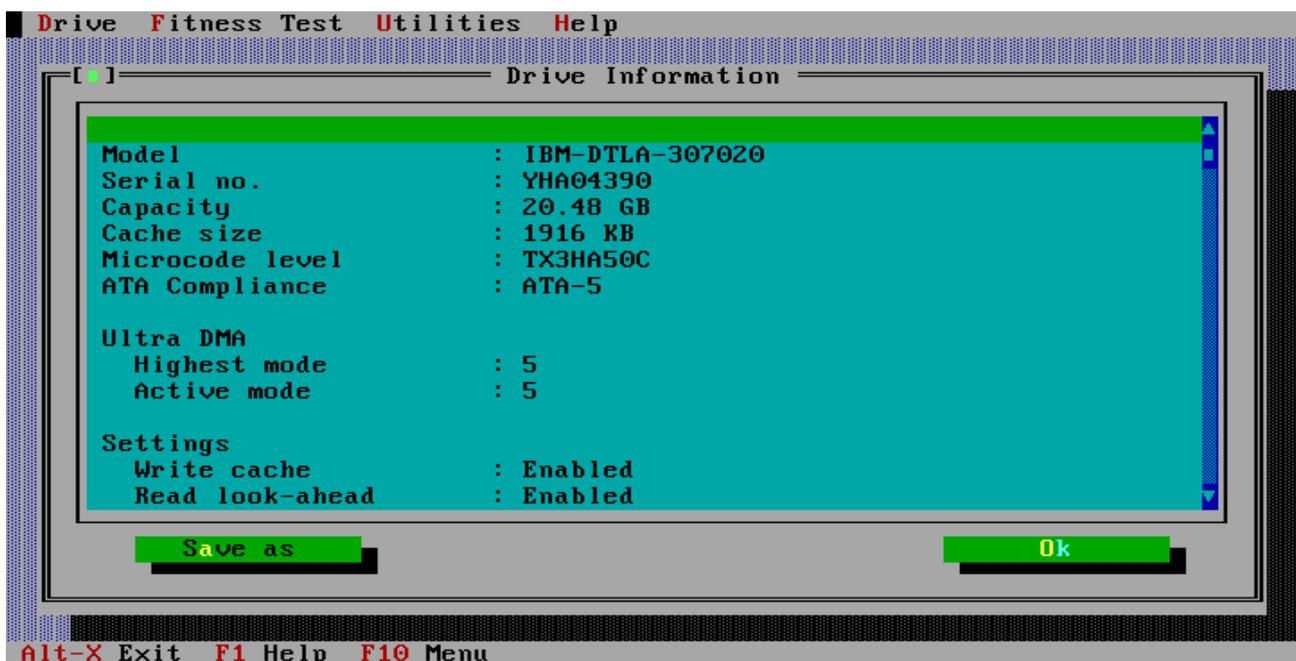


Utilities

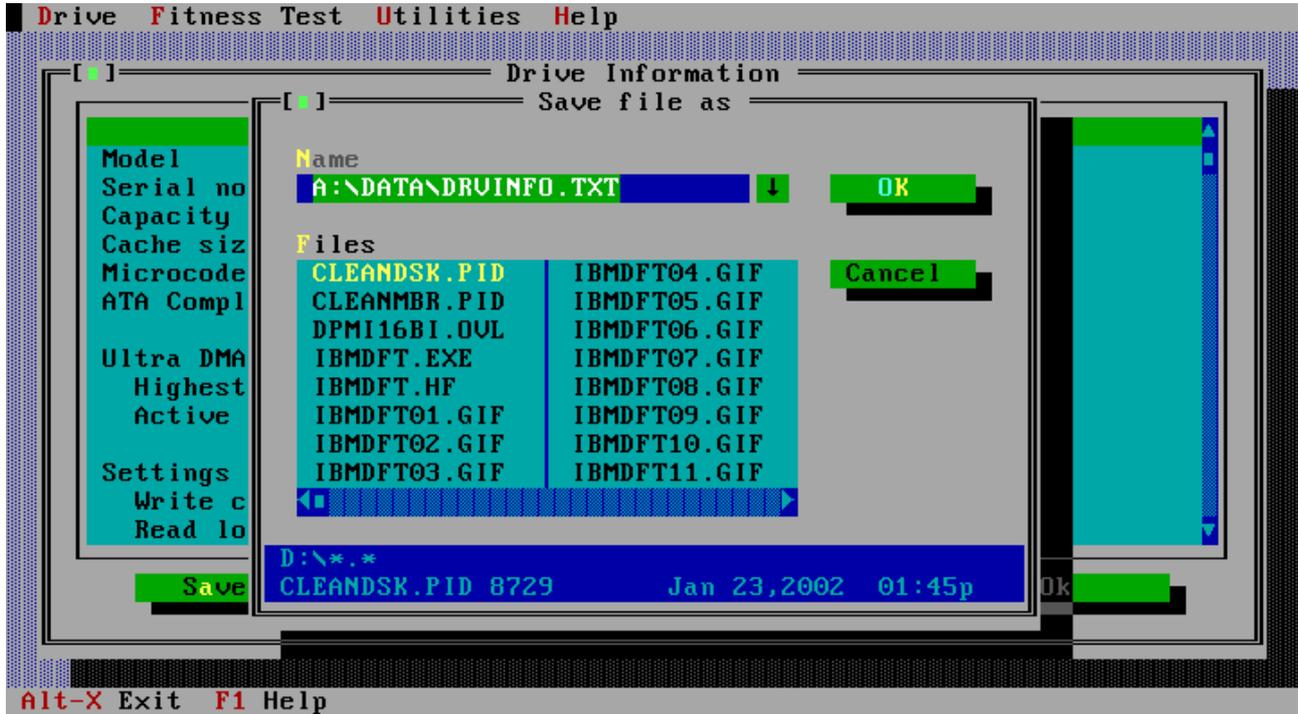
The Utilities menu as shown below, gives you access to several useful tools. These should be used with CARE, for unlike the test described earlier the [Erase Boot Sector](#), [Erase Disk](#) and [Sector Repair](#) utilities **WILL** permanently erase data from your drive(s).



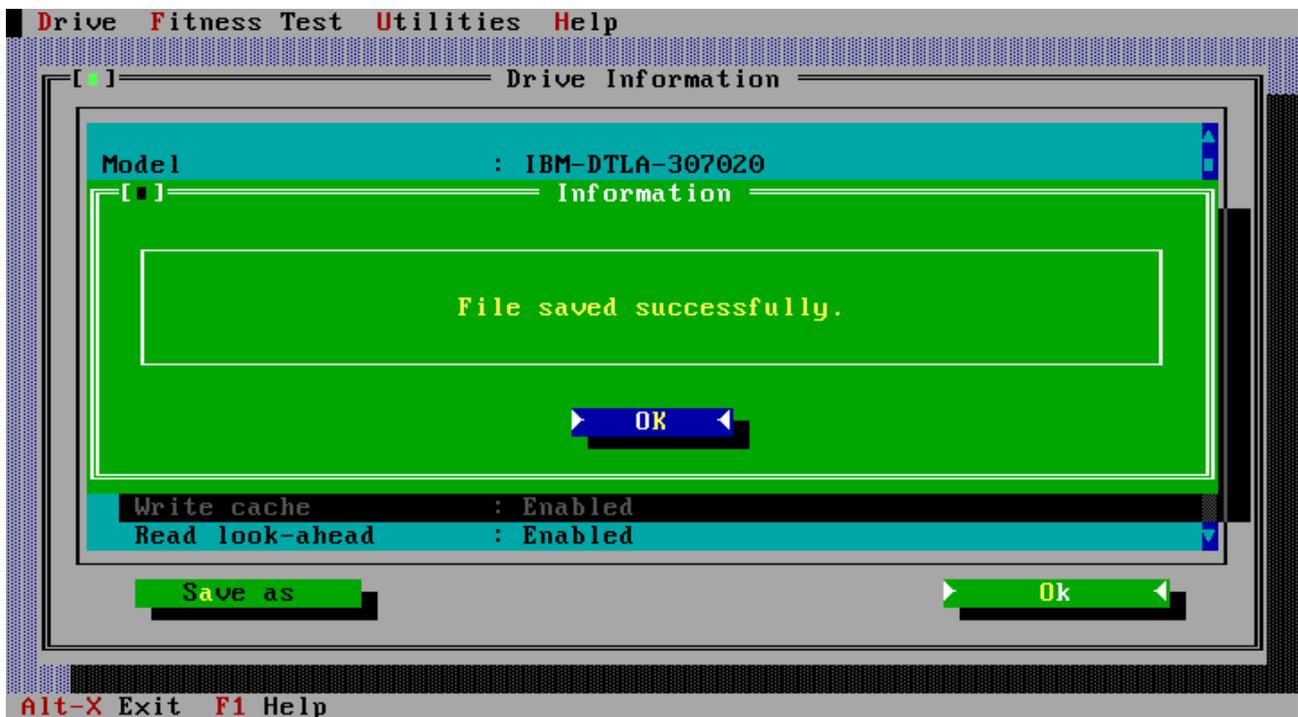
Selection of the **Drive Info**. Option as shown above will display useful information about the selected drive, see following screen. This information could be useful if you need to report a problem back to your drive supplier or Hitachi.



The drive information displayed above can be saved to a text file in the **DATA** sub-directory on the floppy drive. The default name of the text file is **DRVINFO.TXT** as shown below, you can change the filename by over typing this name with, for example, the drive serial number.



The following screen will be displayed to confirm that the file has been saved.



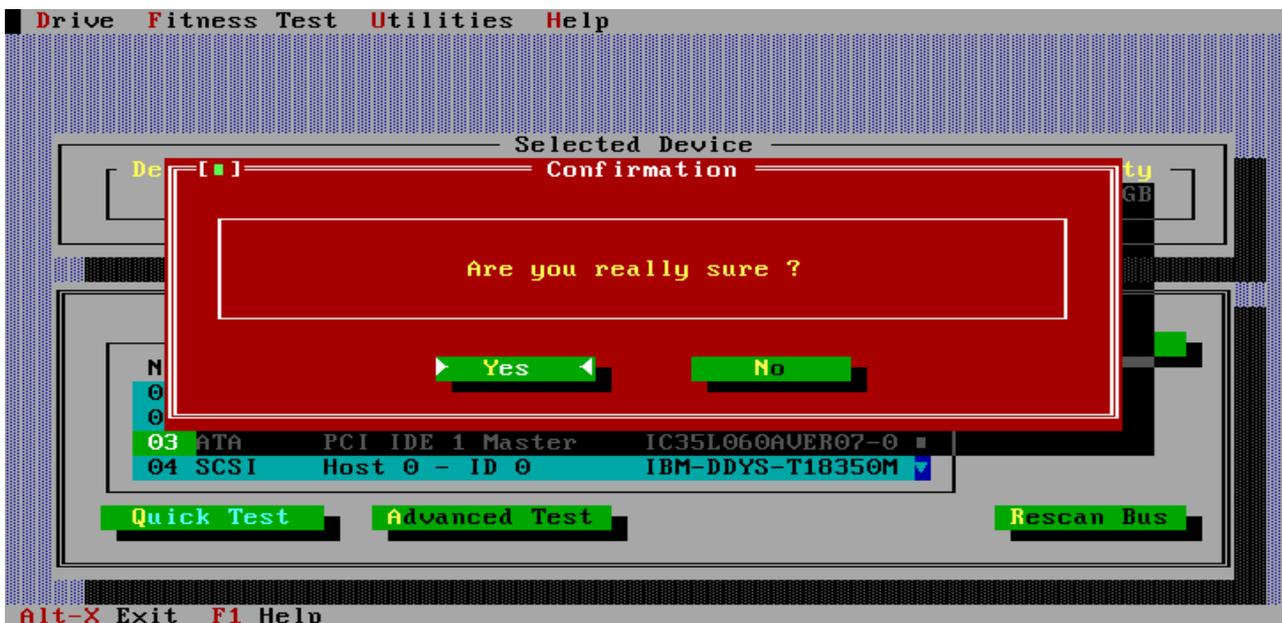
Erase Boot Sector

The boot sector of a disk contains the start-up programs for your operating system, it also contains information about how your disk is partitioned. If this sector becomes corrupted in any way and this is your boot drive you may not be able to start your system or access data on the drive. Re-installation of your operating system in a small number of cases may not fix the problem, for these cases you will need to erase the boot sector, partition the drive and re-install your operating system.

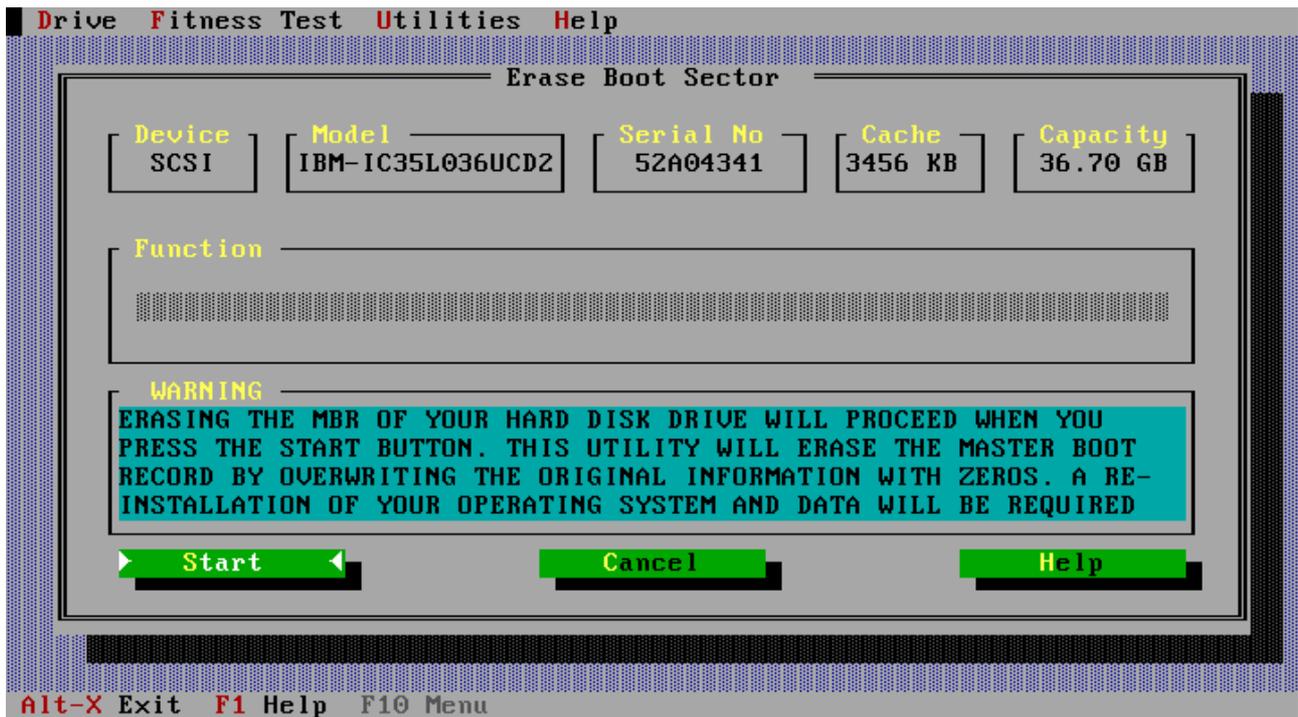
This utility will erase the boot sector by over writing the original information in this sector with zeros. It can be used with both IDE and SCSI drives.



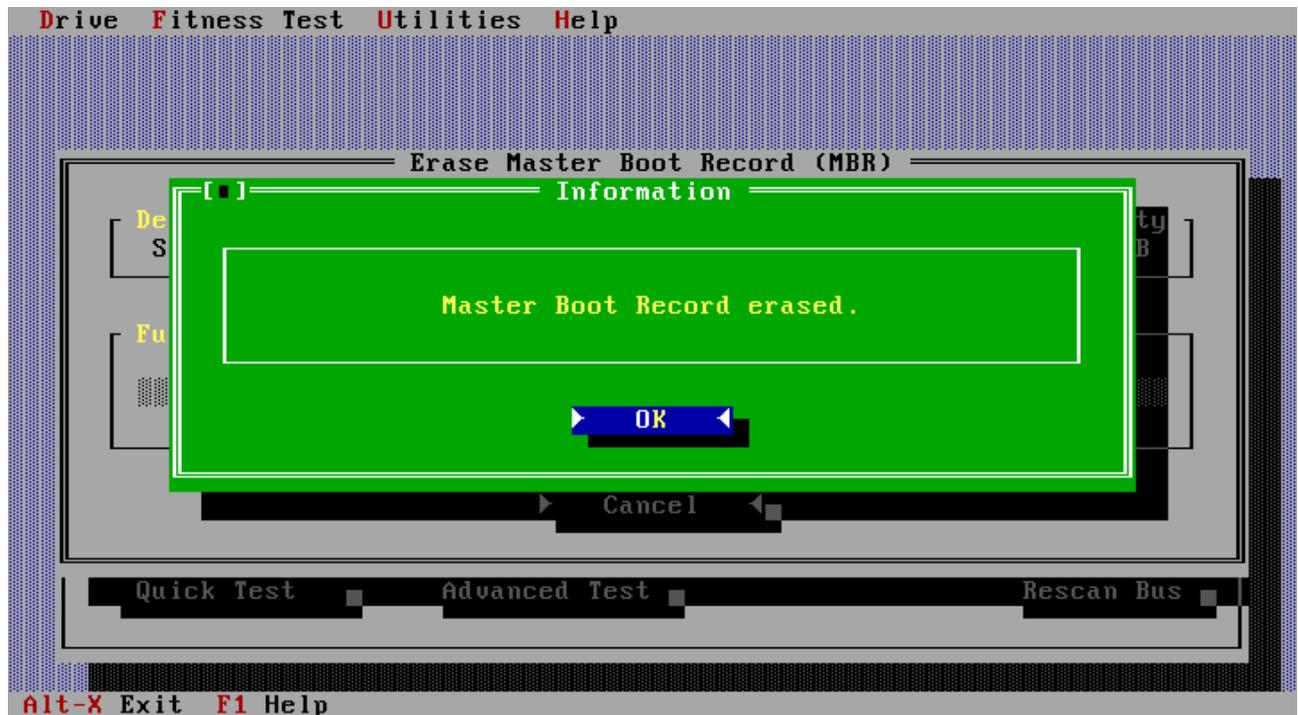
Selecting Erase Boot Sector from the Utilities menu above will display the following screen. This utility will overwrite data on your hard drive, to ensure that you really wish to do this you will be presented with several confirmation screens as shown below, select YES in each case to continue.



When the following screen is displayed press the start button to erase the master boot sector.

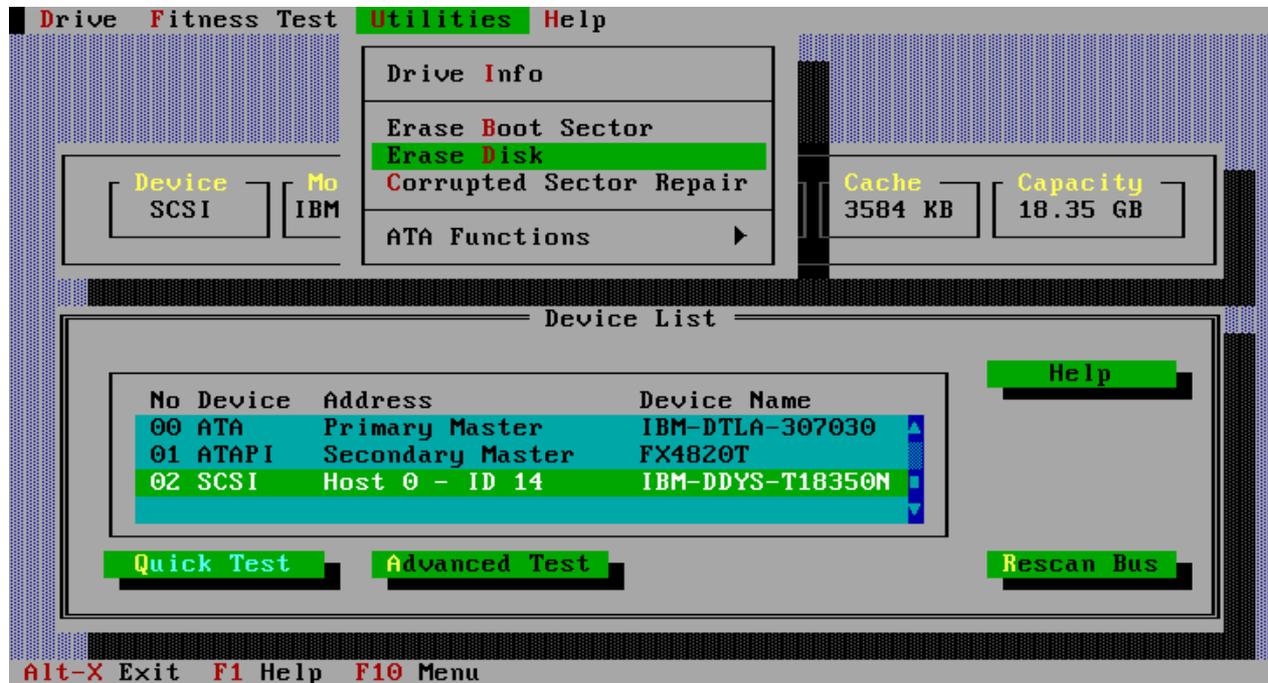


The following screen will be displayed when the operation has been completed successfully.



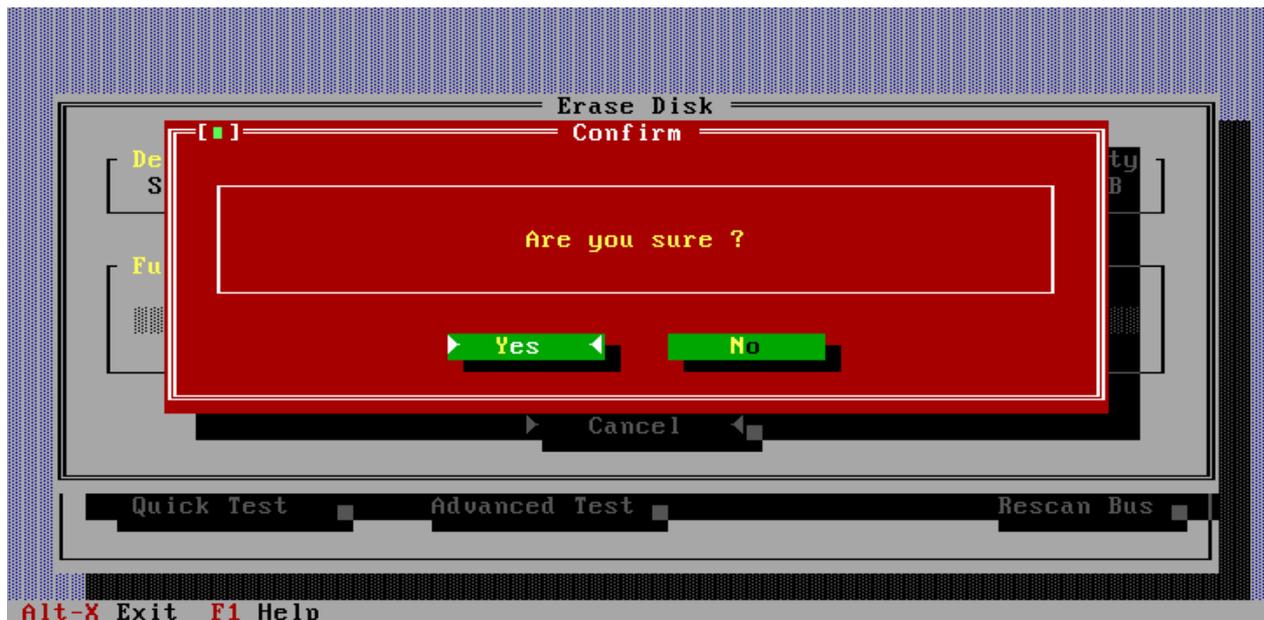
Erase Disk

This utility will write zeroes to every sector of your hard drive including the boot sector, and can be used with both IDE and SCSI drives. This utility is meant to be used to clean-up disk which have errors written to the media (e.g. where a system has been powered off whilst writing data out to the drive). This utility can take a long time to run (more than an hour) depending on the capacity of the drive and the system configuration.

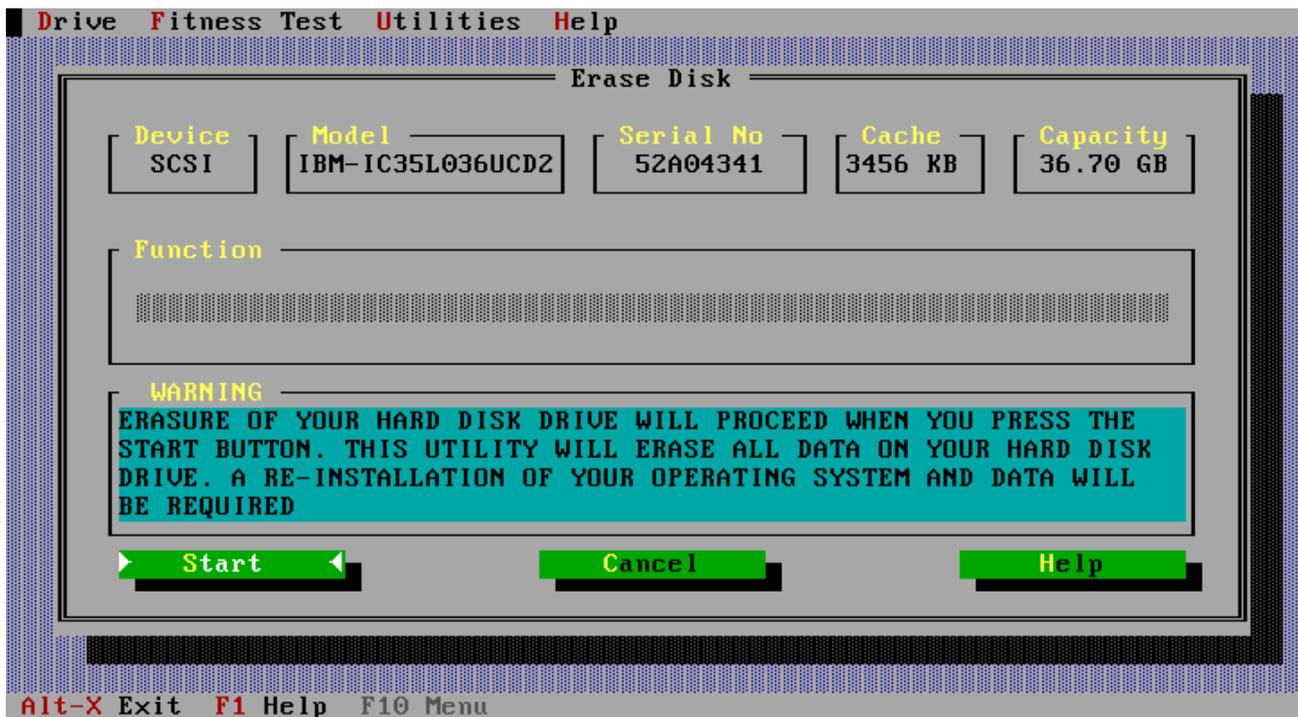


Selecting Erase Disk from the Utilities menu above will display the following screen

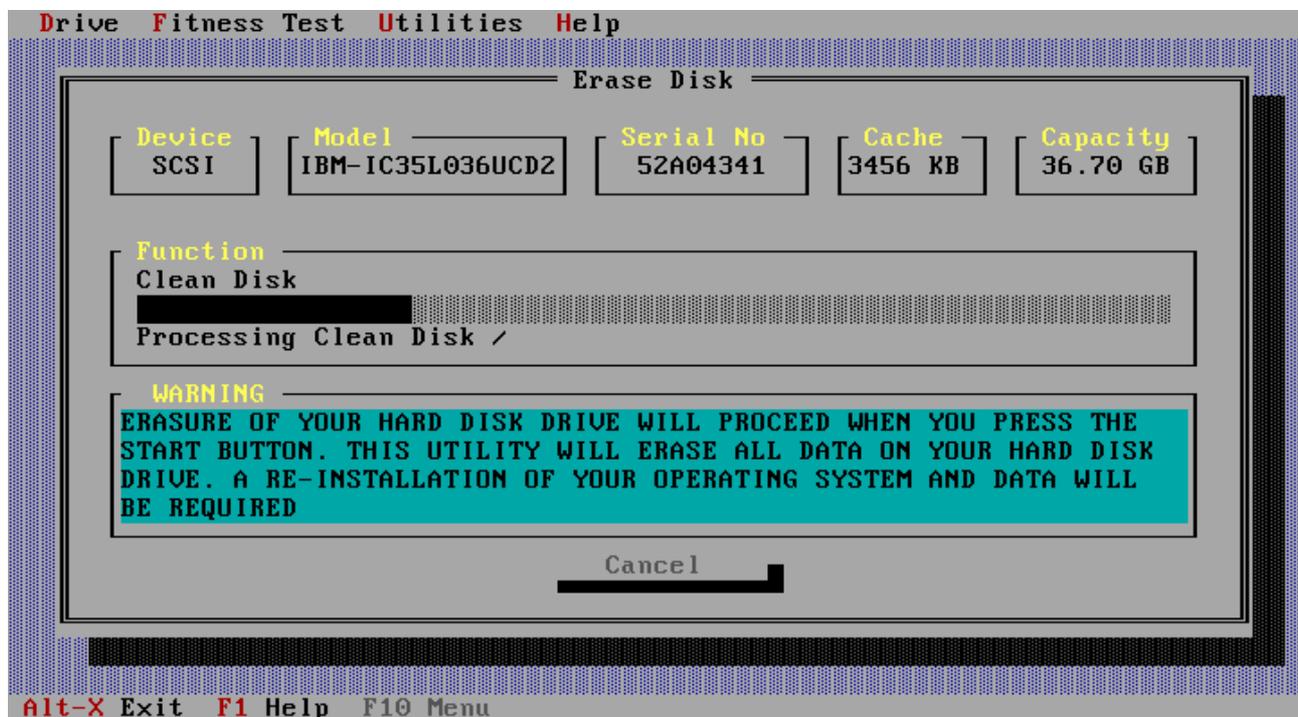
As with the Erase Boot Sector utility, Erase Disk will overwrite data on your hard drive, to ensure that you really wish to do this you will be presented with several confirmation screens as shown below, select yes in each case to continue.



When the following screen appears, pressing the start button will result in your hard disk drive being erased.

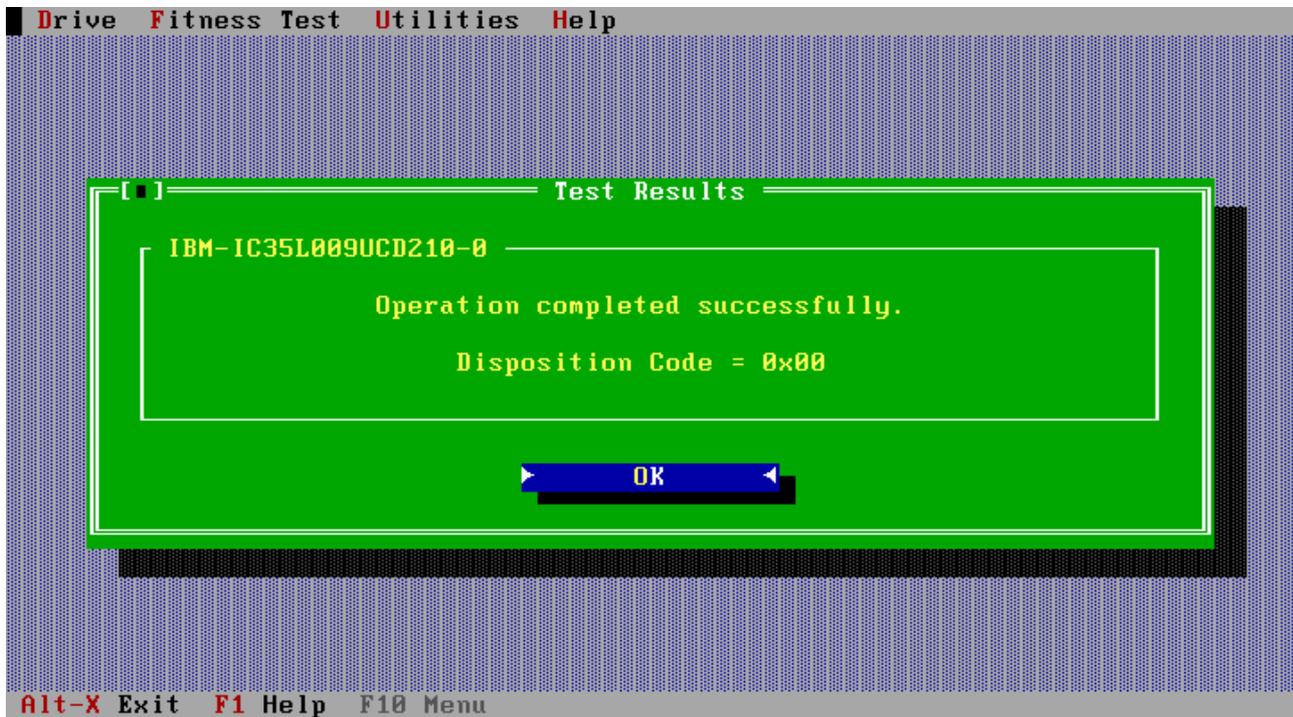


Progress will be illustrated as shown below, note there may be a small delay before the progress bar is updated.



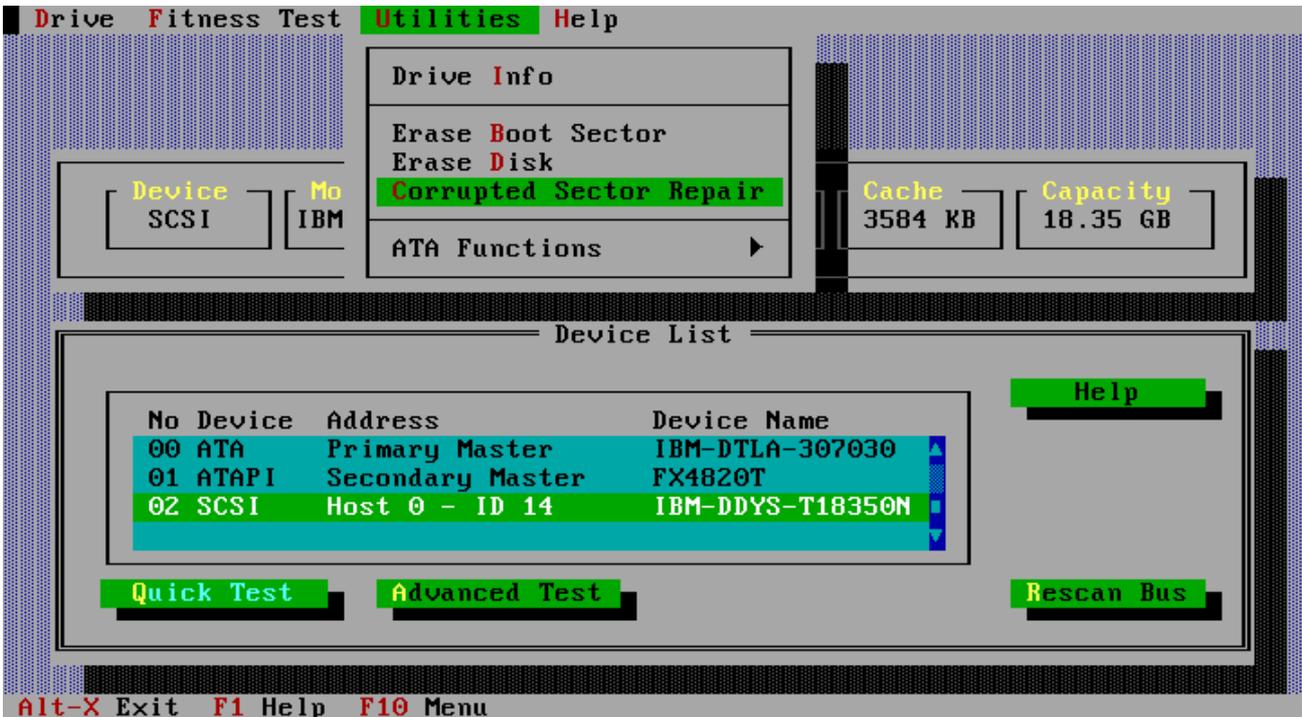
After completing the erasure of the disk a sequential read of the disk is carried out to verify that all sectors have been initialised.

The following screen will be displayed when the operation has been completed successfully.



Sector Repair

This option is used primarily to allow the recovery of sector(s) of the disk that have become corrupt, without the need to completely delete all the data already stored on the disk and re-installing the operating system. The sector repair utility is only supported for IBM disk drives and can be launched manually from the Utilities menu as shown below or as a result of DFT finding corrupted sectors on the drive during testing. The sector repair option with filename to LBA translation is supported for each of the following partition types, FAT16, FAT32 and NTFS.



By selecting the repair sector option you are instructing DFT to initialise all sectors it identifies as corrupt. The initialisation process involves over writing the corrupt sector(s) with zeroes.

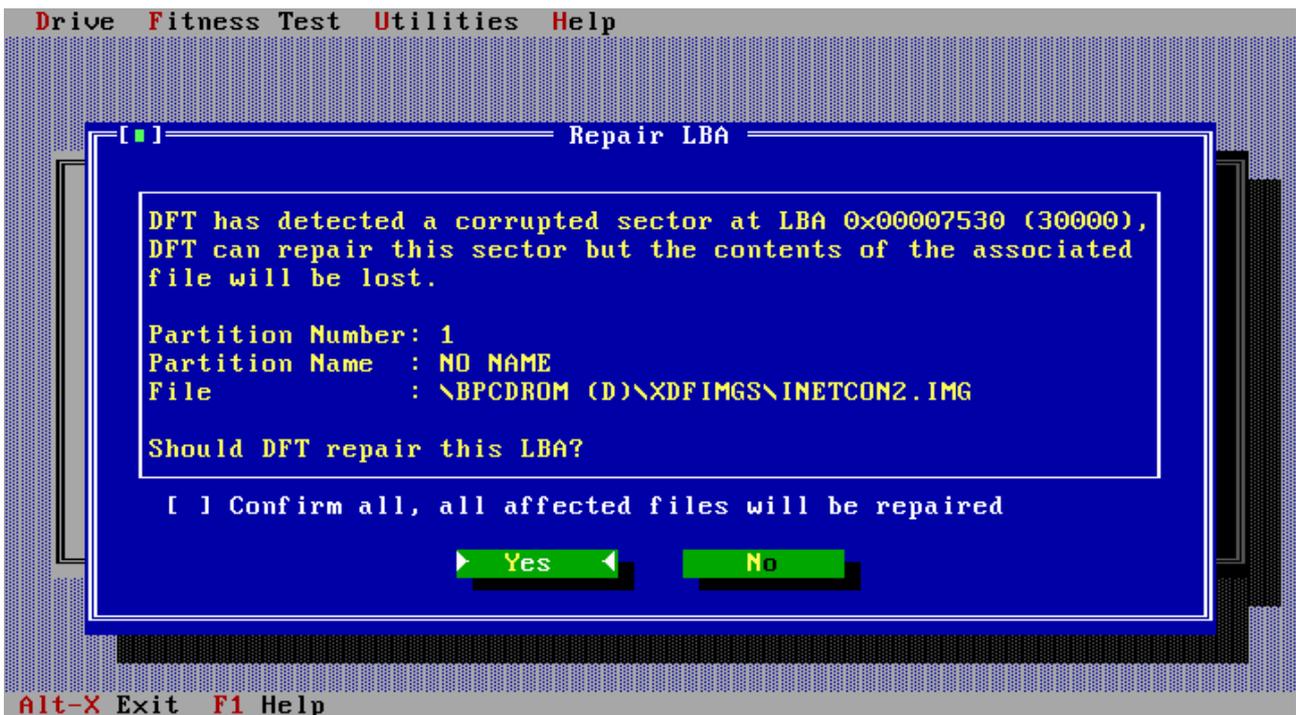
WARNING: The sector repair operation is not doing data recovery, any data that was stored in the repaired sector(s) will be lost.

During normal testing when DFT finds a sector of data on the drive that it cannot read the option to repair that sector will be given (see screen shot on page 14). If you choose to repair the sector(s) and that sector is in a supported partition type (see above) DFT will identify the filename that the sector(s) belongs to, see screen image A below.

These filenames will be logged in a file called <SerialNo>.txt in the data sub-directory on the A-drive where **SerialNo** is the serial number of the tested drive. After the sector(s) have been repaired you will need to re-installed or copy the noted files back to the hard disk as the original files on the disk will now not function or contain incorrect data.

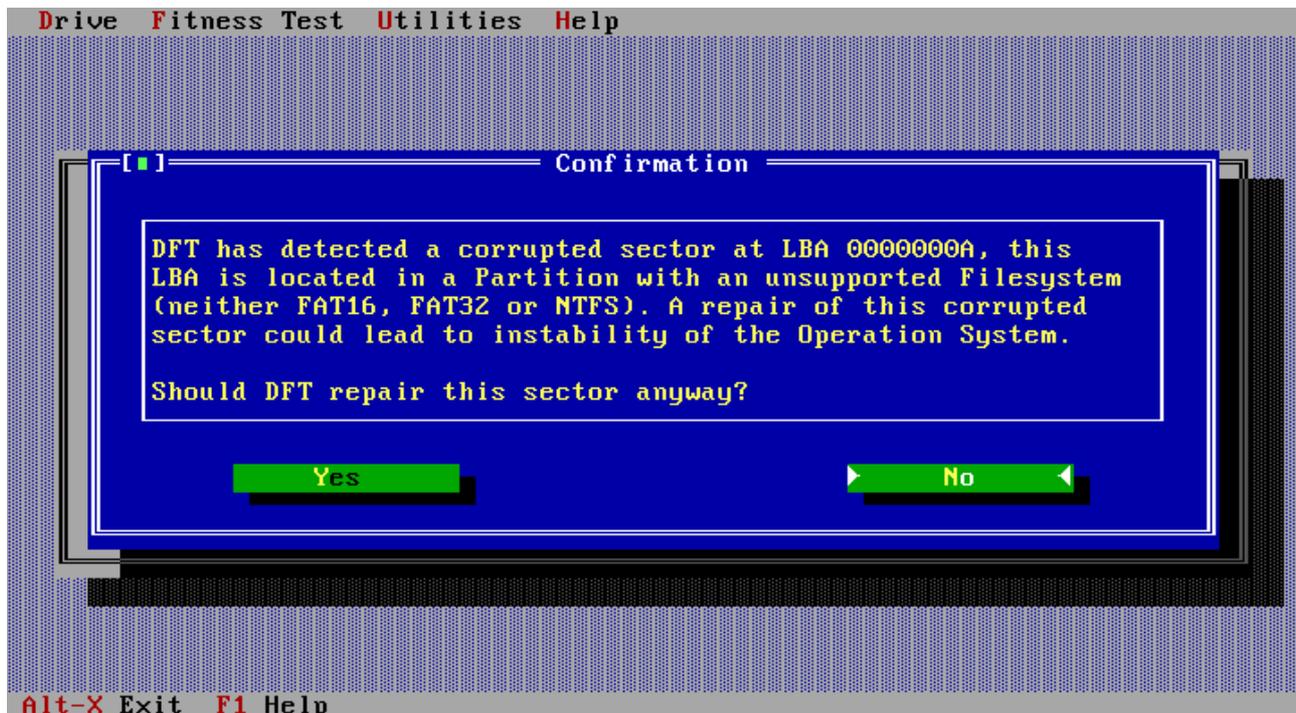
If you choose to repair the sector(s) and that sector is in an un-supported partition type (i.e. ext2fs of Linux, HPFS of O/S2), DFT is not capable of identifying the filename that the sector(s) belongs to. You **will** still be offered the option to repair the sector(s), see screen image B below, but you will have an unidentified file with corrupted data.

A. Corrupted Sector in supported partition type.

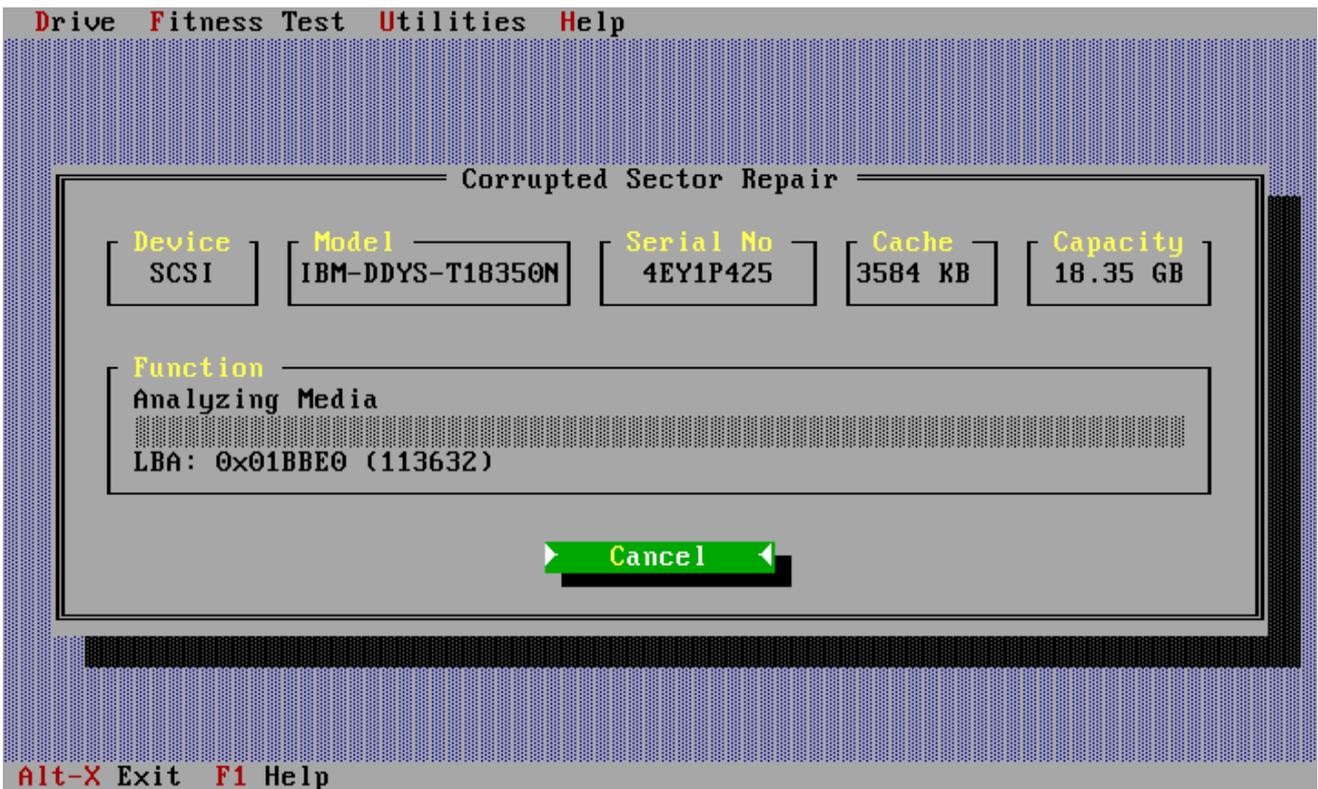


If a check mark is placed in the “confirm all” check box, DFT will automatically correct all correctable corrupted sectors on the disk without further prompt request. All files which have had corrections made to them will be logged in the repaired.txt file on the “A” drive. The check box is reachable by use of the “Tab” key

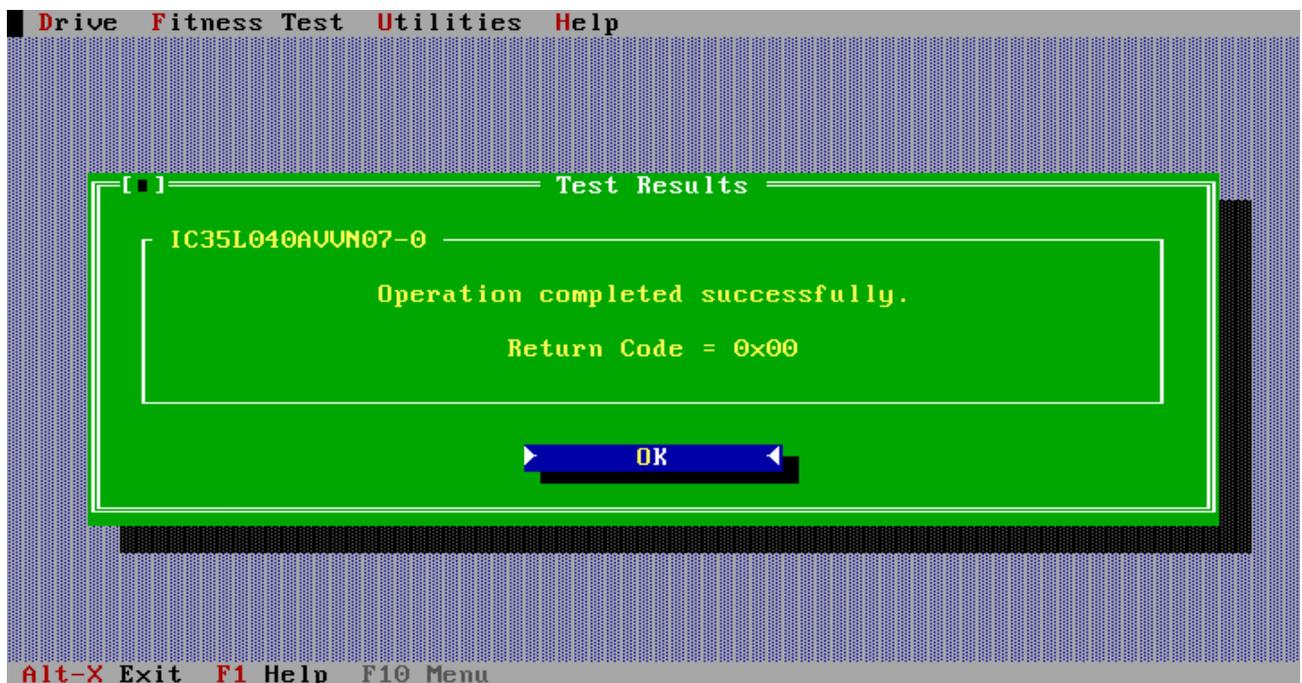
B. Corrupted Sector in un-supported partition type.



The screen below shows DFT performing an analysis of the media as part of the sector repair function.



On successful completion of the sector repair operation a screen similar to that shown below will be displayed.

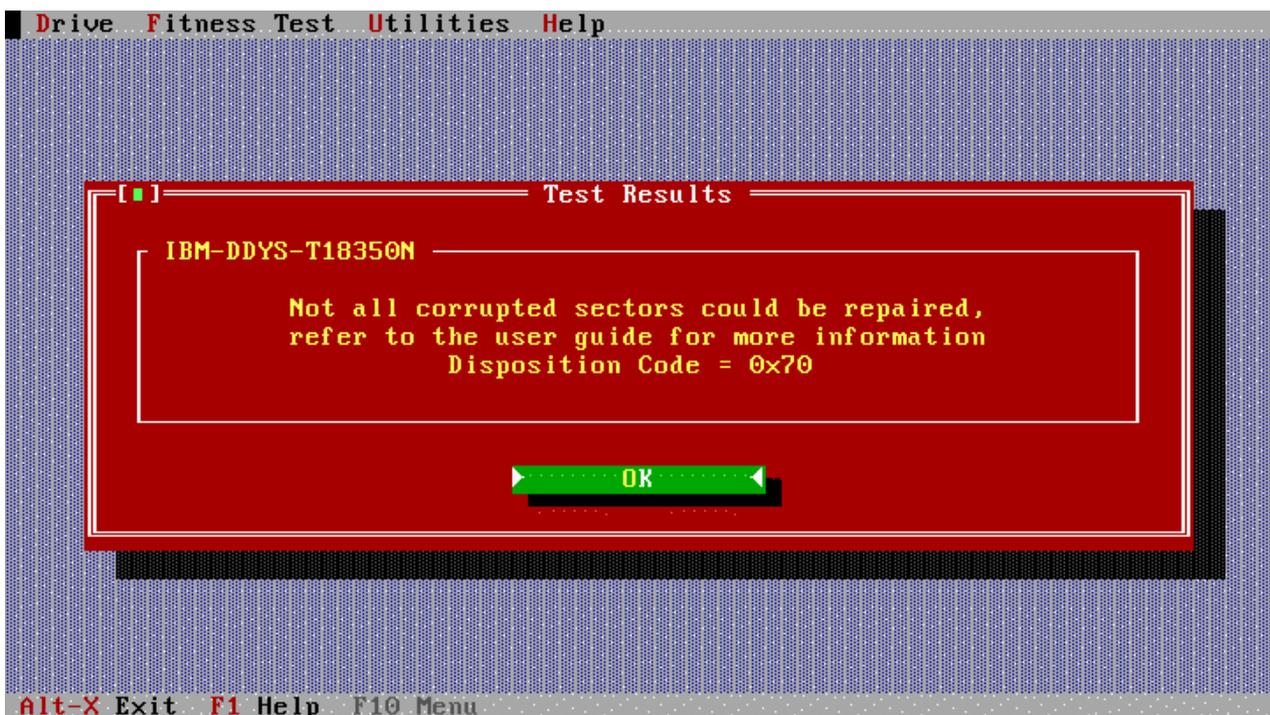


FAT & System Files

If the area of your disk which has become corrupted is the FAT table or contains System Files i.e. files required for your system to boot, DFT will not attempt to repair these files (sectors) as any repair may result in the system becoming unstable or non-functional. In these cases you will be presented with a screen similar to that shown below. If you haven't already done so you should backup all your required data and then re-run DFT but this time select and run Erase Disk from the utilities menu.



If for any reason, other than those stated above, DFT cannot complete the sector repair operation then the following test failure screen will be shown.



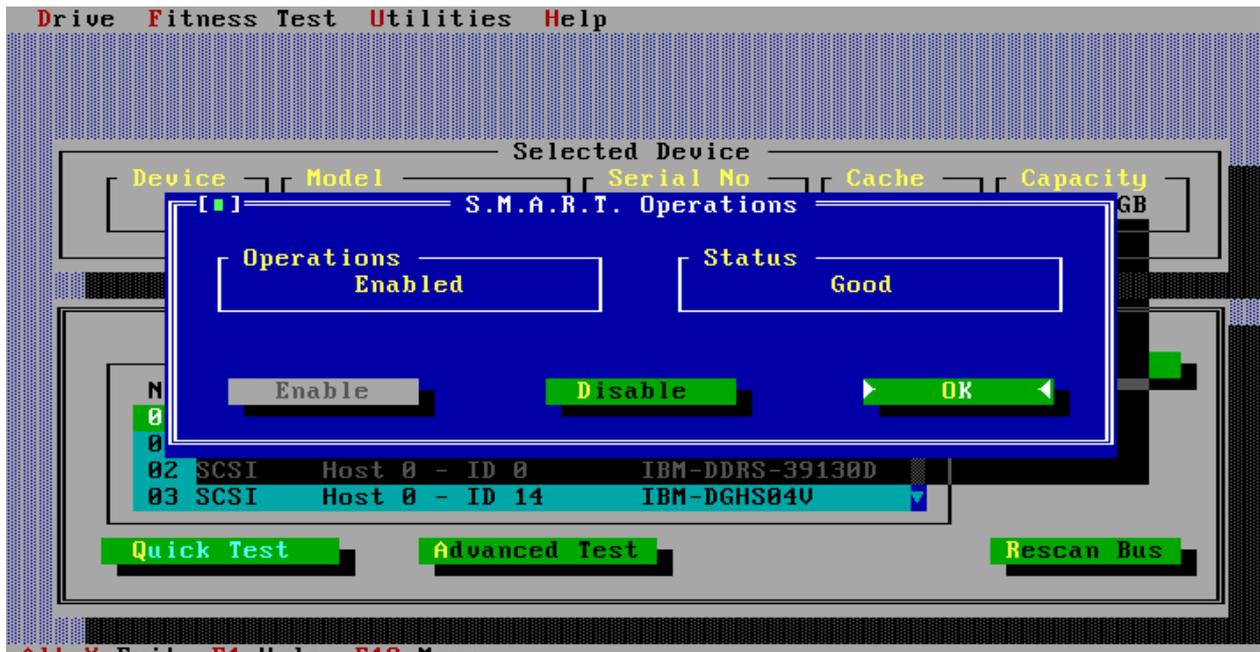
ATA Functions

S.M.A.R.T Operations.

S.M.A.R.T. - Self-Monitoring, Analysis and Reporting Technology is intended to protect user data and prevent unscheduled system downtime that may be caused by predictable degradation and/or fault of the disk device. By monitoring and storing critical performance and calibration parameters, S.M.A.R.T. devices employ sophisticated data analysis algorithms to predict the likelihood of near-term degradation or fault conditions.



To enable/disable S.M.A.R.T., select S.M.A.R.T. Operations from the utilities menu as shown above, S.M.A.R.T. can now be enabled or disabled on the selected drive by selecting enable/disable as shown below.



Error Code and first aid for your drive

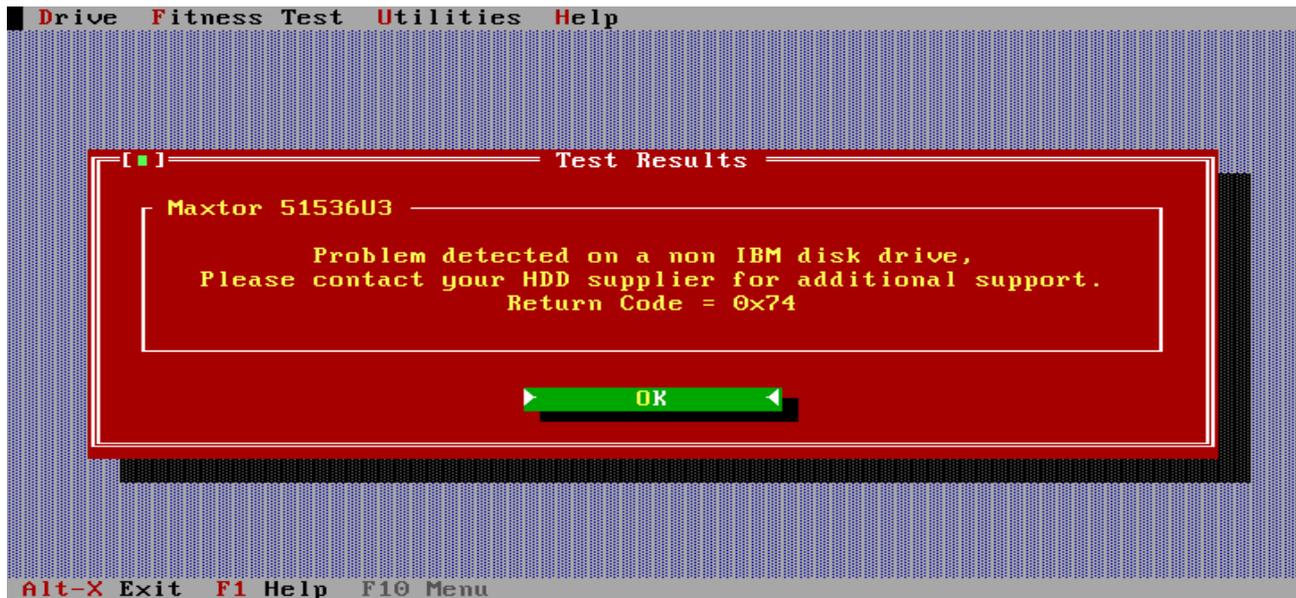
The following table defines all the currently supported DFT error codes. For example if during testing of your hard drive DFT reports a error code of 0x70 as shown on page 14, this indicates that your hard disk drive has problems reading one or more of its sectors. In most of these cases the drive can heal itself of these errors. To do this first back-up all your data from the problem drive (if possible) then run DFT again and select either the Erase Disk or Sector Repair option which is under the Utility heading. If you already have a backup of the data on the hard disk or the data isn't important you can opt to run Erase Disk/Sector Repair from the Test Result screen. Once the selected operation has completed you can then run one of the test options Quick or Advance to confirm that the drive has been healed. The result code, which should be displayed, is 0x00 if the test returns another code then you should check with your drive/system vendor if the drive can be return for warranty replacement.

Codes	Description
0x00	No Error Command complete successfully.
0x10	Test aborted by user. The current test was cancelled by user and cannot be completed. Rerun the test to conclusion
0x20	Selected device not present. The selected device could not be found on the selected port. Check cabling and HDD connectors. If the drive is not seen by the BIOS or is not spinning
0x21	ATA Master device not present. An attempt was made to test an ATA Slave device, but an ATA Master can not be detected. A Master must be present to test a Slave. Check cabling and HDD connectors.
0x22	Device Protected, Selected device is protected by a password. The drive is write and read protected and cannot be tested
0x23	Format Degraded. A SCSI low level format was interrupted.
0x30	Out of memory. There's not enough memory to execute this program.
0x31	Wrong parameter. There is a wrong or unknown parameter.
0x33	Function can not be executed on this device.
0x40	System interrupts the current operation. The System has interrupted the current operation, and the function was aborted. Please exit the program and check if any Power Saving Modes or Cache Programs (like SMARTDRV.EXE) are active. Disable those features and start this program again.
0x41	Bad cable. A data miss compare was detected during the cable test.
0x42	Drive temperature problem. The drive has exceeded the drive temperature limit
0x43	Pending SCSI request. The ASPI Device driver could not complete the SCSI request block. Check the SCSI configuration (cabling, termination, Ids etc.).
0x44	System Vibration The level of vibration that the drive is experiencing is excessive, check the mounting of the drive in the system and ensure it is rigidly mounted. If possible try mounting the drive in a different position.
0x45	Low System Performance
0x70	Corrupted Sector. A general hard disk drive problem was detected. You can run the "Erase Disk" utility. If a subsequent test fails again, the drive is defective and should be replaced.
0x71	Device not ready. The selected drive is not ready for operation. Check cabling and HDD connectors.
0x72	Device S.M.A.R.T. Error. The Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T.) has detected a drive problem. The drive may fail soon and should be replaced as soon as possible.
0x73	Device damaged by shock. This device was damaged by an excessive shock
0x74	S.M.A.R.T Self-test failed An error was detected during S.M.A.R.T. self-test. You can run the "Erase Disk" utility of DFT. If a subsequent test fails again, the drive is defective and should be replaced
0x75	Defective Hard Disk Drive Component

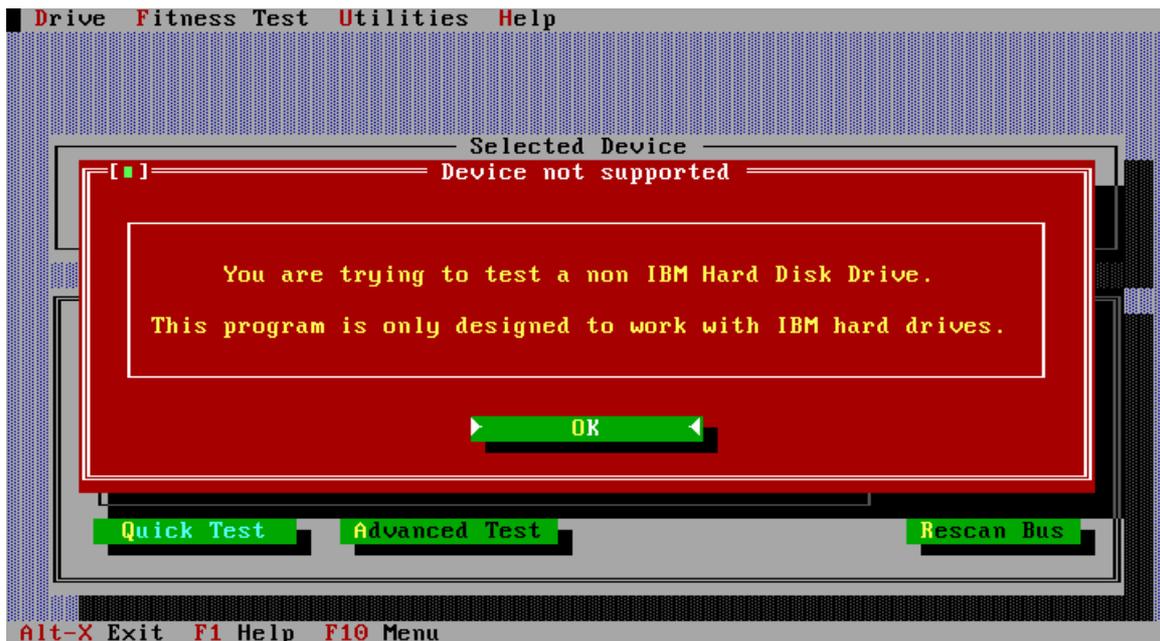
Testing of Non-Hitachi/IBM Hard Disk Drives

DFT supports testing of hard disk drives, which were not manufactured by either Hitachi or IBM. Due to vendor specific design parameters the depth of testing, which will be carried out on these non-Hitachi/IBM, drives will be less than that performed on the Hitachi and IBM drives.

Should DFT detect a problem with the drive, you will be presented with a result screen similar to that below. The recommendation is that you obtain a test utility specific to your drive from your drive manufacturer or your system supplier. Use this utility (if one is available) to re-test your drive, these utilities may also provide information, which you will require should you need to replace the drive under warranty.



Running the Erase Disk, Erase MBR or Partial Sector Repair functions on non-Hitachi/IBM disk drives is not supported by DFT. The screen below will be displayed if you attempt to run either of these functions on a non-IBM hard disk drive



Supplied ASPI Managers

The following ASPI managers are supplied with the DFT Utility and provide support for the listed SCSI Controllers.

ASPI Manager	Version	Supported Controllers
ASPI2DOS.SYS 02-12-98	3.68	<ul style="list-style-type: none"> • Adaptec AVA-1502P,1502AP • Adaptec AVA-1505 • Adaptec AVA-1515 • Adaptec AHA-1510/1520/1522 • Adaptec AHA-1510A/1520A/1522A • Adaptec AHA-1510B/1520B/1522B • Adaptec AHA-1530P/1532P • Adaptec AVA-1502AE/AI,AVA-1505AE/AI,AVA-1505AES • Adaptec AIC-6260/6360/6370 based SCSI host adapters • Adaptec AVA-2825 host adapter
ASPI4DOS.SYS 26-04-99	3.36S	<ul style="list-style-type: none"> • Adaptec AHA-1540B/1542B • Adaptec AHA-1540C/1542C • Adaptec AHA-1540CF/1542CF • Adaptec AHA-1540CP/1542CP
ASPI8DOS.SYS 02-12-98	1.35	<ul style="list-style-type: none"> • Adaptec 2940 family of PCI to SCSI • Motherboards with SCSI onboard – that uses Adaptec AIC-78XX and AIC-75XX chipset
ASPI8U2.SYS 06-12-99	1.07	<ul style="list-style-type: none"> • Adaptec Dual & Single Channel Ultra2 family of PCI to SCSI Controllers • Adaptec Dual & Single Channel ULTRA160 PCI to SCSI Controllers • Motherboards with SCSI onboard – that uses Adaptec AIC-7890 and AIC-7891 chipset.
ASPI8XX.SYS 08-02-2001	4.11.00	<ul style="list-style-type: none"> • Symbios SYM8751SP Single ended Controller • Motherboards with SCSI onboard – that uses Symbios 53C875J chipset. • Tekram DC-390U/W/F/U2 and DC-310/U, DC-390U3W
DPTDDL.SYS 31-03-98	003.EH	<ul style="list-style-type: none"> • DPT PM3334UW Single Channel Raid Controller
ISPI610.SYS 16-04-97	1.04	<ul style="list-style-type: none"> • Initio INI-6100 / 6102 SCSI Controllers
ISPI910.SYS 05-04-97	2.01	<ul style="list-style-type: none"> • Initio INI-9100 / 9100W SCSI Controllers • Initio INI-9XXXU / 9XXXUW SCSI Controllers
BTDOSM.SYS 26-04-99	4.30	<ul style="list-style-type: none"> • BusLogic BT-946C
ADV3550.SYS 24-04-2000	3.1F	<ul style="list-style-type: none"> • Advansys Ultra Wide ASPI Manager
ADVASPI.SYS 19-05-98	2.8N	<ul style="list-style-type: none"> • Advansys Universal ASPI Manager
ASPI320.SYS 05-09-02	d1.10	<ul style="list-style-type: none"> • Adaptec 39320D – Ultra320 Controller
EXPRESS2.SYS 18-07-02	01.01	<ul style="list-style-type: none"> • Atto UL4D – Ultra320 Controller

Troubleshooting

ASPI Manager Fails to Load

Note: Some implementation of SCSI on the Motherboard using the Adaptec AIC-7890 chipset will result in the ASPI Manager *ASPI8U2.SYS* (version 1.07), which is supplied on this DFT diskette, failing to load. Should this be the case and you are sure your SCSI controller is built around this chipset then you should replace the file *ASPI8U2.SYS* in the *A:\ASPI* sub-directory of the diskette with the *ASPI8U2.SYS* which should have been supplied as part of the software support package for your hardware.

Drives Attached to PCI IDE Adapter not seen by DFT

If using a Plug-in PCI IDE adapter that uses the Highpoint HPT366 or the HPT370 chipset in some systems DFT will fail to detect drives attached to this adapter. To fix this problem ensure that the PCI IDE adapter BIOS is upgraded to the latest level. For example if using the EPUSB66 adapter then you will need to have BIOS level 1.25 or above.

BIOS updates can be obtained from the following web site: -

<http://www.highpoint-tech.com/drivers.htm>

Drives Attached to Extended ATA Ports not seen by DFT

Drives attached to the extended ATA ports of some motherboards which also implement Serial ATA may not be detected by DFT. Some motherboards use a common chip to control the extended parallel ATA port in addition to one or more Serial ATA ports when drives are attached the parallel port controlled by these chips DFT may fail to detect the drives, in these circumstances the drive to be tested should be connected to one of the standard ATA ports on the motherboard and tested. If DFT passes the drive then it can be reconnected to the extended ATA port to resume normal system operation.