

STUDY MATERIALS ON HARDWARE INSTALLATION AND MAINTENANCE

(As per the curriculum of fifth semester BSc
Electronics of M. G. University)

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DISK UTILITIES

Disk Utilities are readymade softwares available in the market to help the computer user in managing the disk/drive and to help in the data recovery in case of some failure of the normal disk/drive operation. Example:- PCTOOLS and NORTON Utilities. These programs are useful to undelete accidentally deleted data, unformat accidentally formatted floppy and to recover from data corruption due to ill behavior of some software or some computer virus. New versions of Dos provide some of these facilities but these programs provide the same facilities with a lot more speed, accuracy and with additional options.

PCTOOLS

This package provide facility for:-

- ✓ **Data recovery** – using the programs like **DiskFix, FileFix, Unformat** etc.
- ✓ Unfragementing the disk – using programs like **COMPRESS, DiskEdit** etc.
- ✓ **Detecting and removing viruses** – using the antivirus program **CPAV** (removes around 1400 viruses)
- ✓ **Searching, changing, adding, renaming, deleting and moving directories-** using the **Directory Maintenance** program.
- ✓ **Searching files** using **FileFind**
- ✓ **Providing information about your computer** hardware, operating system and version, memory type and size and system speed – using the **System Infomation (SI)** program.

☐ **DiskFix**

Command:-

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C:\PCTOOL\>DISKFIX
```

Most useful program – can recover the data from very serious damages.

DiskFix should be used regularly to detect and prevent potential problems.

This program can do

- Repair most of the disk problem
- Thoroughly scan the disk surface for defects and damaged data, removing defective sectors and moving recoverable data to a safe location
- Recover lost cluster chains, including directories which CHKDSK cannot do
- Detect sectors going bad
- Low level format a disk that DOS cannot read or write properly without destroying any data.
- Detect viruses hidden in system areas.

Main Menu:-

The main menu of the DiskFix has the following options

- Repair a Disk
- Surface Scan
- Revitalize a Disk
- Configure Options
- Undo a DiskFix Repair
- Advice

Repair a Disk: When this option is used, DiskFix analyzes the DOS file system by doing a series of tests and lets you repair errors in the FAT, Root Directory and Subdirectories. After all tests and repairs are completed, you can send a disk error report to the printer or save it as a file.

Surface Scan: Here the DiskFix scans the disk surface looking for defects in the disk media by reading and writing all the data in the drive. Whenever a defect is found, it is marked 'bad' in the FAT so that, the DOS will no longer use that area to store data.

When you choose the Surface Scan, the Drive Selection dialog box appears. Once a drive is selected, the Pattern Testing Option dialog box appears so that you can select the number of test patterns to apply. After you choose a pattern testing option, the Surface Scan drive map appears and DiskFix begins to scan each track of the disk.

Revitalize a Disk: This option is used when the drive has recurring read and write problems. When we revitalize a disk, DiskFix performs a non-destructive format of the drive. During this process, DiskFix attempts to read, write and repair all the data on the drive.

Configure Options: This facility is used to configure the DiskFix programs for different environment.

The options provided are

- Test Partition Information - This should be always ON

- Check Boot Sector for Viruses - This should be always ON
- Look for Mirror File - When selected, DiskFix looks for a mirror file and compares it with both the FATs and finds which FAT has few errors
- Use BIOS Surface Scan
- Use Custom Error Messages
- Enable Manual Fix Option - If enabled; when DiskFix finds an error, it waits for the user to repair the error. If disabled, then DiskFix repairs the errors automatically.

Undo a DiskFix Repair: The Undo can be done, only if the original disk information has been saved on some disk, before the repair operation.

Advice: This is a help facility which describes various disk and file related problems you may encounter. This includes the error messages generated by the DOS and CHKDSK program.

□ **DiskEdit**

Using DiskEdit, one can view and edit any sector on the disk, including the partition table, File Allocation Table, Directories and Boot Record. DiskEdit shows these areas in hexadecimal representations as well as in their native format.

Command:-

C:\PCTOOL\>DE

Main Menu:-

The main menu of DiskEdit has the following options

- ➡ Select
- ➡ Edit
- ➡ Link
- ➡ View
- ➡ Info
- ➡ Tools

Select: When you choose “Select” from the main menu, you will get different options which are explained as follows:-

- Selecting a Drive
- Selecting a Directory
- Selecting a File
- Selecting Clusters
- Selecting Logical Sectors
- Selecting Physical Sectors
- Selecting a Partition Table
- Selecting the Boot Record
- Selecting 1st copy of the FAT
- Selecting 2nd copy of the FAT
- Selecting the Clipboard
- Selecting Memory
- Exiting DiskEdit

Edit: When you choose “Edit” you will get the following options:-

- Undoing Edits
- Marking a Block
- Copy to clipboard
- Paste from Clipboard
- Fill Block
- Set Date and Time
- Setting Attributes
- Writing changes to the Disk
- Discard Changes

Link: The sub-options available under Link are

- File – When you are in a FAT or Directory editor, “link to file” will take you to the file of which FAT or directory is being examined
- Parent Directory – When you are examining a logical sector or cluster, using this option you can jump to the directory entry of that file
- Cluster chain
- Cluster
- Partition – When examining a partition table of a hard disk you can jump to the first sector of the partition being examined

Window

View: Following are the sub-options

- Hex view – default view – show the objects as it is stored on the disk i.e. shows the ASCII code of the characters.
- Text viewer – displayed as text – editing is not supported in this mode.
- Directory view
- FAT view – FAT entry: either next cluster number in the file / EOF – Last cluster in the file / 0000 – available / xxxx – Bad cluster
- Partition Table view – some of the fields in the partition table view are
 - Boot Indicator – shows which partition will be the boot drive
 - System Indicator – indicates the type of partition i.e DOS-12 / DOS-16 / EXTEND / BIGDOS
- Boot Record view – The information stored in the Boot Record are
 - Bytes per sector: 512
 - Sectors per cluster: 4
 - Reserved sectors at the beginning: 1
 - FAT copies: 2
 - Root Directory entries: 512
 - Sectors per FAT: 200
 - Sectors per Track: 17
 - Sides: 16
 - Total no. of sectors: 254983
 - Volume Serial No.:
 - Volume Label:
 - File System ID: FAT 16
- Split Screen – divide the screen into two windows – for viewing/comparing/linking
- Switching Windows
- Resizing Windows
- Comparing Windows – Disk Edit does a byte-by-byte comparison of the objects in the two windows. If finds a mismatch it highlights it in the active window and positions the cursor on the mismatch byte

Info: Sub-menus under this option are

- Object Information

Drive Information – FAT type, No. of cluster/sector/head/track, Physical drive no.
Mapping Objects – When a file, directory or cluster range is selected, using this option, you can display a cluster map of the selected object. This map can be used to determine the position of the object on the disk and its degree of fragmentation

Tools: Following are the sub-menus

Search
Repeating a search
Recalculating Partitions
Resyncing FATs – make both the copies of the FAT identical
Writing Objects – to a file / cluster / sector ...
Printing Objects – in Hex / Text format, FAT / Boot Record / Partition Table format
Hex Calculator
ASCII Table
Configuring DiskEdit – options are
Read only
Sync FATs,- Whenever any change is made to one copy of FAT, it automatically change the 2nd copy
Auto view- Provides the most appropriate view of the currently selected sector/cluster
Hyper links – allows you to jump from one display to another by pressing Enter key
Quick exit

NORTON UTILITIES

Provides almost identical facilities when compared to the PCTOOL software. The facilities provided are

- 1. Data Recovery facilities**
- 2. Security facilities**
- 3. Speed-up facilities**
- 4. Other tools to make the computing easier and faster**

1. **Data Recovery facilities:-** useful to undelete deleted files, repair damaged files, unformat formatted disks, protect disk against data loss and to diagnose problems with the computer hardware. Programs provided under this package are

- ☐ **Hardware Diagnostics** – to identify problems with the computer hardware

A:\NU\>NDIAGS [switches]

- ☐ **Norton Disk Doctor** – automatically detects and corrects almost all errors.

A:\NU\>NDD [drive:][drive:]...[switches]

Commonly used switches:-

- **/QUICK** test only system area
- **/COMPLETE** test system and data areas
- **/R:file** save the report to 'file'
- **/RA:file** append the report to the 'file'

- **/X:d** Exclude drive d: from testing

☐ **Disk Editor** – used to view / edit repair / rescue the contents of a disk that even DOS cannot recognize or read

A:\NU\>DISKEDIT [drive:][path][file] [switches]

Commonly used switches:-

- **/M Maintenance mode** – Disk Editor bypass DOS and examine disk directly using the BIOS

☐ **Disk Tools** – This program is a set of four utilities

- make a disk bootable
- recover from the DOS RECOVER command
- revive defective diskettes
- mark clusters

A:\NU\>DISKTOOL

☐ **File Fix** – used to diagnose and repair damaged Lotus 1-2-3, Symphony, Excel, Quattro Pro, WordPerfect and dBase files. This can also “UnZap” accidentally “Zapped” dBase files.

A:\NU\>FILEFIX [filename]

☐ **Image** – used to save the copy of important areas of a disk to another disk. So that in case of accidental formatting or some other data read problem, the disk can be recovered using the “image disk”.

A:\NU\>IMAGE [drive:][drive:]...[/NOBACK]

- **/NOBACK overwrite current IMAGE.DAT file** (IMAGE.BAK backup file is not created)

☐ **Rescue Disk** – This program is used to create or restore a Rescue Disk. This rescue disk contains very important information about the computer like CMOS data, partition tables, boot sectors etc.

A:\NU\>RESCUE [/CREATE] | [/RESTORE]

switches:-

- **/CREATE** Create rescue disk
- **/RESTORE** Restore rescue disk

☐ **UnErase** – Unfragmented files are recovered automatically. Fragmented files can be recovered in Manual mode.

A:\NU\>UNERASE [filename]

- ☐ **Unformat** – Complete recovery is possible if you have an “image” of the system information saved using the IMAGE program, before giving the FORMAT command.
A:\NU\>UNFORMAT [drive:]

2. **Security facilities:-** useful to secure the data from unauthorized read and write operations ,protect the computer from virus infection by making the system area and files read only. Programs provided under this package are

- ☐ **Disk Monitor** – used to prevent the data from being written to disk without the user approval.
A:\NU\>DISKMON [switches]

Commonly used switches:-

- /STATUS on-screen status summary
- /PROTECT+ Turn protect features ON
- /LIGHT+ Turn DiskLight feature ON
- /PARK Park disk drive heads
- /UNINSTALL Remove DISKMON from memory

- ☐ **Diskreet** – Used to create a password protected “virtual” disk drive on which all the files are encrypted.
A:\NU\>DISKREET [switches]

Commonly used switches:-

- /ENCRYPT: file name Encrypt specified file
- /DECRYPT: file name Decrypt specified file
- /PASSWORD: xxxxxx Set password to xxxxxx

- ☐ **WipeInfo** – Used to completely remove the deleted data from the disk. (Normal DOS deletion does not remove the data from the storage devices, it just makes the FAT entry 00 and change the directory entry to tell the DOS that the particular file is deleted.)

A:\NU\>WIPEINFO [drive:] [switches]

A:\NU\>WIPEINFO [filenmae] [switches]

Commonly used switches:-

- /E Wipe erased/unused space on the disk
- /N Delete file DOS style without wiping
- /K Wipe extra space at end of file

3. **Speed-up facilities:-** The speedup facilities provided by Norto Utilities are useful to enhance the computer’s performance by using a disk cache and by optimizing and reorganizing the disk data. Programs provided are

- ☐ **Calibrate** – Optimize the speed by reorganizing the data on the disk. Also checks the reliability of data transfer.

A:\NU\>CALIBRAT [drive] [switches]

Commonly used switches :-

- /BATCH Skip all prompts, exit to DOS when done
- /NOSEEK Do not perform seek data
- /NOFORMAT Do pattern testing only, do not format
- /X:drives Don't test listed drives

- ☐ **Norton Cache** – improves the disk read/write performance by using some of the computer's RAM as a cache or holding area for frequently needed data from the disks.

A:\NU\>NCACHE2 /STATUS

- ☐ **Speed Disk** – reorganizes the files and directories on the disk – consolidate the free space and unfragmented files.

A:\NU\>SPEEDISK [drive:] [switches]

commonly used switches:-

- /B Reboot after optimization
- /F Optimize complete disk
- /Q Compress free space only
- /U Unfragment files only

4. **Other tools:-** Norton Utilities provide additional programs to control the computer's display and keyboard, set timers, find files, change directories, format disks, find out information about your computer system etc. Some of the programs are

- ☐ **Norton Utilities Configuration** – to configure (install / remove) device drivers and programs run at the system startup.

A:\NU\>NUCONFIG

- ☐ **Norton Control Centre** – use to control PC's hardware settings viz. cursor size, DOS colours, palette colours, video mode, keyboard settings etc.

A:\NU\>NCC [filename] [switches]

Commonly used switches:-

- /SET Set all options saved in a given filename
- /CO80 Set display to 25*80 colour
- /50 Set display to 50 lines (VGA)

- ☐ **Norton Change Directory** – used to manage the directory structure of a disk (i.e. rename, move, copy, delete directories)

A:\NU\>NCD [directory name] [switches]

Commonly used switches:-

/R Rewscan disk directory

/N Do not write or update TREEINFO.NCD

- ☐ **Safe Format** – used to format a disk without overwriting the data on it.

A:\>SFORMAT [drive:] [switches]

Commonly used switches:-

- /S Copy DOS system files
- /V:label Add a volume label
- /F:size Specify size (360, 720, etc)
- /Q Quick format
- /D DOS format (same as DOS)

- ☐ **System Information** – gives a report on all the aspects of your computer hardware, memory use, available disks, TSRs, device drivers etc.

A:\>SYSINFO [switches]

commonly used switches:-

- /AUTO:n Automatic mode, 'n' sec./screen
- /DEMO Demonstration mode
- /TSR Show only active TSRs
- /N Bypass live memory probe

- ☐ **Text Search** – used to search for a user specified text in files, disks or erased disk space.

A:\>TS [pathname] [text] [switches]

A:\>TS [text] /D [switches]

A:\>TS [text] /E [switches]

Commonly used switches

- /S Include sub directories
- /T Non-interactive Totals mode
- /Cn Start the search at Cluster'n'
- /E Search erased space

