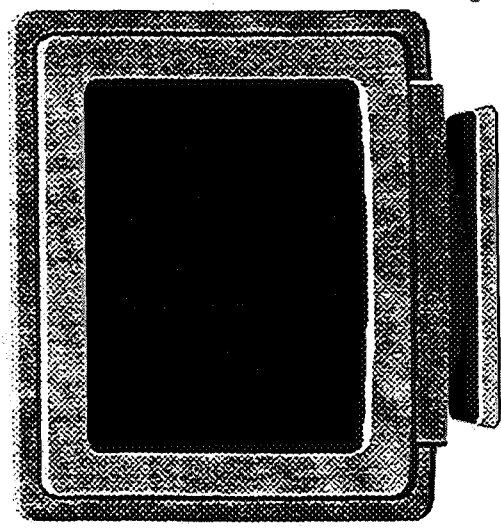
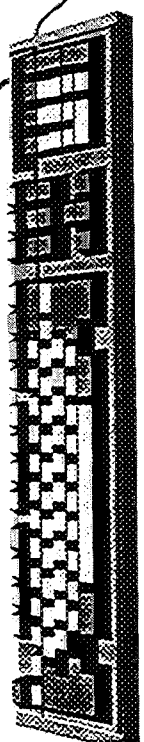
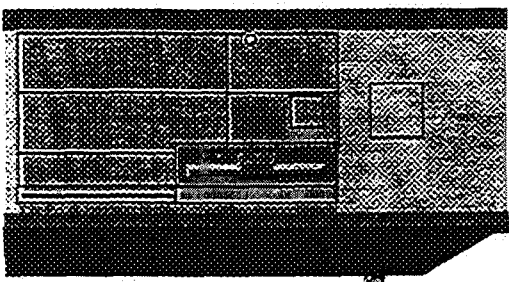


APPENDIX B₁ - COMPONENTS AND INTERCONNECTIONS OF A COMPUTER SYSTEM.

Visual Display Unit



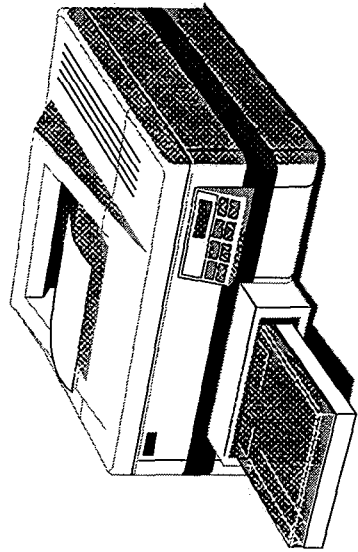
Processing Unit and disk drives.



Keyboard



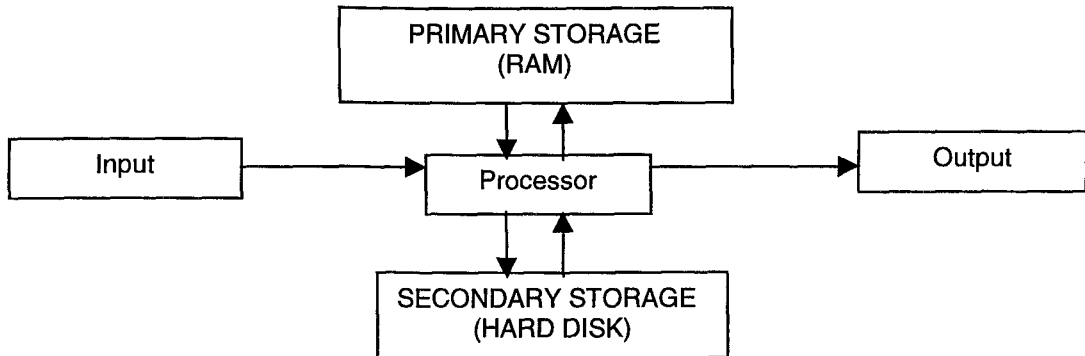
Mouse



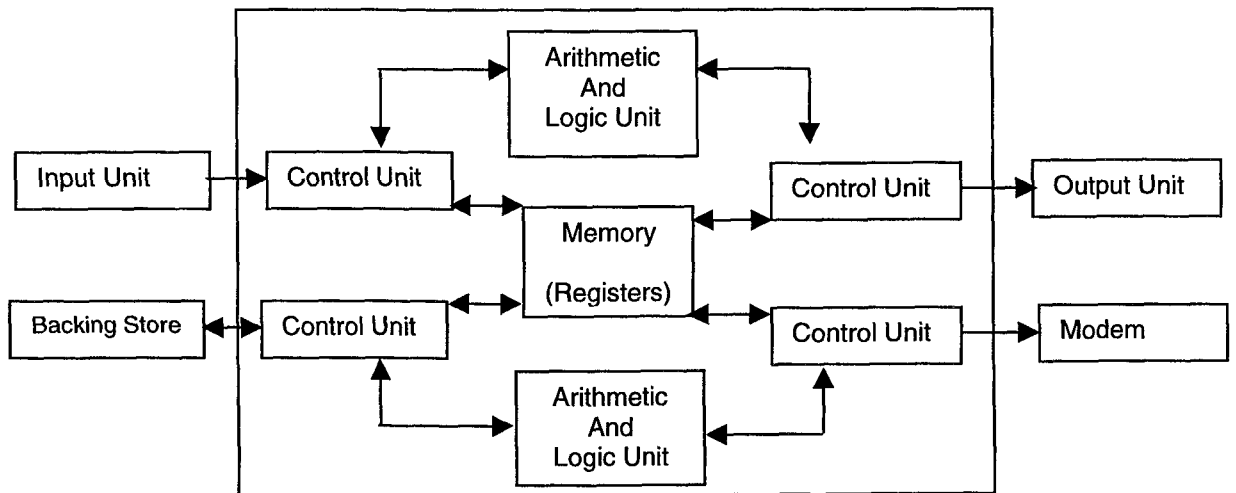
Printer

APPENDIX B₂
(Schematic Diagrams)

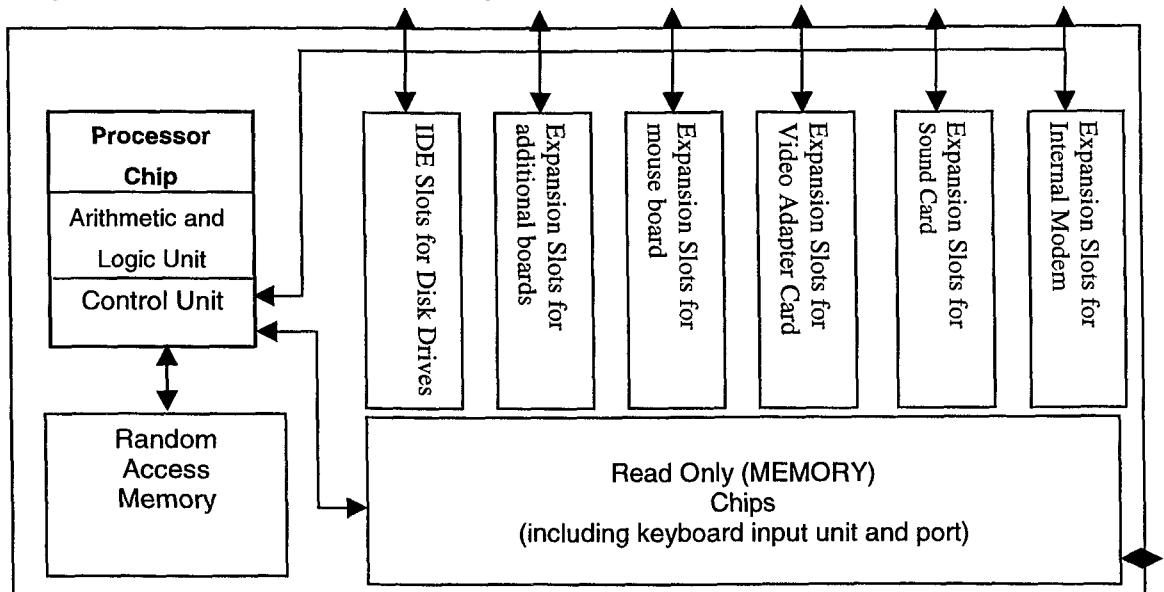
Five Main Components of a Computer



Main Processing Unit Model



Microprocessor Central Processing Unit Model



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APPENDIX C
EXAMPLES OF INPUT AND OUTPUT DEVICES

INPUT DEVICES	
Bar code reader	
Card reader-magnetic	Or magnetic strip
Digitiser	Or graphics tablet
Document reader	Or OCR
Scanner – document: specialist	
Electronic communications (Network Card)	Network
Image processor eg 35mm Film	Film Image Processor
Joystick	Or paddle
Keyboard , midi, qwerty	
Light pen	
Magnetic strip on card	Or card reader
MICR magnetic ink character recognition	
Mouse	
OCR optical character recognition	Or document reader
OMR optical mark reader	
Paddle	Or joystick
POS point of sale terminal	Usually Bar Code
Touch sensitive screen	
Microphone	
Control Systems eg temperature sensors, pressure sensors, movement sensors, light, sound	

OUTPUT DEVICES	
Buggy (Robot Driven)	Or turtle
COM computer output on microfilm	
LED light emitting diode	
Machine tools	
Plotter	
Printers	
Robot	
Turtle	Or buggy
VDU visual display unit LCD/CRT/TFI	
Voice	Speech synthesis
Control Systems (ie door controls, alarms, trucks etc)	

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APPENDIX D₁ STORAGE MEDIA

Capacity

Term	Information
Bit	A B inary D igit either a 0 (zero) or a 1 (one)
BYTE	One character or instruction, made up of 8 bits
Kilobyte	$2^{10} = 1,024$ bytes
Megabytes	$2^{20} = 1,048,576$ bytes
Gigabytes	$2^{30} = 1,073,741,824$ bytes
Terabyte	$2^{40} = 1,099,511,627,776$ bytes

Input and Output Devices

Magnetic Media Technology	
Secondary storage using either plastic or metallic media sprayed with coating of easily magnetised element e.g. cobalt. The coating is magnetised electronically by the read/write head representing the absence or presence of a binary digit (0 or 1).	
Device	Information
Floppy Disk	1.44 Megabytes capacity known as High Density Disks
Zip Disks	2.88 Megabytes capacity compacts the data so it takes up less storage space
Hard Disk	540 Megabytes to 6 Gigabytes
Fixed Disk	Used with mainframe computers, various specifications depending on manufacturer and requirement
Magnetic Tape	Variable speed and capacity depending on computer and systems specification. Used as a backup method on computers

Combined Laser / Magnetic Media Technology	
Device	Information
Super Floppy Disk	120 Megabytes uses a mix of technologies to achieve the high capacity

APPENDIX D₂
LASER TECHNOLOGY AND ELECTRONIC STORAGE

Laser Technology	
A Laser beam detects 'Pits' and 'Lands' on the reflective surface of the disk. The pits are raised areas on the CD-Rom whilst the lands are flat areas separation the pits.	
Device	Information
CD-ROM	Maximum capacity 680 Megabytes
WORM CD-ROM with the capacity of approximately 600 Mbytes Write Once	Read Many used as a systems backup or to store archive data
Erasable ROMs Formatting	CD-Rom which is erasable. Formatting sets up the sectors on the disk and will remove previously stored data.

Electronic Storage	
Device	Information
RAM	Working memory of a computer for storing programs that the computer is operating, including systems and applications, and data that is needed for the program Random Access Memory Each machine will vary and the memory chip may be increased in capacity in the workplace to suit the software and user. RAM is described as volatile because the data and programs are lost when the power is no longer supplied to the CPU either by switching the computer off or by a power failure.
ROM	'Chips' inside the computer that hold programs that are essential for the computer to operate. These programs are manufactured into the chip and are permanent, they are not lost when the computer is switched off. (NON VOLATILE) Read Only Memory

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APPENDIX E
PRINTERS AND PLOTTERS

IMPACT PRINTERS				
Type	Description	Print Speed	Media Type	Quality
Dot Matrix	Builds up characters by a matrix of dots. Pins hit a ribbon. Suitable for use on multi part carbon paper.	30-500 cps	Ink ribbon	Fair 150 to 400 dpi

NON IMPACT PRINTERS				
Type	Description	Print Speed	Media Type	Quality
Thermal paper	Burns character onto thermal sensitive paper. Black only.	5 sheets per/min	Coated paper	Poor
Thermal transfer	Melts or sprays coloured wax or thermoplastic material.	1 sheet per/min	Coated paper	Very High
Laser	A laser beam makes a static charge on a drum. The static on the drum picks up toner powder and transfers it onto the paper. A heater then seals the toner onto the paper surface. Black and colour systems.	5 to 50 sheets per/min	Black and coloured toner	Good to excellent. 150-2000 dpi
Ink jet	Sprays a finely controlled jet of ink onto the paper. High-resolution colour work can be very slow. Black and colour systems.	10 mins per sheet up to 10 sheets per/min	Black and coloured inks	Good to excellent 150-2000 dpi

PLOTTERS				
Type	Description	Print Speed	Media Type	Quality
XY Pen plotter	Pens of different colours move over the surface of the paper. Flat bed type the paper lays on the bed and pen moves in X and Y directions. Cylinder type the paper lays on a cylinder and cylinder rotates for the Y direction pen moves for X direction.	N/A Paper sizes from A5 to A0	Ink pens	Good.

PRINTER BUFFER

The memory available on the printer. Usually RAM. This can usually be increased when required.

A printer with a large memory will accept data from the computer and free the computer to process other work.

Printers with small buffers can slow down the computer while it waits to send data to the printer.

Print buffers need to be quite large to deal with complex graphical output data.

MULTI FEED

Some printers have the facility to feed paper, envelopes, transparencies, sheets of labels and other materials from a variety of trays. These save the time it takes to remove one type of material and replace it with another.

When output is sent to the printer the correct feed tray must be selected.

PAPER-MATERIAL QUALTY AND TYPE

A variety of different types of paper are now available for use on computer printers.

Printers are sensitive to the material upon which they print. The correct type of paper (or other material) must be selected.

For example ink jet printers require a slightly absorbent paper while laser printers must not be used with materials that may melt in the heater stage (eg ordinary acetate sheet.)

The type and quality of the material used affects the quality of output. One example is the photographic quality of paper used on ink jets printers. 1200 dpi can be achieved with good material while only 150 dpi is the normal quality on the same printer.

APPENDIX F

SPECIFICATIONS FOR VISUAL DISPLAY UNITS

Resolution and pixel density

The number of discrete dots which are addressable on the screen. Usually between 500 to 1600 horizontally and 200 to 1200 vertically. High quality VDUs have more pixels.

Colour range

The number of colours which can be reproduced on the VDU. Some systems reproduce only mono (black & white); others up to 16.7 million colours by colour combination and intensity.

Reflections

Reflections can be avoided by reducing the polished finish on the VDU glass screen. Some screens have a ground a ground glass finish, others are covered with a non-reflective surface.

Screen shape and size

VDUs are available in a variety of shapes. The standard screen has a size ratio of 4:3 width to height. Many modern word-processing screens are available in portrait mode 3 units wide by 4 units high. Large screens of non reflective material cause less eye strain. Screen sizes are measured diagonally from corner to corner.

Flicker – Interlace frequency

Eyestrain can be caused by flicker of the VDU screen. This can be avoided by high rates of picture refreshment, or by long persistence, etc. In modes where interlace is used flicker can result particularly if refreshment is at less than 30 Hz.

Graphics standards for IBM PC compatibles

TYPE	NAME	SIZE
MDA	Mono Display Adapter	720 x 350 pixels mono (text)
HGC	Hercules Graphics Card	720 x 348 pixels mono
VGA	Video Graphics Array	640 x 480 pixels colour
MCGA	Multi Colour Graphics Array	1280 x 768 pixels colour
SVGA	Super Video Graphics Array	1600 x 1200 pixels colour

APPENDIX G

STAGES IN COMPUTER PROGRAM DEVELOPMENT

Stages of Development

1. Problem Analysis
 2. Program Design
 3. Coding
 4. Assembly or Compilation
- NB Testing and Debugging and Documentation applies throughout the above stages.

Definitions of the stages of development

1. Problem Analysis – the analyst becomes familiar with the requirements of the user and defines what is needed to meet the user's requirements.
2. Program design – the logical steps of the computer program are defined.
3. Coding – writing program instructions in a programming language (source code) to the program design definition.
4. Assembly/compilation – translating the program from source code into instructions (object code) that can be understood and executed by a computer.
 - Testing and debugging – making sure the program performs as it should by running test data and removing any functional or logic errors
 - Documentation – writing a description of the program and the instructions for using it and providing the information necessary to maintain it.

APPENDIX H

PROGRAMMING LANGUAGES

Programming Languages

1. Machine Code uses binary notation
2. Assembly language uses mnemonics
3. High level language uses syntax close to English
4. Fourth generation language computer assists generation of the code

Advantages and Limitations

1. Machine code is understood by the computer, it does not have to be translated. It is very difficult to learn. Coding can therefore be slow and cumbersome but operational speed is very fast.
2. Assemble language makes full use of the machine's capabilities, is very fast and makes efficient use of storage. It is difficult to learn and more lines of code are required than in a high level language.
3. A high level language is problem orientated and often has a syntax similar to English. It is easier to learn, write and modify programs than with assembly language or machine code. It is more portable but generally NOT as fast or efficient as machine code.
4. Fourth generation application program generators or authoring languages create detailed program code from a given specification. Users can be non-programmers as they require much less specialised knowledge.

Common Examples of High Level Languages

ADA	real time and systems programming
BASIC	beginners language – now more extensive
C	systems programming – now more general
COBOL	business data processing
FORTRAN	scientific calculations
LISP	list processing and artificial intelligence
MODULA 2	process control replaces assembler
PASCAL	structured programming – general use
PL1	combination of COBOL and FORTRAN styles
PROLOG	deals with objects and relationships - logic
VISUAL BASIC	basic to allow writing windows programs
VISUAL C	an advanced form of C and C++ for mainly application development
DELPHI	visual form of PASCAL for windows applications
JAVA	another form of VISUAL C but with more emphasis on data security, being used a lot for writing programs for the Internet

Examples of Forth Generation Languages

- macros in applications software
- use of some HTML Web Page Generators
- use of Access in defining criteria for a search in a database

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APPENDIX I

PROGRAMMING LANGUAGE AND THEIR TRANSLATORS

Translation

1. Assembler Translates from a low level language program to machine Code. It produces an object code file.
2. Compiler Translates from a high level language to machine code. It produces an object code file.
3. Interpreter Translates a high level language to machine code one statement at a time and executes it before translating the next statement.

Run time systems

Run time software creates an environment in which an object program can be run and debugged. Some run time systems are very similar to interpreters.

Types of code used and produced

SOURCE CODE	The original code written in either a high level or low level language.
OBJECT CODE	the compiled version of the source code written in machine code (binary notation)
EXECUTABLE CODE	the compiled and linked version of the object code. Contains all that is required to execute it within the operating environment.

APPENDIX J

FUNDAMENTAL CONCEPTS OF COMPUTER APPLICATIONS SOFTWARE

Applications software

Applications software are programs commonly used by non-computer professional staff to process their data. The types of such software are extensive and include: payroll, accounts, stock control, spreadsheets, database, word-processing, CAD, Bitmap Graphics, personnel records and project management systems.

Concepts of applications software

The main types of data processing which are undertaken in applications software are :

Numbers and quantity	numerical analysis, manipulation and calculation
Textual formatting, (some graphics)	document presentation
Records	data records/database
Line-Vector manipulation	drawings
Bit map Systems	pictures, artwork, photographic

The commonly used applications, which are specifically designed to meet the requirements of these types of processes, are

Application	Purpose	Type
Spreadsheets	Numerical analysis and manipulation	Sheet
Document Processing	Textual documentation (some graphics)	Page
Database	Record sorting and searching	Record
Vector Graphics (CAD)	Drawings	Sheet
Bit Map Graphics	Artwork, photographic work	Page

Most applications packages provide for more than one of these types of data processing but in general each program is most suited to only one of these processes and would therefore be classified as of that type.

Integrated Software

Integrated software uses several different types of application software which enables data exchange between each application and a common tool and menu structure.

APPENDIX K

COMMON DIRECTORY STRUCTURES

Operating systems usually organise their file storage into a hierarchical structure, such as that below:

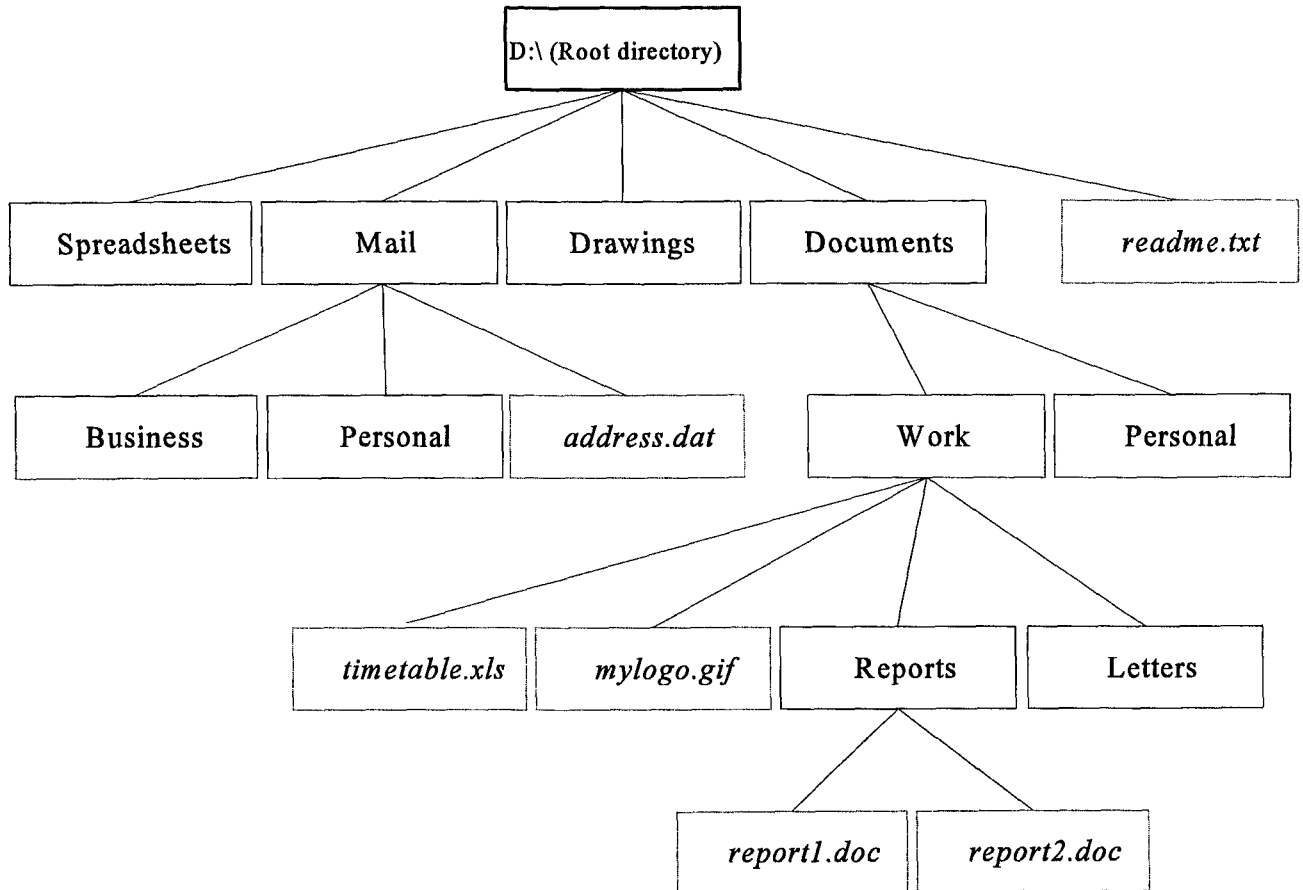


Fig. K.1

(Directories/folders are shown with capitalised names, files are shown in italics)

NOTE: Some operating systems use the term **folder** and **subfolder** instead of directory and subdirectory.

FILENAMES

The filename is the name by which a file is stored in a directory or subdirectory. In Fig. K.1 there is one file in the root directory, its filename is:

readme.txt

The naming conventions for directories and files vary with the operating system. For instance Unix filenames are case sensitive, DOS filenames are limited to eight characters with a three character

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extension. Recent operating systems allow long names with spaces in the name.

Most applications use standardised file extensions to identify the file format. For instance, there are several files with different extensions in Fig K.1:

readme.txt timetable.xls mylogo.gif report1.doc

txt is used to identify a plain text file; *xls* for an Excel spreadsheet; *gif* for a graphics file stored in the Graphics Interface Format; *doc* for a Word document.

SUBDIRECTORIES

A multilevel directory structure is created by producing subdirectories within the directory. In Fig. K.1 there are four subdirectories in the root directory, the subdirectories are:

Spreadsheets Mail Drawings Documents

DISK DRIVE

The root directory shown in Fig. K.1 is of disk drive D, which usually identifies a secondary hard disk drive. Drive identities vary with operating systems, but every drive has a unique name. A large drive, such as occurs on networked systems, may be subdivided into several logical drives (also called partitions) each with a different identifier.

FULL FILENAME SPECIFICATION (PATHNAME)

To locate a file precisely in a directory structure of the kind shown in Fig. K.1 a full filename specification is used. This is often called the pathname. For example:

D:\Documents\Work\mylogo.gif

is the full filename specification for the file mylogo.gif in the Work subdirectory of the Documents subdirectory of the root directory of drive D.

APPENDIX L

DATA SECURITY ,CONFIDENTIALITY AND COPYRIGHT

Data security concerns the protection of data from loss, corruption or access and use by unauthorised persons

Data loss

Loss of data may be caused by data corruption or by damage to the storage medium. Such damage may be due to vandalism or caused accidentally

Data corruption

Data on magnetic disks may be corrupted by overwriting the data in a disk drive or by the disk being placed in the vicinity of a magnetic field. Corruption can also be caused by electrostatic charge and by harsh physical handling.

Most electronic apparatus produce magnetic fields and electrostatic charge is easily produced in most working environments.

Viruses can also cause data corruption.

Disk storage

Magnetic computer media should be stored in appropriate containers and must be protected from

1. Surface abrasion
2. Magnetic fields
3. Electrostatic discharge
4. Temperatures above or below 0° to 60° C
5. Physical damage

Confidentiality

Data held on magnetic media is easily accessible, therefore media containing confidential information should be protected from access in the same way as confidential paper files.

Copyright

Application programs, clip art, music and other data of this kind is created by other people. They may own the copyright. This type of data must **not** be copied without the permission of the originator.

Data Protection Act

The Data Protection Act is concerned with information about individuals (personal data) which is processed automatically, ie in computer systems, with those that undertake the processing (Data users); and with the individuals to whom the data relates (data subjects) The Data Protection Act works in two main ways

- giving individuals certain rights eg access to information held about themselves
- requiring those who record and use personal information on computer to be open about that use and to follow sound and proper practices

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APPENDIX M FONTS

	Sample	Description
Font	The style of the characters that have been chosen from the styles in the font list	A font is a style of the characters that appear on the VDU and are printed. Modern software have a large list of fonts that can be applied in any of the applied to most applications packages. Some options produce symbols instead of letters
Point	8 this is a sample of 8 point size 12 this is a sample of 20 this is a sa 40 this	Characters are measured in points. The higher the number of points the larger the character, both height and width.
Non-proportional font	M m I I " 2 Early printers used this style of font, based on typewriter styles.	All characters take up the same amount of space and are the same height. Original printers (and typewriters) used 'pitch' to describe the print size (the number of characters per inch).
Proportional font	W w l l " 2 Modern printers have a list of fonts, many of them are proportional fonts. These fonts give a better quality finish to the document.	Characters takes up a different amount of space. The widest characters are 'm' and 'w', whilst the narrowest is a lower case 'i' or capital 'I' and a '1' (one).
Character Formats	Bold Bold Italic <i>Italic</i> Underscore <u>underscore</u> The <i>formats</i> may <u>also</u> be <u>used</u> in any <u>combination</u> .	In addition, to changing any font style and size the three characters character formats may be applied to a single character or group of characters to enhance the appearance of a document.

APPENDIX N

PAPER DESCRIPTION AND DIMENSIONS

<p>A4 297 x 210 mm 11^{3/4} x 8^{1/4} ins</p>		<p>A3 420 x 297 mm 16^{1/2} x 11^{3/4} ins</p>
<p>A6 148 x 105 mm 5^{7/8} x 4^{1/8} ins</p>	<p>A5 210 x 148 mm 8^{1/4} x 5^{7/8} ins</p>	

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APPENDIX O DATABASE LAYOUT

Data base

A database is a structured set of records comprising data or information which is usually related.

TYPICAL LAYOUT OF A DATABASE

1	WHALE	DAVID	112-AC/#1	ZC762987P	2622	13-02-79
2	SMITH	GEORGE	177-OF/#1	ZA678932C	2111	11-12-87
3	KAPOOR	JAY	323-AC/#7	JN456728F	2648	13-12-

--	--	--	--	--	--

Field 1 9 Characters	Field 2 9 Characters	Field 3 9 Characters	Field 4 9 Characters	Field 5 4 Numeric	Field 6 8 Date
-------------------------	-------------------------	-------------------------	-------------------------	----------------------	-------------------

STRUCTURE OF THE DATABASE

FIELD NUMBER	FIELD NAME	FIELD CHARACTER	FIELD LENGTH
1	Surname	Character	9
2	Forename	Character	9
3	Employ_No	Character	9
4	Nat_Ins_No	Character	9
5	Tel_Ext	Number	4
6	Date_Emp	Date	8

TABLE 2 – EXAMPLE DATABASE AS ENTERED

EMPLOYEE'S SURNAME	EMPLOYEE'S FORENAME	EMPLOYEE NUMBER	NAT. INS. NUMBER	TELEPHONE EXTENSION	DATE EMPLOYED
Whale	David	112-AC/#1	ZC762987P	2622	13/02/79
Smith	George	177-OF/#1	ZA678932C	2111	11/12/87
Kapoor	John	217-ST/#4	HD426718P	2256	19/06/88
Kapoor	James	218-ST/#1	HD429876G	2244	12/07/88
Allison	Peter	265-AC/#6	ZH819234C	2671	22/12/88
Coates	Graham	271-AC/#3	NS873912K	2618	11/11/91
Anderton	Brian	289-ST/#3	DB671256G	2267	24/07/92
Coats	Mary	312-ST/#5	ZB826563H	2269	17/06/94
Dingle	Elizabeth	316-OF/#3	ND782134L	2167	22/07/94
Smith	Georgina	317-ST/#2	GH286753N	2281	14/11/94
Kapoor	Jay	323-AC-/#7	JN456728F	2648	13/12/94
Kapoor	Joy	412-OF-/#8	CG247908L	2153	23/05/98

TABLE 3 – DATABASE SORTED USING;
 Primary KEY = SURNAME
 Secondary KEY = FORENAME
 Type = Alphabetic
 Order = Ascending.

EMPLOYEE'S SURNAME	EMPLOYEE'S FORENAME	EMPLOYEE NUMBER	NAT. INS. NUMBER	TELEPHONE EXTENSION	DATE EMPLOYED
Allison	Peter	265-AC/#6	ZH819234C	2671	22/12/88
Anderton	Brian	289-ST/#3	DB671256G	2267	24/07/92
Coates	Graham	271-AC/#3	NS873912K	2618	11/11/91
Coats	Mary	312-ST/#5	ZB826563H	2269	17/06/94
Dingle	Elizabeth	316-OF/#3	ND782134L	2167	22/07/94
Kapoor	James	218-ST/#1	HD429876G	2244	12/07/88
Kapoor	Jay	323-AC-/#7	JN456728F	2648	13/12/94
Kapoor	John	217-ST/#4	HD426718P	2256	19/06/88
Kapoor	Joy	412-OF-/#8	CG247908L	2153	23/05/98
Smith	George	177-OF/#1	ZA678932C	2111	11/12/87
Smith	Georgina	317-ST/#2	GH286753N	2281	14/11/94
Whale	David	112-AC/#1	ZC762987P	2622	13/02/79

TABLE 4 – DATABASE SORTED USING; Primary KEY = TELEPHONE NUMBER
 Secondary KEY = (none)
 Type = Numeric
 Order = Ascending.

EMPLOYEE'S SURNAME	EMPLOYEE'S FORENAME	EMPLOYEE NUMBER	NAT. INS. NUMBER	TELEPHONE EXTENSION	DATE EMPLOYED
Smith	George	177-OF/#1	ZA678932C	2111	11/12/87
Kapoor	Joy	412-OF-/#8	CG247908L	2153	23/05/98
Dingle	Elizabeth	316-OF/#3	ND782134L	2167	22/07/94
Kapoor	James	218-ST/#1	HD429876G	2244	12/07/88
Kapoor	John	217-ST/#4	HD426718P	2256	19/06/88
Anderton	Brian	289-ST/#3	DB671256G	2267	24/07/92
Coats	Mary	312-ST/#5	ZB826563H	2269	17/06/94
Smith	Georgina	317-ST/#2	GH286753N	2281	14/11/94
Coates	Graham	271-AC/#3	NS873912K	2618	11/11/91
Whale	David	112-AC/#1	ZC762987P	2622	13/02/79
Kapoor	Jay	323-AC-/#7	JN456728F	2648	13/12/94
Allison	Peter	265-AC/#6	ZH819234C	2671	22/12/88

APPENDIX P DATA PROCESSING USING A SPREAD SHEET

SPREADSHEET PROGRAMS

Spreadsheet software enables, on one sheet of cells laid out in rows and columns, the entry and analysis of related numerical information. Formulae may comprise combinations of number values, cell addresses (number value of the cell) or both. A change in the value of the data in any one cell automatically changes the value of data in any other area where that cell is referred to. Such facilities are ideal for analysing numerical problems and answering “what if” type questions.

TYPICAL APPLICATIONS

Financial analysis of income and expenditure.

Stock control and costing.

Material and labour cost analysis.

Weather statistics.

Statistical analysis of experimental data.

In all these applications it is very valuable to be able to consider what would happen in a variety of situations, such as the investment cost of holding more stock compared with reductions in price for purchasing greater quantity, and the income benefits from greater sales. This type of analysis is commonly called “what if” questioning.

	A	B	C	D	E	F	G	H	I
	ITEM	MONTH							
		JAN	FEB	MAR	APR	MAY	JUN		
3	RENT	£181.00	£181.00	£203.00	£203.00				
4	TAX	£27.00	£18.00	£38.00	£35.00				
5	GAS	£43.00	£38.00	£28.00	£29.00				
6	ELECT	£62.00	£52.00	£61.00	£58.00				
7	PHONE	£17.00	£18.00	£12.00	£16.00				
8									
9	MONTH TOTALS	£330.00	£307.00	£342.00	£341.00				
10									
11		1 ST QUARTER			2 ND QUARTER				£341.00

CELL = C7
 TYPE = NUMRIC
 FORMAT = CURRENCY 2 DECIMAL PLACES
 CONTENT = £17.00

CELL = E9
 TYPE = FORMULA
 FORMAT = CURRENCY 2 DECIMAL PLACES
 CONTENT = E3+E4+E5+E6+E7

CELL = A7
 TYPE = CHARACTER (LABEL)
 FORMAT = LEFT ADJUSTED
 CONTENT = Phone

CELL =
 TYPE =
 FORMAT =
 CONTENT =

B11 (Overflows into other cells)
 CHARACTER (LABEL)
 LEFT ADJUSTED (With spaces)
 1ST QUARTER

SPREADSHEET EXAMPLE 2

	A	B	C	D
1	YEAR	1996	1997	1998
2				
3	INCOME			
4	Quantity sold	2160	1972	3614
5	Unit price	£159	£165	£150
6	Sales income	£343,440	£325,380	£542,100
7				
8	SALES COSTS			
9	Delivery	£12,700	£13,124	£14,763
10	Wages	£31,287	£32,487	£33,241
11	Premises	£14,943	£16,783	£17,452
12	Advertising	£9,783	£11,234	£17,253
13	TOTAL	£68,713	£73,628	£82,709
14				
15	PRODUCTION COSTS			
16	Research and Dev.	£34,921	£27,463	£42,864
17	Wages	£96,124	£101,285	£117,952
18	Premises	£45,637	£49,632	£53,821
19	Energy	£13,879	£12,785	£16,375
20	Other overheads	£11,238	£13,296	£14,267
21		£201,799	£204,461	£245,279
22				
23	PROFIT	£72,928	£47,291	£214,112

TYPES OF DATA IN CELLS

CELL	DATA TYPE	FORMAT	DECIMAL PLACES
C4	Numeric	Decimal	Zero decimal places
B17	Numeric	Currency	Zero decimal places
A23	Character	Centre justified	-
A16	Character	Left justified	-
D1	Character	Centre justified	-
D6	Formula (+D4*D5)	Currency	Zero decimal place