MERLIN'S TECHNO-GUIDE

Extensive
Up-to-date Glossary
of Computer and Technology Related
Terms and Jargon

In Layman's Words

Incorporating: "Beware — The RITS!"

(Rampant Information Technology Syndrome)

Second Edition (Revised)

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"Computers and technology can seem mystical and almost like black magic; but with the right support and assistance, it just seems like magic."

PREFACE

This particular PDF version of Merlin's Techno-Guide (all 70-plus pages)
is a quick refresh to get it up on the web and available for free
download.

The full bound version is currently not available.

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INTRODUCTION

Merlin's Techno-Guide is presented in two parts. Part 1 discusses Rob's *RITS! — Rampant Information Technology Syndrome*. By being aware of the RITS!, you will be able to avoid some of the pitfalls that trap many computer purchasers and users — and there are many to be aware of!

You will be able to save money by being more aware of the rash promises that are sometimes made in the computer industry, and you will be able to make a more informed buying decision about various products.

You will potentially be able to save a lot of time by using your computer equipment in a more efficient manner, being better informed about the possible need for personal abilities, and particular skills training. Some potential mistakes can cost a small fortune in terms of lost time to be recovered (especially in terms of data loss without adequate backup copies).

The extensive glossary is the bulk of *Merlin's Techno-Guide* and is presented in Part 2. It will prove invaluable in helping you to understand many of the terms and much of the jargon falling into common everyday use.

PART 1 — BEWARE – ROB'S *RITS*!

Over recent years there has developed a bewildering variety of new high-tech products. Their extensive ultra-modern capabilities and relatively small size are really quite amazing. Things like compact disks, pocket computer games, fancy video recorders with special effects and fully automatic cameras. And computer systems are no exception.

Many people have thought about buying a computer of some sort, but have been a little baffled by the wide variety of choices, and by the variation in prices. Very often when you pick up a computer book or magazine in the hope of learning some basics you are only confronted by a confusing new world of computer jargon — a plethora of buzz-words, acronyms and strange abbreviations.

Just for starters, things like: *Pentium* MMX processors, *EISA* and *PCI* bus architectures, *cache*, *zero wait-state*, *interleaving* factor, *VGA*, *SVGA*, *PostScript*, 600MHz, *GigaHertz*, *RS-232C*, *LAN*, *routers*, *WAN*, *Internet*, *WWW* and *multitasking*. What about the endless list of software product names that appears in computer magazine advertisements? What on earth do they all do, and how do we pick one for our own use?

Many people believe that it really is getting to be too much. It is so easy to feel yourself getting left behind.

All these things hint at some of the tell-tale signs of Rob's *RITS! — the Rampant Information Technology Syndrome* ! It sounds a bit funny, and it would be if it wasn't so serious!

Part 1 explores this undesirable condition. It explains what it is, and then explains what it means for the average person in the street and for the people in business. As for the people who work in the information technology industry, many will still argue that there really is no problem at all — it's okay for some! Part 1 concludes with some discussion of the symptoms and some clues for conquering this condition.

The fifteen *RITS!* symptoms are presented under four major headings. These headings, and the fifteen symptoms are summarised as:

Information Technology — in General
    #1 — Too Much, Too New, Too Soon
In Search of Equipment
    #2 — The Best Equipment Today, Won't be Tomorrow
    #3 — Rash Promises and Vapourware
    #4 — Shopping Around Extensively
    #5 — All of the Bells and Whistles
    #6 — 'Standard' Computer Equipment
Implementing the Equipment
    #7 — Training is Necessary!
    #8 — The Computer — Just a Tool
    #9 — After-Sales Support? What's That?
Using the Equipment
    #10 — Inherent Abilities are Required
    #11 — Creeping Improvement Sickness
    #12 — Despise Writing Documentation
    #13 — Under-utilised Equipment
    #14 — Constant Upgrades — the 'Leapfrog' Affect
    #15 — Catastrophic Failures

The basis of the material here was first written in 1989, and is now updated to early 2000s relevance. If anything, it is now even more relevant and prevalent than before!

1 WHAT IS ROB'S *RITS*?

Rob's *RITS!* is to do with **information technology** which itself refers to the use of computers to gather, classify, store, retrieve, manipulate and evaluate information. The author (Rob) first coined this definition in his 1989 book *Computers in Business and at Home*.

This Rampant Information Technology Syndrome is literally the problems resulting from the rampant development of information technology. Or if you like:

> *'A set of signs or symptoms indicating an undesirable condition, problem or quality resulting from information technology developing in an unchecked and unrestrained manner, and on a widespread basis.'*

However, this syndrome will not be readily apparent to some people. It relies on the hypothesis that things like computer systems are going through a stage of very rapid and unchecked development. So much so, that these developments could be said to be bewildering for many people, and it is actually very difficult to try to envisage where it will all end up.

All of this ongoing development takes place because the market seems to be demanding better and faster computers, and because the manufacturers are continually trying to keep ahead of their competition. Perhaps unfortunately, the technology itself still has enormous scope for further new developments, and scope for new applications of existing technology and products. When you take a step back and look at it, the pace of developments is really quite amazing. Especially with the explosion of Internet-based technologies, products and services in the late 1990s, and into the early 2000s.

When put into perspective, the basic premise is founded. That is, the technologies and the products which are accompanying the Information Age are developing in an unchecked and unrestrained manner. This condition is very real and in some cases is certainly not very desirable.

Hence, the syndrome of Information Technology developments actually continuing unchecked, or being 'rampant'!

The author used to call this syndrome simply the *RITS*. However, to find information about it on the Web, we now refer to it as Rob's *RITS* so that the internet search engines have a better chance of successfully finding references to it.

2 THE IMPACT OF ROB'S *RITS!*

This undesirable condition is experienced in different ways by different people. It also has a different impact on people in different walks of life.

2.1 People at Home

For the average person in the street who has little to do with computers, and computer-based systems, there is possibly not much to notice, nor to worry about (just yet).

However, for the average person who has actually been caught up with any technological developments and been swept along with them, then the existence of an undesirable condition such as this syndrome could be quite apparent.

But it is becoming increasingly difficult to ignore. From the late 1990s onwards we have been constantly faced with references to the *World Wide Web* (WWW), the *Internet* and *Web surfing*. And parents are finding that school-age children are coming home more and more computer literate at earlier and earlier ages.

Technology within the home is becoming more and more computer-based. Many appliances have contained a microprocessor of some sort and printed circuit boards for many years. But now we are finding that the television and the PC and the home entertainment systems are all becoming closer to being one single system.

It is becoming increasingly difficult to avoid the encroachment of technology and computers right into the home.

2.2 People in Business

For the people in business who are trying to determine which computer system to buy, which software to run, which printer is best or which Local Area Network is the right one to use to link up the other computers in the office, there is a bewildering array of products from which to choose. Mistakes can be both costly and have ongoing ramifications!

Computer systems and telephone systems are merging. Today's voice mail system is computer-based and can be interfaced to a conventional PC. The voice mail system can include intelligence, offer options to the caller, and provide various responses. This is an Interactive Voice Response system (*IVR*).

Mobile business people can keep in touch with the office in a number of ways. With some sort of PC (desktop or notebook) and a modem (either desktop, or a *PCMCIA* card) it has been possible to dial up to the office over the conventional telephone system for a number of years. With the digital mobile phone network, however, there are now more options. And you no longer need a PC to do it. Hand held units are now available that are a mobile phone with mini-notebook PC and Internet/e-mail capability all in one small package. And technologies such as *WAP* are taking this further.

For many people all this is not only confusing, but can be quite daunting. The many people in both small and large business, the hobbyist and the 'tinkerer' are all affected, but to varying degrees. As if there isn't already enough to worry about in business that causes grey hair and ulcers! In smaller business the relative costs of technology are significant, and a poor decision can be very costly. In bigger business everything is more complicated, and applies on larger scales.

2.3 People Working with Information Technology

For anyone who works with information technology — or who simply tries to keep abreast of technological advancements — it is very probable that some symptoms of this syndrome have been observed. Many people who watch the industry publications that are constantly circulating have surely noticed some quite amazing things and perhaps thought nothing much of them.

In the late 1980s the Intel 80386 microprocessor, or chip, hadn't been around very long (less than four years) before the 80486 chip was introduced in both DX and SX versions, followed quickly (about two years later) by the first Intel Pentium chip. By the mid-1990s the Pentium Pro came into being, followed by the Pentium MMX, and the Pentium II (read: Pentium Two), then the Pentium III and Pentium 4. Meanwhile, Intel's competitors have also been frantically trying to keep pace with their functional equivalents. What is not obvious is that the number of components (transistors) in each of these chips has more than doubled with each new one.

As for storage media the *floppy disk* came a long way in the 1980s to its small 3.5 inch size and high 1.44 megabyte capacity in a relatively short time. In the late '80s there were floppy disk products touted with more than 20 *megabyte* capacities. In the mid to late '90s we could buy 100 megabyte 'floppy' disks. That is quite significant considering that in the late 1970s all floppy disks were 8 inch across, and typically stored less than half a megabyte! That was about twice the physical size and only a tiny fraction of the capacity of contemporary products.

The large floor standing mainframe disk storage device that dominated mainframe computer rooms throughout the 1980s is now completely outmoded by very high capacity and extremely compact small-sized Winchester-type disk drives. These drives are now very similar to those used on Personal Computers, and capacities have gone through the roof. Personal Computer hard disk drives were 10 megabytes (MB) in the early '80s, increasing to 20MB, then 40MB and 80MB. By the early '90s 120MB drives were becoming the norm, only to be replaced eventually by 500MB drives, and then one gigabyte (GB) drives by the mid-90s. And in the early 2000s, we can now buy multi-megabyte drives!

There is also the range of *optical*, and *magneto-optical*, *compact disks* for computers. This includes the *CD-ROM* (Compact Disk Read Only Memory), the *WORM* (Write Once Read Many), and the erasable write/read (now called re-writable) disks which are now available. These disks are literally compact, fairly fast and they have reasonable storage capacities. The next leap forward here is to DVD (Digital Video/Versatile Disk) capable of storing several gigabytes of information, including a complete feature length movie comprising full motion video and quality audio. It's like a smaller more modern version of the video laser disk that didn't really take off in the early '90s.

Where on earth will all of this end? Surely we just can't continue to make things faster and more powerful in ever smaller packages! Or can we? How much more power and information can we continue to squeeze into such small spaces? It really is beyond comprehension!

For the professionals in the information technology industry it is a real battle to keep up to date with developments. It is a matter of making time available to continually learn — or be left behind. And even then it is not possible for any one person to have a detailed knowledge of several different branches of the industry.

3 SYMPTOMS — AND SOME CURES

The *Rampant Information Technology Syndrome* has been here for a while (it started in the late '70s with the advent of a variety of *microcomputers*) and is only getting worse. However, it is not difficult to recognise many of the symptoms and set about conquering the syndrome. In this section, under various headings, the more obvious symptoms are outlined and some suggestions for coping with them are included.

For anybody who is contemplating making an investment in information technology equipment they ought to realise that there is a minefield waiting for the unwary. However, there is a logical and methodical approach to stepping through the minefield.

Anyone who has already made a financial commitment to the technology by spending money on computer-based equipment can probably improve their operations somehow. Even though some people are quite happy with their acquisition — and its performance — many people are so disillusioned and disappointed with their investment that they often consider dumping the whole lot. In many cases there is enormous scope for improvement, and there are logical steps towards overcoming individual problems.

Recognising and conquering the individual symptoms of Rob's *RITS!* is a very good start.

3.1 Information Technology — in General

With regard to information technology in general, there is one major symptom of *RITS!* which summarises the continuing rate of development of new technology.

#1 — Too Much, Too New, Too Soon

The Symptom: *There is always something new to be learnt, some new product on the market, or a new technology appearing. It is difficult to keep up with it all and some of it could even be said to be not necessary!*

If you think you are afraid or concerned because you don't understand a lot about information technology and you can not keep up with all of the developments, then don't be afraid! just join the queue with all the rest of us.

There really is an over-abundance of new information about new products and technologies continually hitting the streets. Throughout the 1940s — and the two or three decades that followed — there were relatively gradual changes with new technologies. Internal combustion engines and cars, aeroplanes, communications, radio and television just to name a few. All of these things developed over several decades!

However, the decade of the '80s was much more dramatic with advanced robotics, personal computers, advanced engineering and scientific workstations, optical fibre communications, various data networking options, lasers, optical storage technology and compact disks. Then things exploded through the 1990s. In the early 2000s, technology is now really exploding, with cable TV, cable phone, cable internet access, mobile telephony, WAP, and so on!

The information technology age has well and truly arrived. Professional people in the industry have difficulty keeping up with many of the new concepts and developments in technology, let alone the technical details relating to the vast range of specific products. So no one else can be expected to become a master of information technology and all that it involves.

For many people, especially those in business, it is best to not be overwhelmed by it all. If anyone feels out of their depth, then they should seek professional advice and assistance.

3.2 In Search of Equipment

Having decided that it's time to get some computer equipment there are several things to watch out for, especially when searching for the right equipment to do the right job. The following material is not a definitive guide to choosing equipment, but highlights some of the pitfalls.

#2 — The Best Equipment Today, Won't be Tomorrow

The Symptom: *'Equipment is continually being improved, but I want the best available!'*

In order to buy the best possible equipment available, then wait until tomorrow! Today's equipment will be updated by then. Today's equipment probably will not be out of date tomorrow, but simply updated tomorrow with some improvements.

For anyone who is conservatively waiting for something that will adequately perform the job today, keep pace with developments and allow a ready upgrade later, then they could be running the risk of waiting for a long time. Especially if they are waiting for something good to become available at a good price, and that will definitely not be outdated in the near future.

The reality is that at some stage you need to bite the bullet and take whatever is available today, knowing that tomorrow it may very well be out of date to some extent. Hopefully, the equipment will be expandable and upgradeable.

#3 — Rash Promises and Vapourware

The Symptom: *While most promises of newer and better equipment and products are fulfilled, some others are just a lot of hot air.*

In order to remain competitive some manufacturers of computer hardware and/or software sometimes initiate rumours, or make public announcements of new products that are currently on the drawing board. Sometimes these products are either late in getting to the market, or they never appear at all. These products are known as *vapourware*.

It is important to watch out for rash promises and not to believe absolutely everything that you hear. At least not until you have actually seen it demonstrated.

#4 — Shopping Around Extensively

The Symptom: *It is very tempting to try to see every system, product and package available, in search of the best one to suit specific requirements.*

There are many different products available that are all quite similar. So many, in fact, that there is probably a lot more than just one product that will almost completely suit anybody's specific requirements.

Computer hardware and software is unlike the proverbial mouse trap that comes in a limited range of types, shapes and sizes. Hardware and software comes in almost every imaginable size and price with various combinations of power, performance, functions and features. So much so that confusion is both imminent and common.

Some companies in the industry make a lot of money with a new product, and the world beats a pathway to their door. But this happens only until a competitor produces a better version at a cheaper price with additional features. This leap frogging is happening all the time.

It is important to not get carried away with shopping around extensively and attending every trade seminar and display. Prospective purchasers need to be selective about what they are prepared to look at, and then draw the line somewhere.

#5 — All of the Bells and Whistles

The Symptom: *It is very tempting to opt for the very latest, the very best and the fastest equipment which has all of the bells and whistles.*

If you only want to drive around town then why buy a turbocharged, high performance racing car, or a luxury four-wheel drive complete with heavy-duty tow bar, bull bar and winch?

As tempting as it may be, anybody who acquires equipment which is overly capable of the job at hand will inevitably suffer in some way. The initial price is often higher, the learning process is more difficult and longer, it is awkward and confusing to use because there are too many features and options, and ongoing support can often be more complex, costly and time-consuming.

It is important to resist the temptation to buy the very best just for the sake of having the best. Even if the Jones's want to spend the money and they do spend it, everyone else doesn't have to do it as well.

#6 — 'Standard' Computer Equipment

The Symptom: *It is wise to use standard equipment. However, in some areas there is either no standard, or there are plenty of standards to choose from; so a buyer can just take their pick.*

In some industries there are established standards that can be relied upon. In the information technology industry, however, there are some de facto standards, there are some established standards and there are some instances where there are several so-called standards.

For instance, at the end of the 1970s, the de facto standard microcomputer operating system was *CP/M*. Industry specialists were predicting that it would be around forever. By the mid-1980s, the de facto standard operating system had convincingly developed to be PC-DOS/MS-DOS on personal computers; even despite the existence of other operating systems.

Towards the end of the 1980s, IBM was saying that OS/2 is the next generation of standard personal computer *operating system*; and the technical workstation vendors were insisting that *Unix* was the way to go. Through the '90s *OS/2* did not become the dominant standard; but *MS-DOS/PC-DOS* had persisted. The issues in the late '90s and into the 2000s are more to do with which version of Windows to run with. That is, there is not just one standard operating system, but several to choose from, and this changes over time.

This also applies to data communications because, contrary to popular belief, *RS-232* (*serial communications*) is a very imprecise standard which has been interpreted and implemented in a variety of ways. And there are different *file formats* for the files in various applications such as word processing files, drawing files, graphics files and spreadsheet files. Other areas include printer operations with page description languages, . . . and so it goes on.

So if someone says that a particular product conforms to a standard, then be wary and ask them what they mean and how significant it is.

3.3 Implementing the Equipment

Having purchased or leased some equipment there are still many more pitfalls to watch out for. If the implementation and initial training is not carried out well then the foundations that are being built on may be very unstable.

#7 — Training is Necessary!

The Symptom: *'I have been playing with it for a long time now, but I still can not get the results that I am happy with!'*

Just handing a person a scalpel does not automatically and instantly make them a good surgeon. If investing money in equipment then it is important to make sure that the users are taught what it can do, all that it is capable of, and how to use it!

Many people overlook the fact that it is quite normal to spend some money on computer equipment, and then to invest perhaps a third as much again to get taught how to use it effectively and productively. In a business environment, the efficiency and productivity of the business depends on the tools being used, and the ability of the people to use them well.

In some cases the future existence of the business will depend on such things as adequate training of the computer system users.

#8 — The Computer — Just a Tool

The Symptom: *'The damned thing didn't do what I wanted it to do; it actually did what I instructed it to do!'*

Computers are basically a tool to help do a job quicker, better and smarter. They can't be expected to do your thinking for you. They actually rely on unambiguous instructions from people.

In most cases the computer and software that is being used today can not think for itself, and will only do what it is told to do. As the computer user you have control over the system, you have to enter the information, you have to control the manipulation of it, and you select the options that are available to process it. The computer will not do your thinking for you; and you have to be unambiguous and precise with the instructions. (That is unless you have an artificial intelligence system which learns from experience and can think for itself.)

In the vast majority of cases today the computer really is just a tool to help do a job. Just like the rather primitive pen and pencil are both tools, and the calculator which is also a modern day tool.

#9 — After-Sales Support? What's That?

The Symptom: *'The software supplier said it is the computer's fault, and the computer supplier said it is the software. Who will help me?'*

If anyone thinks that they are getting a raw deal from their equipment supplier, then they shouldn't get upset about it, because they are probably not the only one. Whilst there are many good suppliers of equipment, there are also some terrible ones.

There are two aspects to this. Firstly, it is unfortunate but there are some suppliers around who will give you the best possible price for your computer equipment purchases. But woe betide if you expect any help and after-sales support. Their very low price does not include that sort of thing so you can not expect it of them. If you know exactly what you want, you are aware of the pitfalls and you don't need any support, then by all means purchase from one of these places.

On the other hand, though, if you want someone to help you make your decision — someone who knows what they are talking about and who can give you professional advice and support — then do be prepared to pay a bit of extra money up front; and make it clear that you will expect some support.

There are people who can provide professional advice, show you the alternatives and assist you after the sale. An alternative to relying on the salesperson is to call in a third party to help you over these difficulties. These third parties include computer industry consultants and various organisations such as user groups and the larger accounting firms.

Find someone you feel you can trust, and be prepared to pay for their support in one way or another.

3.4 Using the Equipment

Having successfully implemented some computer equipment does not mean that the hard work is all over. Some people would argue that the hard work has just begun. There are still many pitfalls to watch out for, and only some of them are mentioned here.

#10 — Inherent Abilities are Required

The Symptom: *'I have done some training, but my graphs look plain and my newsletters still look amateurish.'*

Giving someone some paint, brushes, an easel and some art training will not automatically make them a good artist. So when implementing computer equipment it is important to not overestimate the inherent skills and abilities of the people involved.

Some people were not born to be good artists and some were not born to be competent tradesmen. Therefore, if some desktop publishing equipment is purchased to produce the company newsletter, for instance, it is easily possible to end up with disappointing results. Particularly if a company director or the company secretary is expected to quickly pick it up and use it. For professional results, someone with inherent abilities as well as appropriate training and professional experience is needed.

This applies not only to desktop publishing, but also to computer-aided design equipment and many other graphics applications. In fact any application that relies on flair, inherent ability or imagination.

#11 — Creeping Improvement Sickness

The Symptom: *'The document (presentation, spreadsheet or graphics) that I have put together is not quite perfect yet. It is so easy to make little changes with this fancy equipment, so just let me fiddle with it a little bit longer, and a bit longer, and a . . .'*

Now that computers are here it is very easy to get carried away with minor adjustments to the wording in a document, the appearance of a graph or graphics image, the layout of a drawing or the details of a spreadsheet. One of the good features of computer-based equipment is that it is so very easy to make minor changes to the content or general appearance. It is so very easy to make some changes, that it is also very easy to get completely carried away.

'Oh! Wait on! Just one more little change here; and just one more there . . .'

Where does it end? If you have got the time to do it, then fine, but many people don't really have the time.

#12 — Despise Writing Documentation

The Symptom: *Nobody likes writing documentation.*

For many years, in fact as long as computer systems have been around, many programmers and analysts have always tried to avoid writing documentation. Some form of documentation is needed to help the user learn how to drive a system or program and to help someone else make changes to it later. But documenting is often considered a chore.

Now that personal computer users have so much power available on their desktop, they are the ones creating systems and applications. The vast majority of these people are probably avoiding documentation, just like the people before them.

What is *documentation* and why is it needed?

With regard to a complex spreadsheet created with a package such as Lotus *1-2-3* or Microsoft *Excel*, for instance, there can easily be many numbers entered as input into the spreadsheet, and quite a few calculations performed. After a few months the person who created the spreadsheet can easily forget which calculations are performed where. Also, if anybody else was to look at the spreadsheet they could quite easily have trouble following the various calculations and details.

Some form of documentation is often needed to help remind the user of the features and functions available and how to access them, even if the user did create it all himself. In addition, if the user was to move on and someone else was to come along to continue in the job, the new person would probably create the same spreadsheet or system all over again. Either because they didn't know that it was there already, or because they wanted it changed a little and had no idea how this particular one worked.

Documentation could take the form of some notes recorded within the spreadsheet or program. Otherwise, they could be various snippets of relevant information recorded on paper, and stored with other notes in one binder close to the computer for easy reference.

Therefore, as much as we all might hate it, some form of documentation is often necessary to help us remain effective and productive in our use of these modern day tools.

#13 — Under-utilised Equipment

The Symptom: *Having acquired a computer system and implemented it, there is a very good chance that it could still be better utilised.*

Unfortunately, for many people it is a struggle to acquire a computer system and successfully implement it. The system is often intended for a particular use, and that is what it does. The user gains some experience with the system and becomes competent in using it.

However, many computer systems end up doing no more than this. Even though the system is amply capable of performing additional tasks, and being much more useful, it continues to be used just for the task for which it was originally intended.

There is a very good chance that the system could be effectively utilised even more. If only the people responsible could be guided in its additional capabilities.

#14 — Constant Upgrades — the 'Leapfrog' Effect

The Symptom: *Now that you have got the best system for what you need today, you will be tempted to constantly upgrade.*

Whether it was a marathon effort or not, many people who have successfully implemented a computer system do feel a degree of satisfaction and achievement. Many of them are then happy to become comfortable with using the system that they have, rather than continually strive to improve it.

However, that is not the end of it because after a time there is on-going pressure to upgrade the system to something better — either the hardware or the software. The pressure comes from both peers and suppliers. Upgrades of particular software products, from one version to another, often become available and seem to be quite attractive.

However, many people get carried away with the promises of upgrades or new equipment, and they lose sight of the job that their system is to perform.

Before committing to an upgrade it is important to evaluate the benefits, and the value for money. Don't commit to an upgrade just for the sake of it. If the system is performing adequately today, then why upgrade it? *"If it ain't broke, why fix it?"*

It is important to understand the things that drive some hardware and software manufacturers and developers. If their competitor has released a product that is superior to their own, then they will want to improve their own product to make it superior. Thus, their products leap-frog each others' products in even shorter time periods (product life cycles). The best one today might be the second best tomorrow, and then the best again further into the future.

#15 — Catastrophic Failures

The Symptom: *Despite all good intentions, many people do not adequately guard against catastrophic failure of their computer system.*

There are basically two ways that catastrophic failure can strike a computer system, and they can both be guarded against. Unfortunately, many people don't adequately guard against them until the failure occurs the first time. For some people it is not too late to learn at this stage, but for others there is no possible way of recovering and they have learnt their lesson the hard way.

The first basic failure is a loss of stored data. This can be caused by accidental erasure of computer files, or it could be a fault with the disk which renders the data unreadable. This failure could easily be catastrophic if the lost data was either important, or a significant amount of data.

This loss of stored data can be guarded against by understanding the concept of *backups*, by implementing an effective *backup strategy*, and by faithfully performing the backup operations regularly and religiously. And periodically test them to make sure the backup can be read.

The second basic failure is a physical loss of part or all of the computer system. That is, the computer itself is either stolen or destroyed by fire or flood, and the precious data has obviously gone too. This catastrophe could easily send some businesses straight to the wall, but is readily countered. However, any sensitive data that is stolen could produce other problems.

Provided the backups have been diligently performed, and a recent backup copy of the software and data is stored off-site, then the system can be readily restored to a recent condition. The only relatively minor problem is to acquire an equivalent hardware system to load the backup onto, and to re-key the data that was entered since the last backup was performed.

The details of how to perform this recovery should have already been thought through, and should be recorded as **contingency** (or disaster recovery) **procedures**. These procedures would also describe the method of maintaining a recent backup copy off-site — the **off-site vital records storage** facility.

4 SUMMARY

There are a number of pitfalls awaiting the unwary. Be cautious, ask questions, and try to understand some things about technology, and you might be able to avoid many of them. If in doubt, then try to find a reliable source of advice and assistance.

PART 2 — EXTENSIVE GLOSSARY

This glossary is a compilation of both useful and reasonably common terms, words and acronyms and includes many trademark and company names. It is becoming increasingly difficult to differentiate between company names, specific product names and other technological matters. Some company names have been included, usually because they have fallen into common everyday usage. This also applies to some product names.

Because there are so many trademark names included herein, it is very difficult to acknowledge every one of them throughout the text. And to do so would detract from the readability of the text.

This glossary has been compiled specifically for reference by both lay people and professionals. Extra care has been taken to write it, as much as possible, in everyday language. And this is being improved with every version update.

Where possible, related terms have been grouped together under one heading so that the reader does not have to keep turning pages to read their descriptions. For example, many World Wide Web and Internet terms are to be found under the main entry *'Web'*. Likewise, the various buses to be found in personal computers are all grouped together under the main entry *'bus'*. Also, the various video display systems standards are presented under the main entry *'video standard'*.

For those entry words which have a shortened form (acronym or other abbreviation), especially where the shortened form is in common use, the entry word description will likely be found listed under the shortened form.

Entries are listed in strict alphabetical sequence with spaces, hyphens and slash characters ignored. For example, the term *database* is also commonly spelt *data-base* or *data base*, and in this glossary these different spellings would not alter its location.

In some cases, the text herein provides a very brief and sometimes superficial introduction to a much bigger topic that unfortunately cannot be covered in more detail here. In such cases, the information provided is considered to be enough to at least give the reader an overview and introduction to the topic. In some cases, it could be argued that too much detail is provided. We have attempted to strike a balance so that the amount of information and detail is that which most readers of this publication would either want to see, or need to see (eg. *backup strategies*).

World Wide Web addresses (ie. *URL*s) are now being included in their full form to assist the reader to conduct further research. When typing the URL into a web browser, the first portion (http://) is often not required. It is included herein so that electronic copies of this document will render the URL as a valid link that can be clicked on to open a browser window.

10Base2   A variation of *ethernet.*
10BaseT   A variation of *ethernet.*
100Base-FX   A specification for Fast Ethernet over fibre cable.
100Base-T4   A specification for Fast Ethernet over four pairs of (Category 3, 4 or 5) *UTP* cable.
100Base-TX   A specification for Fast Ethernet over two pairs of certified *Category 5 UTP* cable.
16-bit   A term which means that information is processed in chunks of 16 *bits* at a time. (See *bit.*)
286, 386, 486   A generic term used in reference to various *microprocessors* including those from Intel, and other manufacturers. See *80x86, Intel.*
2S/2D   Double-Sided Double-Density (see).
2S/HD   Double-Sided High-Density (see).
3.5 inch disk(ette)   See *diskette, 3.5 inch.*
3270   An IBM display system used with mainframe computers including 3274 communications controller and 3278/3279 visual display terminals. Emulation of this equipment is often required for some PC to IBM mainframe communications. See also *5250.*
32-bit   A term which means that information is processed in chunks of 32 *bits* at a time. (See *64-bit*, *bit.*)
386   See *80x86.*
3G   Third Generation (wireless technologies). An *ITU* specification for the third generation of mobile communications technology. It is designed for high-speed multimedia data and voice. (First generation mobile telephony was analogue based, and second generation used digital encoding and included GSM and CDMA.)
3GL   Third Generation Language (see).
4004, Intel   Said to be the world's first microprocessor, launched in 1971.
486   See *80x86.*
4GL   Fourth Generation Language (see).
5.25 inch disk(ette)   See *diskette, 5.25 inch.*
5250   An IBM display system used with the AS/400 midrange computer system including 5294, 5394 and 5494 communications controllers and various visual display terminals (including: 5251, 5291, 3180, 3196, 3197, 3477, 3487). Emulation of this equipment is often required for some PC to IBM mainframe communications. See also *3270.*
64-bit   A term which means that information is processed in chunks of 64 *bits* at a time. Even though handling 64 bits of information at a time appears twice as good as handling 32 bits, it is

not that simple. The increase in capacity or performance can be much more than double. (See *bit.*)

680x0 (68020, 68030), Motorola   A family of microprocessor chips from Motorola.

8008, Intel   Computer chip, introduced in the 1972 to act as a simple programmable process controller. Was twice as powerful as Intel's 4004, and was subsequently used as the basis for the early microcomputers.

802.x, IEEE   A set of standards that describe various networking functions (within the OSI model).

802.3, IEEE   An IEEE standard (protocol) that specifies an *ethernet* architecture and its physical and electrical connections.

802.5, IEEE   An IEEE standard (protocol) that specifies the *Token Ring* architecture and its physical and electrical connections.

80286, 80386, 80486   See *80x86* below.

8080, Intel   One of several 8-bit chips typically found in CP/M microcomputers. The Intel 8080 was introduced in 1974, with a clock speed of 2MHz (10 times the performance of the 8008). (Other 8-bit chips include: Zilog Z80).

8086, Intel   A 16-bit microprocessor chip, introduced by Intel in 1978, typically used in early personal computers (in the 1970s) and initially running at 4.77MHz. Also used in CP/M-86 microcomputers.

8088, Intel   A microprocessor chip regarded as a hybrid of the 8-bit 8080 and the 16-bit 8086. It treats all data internally as 16-bit data, but performs input/output as 8-bit. This makes it functionally identical to the 8086, but a slower processor for some operations. Was introduced in 1979 and used in the original IBM PC personal computer.

80x86 (80286, 80386, 80486), Intel   A family of microprocessor chips from Intel Corporation, found in many popular personal computers throughout the latter 1980s and 1990s. Other companies produced very similar chips but referred to them by the generic names of 286, 386 and 486 respectively. Also see *Pentium.*

8514, IBM   A video display system standard. See *Video Standard, IBM 8514*.

8-bit   A term which means that information is processed in chunks of 8 *bits* at a time. (Also see: *bit, 32-bit, 64-bit.*) The earlier (CP/M) microcomputers and some early personal computers were 8-bit systems.

- A -

AARNet   Australian Academic and Research Network. An internetwork of regional networks connected to each other and internationally to link universities and other research institutions electronically around Australia. http://www.aarnet.edu.au

Abilene   A backbone portion of the *Internet2* network, named after an important railhead in Kansas, USA. See *Internet2*.

ACA   Australian Communications Authority (see).

ACD   Automatic Call Distribution. The automatic routing of telephone calls through a PABX system. An ACD system is typically utilised by a Call Centre to receive incoming telephone calls on behalf of several businesses, and route the calls to a particular group of appropriately skilled Call Centre operators, and to whichever operators in the group are free and available to receive a call.

ACK   ACKnowledgement (data comms). A *control character* which is sent by a device to acknowledge that a block of data was received.

acoustic coupler   A device used to interface a computer to a regular telephone hand-set in common use through the 1980s, but much less so into the '90s (supplanted by the *modem*). It generally comprises two cups which each fit over the mouth-piece or ear-piece of the telephone hand-set, and is connected via serial cable to the serial port of the computer. It converts the computer's electrical (digital) output signals into audible tones (analogue signals) for transmission over the analogue telephone lines and vice versa. See also *modem.*

ACPI   (Advanced Configuration and Power Interface) A specification announced in early 1997 by Microsoft, Intel and Toshiba to take better control of power management features in computer systems (desktops and portables) to conserve electrical power and maximise work time on portable machines (laptops). It is also expected to reduce the sometimes lengthy boot-up times of computers.

ACR   (Automatic Call Rejection) Associated with the *CND* (Calling Number Display) telephone facility. The automatic rejection of an incoming telephone call that has its caller's phone number flagged as not-available for display.

Acrobat Reader (software), Adobe   A component of the *Adobe Acrobat* software package used for viewing and printing files of the *PDF* file format. Acrobat Reader is freely available from the Adobe web site. See *Adobe Systems Incorporated*. http://www.adobe.com

Acrobat software, Adobe   A software package from Adobe Systems Incorporated for creating and managing files of the *PDF* file format. See *Adobe Systems Incorporated*.

ACRS Australian Cabler Registration Service. An organisation in Australia responsible for registering people and organisations who perform cabling works.

ACS Australian Computer Society. http://www.acs.org.au

Active Server Page (ASP) A web page that is displayed on a client PC, but which contains some program logic which is to be executed on the server.

ActiveX A technology from Microsoft for Internet use. ActiveX controls are small programs that can be downloaded over the Internet to run inside Microsoft's Internet Explorer *Web browser*. Also see *Java.*

A/D See *analogue-to-digital converter.*

adapter card See *expansion board.*

ADB (Apple Desktop Bus) An interface on earlier Apple computers (a round 8-pin connector).

ADC Analogue-to-Digital Converter (see).

ADCCP Advanced Data Communications Control Procedures.

address Refers to specific memory locations within a computer. Also see *'memory, computer'.*

address bus (also *address lines*) See *bus, address.*

ADO (ActiveX Data Objects) *Microsoft's* strategic, high-level interface to all kinds of data for application in client/server and Web-based solutions. http://www.microsoft.com

Adobe Systems Incorporated A software company infamous for a number of software packages, including: *Acrobat* and *Acrobat Reader* (see) and PageMaker, Illustator, Photoshop, PageMill and various typefaces. http://www.adobe.com

ADSL Asynchronous (also Asymmetric) Digital Subscriber Line. A type of *DSL* technology to deliver faster telephone services. Under development in Australia in the late '90s, and being offered in a limited form by 2001. Also see *DSL.*

Advanced Configuration Power Interface (*ACPI*, see)

Advanced Micro Devices (AMD) (see)

AGP A bus introduced by Intel to support powerful graphics cards. Also see *'bus, universal serial'.*

AI Artificial Intelligence (see).

AIIA Australian Information Industry Association.

AIX IBM's implementation of Unix.

Algol Algorithmic Language, or Algorithmic Oriented Language. An early scientifically oriented (third generation) computer language.

algorithm A set of well-defined procedures or instructions for the solution of a problem in a finite number of steps. Algorithms are implemented on a computer system as a computer program. Also see *program.*

allocation unit See *cluster.*

alphanumeric characters The set of characters which includes alphabetic letters, numbers and other printable symbols (such as: @, [, <, $ and %). Also see: *ASCII.*

ALU Arithmetic and Logic Unit. The part of a CPU that performs mathematical functions and logical functions. That is, calculations such as addition and subtraction, and comparisons of numbers. See also: *control unit, CPU.*

AMD Advanced Micro Devices. A company which specialises in producing various personal computer processors in competition to Intel. In mid-1999 AMD announced the K7 processor, marketed as Athlon. In mid-1997 AMD released the K6 processor in competition to Intel's Pentium II. (Its previous processor was the K5). http://www.amd.com. Also see *Cyrix, Intel.*

AMPS Analogue Mobile Phone Service. The mobile phone service that was progressively closed down in 2000 in lieu of the newer digital mobile phone services.

analogue A continuous-value, or continuously varying, representation of a physical quantity. An *analogue signal* is a signal which can change in small amounts, the value of which is usually read on a dial; such as the speed of a motor car, and reading the time from the face of a clock. Also see *digital.*

analogue-to-digital converter (A/D or ADC) A device which converts an analogue signal to a digital signal. Useful for converting the readings from instruments or sensors into an input appropriate for manipulation in a computer.

analyst, business/system See *system analyst.*

annotation Text information placed onto graphs, charts or drawings.

ANSI American National Standards Institute. A standards development body in the USA.

anti-virus software See *software, anti-virus.*

API Application Programming Interface. A set of programs that is used to provide an interface between application programs and computer system services such as network access.

APPC Advanced Program to Program Communications. Specifies a protocol within IBM's SAA and describes how computer programs will talk with each other, particularly in a true distributed processing environment. Used synonymously with *LU 6.2.*

Apple Computer, Apple Mac Apple Computer Corporation. http://www.apple.com

applet, Java See *Java applet.*

application generator A type of fourth generation language which facilitates the production of an application system.

application server   A file server that hosts one or more software applications, and which provides access to the application(s) for multiple PCs over a network. The advantage is that the PCs do not need to have the application installed on their own hard drives.

application software   See *software*.

application software, general purpose   See *'software, general purpose'*.

application software, specific purpose   See *'software, specific purpose'*.

application system   One or more programs which collectively perform specific tasks; and typically includes a database, data-entry screens, enquiry screens and report programs. For example, a payroll application system, accounting system, etc.

archive   To store electronic information in a manner which makes it not directly accessible. Often to computer magnetic tape, CD, or some other slower access storage device.

ARCnet   A relatively inexpensive local area networking system using token passing access and star topology. See also: *token passing*, *star topology*.

array   (computer programming) syn. *matrix*. A set of values under a common variable name which can be referenced collectively by that variable name, or which can each be accessed using a subscript. For example, an array called X can have several elements, or subscripts, such that the first element (subscript number 1) is referred to as X(1), the second is X(2), and so on.

array, multi-dimension   An array with more than one dimension. Most commonly this is a two-dimension array where, for example, the four array elements A(1,1), A(1,2), A(2,1) and A(2,2) represent four values under the one array name 'A'. This particular example also represents a square matrix with four elements.

array, single-dimension   An array with only one dimension which, in mathematical terms, could be regarded as a column or row matrix, or vector. For example, the collection of values represented by X(1), X(2), etc.

Artificial Intelligence (AI)   The ability of computers to perform human-like thinking and reasoning.

AS/400   A series of mid-range, or mini, computers from IBM. (A registered trademark of IBM Corp.)

ASCII   American Standard Code for Information Interchange (pronounced 'ass-key'). A standard which defines how various characters and symbols are to be represented, stored and manipulated in computer systems. (One of several character *encoding systems*, or *character sets*, for encoding characters in *binary* format for internal representation within a computer). Is reported to have originated in 1968. The basic ASCII *character set* utilises 7 bits and is limited to 128 characters (ie. 2^7 — 2 to the power 7 — covers all possible combinations of seven binary digits — ones and zeroes — from 0000000 to 1111111). The ASCII character set includes: 26 uppercase letters, 26 lowercase letters, ten digits, a space, a blank, 32 punctuation marks and other printable characters, and 32 control characters. File systems typically allow only ASCII characters in their *file names*. Files can be readily interchanged between different systems provided they contain only ASCII characters.
Refer to the table in the Appendix for some selected alphanumeric characters and their equivalent ASCII (and corresponding EBCDIC) codes. See also: *encoding systems, character set, BCD, EBCDIC.*

ASCII (disk) file   A file stored on disk in ASCII format (binary encoding according to the ASCII standard), which is displayable in human-readable form.

AS/NZ4444   An Australian and New Zealand standard for Information Security Management Standards.

ASP   Active Server Page (see).

ASR   Automatic Send/Receive (also: *teletype device*). Early form of computer terminal with integral printer which was commonly used with minicomputers. Also often included a paper-tape punch and reader.

assembler (program)   A language-translator program which generates the machine-executable program (object code) from a human-readable assembly language program (source code), in the correct form for a specific microprocessor (ie. for Zilog Z80, or Intel 8080, or Motorola 6800, etc).

assembly (assembler) language   A (low-level) programming language where computer instructions are expressed in symbolic form as mnemonic codes. Programs written in assembly language must be converted to machine language by an assembler (program) before execution, and they then execute very quickly. Regarded as lower than the 3GL languages (Basic, Fortran, Pascal, Cobol, etc), but not as low as machine language.

asynchronous transmission   A particular method of data communications where electronic signals representing information are transmitted between computer devices (such as computers, printers, modems, etc), without a set time between characters, but with start and stop bits at the beginning and end of each character. As soon as one transmission completes, a subsequent transmission can start. Also called *start/stop transmission*. Compare: *synchronous transmission*.

AT-bus   See: *bus, AT*. See also: *ISA, EISA, MCA, PCI.*

Athlon   A microprocessor from *AMD* (see).

ATM   Asynchronous Transfer Mode (data comms).

ATM　Automatic Teller Machine (bank).

AT PC　A generic term used to refer to both IBM's original PC/AT personal computer, and its clones as produced by other manufacturers.

audit trail　A record of all (change) activity performed on a file. The activity recorded can include: the condition before the activity, what change was made, the condition after the activity, when the change was made, and by whom.

AUSSAT　Australia's national satellite system.

Austel　The telecommunications standards body in Australia until deregulation in July 1997, when it was superseded by the Australian Communications Authority (ACA).

AUSTPAC　Australia's public packet-switched data communications service, provided by Telstra. (See *X.25*)

Australian Communications Authority (ACA)　The telecommunications standards body in Australia that took over from Austel in July 1997. http://www.aca.gov.au

authentication　A process by which a valid and authorised computer user can be positively identified before being granted access to a system, or rights or privileges. A common authentication approach is the use of user accounts relying on user names and passwords. Digital signatures and certificates is another approach. Authentication is considered to be one of the pillars of *security* (see).

authentication, two factor　This type of authentication requires users to identify themselves via two different means, one of which can be a username/password combination, and the second could be using biometrics, or an authentication device such as a type of smart card or a unique single-use password generator.

autoanswer　The feature of a device (modem, computer) that will automatically answer incoming telephone calls.

autodial　The feature of a device (modem, computer) to automatically dial a pre-defined telephone number.

AUTOEXEC.BAT　On a DOS-based personal computer system, a batch file of DOS commands which resides in the boot disk's root directory. At boot time the system automatically looks for a batch file named AUTOEXEC.BAT which is executed if found. (Pronounced: auto-exec-dot-bat.) See also: *batch file, CONFIG.SYS*.

auxiliary storage　See *storage, secondary*.

AVI (Audio Video Interleave)　A *file type* (see).

- B -

b　abbr. for *bit* (see)

B　abbr. for *byte* (see)

B2B (Business to Business) Refers to the dealings and communications that take place between two businesses.

B2C (Business to Consumer) Refers to the dealings and communications that take place between a business and the consumer.

B2G (Business to Government) Refers to the dealings and communications that take place between a business and government.

background　In multitasking or time-sharing, refers to when a computer performs tasks (eg. executes programs) at lower priorities when resources are available, in the background, whilst other tasks take place. Compare: *foreground*.

backup and restore　Backup is the process of duplicating (disk) files/information, in case of inadvertent loss or destruction of the original. The resultant duplicate copy is known as a *backup copy*. There are various *backup strategies*, depending on various user requirements, including consideration of the storage of a recent backup copy off-site in case of catastrophic destruction of the computer and the local backup storage facility. In case of a problem with some or all information on the computer system, the backup copy can be re-applied to the system in what is referred to as a *restore* process, to restore the system to a sound state as at a particular point in time.

backup, complete　See *backup stategies*.

backup, incremental　The set of backup processes where a complete backup is taken of a system on a particular day. The next backup taken (eg. the following day) will be only of the files that have changed since the last complete backup. The next one will likewise be only of changed files, and so on for a set number of backups (eg. for a week). This then becomes one set of backups. To *restore* from this set of backups, it can be necessary to search the first complete backup for the required file(s), and then search each intermediate incremental backup until they are found.

backup, partial　See *backup stategies*.

backup strategies　When implementing routine periodic backup processes, there are various strategies that can be adopted including the following.

(1) Partial versus Complete. Depending on the amount of information to be backed up, and the capacity of the backup device, the backup process can either be of the complete computer

system, or of a particular part (eg. just user data), or even a selective portion based on criteria such as the latest change date.

(2) Backup Frequency — Daily, Weekly, Monthly. Computer files that potentially change at least daily should be backed up on a daily basis. Files that change less frequently are typically backed up on a weekly, or even monthly basis. eg. It can be good practice to take a complete backup of the entire system on a monthly basis, and to take partial backups on a daily basis.

(3) Grandfather-Father-Son: where three sets of backup tapes (or other media) are used, and are recycled in sequence. ie. For a daily backup routine, the backup performed today is the first generation (grandfather), tomorrow's backup will be the second generation (father), and the following day's will be the third generation (son). On the following day, the first generation media (grandfather) can be reused.

band printer   A high speed printer whose characters are on a closed-loop band (or chain). The band is struck by a small hammer as the character to be printed comes into position over the paper. Usually prints between 50 and 600 lines per minute, and is quite expensive.

bandwidth   (data comms and radio) Describes the capacity of a communication channel or link, and is the difference between the highest and lowest rates at which transmission can take place. Often referred to in bits per second (bps) or 1000 multiples thereof (ie. kilo, mega, giga). For data communications, bandwidth and speed are used interchangeably to mean the same thing. See *modem speed*. In radio frequency terms bandwidth is measured in Hertz. Also see *baud.*

barcode   A machine-readable code consisting of a series of parallel black and white bars, representing a string of alphanumeric characters. Each bar is the same width, but adjacent bars of the same colour can give the appearance of bars of different widths and different distances apart. Commonly found on many consumer products. See also *optical recognition*. Various bar code schemes include: EAN, UPC, 2 of 5, Code 3 of 9. Some bar code schemes cater only for numeric characters.

baseband   (data comms) The frequency band occupied by information-bearing signals before they are combined with a carrier in the modulation process. See also *carrier*.

base component   (number systems) The number systems in common use on computer systems include those to base: 2 (*binary*), 8 (*octal*), 10 (*decimal*) and 16 (*hexadecimal*). See each of these for details.

base memory   See *memory, conventional.*

BASIC   Beginner's All-purpose Symbolic Instruction Code. A common and relatively easy-to-learn high-level programming language; comes in several variations (eg. Visual Basic, CBasic, GW-Basic, MBASIC, SBasic).

bastion host   A *Web server* (also known as a sacrificial host) that is placed onto a company's computer network *DMZ* LAN segment that is essentially outside the full protection of a *firewall.* This allows incoming *Internet* traffic to find the web server, without gaining access to the company's internal networks and equipment. The web server in this case is known as a bastion, or sacrificial, host as it is quite vulnerable to hackers with only limited firewall protection.

batch   A collection of similar items or work, or a group of jobs, which are to be processed together on a computer in succession without user intervention. Typically used on mainframe computers.

batch file   (DOS) A number of DOS commands, and additional batch processing commands, stored (as a computer program) in a disk file which can be readily executed. The batch file is a plain text file, with the *file extension* BAT, that can be created and edited using a simple text editor such as Notepad, or a word processor provided it is saved as plain text (with the BAT *file extension*). Contemporary Windows systems have less use for the conventional BAT file, as they can utilise various scripting or Basic programs instead. See also *AUTOEXEC.BAT.*

eg.: The following sample DOS batch file, named SAMPLE.BAT, creates a directory at the root level of the C: drive, and copies files from the A: drive into the new directory (the REM text to the right is a REMark or comment which would normally appear on a line of its own and is ignored by the system when executing the batch file).

```
ECHO OFF           REM suppresses display of messages
C:                 REM change to the C: drive
MD \my_temp        REM Make a new Directory
XCOPY A:\*.*  C:\my_temp\*.*
                   REM Copy files from A: drive
```

battery, LiIon (Lithium Ion)   A battery technology in popular use (from about 1997) as a long-life battery in notebook computers and other devices such as mobile phones. Considered to be better than NiCad and NiMH batteries because they hold a charge for longer, and do not suffer from the *battery memory effect* that NiCad batteries exhibit.

battery, LIP (Lithium Polymer)   A portable computer battery technology still under development (1997).

battery memory effect   The phenomenon exhibited by some rechargeable batteries (eg. NiCad) where if it is recharged before it is completely discharged, then it will hold its charge for a shorter period of time.

battery, NiCad (Nickel Cadmium)   A type of rechargeable battery in common use in electrical and electronic equipment. Was in common use in portable computers (laptops, notebooks).

battery, NiMH (Nickel Metal Hydride)   A battery technology that largely replaced the NiCad battery in portable computer equipment. Currently (1997) most common in entry-level notebooks as it can discharge relatively quickly.

battery, ZA (Zinc Air)   A portable computer battery technology available since 1995 with long-life characteristics, but is costly, and has limited recharge cycles.

baud   A measurement of communications speed, or rate of data transfer, between devices — such as between a computer and a serial printer, or between two computers, or through a communications network. It is the number of times per second that a transmitted signal changes (modulates or demodulates). It approximates to bits per second (bps), and is often incorrectly used interchangeably for bps. In the 1980s baud rates typically varied from 110 baud (slow) to 19,200 baud (quite fast), and even more (commonly: 110, 300, 600, 1200, 2400, 4800, 9600). Into the 1990s the term baud has generally been replaced by bits per second.

BBS   Bulletin Board System (see).

BCC   Block Check Character (data comms) (see).

BCD   Binary Coded Decimal. One of several character encoding systems for encoding characters in binary format for internal representation within a computer, and utilising only four binary digits. It is a common interface form among small instruments. See also: *character set, encoding systems, ASCII, EBCDIC.*

benchmark   A measurement which is the result of a benchmark test and is used to compare the relative performance or capacity of competitive products or systems.

benchmark test   A well-defined and repeatable test that can be conducted on a software or hardware product or system, from which a measurement can be made. Various organisations define their own set of benchmark tests. See also *benchmark.*

BeOS   An *operating system* from Be Incorporated that was designed for digital media, Internet applications and embedded products.

bespoke software   See *custom-written software.*

BERT   Bit Error Rate Tester A device that determines the bit error rate on a particular communications channel.

bi-directional interface   An *interface* which can communicate intelligently in both directions.

binary   See *number system, binary.*

binary digit   See *bit.*

Binary Large Object (BLOB, See)

biometrics   A means of identifying people through their physical characteristics such as iris, thumb or finger print, facial texture, voice. (A technology that was available but had not caught on quickly in the late '90s. By 2001, finger print scanning and recognition equipment was widely available for use with PCs.)

BIOS   Basic Input/Output System. Some executable program code which handles the actual input and output in a computer. It acts as an interface between the operating system and various items of hardware such as: keyboard, video display and disk drives. It is typically different for each computer operating system. It can be stored in *ROM.*

bisynchronous transmission (binary synchronous, or bisynch) See: *BSC, synchronous transmission.*

bit   (binary digit, abbr. b)   Smallest unit of information in the binary system of notation, with a value of either 0 or 1. An 'on' bit has the value 1, and an 'off' bit has the value 0. Information is stored and handled in computers in bits. Several bits are used to describe each piece of information. Also see *byte.*
8-bit, 16-bit, 32-bit, 64-bit   These terms generally refer to chunks of information that are handled in either 8, 16, 32 or 64 bits (respectively) of information at a time. They are used in reference to such things as software, operating systems, processors, bus architectures and encryption. A 16-bit system (operating system, microprocessor or bus) will generally operate faster than an 8-bit system when performing similar functions, but not as fast as a 32-bit system, or a 64-bit system.

bit map   Typically refers to graphics images where the image is represented in the computer by reference to each pixel (picture element) that makes up the image, much like small tiles that make up a much larger mosaic image. For black and white images, each pixel can be described by one bit, where the bit is either on or off to represent either black or white. For images with up to 256 grey shades or colours, eight bits can be required for each pixel. For photographic quality full colour images up to 24 bits or more can be required. See also: *object-oriented, pixel, resolution, raster, vector.*

bit-mapped font   A font (each different point size and style of a typeface) which is stored in bit-map form. Compare *outline font.*

BLOB   Binary Large Object. A potentially large object such as a graphics image that is stored in binary form within a field of a database.

block   A group of characters which are handled or transmitted as a unit.

Block Check Character (BCC) (data comms) A character which is the result of an algorithm, used to verify successful transmission of a block of data between two devices. It is calculated from the block of data by the sending device, included at the end of the transmitted block of data, and compared to the value calculated from the block by the receiving device.

Bluetooth A wireless communications method utilising radio frequency technology which provides a universal method of inter-connecting devices without needing a cable or connector intended for short range usage. Bluetooth was initially developed by a consortium including Ericsson, Nokia, IBM, Toshiba and Intel. It was devised in 1998, named after an ancient Viking king who tried to unite Denmark and Norway, with version 1.0 of the specification released in 1999. It supports both voice and data and is intended to be included in a range of devices, including: notebook computers, mobile phones, digital cameras and desktop computers. Also see *Firewire, Jini*.

BMP file format See '*file format, BMP*'

BOB Break Out Box (see).

bookmark (also referred to as an *anchor*) A location in a file that can be the target of a hyperlink from elsewhere in the same file, or from another file. The bookmark can be a point in the file, or a number of consecutive characters.

boot or **booting** (abbr. for *bootstrap*) The process of loading a computer's operating system, usually from disk (or tape in earlier days). This is performed at power up, and can usually be performed by pressing a boot, or reset, button or switch, or by hitting a combination of keyboard keys (typically CTRL, ALT, DEL on a personal computer). In the boot process the operating system is typically loaded into RAM memory in stages, initiated with the loading of the boot record, and terminating with execution of the (DOS) AUTOEXEC.BAT file if there is one, or displaying of the (DOS) prompt. See also: *boot record*, '*boot, cold'*, *'boot, warm'*.

boot, cold A *boot* operation performed on a system from 'cold', usually including powering on the equipment, and a self-test (various diagnostic checks). See also *'boot, warm'*.

boot disk (Also *system disk,* or *DOS disk* on DOS systems.) A computer disk which contains the operating system, and which can be 'booted from'. When the computer is booted it looks at the boot disk for the operating system and other information (such as the files CONFIG.SYS and AUTOEXEC.BAT, normally on disk C: or disk A: of a DOS system). Also see *rescue disk.*

boot record A small string of information typically located in the first sector of the first track of a computer system's boot disk. It contains some system information, and a short program to load the operating system during the boot process. See also *boot.*

bootable disk See *boot disk.*

bootstrap Using one short program to initiate the multi-stage process of loading the operating system. See also *boot.*

boot, warm (also *system reset*) A boot operation performed with the computer system already powered on, and excludes some procedures such as system self-test, or diagnostic checks. It is typically performed by hitting a boot or reset button or switch, or a combination of keyboard keys (typically CTRL, ALT, DEL on a personal computer). See also *'boot, cold'.*

bpi bits per inch. Number of bits (binary information) that can be stored along one inch of magnetic tape.

bps bits per second (also *bit/s*). Data transmission rate (or speed), describing the number of bits (each 0 and 1) that are transmitted through a communications device, or over a communication network. In the early 1980s speeds of several kilo-bps (eg. 9.6 or 19.2 kbps) were common with several mega-bps (eg. 2 to 10 Mbps) more common in the mid-90s, and giga-bps introduced in the late 1990s.

Break Out Box (BOB) (data comms) A testing device used to test data transmission. It permits the user to cross and patch individual leads in a communications connection using jumper leads.

bridge A device used to inter-connect two local area networks (or two networks) thereby enabling the stations on either network to access the available resources on the other network, or to transmit information to the other network. Compare: *gateway*.

broadband (data comms) (1) Generally used to refer to high-speed transmission. Some believe that it refers to speeds of about 1Mbps and above, whilst others claim it refers to 45Mbps and above.
(2) Also used to refer to the method of transmitting data, voice and video using frequency division multiplexing (FDM) to be able to concurrently carry multiple signals on the one media (cable) such as with cable TV services. See also: *narrowband, wideband.*

bromide (publishing) A photographic print on paper of a typeset page of a book or magazine, etc., to which artwork can be pasted before filming and platemaking. Also see: *imposition, imagesetter.*

browser, Web See *Web browser.*

BSC Binary Synchronous Communications. An IBM communications protocol that has become an industry standard. It is a method of transmitting information using a defined set of control characters for synchronised transmission of binary coded data. See also *synchronous transmission.*

bubble memory   A type of non-volatile memory where information is represented by the presence or absence of magnetised areas (bubbles) formed on a thin piece of garnet.

buffer   Some memory in a computer or peripheral device which is used for the temporary storage of information while transferring the information between devices. In printers there is a buffer where information is stored after receiving it from the computer, and while it is being printed.

bug   An error or malfunction in a computer program.

Bulletin Board System (BBS)   An electronic equivalent of a conventional bulletin (or notice) board. It is incorporated as a part of a total computer system and communications devices (such as modems) where computer users can connect in (over the normal telephone line) to post messages, read messages posted by other users, and upload or download various computer programs and files. The common BBS of the 1980s and early 1990s is different to the BBS-type service being offered now on the Internet.

bus   (1) A set of connections within a computer or microprocessor which form an electrical path for data or other information to be passed from one point to another. Typically interconnects components such as: CPU, memory, input/output system. See also: *bus width*, *address bus*, *data bus*, *control bus, expansion bus*.

bus   (2) (bus topology) See *'topology, bus'*.

bus, address (also *address lines*)   The bus, or electrical pathway, used to transfer an address, which refers to a storage location within memory where either some data resides, or the next instruction resides. See also: *data bus, control bus, expansion bus*.

bus, AT   A term used to refer to the bus in the IBM AT personal computers and compatibles (in the 1980s). See '*bus, ISA'*.

bus, control (also *control lines*)   The bus, or electrical pathway, used by the control unit to control the timing and movement of data within a computer system. See also: *address bus*, *data bus, expansion bus*.

bus, data (also *data lines*)   The bus, or electrical pathway, used to transfer data to and from memory, the CPU, or an input/output port. See also: *address bus*, *control bus, expansion bus*.

bus, EISA   (Extended Industry Standard Architecture). A bus architecture for personal computers which is an extension of the previous ISA (Industry Standard Architecture) standard, and is upwards compatible from ISA. It was developed by a consortium of companies — the so called Gang of Nine — in response to IBM's introduction of the Micro Channel Architecture. It was designed to take advantage of the Intel 80386 and 80486 32-bit processors.

bus, expansion   An extension of the bus of a computer which incorporates a number of expansion slots into which expansion boards can be connected.

bus, ISA   (Industry Standard Architecture)   A bus architecture for personal computers. It is an extension of the original PC bus, with four additional address lines (24 total), eight additional data lines (16 total), as well as extra control signals. In use in personal computers from the AT and 286 onwards. Partially supplanted by the EISA bus, and then the PCI bus. However, most computers in the late '90s had both ISA and PCI buses, with the ISA bus being used for backwards compatibility with legacy adapter cards and less data-intensive peripherals.

bus, MCA   (Micro Channel Architecture) A proprietary bus architecture from IBM introduced in 1987 in IBM's range of PS/2 computers. The bus had a 32 bit data path, and was significantly faster than the ISA bus. It was subsequently discontinued.

bus, PCI   (Peripheral Component Interconnect) A 32-bit bus architecture introduced by Intel in 1993 for the 486 and Pentium and subsequent computers. It became an open international standard through the '90s, but by late '98 it was perceived to be not fast enough for contemporary file servers. An updated standard, PCI-X, was proposed..

bus, PC/XT   A term used to refer to the expansion bus in the IBM PC and XT personal computers and compatibles. This bus has 20 address lines and 8 data lines (8 bits wide); was originally used in the IBM PC with the Intel 8088 chip (which has 8 data lines and internally treats data as 16-bit). In common use in the 1980s, but supplanted by the *AT-bus* (see).

bus, SCSI   Small Computer Systems Interface (see).

Bus, Universal Serial   (USB). A connection standard intended for peripheral devices such as modem, printer, keyboard, mouse, joystick, game controller, scanner, monitor, digital camera and various storage devices. A high speed serial bus unlike the ISA and PCI buses which are embedded on the motherboard. Operating at speeds up to 12Mbps, it includes an external connector that allows up to 127 hot-swappable external peripherals to be readily connected to the computer. (It is about 50 times faster than the old style serial ports, and about 1200 times faster than the *ADB*.) It will allow the computer to automatically detect and configure the connected devices. Introduced into personal computers in the late '90s and the new Apple iMac in '98. Also see *Firewire, ADB*.

bus, VL   The VESA Local bus is a 32-bit bus designed to provide very fast access for the devices needing high speed connection to the system bus (eg. graphics adapters, hard disks).

bus topology   See *'topology, bus'*.

bus width   The number of parallel paths across a bus. For instance, an 8-bit bus moves data 8 bits at a time, and a 16-bit bus moves data 16 bits at a time.

byte (abbr. B) A group of *bits*, typically eight, used to represent a single *alphanumeric character* (see). A *byte* in computer memory can hold a character, or a binary number in the range of zero to 255, or a computer instruction. A thousand bytes is referred to as a *kilobyte* (even though a *kilobyte* is actually 1024 bytes), and the standard SI prefixes are used for greater multiples (ie. mega-, giga-, tera-, peta-, exa-). The correct abbreviation is a capital B, as the lower case b represents a *bit* (see). See also: *kilobyte, megabyte, gigabyte, terabyte, petabyte, exabyte*.

- C -

C, C++ A programming language, developed at Bell Laboratories, that is considered to be a powerful, high-level language. Its original purpose was for the development of system software.

C# (pron. see sharp) A programming language from Microsoft and derived from C++. A key component of Microsoft's .NET strategy in 2001/02.

cable/cabling, data The electrical-type cabling that is installed through a building to inter-connect various computer systems, and carry computer-type signals. There are various types of data cable (eg. IBM's Type 1, generic Type 3, etc.). There are also various cable standards to indicate a particular grade or quality of cable (eg. Category 3, Category 5). The data cable in common use as a commercial standard through the 1990s was known as Cat 5 UTP (ie. Category 5 Unshielded Twisted Pair). See *UTP, STP*. Data cable is often also used for telephone systems.

cable, Type 1 Shielded two pair twisted wire for data transmission.

cable, Type 2 Shielded six pair twisted wire for voice and data transmission.

cable, Type 3 Unshielded Twisted Pair (UTP) wire for voice and/or data transmission. Also refers to standard telephone wire. Also see *UTP, STP, Category 5 cable.*

cable, STP (Shielded Twisted Pair) A variation of Unshielded Twisted Pair (UTP) cable (see) where a metal sheath is included around the cable pairs, under the outer insulation jacket, and intended to provide some degree of shielding.

cable, UTP (Unshielded Twisted Pair) A type of data cable in very common use through the 1990s for Local Area Network applications. Has gone through several iterations of improvement. The successive specifications that define quality, characteristics and capabilities are known as Category 3, Category 4 and then Category 5. Also see '*cable, STP*'.

cabling, saturated Data cabling is commonly installed in a building with one or two data outlets (data points) at each desk location that requires it (ie. some desk locations do not have data outlets installed). Saturated cabling refers to the installation of cabling to every desk location whether it is needed or not, and this can be two or three outlets per desk location.

cabling standard, Category 5 The cabling specification which defines cable and cable hardware characteristics (this includes patch panels, fly leads, patch cables, hubs, etc.). Category 5 components are characterised up to 100 MHz, and are typically intended for transmission rates up to 100 Mbps.

cache memory See *disk cache*.

CAD Computer-Aided Design (sometimes: Computer Aided Drafting). Process which uses a computer to assist in the creation or modification of a design.

CADD Computer-Aided Design/Drafting.

CAE Computer-Aided Engineering.

call centre A number of people, desks, telephones and computer terminals that handle incoming or outgoing telephone calls. The incoming calls can be from people requesting information, products or services. The outgoing calls can be for such things as market research, or telemarketing or telesales operations. Also see: *CTI, IVR.*

CallPath An API standard developed by IBM for use with CTI systems (see).

CAM Computer-Aided Manufacturing.

card, punched See *punched card*.

carrier (data comms) A steady electronic signal. It is modulated by another signal to transmit information. See also: *modulation, demodulation.*

Carrier Detect (CD) (data comms) A modem signal that indicates that the modem is receiving a signal from a remote modem. Also see: *carrier, modem indicator lights*.

cartridge tape A form of magnetic tape for the storage of information. Available in different types and sizes, and with varying data storage capacities (from about 60MB up to many GB). Also comes in a variety of different storage methods or technologies (eg. QIC, 4mm DAT, 8mm). Is in common use on various computer systems for performing backups. See also *DAT, QIC, DDS, helical scan, reel tape, paper tape*.

CAS, DCA/Intel Communicating Applications Specification, DCA/Intel (see).

CASE Common Application Service Elements (IS8649 - OSI).

CASE Computer Aided Software Engineering.

catalog See *directory*.

Category 5 cabling standard See *cabling standard, Category 5.*

CCITT The International Telegraph and Telephone Consultative Committee. An international organisation that devises and proposes worldwide telecommunications standards. (Translated from: Comite Consultatif Internationale de Telegraphique et Telephonique.)

CD Carrier Detect (see).

CD Compact Disk. The disk storage medium used with optical (laser) disk storage devices. Is available in Read Only version (CD-ROM), Write Once Read Many (WORM) and Re-writable (CD-R). Also see *optical disk*.

CD burner See *CD writer*.

CDMA (Code Division Multiple Access) A technology for mobile telecommunications, offered in Australia from 2000. Also see *D-AMPS*.

CD-ROM Compact Disk Read Only Memory. Pre-recorded Compact Disks for use in computers contain various types of information (text, graphics, audio, video). Strictly speaking these disks are not computer 'memory', as their name implies, but disk storage. Typical CD-ROM storage capacity is about 650MB. See also: *compact disk, DVD, HD-ROM, WORM, 'optical disk, erasable'*.

CD writer A device used to store information onto a CD. Also referred to as a *CD burner*.

Celeron A type of *Pentium* processor from Intel.

cell phone (Also: mobile phone) Any type of telephone that utilises cell-based technology, which relies on a network of base stations. Each base station transmits and receives signals within a finite distance. The area of coverage of a base station is referred to as a cell. Adjacent base stations cover similar cells with some amount of overlap. A telephone call made by a caller who is moving from one cell into another will generally have the call transparently transferred from one base station to the next.

Central Processing Unit (CPU) See *CPU*.

Centronics (parallel interface) A widely-accepted standard interface for *parallel* data communications, in particular between personal computers and printers. Many printers are supplied with both a Centronics (parallel) interface and an RS-232 (*serial*) interface, either as standard or available as optional extras. The Centronics interface cable, to connect the Centronics parallel printer port on a computer to the input port on the printer, incorporates a 36-conductor cable with special Centronics connectors (plugs) which have two rows of 18 connecting pins. See also: *serial interface, bi-directional interface, parallel interface, EPP* (Enhanced Parallel Port).

CGA (Colour Graphics Adapter). A video display system standard. See *Video Standard, CGA*.

CGI (Common Gateway Interface) A mechanism for linking a web server with outside applications so that, for example, a web visitor can gain access to information in a database that is not located on the web server.

CGM Computer Graphics Metafile (file format). A popular file format for interchanging graphics files among even disparate operating systems (eg: DOS, Unix, VAX/VMS). See *file formats.*

channel See *communication channel*.

channel sales The chain of organisations through which equipment passes from manufacturer, distributor and reseller to end purchaser.

character set A specific defined collection of characters and their corresponding numeric value. The ASCII character set uses 7 bits to define 128 characters (ie. 2 to the power 7, or $2^{7)}$, and is considered the lowest common denominator as it is a sub-set of almost every other character set. The character sets in early use on pre-Windows PCs were known as *code pages* (see). Also see *ASCII, BCD, EBCDIC*.

chat, internet See *internet chat.*

chat, internet voice See '*internet chat, voice-based'*.

chat room See *internet chat*.

chip An integrated circuit (see).

chipset A group of complementary chips (integrated circuits), designed to work together to perform a particular function such as communications within a modem.

CIM Computer Integrated Manufacture. The use of computers within manufacturing.

circuit switching The method of establishing a route through a network for communications in which a complete link from the calling to the receiving stations is established and maintained.

client A network workstation which can be a personal computer, or a network *thin client*.

client/server The computing environment where processing efforts are shared between both the client (typically a desktop PC, or thin client) and the server (can be a file server, mid-range or mainframe computer).

clip art Refers to prepared illustrations, symbols and other graphics images, for which there is no copyright protection, and which can be utilised to enhance a user-generated document, chart or other graphics. The images are supplied collectively (as a *clip art library*) on disk in a universal format, and can be imported into various applications packages such as: word processing, desktop publishing and graphics software packages. The images are typically customisable by editing with an appropriate graphics software package. Specific clip art libraries are typically specialised in a variety of different fields, including: general business symbols, computer and

communications, office equipment, mathematical, chemical, petrochemical, sports, anatomy. Also called *symbol library*.

clipboard A feature of some operating environments (such as Windows) and/or applications packages (desktop publishing, graphics or word processor) which allows some material to be 'cut-and-pasted' from one file by copying the material to the clipboard, and then inserting it either elsewhere within the same file or into another file.

clock speed The rate at which electrical pulses are delivered to the system from the system clock. The pulses are used for the timing of the execution of program instructions, and for hardware control. It is one major factor in determining the speed with which a computer system can execute instructions. Typical clock speeds for personal computers were initially 8MHz or 12MHz (in the early to mid 1980s); then speeds up to 25MHz, 30MHz and 33MHz were common (in the late 1980s), to 66MHz, 90MHz, and 120MHz in the early 1990s, up to 200MHz to 300MHz in the late 1990s, and above 1GHz into the early 2000s. See also: *system clock, wait state*.

clone A copy of an original. Many personal computers are said to be IBM-compatible, or they are referred to as clones. This is because they are derivations of the basic design that IBM introduced in the early 1980s with the so-called IBM-PC.

CLR Common Language Runtime (Microsoft).

cluster The smallest unit of disk space that can be allocated for use by a disk file. It is one or more adjacent (contiguous) sectors on a disk storage device into which the operating system will store a part or all of a file. Typically 1 or 2 sectors per cluster for floppy diskettes, and four or eight for early hard disks. Also known as *allocation unit*. Also see: *sector, track, FAT*.

clustering technology The technology where two or more host computer systems are interconnected to share resources, and are seen by users and applications as only one machine. This can provide for distributed processing, and fail-over (see). Digital Equipment Corporation offer this facility extensively through their (mid-range system) product range.

CND Calling Number Display. A telephone facility where an incoming telephone call brings with it the telephone number that the call is being made from, and this calling number can be displayed on an LCD screen on the called telephone. Also see *ACR*.

coaxial cable (also *coax*) A type of communications media (cable) used in networks, and for connecting terminals to mainframes. It has a central copper wire surrounded by an insulator, and then a woven copper or foil shield.

Cobol (Common Business Oriented Language) A high-level programming language designed specifically for business and commercial use, and for manipulation of large data files.

code Often used as a generic reference to program source code, object code, run code, etc. Refer to each of these for details.

code page A particular type of *character set*. In the days of microcomputers, and DOS and PCs, when the computers were text-mode only and used a monochrome display screen, various *code pages* were devised to describe the alphanumeric and other displayable (and printable) characters. A key inclusion in the code pages was a set of line drawing characters to handle such things as boxes and tables. The commonly used English language code page was Code Page 437 (US-English).

Other Code Pages in use included: Canada-French 863, Multilingual 850, Norway-Denmark 865 and Portugal 860. These different code pages had very similar characters defined in the first 128 positions (ASCII 0 to 127), with various international language characters described in many positions in the range 128 to 255 (such as non-English characters with diacritics: accents, umlauts and grave characters). In various versions of DOS, the Code Page to be used was specified in the CONFIG.SYS file. With various versions of Windows, the need for these code pages has been supplanted by Windows ANSI character sets. Also see: *ASCII, character set, Unicode*.

COLD Computer Output to Laser Disk. Outputs from a computer system that might normally be printed are instead stored onto a laser disk (eg. CD-ROM).

cold boot See *'boot, cold'*.

COM Computer Output Microfilm.

COM device Computer output device which utilises an in-built camera to output directly onto photographic film — microfilm or microfiche.

COM output The output film from a COM device (microfilm or microfiche).

COM port See *'port, serial'*.

comma-delimited A method of storing data items, each one separated by a comma, typically in a disk file for subsequent input into a computer program. See also: *delimiter, Comma Separated Value (CSV)*.

Comma Separated Value (CSV) A file containing data items in comma-delimited form.

Communicating Applications Specification (CAS), DCA/Intel A specification, jointly from DCA and Intel Corporation, which describes the function of initiating and performing background communications tasks on a personal computer. A computer with this feature allows the user to initiate communications activities - such as facsimile transmission, electronic mail and file transfer operations - from within an application such as a word processor or spreadsheet.

http://www.hotkey.net.au/~brain/

communication channel The medium, or pathway, through which information is transmitted between devices. Includes: wire cable, optic fibre, infra-red or microwave.

communications software The category of application software that is used to communicate from one system to another system. Includes: PC to PC, PC to BBS, PC to host, PC to Internet. In broader terms also includes host computer system to another host. (1) Can be using a direct connection from one PC to another over a short distance using either a serial or parallel cable, or via a cableless method such as infra-red or radio frequency.

(2) Can be using a connection over longer distances utilising one or more modems, and possibly a telecommunications medium (such as the PSTN telephone network, or cable).

compact disk (CD) (see)

compact disk read only memory (CD-ROM) (see)

Compaq Trademark of Compaq Computer Corporation.

compatible Machines which have the same functions as an 'original' machine, but which have been forward engineered and do not necessarily infringe copyright or designs. (eg. *IBM-PC compatible.*) Also see *clone.*

compile The process of translating a computer program written in a human-readable high-level programming language into machine language for computer execution. Most 3GL languages (Fortran, Cobol, etc) require compiling, using an appropriate language compiler, prior to execution.

compiler A language-translator program which accepts as input a user-written computer program (source program file written in a high-level language such as Fortran or Cobol) and produces as output an object file (a file in object code) containing the machine instructions (in machine language) to be executed. A different compiler is required for each high-level language, and for each different machine language that is output.

computer operator A person who is directly responsible for the actual starting up, running and control of a computer system - typically a mainframe or minicomputer system.

CONFIG.SYS A file (under DOS) which is the system configuration file residing in the boot disk's root directory, and which can be used to customise some features of the DOS operating system. It gets read by the system at boot time to set up certain DOS conditions. (Pronounced: config-dot-siss.) See also *AUTOEXEC.BAT.*

configuration (verb) The process of changing certain settings on a computer, printer or other device. For instance, printer configuration can involve changing dip-switch settings, or making selections from the control panel, to specify such things as: the type of communications (serial or parallel), communications speed if appropriate, default typeface, and line spacing.

context-sensitive help The help information which is offered within an application program, and which is directly relevant to the part of the application being used. For example, having selected the print function within a word processing package, and then hitting the help key, the information displayed pertains to the printing functions.

contiguous file A file which is stored on disk in adjacent clusters. See also: *fragmented file*, *disk optimising.*

control bus (also *control lines*)   See *'bus, control'.*

control character (or code) A special character which is used to perform a specific function or operation. For example: ESC (escape), CR (carriage return), LF (line feed), ACK (acknowledge), NAQ (negative acknowledgement). Usually entered on the keyboard using the Control key and another keyboard key (alphabetic or punctuation mark key). These are defined in the ASCII standard (see).

controller, device A piece of hardware, typically an expansion card, to control the flow of information to and from a hardware device (such as: disk drive, printer, monitor). It is operated by software under the control of the operating system. Also see *disk controller.*

control unit The part of a CPU which interprets instructions it receives from memory, and directs the sequence of events necessary to execute those instructions. It also establishes the timing of these events using the system clock. See also: *ALU, CPU.*

cookie A small text file that is sent from a *Web site* to your computer, and stored on your computer, when you view the Web site's *Web pages.* Each time you re-visit the Web site the cookie information is accessed and updated. It can include various information about your Web site visit, and the Web pages that you have accessed. It's purpose is to help improve your Web surfing experience; but also to help the Web site gather information about its visitors and to better market their products or services. Cookies are stored as normal disk files, and receiving or rejecting them can be controlled with the *Web browser* preference settings. Some web pages need cookies enabled on your computer for the web page to display properly. First developed by Netscape Communications in 1994.

co-processor An additional computer processing unit (chip) which handles specific tasks in conjunction with the main (central) processing unit. It relieves the central processing unit from some tasks thereby freeing it up for other activities. In personal computers it is typically a math co-processor to improve the performance of applications which involve intensive graphics display work, or lots of calculations.

co-resident program   See *memory resident program*.

cpi   characters per inch. A measure of pitch, particularly in reference to the number of characters of a fixed-pitch font printed per inch across one line of printed output. When fixed pitch fonts were more common, printed output was generally 10 cpi or 12 cpi. Compressed printing often utilised: 15 cpi, 16.7 cpi or 18 cpi. Expanded print was 6 cpi or 8 cpi.

CP/M   Control Program for Microcomputers. A disk operating system from Digital Research Inc. (USA), available in several versions. It is an 8-bit operating system for the 8080 and Z80 CPUs. CP/M was one of several operating systems (and arguably the industry de facto standard) for microcomputers through the 1970s until the advent of MS-DOS and personal computers in the early 1980s. Other microprocessor operating systems included: *TRS-DOS, TRS-80*.

CP/M-80   The original CP/M was renamed to CP/M-80 in order to avoid confusion when CP/M-86 was introduced.

CP/M-86   An enhanced version of CP/M which runs on the 16-bit chip machines, including 8086 and 8088. This operating system was available in both single-user form (as CP/M-86), and multiuser (incl.: MP/M-86, Concurrent CP/M-86, Multi-user CP/M-86).

cps   characters per second. A measure of the speed with which computer information is input or output, in particular the printing speed of character printers (the printers that print discrete characters one after the other).

CPU   Central Processing Unit (also processor). The unit of a computer (typically a microprocessor chip, or a portion of one) that includes circuits controlling the interpretation and execution of instructions. Typically comprises the arithmetic and logic unit (ALU) and the control unit and cache. See also: *ALU, control unit, cache*.

CR   Carriage Return. An ASCII or EBCDIC control character that moves the cursor on a screen, or print mechanism on a printer, to the left margin (without a line feed). Also see *control character*.

crash   The condition where software breaks down as a result of some sort of malfunction of software or hardware; typically the result of a bug or unforeseen condition. See also: *head crash*, *deadly embrace*.

CRC   Cyclic Redundancy Check (data comms). A scheme for detecting errors in transmitted data.

CRM   Customer Relationship Management. A term in broad use with varying definitions. It includes the processes and systems that are used to record information about a company's customers so that a better level of customer service can be offered. A call centre could use CRM techniques and computer systems to record details about the interactions with customers, so that with a future customer interaction, a good history of interactions will enable the call centre operator to understand more about the customer's history.

cross hairs   Two short fine lines at right angles to each other to indicate a point. (1) On a display device is an alternative cursor, commonly used in graphical applications such as CAD and mapping. (2) On the perspex window of a puck (input device) is used to digitise existing graphics images.

cryptolope   A secure container technology devised by IBM for use with Internet applications. It is an encrypted electronic envelope (a packet of information) that can carry digitised information to an end user. The recipient can read an attached abstract describing the cryptolope's contents, and then decide to purchase the item and open the encrypted envelope.

CSIRAC   A first generation computer consisting of vacuum tubes built in 1949 (CSIRAC Mark I was first switched on in November 1949), and is on display in Melbourne's Museum (2001).

CSMA   Carrier Sense Multiple Access. A technique for controlling access to a computer network (a network access method). A station on the network that wants to transmit over the network first senses the carrier signal, and transmits if the network is idle. See also: *network access method*, *ethernet, token ring*.

CSMA/CA   Carrier Sense Multiple Access with Collision Avoidance. The CSMA network access method which employs special techniques to avoid collision of data sent from more than one network station.

CSMA/CD   Carrier Sense Multiple Access with Collision Detection. The CSMA network access method which detects and manages any collision of data sent from more than one network station.

CSV   Comma Separated Values (file format) (see).

CTI   Computer Telephony Integration. The technology that integrates the conventional telephone system with contemporary computer systems more often being implemented in telephone call centres. Includes such functions as: automatic telephone call dialling (initiated from the computer), call-based data selection in which the computer generates information for display to the caller based on the person or company being called. Also see *IVR*. Contemporary CTI systems utilise such developing API standards as: *TAPI* (developed by Intel and Microsoft)*, TSAPI* (developed by AT&T and Novell)*, JTAPI* (developed by Sun for use with Java-enabled applications)*, CallPath* (developed by IBM)*.

CTS   Clear To Send (data comms). A modem signal (in serial communications like RS-232) that indicates to the attached DTE device (computer) that it may begin transmitting.

current loop interface (data comms) A method of interconnecting computer equipment, and transmitting signals. Usually 20 mA (20 milli-amp) current loop, and is a possible substitute for RS-232 communications.

cursor (1) A special character on the computer's display screen that indicates a specific position, such as where a deletion or insertion will be made. Alternative types of cursors include: underline, character cell (small rectangular box), cross hairs and arrow-type pointer.

cursor (2) The physical pointing device used in conjunction with graphics (digitising) tablets in lieu of the stylus; also called a *puck*.

custom-written software (also bespoke software) Software that is created especially for a specific use, and customised to fit the requirements as close as possible.

cut-and-paste A feature of many applications packages (such as desktop publishing, graphics and word processing) which allows some material to be 'cut' from a file by copying the material to some temporary storage area (sometimes called the clipboard), and then 'pasting', or inserting, it either elsewhere within the same file or into another file.

cut sheet feeder A device that can be included as an integral part of a printer to automatically feed single sheets of paper (such as company letterhead) into the printer. Is an optional device on some printers (especially dot matrix or continuous forms impact printers). Most contemporary laser and ink jet printers only feed cut sheets.

cyber cafe A (real live) cafe or coffee shop which provides access to the Internet via terminals, usually for a fee. It is a good place for Internet access for those who don't otherwise have Internet access, or who are away from their usual access medium, especially for tourists and travellers.

cyberspace A world created by interconnecting a number of computers and/or computer networks. Typically refers to the Internet.

cylinder The term that refers to the tracks on each surface of a disk which are all equi-distant from the edge. That is, the tracks which lie one below the other on the top and bottom surfaces of each of the disk platters that make up the disk. For instance, a disk comprised of two platters which each have two recording surfaces will have a track number 12, for example, on each surface of each platter, one below the other, and these four tracks numbered 12 are regarded as one cylinder. Also regarded as all of the tracks on all surfaces which can be read with the disk read/write heads in the one position.

Cyrix A company which produces various personal computer processors in competition to Intel and AMD.

- D -

D/A See *digital-to-analogue*.

DAC Digital-to-Analogue Converter (see).

daisy-chain Connecting a number of devices together, one to the other, essentially in a line, rather than having a number of devices all connected in to one central device in a star fashion. Also known as cascading.

daisywheel printer A type of impact printer that uses a print wheel which resembles a daisy (flower) to produce letter quality output. The spokes, or 'petals', of the print wheel each have a fully formed character which is pressed against the ribbon and paper by a small hammer. Very similar concept to the thimble printer. These printers are largely replaced by dot matrix impact printers, ink jet and laser printers. (See also *printer*.)

D-AMPS Digital Advanced Mobile Phone Service. A technology standard for mobile (phone) telecommunications. Also see *CDMA*.

DASD Direct Access Storage Device (see).

DAT (Digital Audio Tape) Tape storage technology borrowed from video recorders now used with computer systems for data storage. Common tape sizes/formats are 4mm and 8mm. Storage capacities are in the order of gigabytes. See also: *DDS, QIC, helical scan.*

data-acquisition The process of collecting information, and entering it into a computer, typically using either: (1) direct connection of the computer to some instrumentation or equipment; (2) *machine readable encoding methods* (see); or (3) a manual data entry device (eg. terminal or PC).

database A collection of related information stored together in a logical fashion so that individual pieces of information can be easily accessed in a number of different ways. A database can be comprised of one or more computer files, each of which is typically comprised of a number of records which themselves are comprised of a number of data fields or data items. The arrangement of data fields within the record is generally identical for all records within one file, and is often described in the database schema.

database administrator The person within an organisation who has responsibility for the design, implementation and maintenance of a database.

database locking A protection procedure where a database being used by one person, or application, can be locked to prevent concurrent access by another user or application. Compare *record locking.*

database management system (DBMS)   (1) The collection of computer programs which is used to establish, administer and maintain a database. (2) The interface between application programs, users, and the data in a database.

database query language   A fourth generation language that is used in conjunction with a database. It acts as an interface between the user and the database to help the user to easily access data without the use of complex programming code. See: *Structured Query Language, Query By Example.*

database schema   The documented design of a database that shows the relationship between the elements of the database.

database server   See *'server, database'.*

database structure   The way that information is organised in a database.

database structure, hierarchical   A database structure in which the database elements are organised (related) in a hierarchical manner. See also: *hierarchical structures.*

database structure, network   A database structure that is similar to the hierarchical structure, but allows many relationships and is, therefore, more complex, but is also more versatile and flexible.

database structure, relational   A database structure in which the data is organised into 'tables' where a row in the table represents a record, each column in the table represents a data field within the record, and each complete table is stored as a file. The relationship between tables, and between fields of different tables, need not be defined during database development, and can be readily modified. Much material has been published about true relational data managers, including some by former IBM researchers Dr E.F Codd and C.J Date; in particular a number of 'rules' known as Codd's rules. See also *SQL.*

database system   See *information system.*

data bus (also *data lines*)   See '*bus, data*'.

data cable/cabling   See '*cable, data*'.

data cartridge   See *cartridge tape.*

Data Communications (or Circuit-terminating) Equipment (DCE) (data comms) Equipment that performs the functions necessary for data communications (establish, maintain and terminate the transmission), such as a modem. Compare *DTE.*

data communications   The transmission of data (information) in coded form by electrical means over a medium. The medium could be cable or air.

data dictionary   The documentation that records various details about the components of a database, including: data elements, data type, structure.

data field   (1) A place on the computer screen where some information can be entered. (2) A data item which, along with other data items, makes up a record within a file or database. For instance, in a database (or file) of name/address information there could be one data field set aside for each of: person's title (Mr, Mrs, Miss, Ms), person's initials, first name, middle name, family name (surname), street address, suburb, state, postcode, phone STD code, phone number. See also *data item.*

data input methods   See *input methods.*

data integrity   Being able to ensure that the data (ie. information) that has been sent by a sender has not been altered in transmission either accidentally or intentionally.

data item   A piece of information which can be a single alphanumeric character, word, code, number, collection of words, phrase, complete string of text, date or graphic image. See also *data field, BLOB.*

data manager   Software that provides a facility for the manipulation and management of data. Synonymous with *DBMS.*

data privacy   See '*security — data privacy*'.

dataset   (1) A term used on some computer systems synonymously with *file.* (2) (data comms) Generally synonymous with *modem.*

data structures   See *database structure.*

Data Terminal Equipment (DTE)   (data comms) Equipment that acts as a data source, data sink, or both. Typically a computer system, personal computer or terminal connected to a modem. Compare *DCE.*

data warehousing   The concept of accumulating relatively large amounts of disparate data for subsequent reprocessing and retrieval in different forms to provide different views of the data. See also *OLAP.*

Datel   One of several data communication services available in Australia, provided by Telstra, and which uses either the conventional public switched telephone network (PSTN), or privately leased Datel lines, for data transmission. See also: *Austpac, Digital Data Service.*

DB25 connector   A connecting plug with 25 pins (arranged in one row of 12 and one of 13) typically used in RS-232 serial communications and is common on computer equipment; one of the 'D' series of connectors which includes 9-pin and 15-pin connectors.

DBA   Database Administrator (see).

DBCS   Double Byte Character Set. Also see *Unicode.*

DBMS   DataBase Management System (see).

DCA   Document Content Architecture (file format).

DCA/Intel, Communicating Applications Specification (CAS)   See *Communicating Applications Specification (CAS)*.

DCE   Data Communications (or Circuit-terminating) Equipment (see).

DD   Double-Density (see).

DDE   Dynamic Data Exchange.

DDIF   DEC's Document Interchange Format.

DDN   Digital Data Network. The network that is used to provide Telstra's DDS (see).

DDP   Distributed Data Processing (see).

DDS   Digital Data Service. One of several data communication services available in Australia, provided by Telstra, and which uses a digital data network (the DDN) for data transmission. See also: *Austpac, Datel.*

DDS   Digital Data Storage. A tape storage format (developed by Sony and other technology partners) to support DAT tape drives, and utilising helical scan recording methods. Also see: *DAT, QIC, helical scan.*

deadly embrace   The condition where two, or more, computer programs are attempting to access the same resource (database record, file, disk or peripheral), and each is waiting on the other to complete before proceeding. See also *crash.*

debug   To locate and correct errors, or bugs, in a computer program or computer equipment.

DEC   Digital Equipment Corporation, also known as Digital. A large computer company in the 1970s and '80s making PDP-x (eg. PDP-8, PDP-11) and VAX minicomputer systems, and later PCs and servers including the Alpha servers. Taken over by Compaq in mid-1998.

decimal   The base 10 number system, representing numbers using combinations of the digits 0 through 9. Also see: *number systems.*

Decision Support System (DSS)   Similar to an information system, or database system, except that it is regarded as generally more user-friendly and provides for more user interaction with 'what if' type scenarios. Very similar to *EIS* (see).

DECT   A technology standard for cordless telephony.

dedicated (LAN) server   See *'server, dedicated'.*

default   A value or setting in a computer, printer or other equipment that will be used unless changed by the user. Usually takes effect after power-on, a reset, or re-initialisation. Printers typically have a default font, paper size, and number of lines per page that can be over-ridden.

defrag, defragment   The process of rearranging files on disk so that fragmented (non-contiguous) files become contiguous. This is intended to result in faster disk access to complete files, and some saving of disk space (less wasted space). Very small disk files can be stored in a single disk *cluster*; but larger files are too big for one cluster, and must be stored across several clusters. When writing a file to disk, the computer's file system generally looks for the next available disk cluster. A disk file might be stored in several clusters, none of which need to be physically adjacent to each other, in which case the file is fragmented. When reading this file in the future, the total time to read the file will be longer than if the file was stored in adjacent (ie. contiguous) clusters. The defrag process rewrites a fragmented file so that it is stored in contiguous clusters.

DEFT   Direct Electronic Funds Transfer.

delimiter   A character which marks the beginning or end of a piece of information and is not a part of the information; is often a comma, semi-colon, full-stop, space, quotation mark or slash. See also *comma-delimited.*

DeMilitarised Zone (DMZ, see).

demodulation   (data comms) The process of separating the information signal from the carrier signal. See also: *modem, carrier, modulation.*

DES   Data Encryption Service.

desktop PC   See *'PC, desktop'.*

desktop publishing (DTP)   The category of application software which is used for the electronic publishing of publications, typically utilising desktop computer equipment such as the personal computer.

desktop videoconferencing   See *'videoconference, desktop'.*

device controller   See *'controller, device'.*

device driver   See *'driver, device'.*

DHCP   Dynamic Host Configuration Protocol. A TCP/IP configuration protocol that provides both static and dynamic address allocation, and management. A DHCP Server can assign an IP address to a device (eg. a PC) when the device establishes a connection to its attached network.

DHTML   Dynamic *HTML.*

dictionary attack   An approach to gaining unauthorised access to a computer system where a person attempts to log in to the system using every word from a dictionary. This is based on the premise that many people use a standard dictionary word as their password. Also see: *security.*

digital　A discrete, or non-continuous, representation of a physical quantity. The term *digital signal* pertains to data, or information, expressed in the form of digits such as 0's and 1's. See also *analogue*.

Digital　A trademark of Digital Equipment Corporation (see *DEC*).

digital audio tape (DAT)　(see).

digital certificate　A digital document that is issued by a certificate issuing authority (Certification Authority), and which attests to the binding of a particular *public key* to a particular individual (or computer system, program or entity). It can be included as an attachment to an electronic message that is used to authenticate the sender, and it can also help to guarantee that the message has not been tampered with. Also see: *PKI, encryption.*

Digital Data Service (DDS)　(See)

digital ink　(also electronic ink, electronic paper) A display technology (new in 1999) that utilises a flexible display screen, and can store large amounts of information.

digital key　See *encryption*.

digital signature　When an electronic document (or other digital item) is to be sent with a guarantee that the document is in fact from the sender (and not from someone else impersonating the sender), the document can be sent with a block of data that has been encrypted by the sender's private key. This block of data is the digital signature. Thus, the message sender's identity can not be repudiated. The digital signature can also be used to ensure that the message was not changed in transit (ie. to ensure data integrity).

digital-to-analogue converter (D/A or DAC)　A device which converts a digital signal to an analogue signal. Useful for converting output from a computer into electrical signals for such things as: the control of electrical equipment, and better quality colour display systems.

Digital Versatile Disc (DVD)　(see)

Digital Video Disk (DVD)　(see)

digitise　The process of converting something into digital form. It is typically the process of inputting a graphical image (picture, sketch, drawing, etc.) into a computer by using a *digitiser device* to trace over the outline and features of the image. With appropriate equipment a three dimensional object can also be digitised. This has tended to be using specialist table-top equipment that incorporates a probe, the tip of which has a location in space that is known by the controlling equipment.

digitiser　An input device used to input 2-dimensional (2-D) graphical images or (3-dimensional) objects into a computer by *digitising*. The devices for 2-D have a surface through which coordinate points can be identified using a cursor, *stylus pen* or *puck*. Sometimes called: digitising tablet, *graphics tablet* (see). Also see *digitise.*

DIMM　(Double In-line Memory Module) See *'memory, DIMM'.*

DIP　Dual In-line Package. The arrangement of the pins, and the mating socket, as found on the conventional bug-like computer chip (integrated circuit) typically with something like 8, 16 or more metal legs in two lines, one line down each side. See also: *SIPP*, *SIMM*.

dip switch　A very small block of switches, typically located on circuit boards in computers, printers and other devices, and typically with two, four, six or eight switches per block. It can connect into a standard DIP type socket; typically used to set certain parameters to default values, such as (in printers): paper size, character set (eg. ASCII, modified ASCII or an international country set), and serial or parallel transmission. Can perform a similar function to a jumper block.

Direct Access Storage Device (DASD)　A storage device which allows direct access to information stored on it (typically any sort of disk storage device), as opposed to the sequential access magnetic tape storage device.

Direct Numerical Control (DNC)　The numerical control of machine tools by direct communications between the computer and the machine. See also *numerical control*.

directory　A collection of *files* that are stored together on disk. The business office analogy to a directory containing files is a drawer of a filing cabinet containing folders. On some computer systems is synonymous with *folder* or *catalog*.

directory listing　A list of the *files* that are stored within a *directory*, which itself is stored on the disk along with associated file information (such as: filenames, location on disk, size, creation date, last update date).

directory name　The name of a *directory*.

directory, root　The directory in a hierarchical directory structure from which all sub-directories branch.

directory structure, hierarchical　A method of organising files stored on disk into directories and sub-directories in a hierarchical structure. It comprises a single root (or 'parent') directory which can contain a number of files and sub-directories. Each sub-directory ('child') in the root directory can in turn be a parent to another generation of sub-directories. Also referred to as *multilevel*, or *tree-structured*. See also: *hierarchical structures*.

disk The flat circular medium upon which information can be stored. See also: *disk pack, diskette, disk drive, disk cache, RAM disk, virtual disk, fixed disk, hard disk, hard card, optical disk.*

disk allocation unit See *cluster.*

disk cache A technique employed to provide faster access to data (information) on disk by setting aside some memory (either RAM or specially supplied memory) to store the most recently accessed data, and reduce the number of read/write operations. On reading information from disk, the cache memory can temporarily store more information than was actually requested, in case there is a request for the next block of information. On writing information to disk, the cache memory can store it and write it in its own time while the computer's processor and normal RAM proceed with the next tasks. It can also temporarily store the information, in case there is a request to access the same information again.

disk controller A device controller for disk drives; typically with a standard disk interface. See: *ESDI, SCSI, ST-506/412.*

disk drive The device that is used to read and write information to and from a disk. See also: *floppy disk, 'disk, hard', CD-R, WORM..*

disk drive, Iomega Zip A high capacity disk drive, utilising removable media not unlike floppy disks, and capable of storing up to 100 megabytes.

disk drive, Iomega JAZ A high capacity disk drive, capable of storing up to 1 gigabyte.

diskette (1) A generic term in common use to refer to any type of floppy disk. Now synonymous with *floppy disk.* See also: *floppy disk, minifloppy diskette, microfloppy diskette.*

diskette (2) One of a number of terms originally used for the 8-inch floppy disk, commonly called *flexible disk,* that were in early use on some microcomputers and minicomputers. They came in both hard-sectored and soft-sectored versions, and in several different formats.

disk(ette), 3.5 inch The floppy disk of 3.5 inch (90 mm) nominal size, comprising a rigid plastic jacket housing that can fit into a shirt pocket. Initially was typically used to store 720kB (double density) or now more commonly 1.44MB (High Density). Capacities of 2.88MB became available in the late 1990s; but did not become popular. This floppy disk was also known as a *microfloppy.*

disk(ette), 5.25 inch The floppy disk of 5.25 inch (135 mm) nominal size, comprising a flexible plastic jacket. Initially was typically used to store 360kB (DS-DD) or 1.2MB (DS-HC) of information. The 1.2MB disks are referred to as High-Capacity (HC) or High-Density (HD). Very early personal computers used diskettes with capacities of: 160kB single-sided, and 320kB double-sided. This floppy disk was commonly known as a *minifloppy,* and was little used by the late 1990s.

diskette, Double-Density (DD) The information stored on the diskette is at double the density of the earlier single-density disks. That is, twice as much information can be stored on the same amount of physical space. See also *'diskette, Double-Sided', 'diskette, High-Capacity'.*

diskette, Double-Sided (DS) Information is stored on both surfaces (top and bottom) of the disk, unlike the very early disks which only stored information on one side (Single-Sided). See also *'diskette, Double-Density'.*

diskette, Double-Sided Double-Density (DS-DD) A configuration of diskette in common use on personal computers in the 1980s, typically 360kB capacity. See also *'diskette, minifloppy'.*

diskette, High-Capacity (HC) Minifloppy diskettes of 1.2MB capacity. Also referred to as *High Density.* See also *'diskette, Double-Density'.*

diskette, microfloppy See *'disk, 3.5 inch'*

diskette, minifloppy See *'disk, 5.25 inch'*

diskette, Single-Density (SD) The early version of (8-inch) floppy disks which stored data at a nominal density which is now referred to as single density. No longer in common use.

diskette, Single-Sided (SS) The early version of (both 8-inch and 5.25-inch) floppy disks which were certified to store data on one side of the disk only. See also: *flippy floppy, 'diskette, Double-Sided'.*

disk file A *file* stored on disk. Depending on the computer system, files are typically stored on disk in one or more *clusters,* which need not be adjacent to each other. A very small file will use one cluster regardless of how much of the cluster it actually occupies. See also *file, cluster, contiguous file, directory.*

disk, fixed See *'disk, hard'.*

disk, floppy The generic term used to refer to any of the 8-inch, 5.25-inch or 3.5-inch *diskettes* (see).

disk, hard A *disk storage device,* used for magnetic storage of information, comprising one or more rigid disk platters as well as the read/write mechanism all fully enclosed and sealed within the one unit. In the '80s they were available in a variety of capacities from about 10 megabytes up to several hundred megabytes. By the late '90s capacities of several gigabytes were common. Also known as: *fixed disk, Winchester disk.* See also *disk file, 'disk, removable', disk space, disk storage.*

disk image See *SOE.*

Disk Operating System (DOS)   A generic term for an operating system which is used principally for the management and manipulation of a computer disk and its contents. It typically resides on disk and must be loaded into memory before use, but it can also reside on tape or in ROM. See also *DOS, operating system*.

disk optimising   On PC systems usually refers to the process of *defragmenting* (see).

disk pack   One or more disk platters contained in a (plastic) case which can be loaded into a disk drive storage device. The disk pack is removable, meaning that several disk packs can be used interchangeably in the one disk drive. Historically used with mainframe computers, and minicomputers.

disk, removable   The *disk storage device* equipment which allows the disk to be readily removed. The disk can then be transported off-site for storage (as with a *backup*), or transported to another system. Includes: conventional floppy disks, and various higher capacity disks initially popularised by Iomega and SyQuest (eg. Zip and JAZ drives). Capacities were initially in the order of 100MB or 120MB, and later up to 2GB.

disk space   A *disk storage device* has the capability to store a finite and measurable amount of information (measured and expressed in bytes — either *kB, MB, GB, TB*). The term *disk space* refers to a part, or all, of the storage capacity on the storage device. Each stored file will use up a certain amount of disk space. Small files will use small amounts, and large files will use up large amounts of space. Early floppy diskettes had a disk space (storage capacity) of 320kB, and eventually 1.44MB (see *diskette*). Also see *'disk, fixed'*.

disk storage (device)   The part of a computer system that is used to store information semi-permanently (semi-permanently because there are ways that it can be readily removed or deleted). It comprises some sort of circular spinning platter (or disk) onto which information can be stored, and subsequently read back. Simple disk storage devices (eg. *floppy disks*) comprise just one platter; whereas other devices (eg. hard drives) can comprise several platters mounted one above the other on a single spindle. Compare *'memory, computer'*. Also see *disk space.*

display, DSTN   (Dynamic Super Twisted Neumatic, also referred to as Dual Scan). One particular type of colour liquid crystal display used in notebook computers. Also see *'display, TFT'*.

display, TFT   (Thin Film Transistor). One particular type of colour liquid crystal display used in notebook computers. Is often considered to be superior to DSTN displays; but TFT does have advantages. Also see *'display, DSTN.'*

display device (also display screen)   A generic term used for a family of devices that display images including: monitor, screen, VDU, VDT, terminal, LCD display, flat panel.

Distributed Data Processing (DDP)   (1) The concept of having computers and associated equipment in physically dispersed locations, but still connected. (2) Spreading the computational work load across several computers (minicomputers or PCs) instead of centralising it onto fewer computers (a mainframe or only few minicomputers).

distributed file system   The collection of (disk) files that reside on networked computers and which are made available to other computers on the network.

distributed processing   See *Distributed Data Processing*.

dithering   A technique used initially with colour output devices (such as colour printers) for shaded areas to impart a small degree of randomness into the shades of colour in the dot pattern that makes up an output image (it is not necessary for line images). It is intended to minimise 'banding' and other undesirable patterns that can occur. There are many different dithering techniques.

DLE   Data Link Escape. A control character used exclusively to provide supplementary line control signals (control character sequences).

DMA   Direct Memory Access.

DMZ   DeMilitarised Zone. A key part of a company's computer network architecture is the inclusion of both a DMZ LAN segment, and a *bastion host* web server. A DMZ LAN segment is usually attached to the *firewall*, and will allow most incoming traffic from the internet to access the devices on the DMZ. Typically, a company's *web server* is placed on the DMZ, and not behind the full security of the firewall. This allows incoming internet traffic to find the web server, without gaining access to the company's internal networks and equipment. The web server in this case is known as a bastion, or sacrificial, host as it is quite vulnerable to hackers with only limited firewall protection.

DNA   DEC Network Architecture.

DNC   Direct Numerical Control (see).

DNS   Domain Name Service.

domain   Some space on an *Internet* server where *web pages* and related *disk files* reside. The name of the *domain* is referenced in the *URL*. See *domain name, URL*.

domain name   (also network location) A unique name that identifies a particular web site. The name of a *domain* is generally comprised of several parts. eg. *www.companyname.com.au*. Where each part is as follows:

www – indicates the domain resides on the *World Wide Web* (this is not always required);

companyname – is a string of *alphanumeric* characters that is appropriately registered with the domain registration authorities for use by a particular company or individual. It is often the name of a company or business, and can include dot separators between words to refer to sub-groups within the company;

com – indicates the domain name is a company (as opposed to *org*, *net*, *asn*, *gov*, *edu*); and

au – the country identifier (*au* for Australia in this example), except that Web sites can be registered without the country code (the country codes conform to the ISO Country Codes standard). Originally, web sites registered in the USA did not use a country code (and still don't). Also see *URL*.

Domino, Lotus   See *Lotus Domino*.

DoS (Denial of Service) hack attack   The process whereby a computer user orchestrates a flood of electronic messages (usually over the *internet*) directed to a particular *web server* so that the web server is so inundated that it cannot respond to them all, nor send out its own electronic messages (internet traffic). The end result is that a *web surfer* who wants to validly access the web server will get no response. The web server is essentially off the air. Also see *hacker, security.*

DOS   Disk Operating System. (1) A generic term for a particular type of operating system. See *disk operating system.* (2) The generic name of various versions of the *operating system* used on personal computers in the 1980s and '90s, and generally supplanted by *Microsoft Windows*. See: *MS-DOS*, *PC-DOS.*

DOS disk   See *boot disk.*

dot-com   A term used loosely to refer to companies that specialise in internet or other high-tech, computer-based or electronics fields. During the so-called "tech wreck" of April/May 2000, a number of so-called dot-com companies went through difficult times, and some went out of business.

dot matrix printer   A type of impact printer that uses a print head containing several pins or wires — usually 9, 18, 24 or 48 — which are selectively struck or drawn forward to strike the ribbon producing characters comprising patterns of dots. See also: *printer, NLQ, LQ.*

double byte   The use of two *bytes* of information together to represent: (1) a number with more significant digits, or (2) a character that could not otherwise be represented with a single byte.

Double-Density (DD)   See *'diskette, Double-Density'.*

double precision   The use of two computer words to store a number during program execution instead of single precision, or a single computer word. This technique provides for extra precision (more significant places) in calculations.

Double-Sided (DS)   See *'diskette, Double-Sided'.*

download   The process of transferring information from one piece of (computer) equipment to another, in particular from a larger or more powerful device down to a lesser one (such as mainframe to minicomputer, or minicomputer to personal computer, or personal computer to printer). Fonts are downloaded from a computer to a printer; and computer files are downloaded from a remote computer (a bulletin board system, Internet Web site or host mainframe, etc.) to the user's own local computer. Compare: *upload.*

DPS   Display PostScript. See *PostScript.*

draft quality print   See *'print quality, draft'.*

drive, hard   See *'disk, hard'.*

driver, device   A computer program that is used to interface the computer to a particular peripheral device (eg. keyboard, mouse, graphics tablet, screen, printer, plotter).

(1) It is typically transparent to the user, and is linked to the operating system. In DOS a device driver can be specified in the CONFIG.SYS file using the DEVICE directive.

(2) Specific application software packages (word processors, spreadsheets, etc.) have a 'device driver' to handle communications with a device, such as a specific printer, and which converts output from the computer into the appropriate format for the particular device. This can be implemented by having a separate device driver file for each supported device.

drum plotter   See *'plotter, drum'.*

DS   Double-Sided (see).

DS-DD   Double-Sided Double-Density. See *'diskette, Double-Sided Double-Density'.*

DSL   Digital Subscriber Line. A technology to deliver faster telephone services for both voice and data, utilising existing copper telephone lines (available in some countries since about 1997). DSL technologies theoretically offer data transmission speeds up to 8Mbps (in practice, this could be limited to about 1.5Mbps downstream to the user, and 384kbps upstream to the exchange). Implemented in various countries in different forms (eg. ADSL, HDSL). Includes: ADSL (see), HDSL (High Speed), SDSL (Symmetric).

DSR   Data Set Ready (data comms). A modem signal (in RS-232 communications) that indicates that the terminal is ready for transmission. Also see: *CTS, CD, DTR.*

DSS   Decision Support System (see).

DSTN   Dynamic Super Twisted Neumatic. One particular format for colour liquid crystal displays in notebook computers. Also see *TFT, HCAD.*

DTE   Data Terminal Equipment (see).
DTP   DeskTop Publishing (see).
DTR   Data Terminal Ready (data comms). A modem signal (in RS-232 communications) that indicates to the modem that the DTE device (computer or terminal) is ready for transmission. Also see: *CTS, CD, DSR.*
Dual Independent Bus architecture   A bus architecture from Intel introduced with the Pentium II processor and which utilises two separate buses — one that is linked to the L2 cache, and the other is dedicated to the main memory. This allows the processor to access data from either of its busses simultaneously and in parallel, rather than in a singular sequential manner.
dual processor   A computer system operating with two *processors* instead of just a single processor.
dumb terminal   A keyboard and display screen that can send and receive data, but has limited processing capability. Typically emulates a specific make and model of terminal. Is typically connected to a multi-user host computer system such as a mainframe or mid-range system. See also *intelligent terminal, thin client.*
duplex transmission   See *full duplex.*
DVD   Digital Video Disk (also referred to as Digital Versatile Disc). A compact disk technology standard providing much greater capacities and capabilities than conventional compact disks. In excess of 2GB, is often about 5GB, and up to 17GB. Also see *CD-ROM, HD-ROM.*
DVI   Digital Video Interactive. Refers to full motion video stored on compact disk to be read and displayed by computer systems. The data is stored in compressed form on disk and is decompressed for display purposes. Contemporary personal computers need an add-in board that reads the compressed image files from the disk and decompresses the images to generate TV-quality images. Can also drive external speakers.

- E -

EBCDIC   Extended Binary Coded Decimal Interchange Code (pronounced 'eb-see-dick'). A character encoding system, used primarily in IBM large system equipment, for encoding characters in binary format for internal representation within a computer; utilises 8 bits, and is limited to 256 characters total. Refer to the table in the Appendix for some selected alphanumeric characters and their equivalent EBCDIC (and ASCII) codes. See also: *encoding systems, ASCII, BCD.*
e-commerce   See *electronic commerce.*
ECP   Enhanced/Extended Capabilities Port. A parallel port standard for PCs. Also see *EPP.*
edge connection and **edge connector**   An electrical connector which is formed by continuing the conducting paths of a printed circuit board to the edge of the board. PC expansion boards interface to the expansion bus in the PC with their edge connection.
EDI   Electronic Data Interchange (see).
EDO memory   See *'memory, EDO'.*
EDP   Electronic Data Processing. A term in common use in the '70s and '80s referring to the very broad and general field of processing of information by computer systems. Depending on the context, synonyms include: *MIS (Management Information Systems), IT (Information Technology).*
EEMS   Enhanced EMS (Enhanced Expanded Memory Specification). A specification for expanded memory in personal computers that is an upgrade from EMS version 3.0. It was developed by a consortium of organisations and provided up to 16MB of RAM. No longer in common use.
EFT   Electronic Funds Transfer.
EGA (Enhanced Graphics Adapter)   A video display system standard. See *Video Standard, EGA.*
EIA   Electronic Industries Association. A standards organisation in the USA specialising in the electrical and functional characteristics of interface equipment.
EIS   Executive Information System. A particular type of information system intended to provide senior management with the ability to readily analyse business data at the touch of a computer screen. Generally comprises a database of information (not unlike a data warehouse), software that facilitates ready access to the information, and software that enables the information to be displayed in a very useful form on screen (often in graphical form). Also see *Decision Support System.*
EISA   See *'bus, EISA'.*
electronic commerce   The conducting of business electronically over a network. Is basically EDI (Electronic Data Interchange) (see). The network used can be a private network established between specific trading partners utilising a public domain network (such as *leased lines*, *PSTN*, *ISDN*), or a public network such as the *Internet.*
Electronic Data Interchange (EDI)   The standard which describes the electronic transfer of trading documents between trading partners, including: purchase orders, invoices and shipping documents. Initially carried out over dedicated point to point communications lines, but now more and more over the internet (and utilising VPNs). (Referred to by some people as Electronic Document Interchange.)
electronic mail (e-mail)   See *e-mail.*

electronic ink/paper   See *digital ink*.

electronic publishing   The creation of a document by entering text, graphics and images into a computer system, and laying out each document page on the computer screen. The resultant output is material to carry to the printing stage. See also *desktop publishing*.

electronic spreadsheet   See *spreadsheet*.

electronic trading   See *electronic commerce*.

electrostatic printer   A type of printer that uses a 'dot matrix' type of print head to emit electrical charges at selected dot points close to the surface of special dielectric printer paper. The electrically charged areas become dots as a toner is applied to the paper, forming a character matrix. (See also: *printer*.)

e-mail   Messages that are transmitted electronically by computers over a network or other communications channel. E-mail can be transmitted over a *Local Area Network* within a business enterprise, or across a *Wide Area Network*, or over the *Internet,* or other form of computer network. An e-mail message is prepared using some sort of text editor or word processor. It has one or more recipient's e-mail address(es) specified (in the e-mail header), along with a reference to the subject matter. It is typically no more than one or two pages in length, and can have one or files attached (eg. larger documents, graphics files, sound files, movie files, other e-mail messages). Also see *snail-mail, spam*.

e-mail address   The unique address for an electronic mailbox. eg. fred@company.com.au. In some software (especially in *Web pages*, and in word processing software) the prefix *mailto:* indicates that it is an *e-mail* address.

EMA   Extended Memory Area.

EMF   Enhanced Meta Format (file format).

EMS   Expanded Memory Specification. A specification for expanded memory in personal computers. EMS 3.0 was developed in 1985 and provided 8MB of RAM. This was succeeded by EEMS, and then by EMS 4.0. See *expanded memory*. No longer in common use.

emulate   The characteristic of a personal computer, computer terminal, system, or peripheral hardware, in imitating, or behaving like, another.

(1) For a PC that is connected to a multi-user host (eg. mainframe or mini-computer) the PC behaves like a device that is native to that host.

(2) For computer terminals and systems it allows interaction between two otherwise incompatible systems. A specific terminal emulation is often required for dial-up access to bulletin board systems and other on-line services.

(3) For peripheral hardware, such as printers, it allows a less common brand to behave like a more common brand. This means that a less common brand device can be used with application software which has a device driver for a more popular one. For instance, many dot matrix printers will emulate the Epson brand of printers; many laser printers will emulate the Hewlett-Packard brand; some brands of mouse will emulate the Microsoft mouse; and some graphics (digitising) tablets will emulate the Summagraphics.

encoding system   A means of coding alphanumeric characters in the binary notation that computer systems can readily handle. Thus, each alphanumeric character (as on the keyboard) will have a binary number associated with it; but a possibly different binary number in each encoding system. Relatively common encoding systems include: ASCII and EBCDIC. See: *ASCII, BCD, EBCDIC*.

encryption   The technologies and methods for encoding information to ensure that it can only be read by authorised parties. Also see: *security.*

encryption, secret key   Encryption in which a key which is used to both encrypt, and decrypt, messages. See also '*encryption, public key'*.

encryption, public key   (or cryptography). Encryption in which a pair of keys (one private and one public) are used to encrypt and decrypt messages. The public key can be widely distributed and used to encrypt messages that are forwarded to an individual who uses their private (secret) key to decrypt the message. See also *'encryption, secret key'*.

Enhanced EMS   See *EEMS*.

ENQ   Enquiry (data comms). A transmission control character which is transmitted to a remote device as a request for a response from that device.

enterprise portal   See *'portal, enterprise'*.

EOF   End Of File.

EOT   End Of Transmission (data comms). A transmission control character which is used to indicate the conclusion of the transmission.

EPP   Enhanced Parallel Port. A *parallel port* standard for PCs that supports bi-directional communications between the PC and the attached device(s) (such as a parallel printer). It is about 10 times faster than the older *Centronics* printer standard (about 600 to 1500 MBytes/sec versus the Centronics 150kBytes/sec); but is still compatible with the Centronics standard. It's speed is rated in Bytes/sec (not bits per second) because the family of parallel interfaces transfer a whole byte a time (see *parallel communications, parallel port*).

EPROM   Erasable Programmable Read Only Memory. A type of semiconductor computer memory which is read-only and non-volatile, like a ROM, but is erasable under ultra-violet light and subsequently reprogrammable. See also: *PROM, ROM*.

EPS   Encapsulated PostScript (file format). These files can contain two versions of a graphics image: PostScript (resolution independent text description), and an optional bit-mapped version stored in PICT format.

ERP   Enterprise Resource Planning. A term in use in the late '90s with very similar meaning to *MRP*. An ERP software package is typically a large package running on a networked, or a large, computer system and accessed by many people from different parts of a company. It attempts to cover all facets of managing a business, and is typically used for such business functions as: Accounting (Debtors, Creditors, General Ledger), Asset Management, Purchasing, Inventory Control, manufacturing planning, Distribution, Customer Sales.

ESC   Escape character. A special character (control character) typically used in computer communications with a printer or other computer device. When combined with one or more following characters it forms an escape sequence.

escape sequence   A sequence of characters, the first of which is the escape character (ESC), used to indicate a special command or instruction.

ESDI   Enhanced Small Device Interface. A popular device interface, used in particular for disk drives. See also: *SCSI, ST-506/412*.

ETB   End of Transmission Block. A transmission control character which is used to indicate the end of a block of transmitted data.

ethernet   A local area networking system and its associated protocol, originally developed for the Xerox Corporation in the early '70s. It is a baseband system, using CSMA/CD network access control protocol and bus topology. It is available in several versions including: standard Ethernet, ThinNet and twisted pair Ethernet (the later using hierarchical star topology), also 10Basexx and 100Basexx.

ETSI   European Telecommunications Standards Institute.

exa-   The SI unit prefix for 10^{18} (ie. 1,000,000,000,000,000,000 or billion billion).

exabyte (EB)   Approximately one billion, billion bytes (derived as 2^{60}). Exabyte is very rarely used yet, if at all (early 2000s) as storage devices, memory or transmission speeds have not yet reached any where near this order of magnitude. See also: *byte, kilobyte, megabyte, gigabyte, terabyte, petabyte*.

Exchange, MS   The electronic and messaging standard, environment and product from Microsoft.

Executive Information System (EIS)   (see)

expanded memory   See *'memory, expanded'*.

expansion board   See *expansion card*.

expansion bus   See *'bus, expansion* .

expansion bus, AT   See *'bus, AT'*.

expansion bus, PC/XT   See *'bus, PC/XT'*.

expansion card (board)   A printed circuit board including various integrated circuits, electronic components, and plugs, sockets or connectors. It connects into the expansion bus of a computer and provides the computer with additional, or enhanced, functions or features. Also called *adapter card*.

expansion slot   The socket or connector in a computer, which is connected into the computer's expansion bus, into which an expansion board can be connected. These come in different sizes and configurations. See also: *bus, 'bus, expansion', 'bus, PC/XT', 'bus, AT'*.

expert system   A computer system capable of considering a vast amount of information (knowledge), human-like reasoning, and then recommending a course of action. Also see: *Artificial Intelligence*.

extended memory   See *'memory, extended'*.

extension, filename   See *file extension*.

Extranet   A network based on *Internet* and *Intranet* technology that allows selected *Web surfers* to gain access to what would otherwise be an Intranet type network not normally available to Web surfers (from outside the organisation). Also see *Internet, Intranet.*

- F -

FAQ   Frequently Asked Questions.

FAT   File Allocation Table. Information stored on a *disk drive*, and used by the *file system* of a computer to track the location of information on the *drive*. The FAT tracks *clusters* of disk space. DOS version 1.0 had a 12-bit FAT. DOS versions 2.0 onwards had a 16-bit FAT. Windows 95 (version B) had a 32-bit FAT.

FAT16   A specific FAT utilising 16-bits, which inherently limits the useable disk drive size to 2GB with 32kB *clusters*.

FAT32   A specific FAT utilising 32-bits, allowing larger useable disk capacities (ie. larger addressable space).

fail-over The principle whereby one piece of equipment is backed up by a second one. Often refers to two computer systems (eg. servers), one mirrored by the other, where if one system should fail (abort or crash) the second system will continue to operate and provide network services.

FDD Floppy Disk Drive.

FDDI Fibre Distributed Data Interface. A standard for fibre optics.

FDX full duplex (see).

FEM Finite Element Method (see).

fence line message technology A technology for sending/receiving electronic messages along a conventional wire farm fence. Initially developed for controlling electronic fences (a remote switch to turn them on or off), has been further developed to operate other farm devices (eg. gates, water valves).

fibre optics A technology for transmitting information via light waves moving through a fine filament, or optic fibre.

field See *data field.*

FIFO First In First Out.

file A collection of information stored together as one unit on disk (or on computer tape, flash memory, ROM, or other storage medium) and has a *filename*. A *file* can be a document, spreadsheet, graphics image, sequence of images (either cartoon like, or movie-like), sequence of sounds, or a combination of these. It can also be a computer program written in one of many computer programming languages. For example, a *file* can comprise a number of similarly laid out *records*. The business office analogy of a *file* containing *records* is a folder in the drawer of a filing cabinet containing a number of sheets, documents or forms, etc. Also see: *filename, record, disk file, directory.*

file and print services A server is said to offer *file services* to PCs over a network when the server has disk space for the central storage of computer files. A server is said to offer *print services* when it accepts requests to print files from PCs, and prints them to one or more centralised printers. Early file server installations offered little more than these *file and print services.*

file extension The file extension usually gives an indication of the type of file; and in many systems is limited to up to 3 characters in length. It is included at the end of a filename and is separated from the filename by a full stop. Some samples: BAT –batch file, COM or EXE – executable file, TXT – text file, PDF – Adobe PDF file. See *filename.*

file format When information is stored in a computer file (on a disk or tape) there are many ways of arranging the information within the file. The simplest is the plain text format. More complex file formats have been devised for specific purposes, and can have provision to include such things as: text character formatting (ie. typeface and font size, including attributes like bold, italic, underline); file edit history details (nominal name of the file owner, password, number of times been saved, etc.); graphics images, database information.

file format, BMP Bit Map. A format for storing images.

file format, GIF (Graphics Interchange Format). A format for encoding and storing images that contain up to 256 colors.

file format, plain ASCII A very plain and simple computer file format where the file contains alphanumeric characters, and possibly escape characters.

file formats, graphics Various formats include: CGM, PCX, Paint, PIC, PICT, TIFF, EPS, PostScript.

file fragmentation The result of continued creation and deletion of files on disk which results in lots of little bits of disk space between the remaining files. This results in slower disk access times, and difficulty in storing large files such as word processing or spreadsheet files. The fragments of disk space can be made contiguous by shuffling the files around using a disk management, or disk optimising, utility package. Also see: *defragment.*

file-locking A protection procedure where a file being used by one person, or application, can be locked to prevent concurrent access by another user or application.

filename The name of a *file* that is stored in a computer system. In a DOS-based system the name of a file is comprised of up to eight *alphanumeric* characters (including only some special characters), followed by a dot and up to three characters called the *file extension.* Other systems allow more than just eight alphanumeric characters. Contemporary versions of Windows (Windows 95 onwards) allow long filenames. Also see *filename extension.*

file server See *'server, file'.*

file transfer protocol See: *XON/XOFF, Xmodem, Kermit.*

file types Computer disk *files* can be stored in different *file formats*, or file types. A *file type* can often be determined by the file name extension. Just some of the commonly used file types include: DOC, TXT, AVI, GIF, JPG, JPEG, MPG, BMP, PCX, WMF, TIFF, TAG, EPS, CLP, WK, WQ, XCL, PPT, BAT, COM, EXE, INI, DLL, CAB, HTM, HTML.

film recorder An output device which reproduces computer images on photographic film by displaying the image on a small internal display screen and taking a controlled time exposure

photograph of it. The output can be 35mm slide, print, instant-developing print, or pocket overhead transparency. Also: *slide maker*.

Finite Element Method (FEM) The analysis of objects during their design stage by dividing the object into many elements in order to calculate parameters such as stress, strain, heat transfer and other physical characteristics.

firewall A combination of hardware and software that is used as an interface between an inhouse networking system (eg. LAN) and an external network (eg. the internet). It readily allows network traffic to pass out, but screens and filters incoming network traffic. Is primarily intended to prevent computer system hackers from gaining access to inhouse computer systems. It can be implemented as software onto some sort of server hardware (which is already running an operating system such as Unix or Windows NT), or as a network appliance which does not rely on anyone else's operating system. Firewall software can also be invaluable for a single PC with a permanent or semi-permanent internet connection (eg. a home PC with a cable connection to the internet).

FireWire A high speed serial connection standard, for connecting devices to computers or for peer-to-peer communications. Introduced in mid- to late-1997, similar to the USB (Universal Serial Bus) but faster. Supports transfer rates of up to 400Mbps. Many FireWire capable devices were introduced in early '99 (eg. printers, digital cameras, music synthesisers, audio mixers, home entertainment systems and various disk drives. FireWire devices are *hot-pluggable* and can be *daisy-chained*. Macintosh computers included FireWire ports from '99. Also see: *Bluetooth, Jini*, '*bus, universal serial*', *ADB, AGP*.

firmware A computer program, or software, stored permanently in ROM or PROM, or semi-permanently in EPROM.

first generation computers Computers developed and used prior to about 1960 and which employed vacuum tube technology.

fixed disk See *'disk, fixed'*.

fixed pitch (typeface) (also: monospaced typeface/font) Some older typefaces (eg. `the courier typeface which this text is`) utilise fixed character spacing where every printed character takes up the same amount of horizontal space. This results in a little extra space around the slimmer characters (such as the letters 'i' and 'l') and some characters (such as the letters 'm' and 'w') appearing cramped. (As opposed to the remainder of this text which is printed using a proportional typeface.) See also *proportional (typeface)*.

flatbed plotter See *'plotter, flat bed'*.

flat panel display A type of display screen that does not use a picture tube to display characters as in the conventional CRT display. Commonly in use in laptop and portable computers, including liquid crystal and gas plasma types.

flexible disk See *floppy disk*.

flippy floppy In earlier times when single-sided disks were popular, many people managed to use the second side by 'flipping' the disk over and re-inserting it into the disk drive upside down. The disks were certified for single-sided use, but the second side was often also of certifiable quality. See also *'diskette, Single-Sided'*.

floating-point A method of representing a real number (numeric value which contains a decimal point).

floppy disk (also *floppy diskette*) The generic term for a disk storage medium used for the magnetic storage of information and made of thin, flexible, magnetised plastic. It is enclosed in a vinyl (or cardboard) jacket which includes a lint-free fabric liner. See also: *diskette*, *'diskette, minifloppy'*, *'diskette, microfloppy'*.

floppy disk drive The device into which a floppy disk is inserted to transfer information to and from the floppy disk.

folder See *directory*.

font All the printable characters (letters, digits, punctuation marks, symbols) of one combination of typeface, style and size. For instance, many text books are set in the Times Roman or Century Schoolbook typefaces in upright style at 10 points, using bold and italics for emphasis, each of which is regarded as a different font. See also: *font characteristics*, *typeface*.

font cartridge (or module) A device about the size of a slim packet of cigarettes which can be obtained for use with a printer, especially for laser printers, and which contains additional fonts for use by the printer. It plugs into a special socket.

font characteristics The features of a particular font, including: orientation (across the page or down the page - portrait or landscape), spacing (proportional or fixed), pitch (characters printed per horizontal inch), character height or point size (10 point, or 12 point, etc), style (upright, italic), stroke weight (bold, medium, light), and typeface (Courier, Times Roman, Century Schoolbook, Helvetica, etc).

foreground Refers to a (high priority) computer program or task that takes precedence over less critical ones which can be referred to as background programs. Compare: *background*.

form factor (eg. 5.25", 3.5", etc.) Indicates the physical size of a device. The 3.5" or 5.25" form factor for various disk drives refers to their physical, or the space they take up when installed into a computer system case.

form feed A control code, and a printer panel button, that advances the paper to the top of the next page.

form letter A letter (document) of standard form to which is added various information such as name/address details. Commonly used in mail-merge operations.

Fortran FORmula TRANslator. A high level computer programming language used primarily for technical, scientific and engineering applications.

forward engineer The process of producing a product (such as a 'compatible' personal computer) by making it perform the same way as an 'original' product. This can be done from specifications, or by close examination of the original. See also *reverse engineer*.

fourth generation computers Computers developed and used from the early 1970s to the present day, and which make use of LSI (and VLSI) integrated circuits.

fourth generation language (4GL) A type of programming language in which the user needs very little programming knowledge to create a computer program. Examples include: database query languages, report generators, and application generators.

FP memory (Fast Page memory) See *'memory, FP'*.

fps frames per second (video).

fragmented file (also *non-contiguous*) A file which is stored on disk in clusters which are not all physically adjacent. This comes about after several files have been written to disk, and then some of them erased leaving behind some re-usable clusters into which the operating system may put a portion of the next file being written to disk (or as much as will fit). This new file can then be fragmented, or non-contiguous. Also see: *contiguous, disk optimising*.

frame, Web page See *Web page frame.*

frameset, Web page See *Web page frameset.*

freeware Software that is made freely available for duplication and use without requiring any payment for purchase. It can be freely copied and distributed. It can provide the same or similar functions to commercially available software; but carries no guarantees for performance. Sometimes also called *public domain software*. See also *shareware.*

FTP File Transfer Protocol. A protocol used for transferring files over TCP/IP, and over the *Internet.* See also *HTTP.*

full duplex (FDX) The simultaneous, two-way, independent transmission in both directions of information on a communications line. A device (computer or modem) that is transmitting information to a second device along a communications line can also be receiving information from the second one at the same time. Compare: *simplex, half duplex.*

full-height A term used to describe the relative height of various devices — disk or tape drives — for internal installation into a personal computer. The early Personal Computer and older PC XT computers use full-height floppy disk drives. Most personal computers now use half-height devices, except for higher capacity disk drives.

- G -

GB See *gigabyte.*

Gbps gigabit per second.

gateway A device used to join two networks that run totally incompatible protocols. Such as to connect a PC network to a host mainframe. Compare: *bridge.*

general purpose application software See *'application software, general purpose'.*

GEO Geostationary Earth Orbit satellite. See *'satellite, GEO'.*

giga- The SI unit prefix for 10^9 (ie. 1,000,000,000 or billion)

gigabyte (GB) Approximately one billion bytes (ie. 10^9), or exactly 1,073,741,824 bytes (derived as 2^{30}). Gigabyte is now in common use (in the late 1990s) because disk storage devices (eg. hard disk drives and CD or DVD ROM disks) are common in capacities of several gigabytes. See also: *byte, kilobyte, megabyte, terabyte, petabyte, exabyte.*

GIGO Garbage In Garbage Out. Incorrect, inaccurate or faulty input information often results in incorrect output.

GIS Geographic Information System.

gopher An Internet protocol for displaying and retrieving files.

Graphical User Interface (GUI) environment A user interface in which information is displayed on the computer screen in graphical form, as opposed to a character-based interface which displays mainly text information. The graphical information displayed can include: icons, the cursor, a scroll bar and menu bars. The user typically utilises a pointing device (mouse or graphics tablet) to make selections and interface with the system. Examples include: the Apple Macintosh user interface, Microsoft Windows, GEM (Graphics Environment Manager) and Presentation Manager.

graphics software A category of application software which in simplest terms can draw or paint images. Can also be used to prepare presentation materials and various publications.

graphics tablet   A computer input device. A flat rectangular panel that sits horizontally on the desktop and is used with a *stylus pen* or *puck*. Can have areas of its surface reserved for pre-programmed menu items or keyboard sequences (macros) . Often used with CAD systems and by graphic artists in lieu of a mouse. Also see *digitiser*.

green screen   A generic term referring to a *dumb terminal* (see).

groupware   Specialist software which exists for specific use in a workgroup environment, including the functions of: electronic mail, and workgroup diary and calendar.

GSM   Global System for Mobile communications. A technology for digital mobile telephones. Developed in the 1980s, and first introduced in 1991/92, became the predominant technology for mobile phones around the world during the 1990s. In 2001, is still the dominant technology in Australia (with the phasing out of the analogue mobile phone system).

GUI   Graphical User Interface (see).

- H -

hacker, computer   A person who attempts to gain unauthorised access to a computer system in one of a variety of ways including: (1) continuous attempts to guess a username that requires no password (eg. username guest); (2) continuous attempts to guess a username and password combination; (3) monitor network traffic and pick up enough information to be able to gain access. Also see *dictionary attack, DoS*.

Half DupleX (HDX)   The transfer of information on a communications line in either direction, but not simultaneously in either direction. A half duplex mode device can transmit, or receive, but not at the same time. Compare: *full duplex*, *simplex*.

half-height   A term used to describe the relative height of various devices — disk or tape drives — for internal installation into a personal computer; and refers to one-half of the height of a full-height device. See also: *full-height*.

handshaking   The exchange of control characters, or predetermined signals, between two communicating devices. Usually a part of a communications protocol. The handshaking process takes place between two modems (or two fax machines) when they first connect; and enables them to agree on such things as speed at which to communicate, and any error correction standard that is to be used.

hard card   A slender hard disk drive and controller combined on one personal computer expansion board which fits into an expansion slot within the personal computer; (was) typically available in 20MB or 40MB capacities.

hardcopy   A copy of computer information on a permanent medium such as paper or film, generated by an output device such as a printer or plotter (eg. list of information, graph, chart, program listing, drawing).

hard disk (drive) (HD or HDD)   A disk drive storage device, used for magnetic storage of information, comprising one or more rigid disk platters. In the '80s they were available in a variety of capacities from about 10 megabytes up to several hundred megabytes. By the late '90s capacities of several gigabytes were common. See '*disk, hard', 'disk, fixed'*.

hard-sector   See *'sectored, hard'*.

hardware   The physical components, parts and devices which collectively make up an entire computer system. If you can see and touch it, then it is hardware. The basic PC system configuration typically includes the following hardware items: system unit, monitor (or screen, or VDU), and keyboard. These can also be accompanied by other hardware devices such as: a mouse or graphics tablet, printer, modem, external disk drive, and tape drive.

HC   High Capacity (see).

HCAD   High Contrast Addressing Display. A relatively new format for colour liquid crystal displays in notebook computers, introduced in late 1997. Also see *DSTN, TFT*.

HD   High Density (see).

HDD   Hard Disk Drive (see).

HDLC   High-level Data Link Control. A communications protocol, defined by ISO as an international standard; enables unlike devices to communicate with one another over large data communications networks.

HD-ROM   (High Density ROM) The Norsam HD-ROM, developed by Norsam Technologies, is like a CD-ROM disk, but capable of storing up to 165GB. Utilises a 50 nanometer laser-writing technology (in lieu of the more conventional 800 and 350 nanometer). Marketing of this technology commenced in 1999. Also see *CD-ROM, DVD.*

HDSL   High Speed DSL (see DSL).

HDTV   High Definition Television.

HDX   Half DupleX (see).

head crash   The event when the read/write head of a disk drive comes into contact with the disk surface resulting in damage to the head, the disk, or both.

head, read/write   The electromechanical component of a tape or disk drive that performs the actual reading of data from, or writing of data to, the magnetic tape or disk. With a hard disk the head normally floats a minute distance above the disk surface. See also *head crash*.

http://www.hotkey.net.au/~brain/

helical-scan   (tape drives) A recording method employed in tape storage technology. Information is recorded on an angle on the tape (in barber-pole fashion). Has been used in video recording applications since 1956. Also see: *DAT, DDS, QIC*

Hercules Graphics Adapter   A video display system standard from the Hercules Computer Technology organisation. See *Video Standard, Hercules*.

Hertz (Hz)   A measure of frequency as cycles per second. Also: *kHz* - kilohertz, *MHz* – megahertz, *GHz* - gigahertz. When used in reference to computers, it generally refers to the speed of the processor. Very early computers had processors that ran in the order of 4MHz. See also *MHz*.

Hewlett-Packard   A manufacturer of electronic equipment, made famous by its HP printers, and computer systems.
   http://www.hp.com.au

hexadecimal   See *number system, hexadecimal.*

HGC   Hercules Graphics Card (see).

hidden file   A file that cannot be seen during normal directory searches. Some operating systems and application packages use hidden files (including DOS and Windows).

hierarchical database structure   See *'database structure, hierarchical'*.

hierarchical directory structure   See *'directory structure, hierarchical'*.

hierarchical structures   A structure (of directories and databases) resembling an organisation chart of a business in which elements in the structure are organised in a parent-child relationship where each parent can have many children, but each child can have only one parent.

High Capacity (HC)   Indicates the storage capacity of a diskette. Also referred to as *High Density*. See also *diskette, Double-Density, 'diskette, High Capacity'*.

High Density (HD)   See *High Capacity*.

high-level language   Any computer programming language which can be readily written and interpreted by people (including: BASIC, Pascal, Fortran, Cobol, PL/1, Algol) and closely resembles human language and mathematical notation. Usually refers to third generation languages (3GL) and higher (including 4GL and 5GL). A computer program written in a high level language is usually executed by the computer after it has been compiled. The exception to this is with interpretative languages such as some versions of BASIC, and some fourth generation languages. See *interpreter*.

HIPO chart   Hierarchy plus Input, Process, Output. A type of chart used as a tool to aid in writing computer programs. It shows the types of input, processes and output that is associated with specific functions or modules.

hit, Web page   A hit on a *Web page* is when a *Web surfer*, using their *browser*, requests a Web page from a Web site. As a result of which the requested page is sent to the user's browser for display.

Hollerith Card   See *punched card*.

home-based LAN   An adaptation of LAN technology to provide inter-connection of PCs in the home.

home page   See *Web home page.*

horizontal cabling   The data cabling that is installed throughout one level of a building, and terminating in a *wiring closet*, or communications cabinet.

horizontal market software   General purpose software. Compare: *vertical market software*.

hot-key   A particular combination of keyboard key-strokes that will invoke a particular memory resident program.

hot-pluggable   The feature of a computer system and its peripheral devices that allows a device to be connected up while the system is up and running, and the system will readily recognise the newly attached device. With earlier computer systems (DOS-based and early Windows systems) it was necessary to restart the computer to enable the computer to recognise that a device has been connected. Also see *FireWire*.

hotspot, Web page   A hotspot on a *Web page* is an area of the page that contains a *hyperlink*. The area need not be regular in shape. Also see *Web page image map*.

HP   Hewlett-Packard (see).

HP-GL   Hewlett-Packard Graphics Language.

HSTR   High Speed Token Ring. Rated at 100Mbps. See also *Token Ring*.

HTM (file format)   A file containing HTML.

HTML (HTM)   Hyper Text Markup Language. A language that is used to describe the contents and structure of *Web pages*. It includes HTML tags which are written inside the characters < > and set various characteristics such as text formatting, image placement, etc. (eg. <TABLE> and </TABLE> are a pair of tags that will have other information between them comprising the contents of a table, and the layout and format for the table.)

HTTP   Hyper Text Transfer Protocol. A communications protocol of the *WWW* that allows *Web browsers* to retrieve information over the *Web*, and facilitating the transmission of *Web pages*. Also see *FTP*.

hub   A device used on a LAN to connect together the computers on the LAN.

hyperlink   A connection, or implied link, from one point in a document (or a *Web page*), to another point in the same document (or *Web page*) or to a location in another document (or *Web page*). The link can also be to a file (eg. a multimedia file).

hypertext   Originally, this referred to text files (including simple graphics images) that contained links (*hyperlinks*) from a location in the file to another location in the same file, or to a location in another file. *Hypertext* now refers to text and links including many different file types (eg. graphics, sound, animation, video, etc.).

HyperText Markup Language (*HTML*, see).

Hz   Hertz (see).

- I -

i486   Reference to Intel's *80486* processor (see).

IAP (Internet Access Provider)   See *Internet Service Provider (ISP)*.

IBM 8514   A video display system standard. See *Video Standard, IBM 8514*.

IBM PC   The very original personal computer launched by IBM in the early '80s. Prior to their introduction, various *microcomputer* systems were in use through the '70s running various operating systems such as CP/M, and TRS-DOS. The IBM PC was superseded by the *IBM PC/XT*.

IBM PC/AT   The personal computer launched by IBM as the successor to the original IBM PC/XT.

IBM PC/XT   The personal computer launched by IBM as the successor to the original IBM PC.

iBook   Apple Computer Corporation's notebook computer launched in mid-'99.

IC   integrated circuit (see).

ICA   Independent Computing Architecture. An architecture from software company Citrix. See *Thin Client/Server Computing*.

ICANN   Internet Corporation for Assigned Names and Numbers. The non-profit international association that was founded in 1998 (as the successor to IANA — Internet Assigned Numbers Authority) to assume responsibility for such things as: internet addresses, IP address space allocation and internet domain names. ICANN maintains a list of accredited address and domain registrars who administer at regional or local levels. Also see INWW. http://www.icann.org

icon   A graphical symbol, typically used in a graphical user interface (GUI) environment, which represents such items as: an application, data file, spreadsheet file or word processing document.

ICR   Intelligent Character Recognition (see).

ICT   Information and Communication Technology (similar to *IT&T*).

IDE   Integrated Drive Electronics. A type of disk drive controller. See also: *SCSI, ESDI, ST-506/412*.

IE   Microsoft's Internet Explorer. A *Web browser* from Microsoft.

IEEE   Institute of Electrical and Electronic Engineers. An international society that, amongst other things, issues various standards including the *802.x* standards (see).

IEEE 1284   A standard for an enhanced *parallel port*. See: *EPP, ECP, parallel port*.

IETF Internet Engineering Taskforce   http://www.ietf.org

IGES   Initial Graphics Exchange Specification. A specification which describes a format for the interchange of (CAD) graphics files between otherwise incompatible systems.

IIS   Internet Information Server. Microsoft's secure Internet server based on Windows NT Server, and supporting the *WWW*, *FTP* and *gopher*.

ILE   Integrated Language Environment. A method of linking programs which makes the integration of modules written in different languages possible.

IM   Instant Messenger. Netscape/AOL's instant messaging service (see *instant messaging*).

iMac   A new-generation model of computer from Apple, released in late '98, shaped like a giant translucent-coloured jelly bean with a built-in monitor.

image enhancement   The displaying of an image (displayed or hardcopy) in finer detail. Can be performed on a PC with special software.

image map, Web page   See *Web page image map*.

imagesetter   (publishing) A device which electronically produces an image for projection onto photosensitive paper or film, used to prepare printing plates. Synonymous with *phototypesetter*.

impact printer   A type of printer (eg. *dot matrix printer*) which has mechanical parts to physically strike the paper through a ribbon to create the printed impression.

imposition   (publishing) A group of pages pasted up, or laid out together, to produce a printing plate for the printing of a *signature*.

Independent Computing Architecture (ICA)   See *Thin Client/Server Computing*.

Industry Standard Architecture   See *'bus, ISA'*.

information system (IS)   A computer-based method of storing, organising and retrieving information, so that the information can be made available to the people who need it in a timely and accurate manner. Also *database system*.

information technology (IT)   The use of computers to gather, classify, store, retrieve, manipulate and evaluate information.

inkjet printer   A type of non-impact printer where characters are formed on the page by squirting very fine droplets of ink. (See also: *printer*.)

Inmarsat   An international cooperative which provides mobile communications worldwide. The organisation is owned by about eighty communications companies around the world. Established in 1979, is a provider of global mobile satellite communications. (Also see *VSAT*.)

input device   A device that is used to get information or data into the computer, such as: keyboard, mouse, graphics (digitising) tablet, bar code reader, magnetic stripe reader, scanner device (handheld, desktop and benchtop) and video imaging equipment.

input methods   See: *Optical Bar Recognition (OBR)*, *Optical Character Recognition (OCR)*, *Optical Mark Recognition (OMR)*, *Magnetic Ink Character Recognition (MICR)*.

instant messaging   A service on the internet whereby two (or more) *web surfers* can exchange text-based messages (and in some cases graphics images or spoken voice). Somewhat similar to *internet chat*, except there is no need to log in to an *internet chat room* with potentially many other people, and the text-based discussion is essentially private. With an internet connection established, a web surfer firstly needs to register with the messaging service provider (and install any required messaging software), and then login to the service. Any friends that you want to "chat" with need to be set up in an instant messaging buddy list. Any friends who have also registered and logged in will be notified that you are on-line. You will then be able to "chat" amongst your group of friends. Messaging services and providers include: ICQ, Yahoo!/Messenger, Excite Messenger, Netscape/AOL Instant Messenger. http://www.yahoo.com http://www.excite.com (look for the Messenger link).

instant messaging buddy list   A list of people's instant messaging login names. When connecting to an instant messaging service, any people on the buddy list will be notified of your connection, and vice versa.

instruction set   The group of commands that are available to a particular CPU (for operations such as: addition, subtraction, comparison, and storage and retrieval of data). See also *RISC*.

integrated circuit (IC)   A single electronic semiconductor circuit, containing many electronic circuit elements and their interconnections, fabricated into the surface of a silicon chip. The first IC was made in 1958. Also called a *chip* or *microchip*. See also *DIP*.

Integrated Language Environment (ILE)   A method of linking programs which makes integration of modules written in different languages possible.

Integrated Services Digital Network (ISDN)   (see)

integrated software   An application software package that includes several major functions rolled up together, typically including at least: word processing, electronic spreadsheet and business graphics. This term was in more common use in the '80s and early '90s. By the late '90s this term was replaced by *office (productivity) suite*.

integrity   See *data integrity, security.*

Intel   A company which produces microprocessors for computers, including: 80x86 (see), Pentium, Celeron, Pentium MMX. http://www.intel.com

Intelligent Character Recognition (ICR)   Similar to optical character recognition (OCR), except that it includes extra text recognition capability.

intelligent terminal   A terminal that can perform local processing and storage activities; it provides the capabilities of a dumb terminal but with additional features such as: terminal emulation, screen editing, buffering. Also called *smart terminal*. Compare *dumb terminal, thin client*.

interface   (1) (user interface) See *'interface, user'*. (2) The physical interconnection, or shared boundary, between computer hardware components. An interface can be defined by the physical interconnection characteristics, the electrical signal characteristics, and the meanings of the interchanged signals. See also: *Centronics*, *parallel interface*, *RS-232*, *serial interface*, *current loop interface*.

interface, menu   The collection of menus that are utilised by a user to interface to a piece of computer equipment (computer, printer, etc). Compare: *Graphical User Interface*.

interface, user   That which the computer user sees displayed on the computer screen, and responds to. See also: *'interface, menu'*, *Graphical User Interface*.

interlaced Web page image   A Web page (GIF) image that is downloaded to the *Web browser* in stages. It is firstly downloaded at a coarse resolution so that the user can see the approximate size of the image and a fuzzy or blurred image. The image resolution is refined as the remainder is downloaded.

interlacing   A (CRT) display screen produces the displayed image by sweeping the screen twice for each frame. Achieves a higher vertical resolution. The image on a (CRT) video display screen is actually made up of many horizontal lines (generally between 640 and 1024 lines). These lines of the picture are made by an electronic gun which scans across each line, one at a time, starting with the top line, and then each successive line down the screen. An interlaced screen builds each second line down the screen, and then on the second pass builds each other line.

interleaving, disk   A technique to improve disk access time by storing information on disk in a smarter manner. Information stored on disk is typically stored in sectors within tracks, with any

one file typically using more than sector. Disk interleaving is where a file is stored on disk across several sectors, but not necessarily adjacent available sectors. Disk interleaving of 2:1 (two to one) means that the file is stored in every second available sector; while 3:1 means every third available sector. With disk interleaving of 1:1 it can be necessary for several rotations of the disk before a file is written or read.

International Business Machines Corporation (IBM)

Internet (or *internet* because of common usage) A worldwide public computer network comprised of many, many computers (reputed to be several million) and computer networks all of which are interconnected. It is used by many millions of people for a variety of purposes to send or retrieve different types of information. Communication over the Internet is based on the TCP/IP networking standard.
(1) Can be used to transmit *e-mail* to another party.
(2) Can be used to view the contents of a *web page*, using a *web browser* and the *http* protocol.
(3) Can be used to search for information on any topic as there are many databases of information available to access (like a huge on-line reference library). See *search engine*.
(4) Can be used to participate in a world-wide discussion on a particular topic by reading submissions that other people have made to a newsgroup facility, and leaving your own message for others to read.
(5) Can be used to conduct an on-line chat session with other people from around the world by entering text that will be seen by others almost instantly.
(6) Can be used to transmit files, using the *FTP* protocol.
(7) Can be used as a public network to conduct *electronic commerce.* This can be by transmitting *EDI*-type transactions between trading partners, or browsing for goods or services and placing an order for the same.
(8) Can be used by businesses to: publish information, advertise or market goods/services, promote employment vacancies, display classified advertisements, disseminate information.
Internet history: The Internet was first developed in September 1969 in the Engineering Department at UCLA (University of California Los Angeles),using a computer called IMP (Interface Message Processor) connected to a second computer. This linkup was developed into a network of computers and subsequently called ARPAnet (administered by Advanced Research Projects Agency). By 1972 the ARPAnet was installed at 15 locations (universities and research institutes) in the USA. Use of it grew significantly once *e-mail* was invented (1972), then again when PCs were invented and connected in the early 1980s, and again when the *WWW* was invented in 1990. It's development was also assisted through the '70s, '80s and '90s with: the introduction of TCP/IP (networking protocol), Usenet (a system for sending and receiving messages and the forerunner of todays news groups), and the Domain Name System.
See also: *ISP, IAP, Internet2, intranet, extranet, web browser, web surfing, WWW, web page, web presence, web server, web site, URL, Java, search engine, HTML, CGI gateway, POP.*

Internet2 Essentially a second Internet, based on newer generation technology. Announced in 1996, is a high speed research network. Abilene is the fibre optic backbone, operating at 2.4Gbps. http://www.internet2.org

Internet Access Provider (IAP) See *Internet Service Provider.*

internet address A unique name that identifies a *Web server*, *Web page*, or other Internet resource. Also called network location.

internet chat A service whereby *web surfers* can carry on a text-based (not voice-based) conversation using an *internet chat room*. Specific service providers offer the facility of a *chat room* which is not a real physical room, but a virtual room in *cyberspace*. A *web surfer* connects to the service provider's *web site*, and logs in to "enter" the room where there could be a number of other people already present. The web surfer's login name, or alias name, usually appears on a list on the screen along with the login or alias names of the other people in the chat room. The web surfer can type a message onto their own screen and send it to the *chat room* where it is displayed at the end of a list of messages for everyone in the room to see. Others can then respond by entering another message. Also see *instant messaging.* http://www.excite.com; http://www.yahoo.com

internet chat room When a web surfer logs in to an internet chat service, there are generally a number of virtual chat rooms that the surfer can log into, or enter. They will be presented with a list of the other logged-in surfers who are also in that particular room. A chat service generally provides a number of different chat rooms based on specialised interests (eg. gardening, wine, etc.), or general rooms with no particular topic.

internet chat, voice-based Somewhat similar service to *internet chat* except that it is a true voice-based service. It requires appropriate voice equipment such as a sound card, microphone and speakers. A number of web sites offer this service (eg. Yahoo!) Also see *instant messaging.* eg.: http://www.hearme.com

internet connection The physical link between a computer and an ISP's computer system(s). (a) For a home-based computer user with a dial-up facility, this will require a cable connection from the computer into a modem (for an external modem, not required for an internal modem), then a

cable connecting the modem to the phone line. At connection time, the computer's software tells the modem to take the phone line *Off Hook*, and to dial the phone number for the selected *ISP*. Once the ISP's modem answers their incoming call, the two modems attempt to hand-shake and agree on how to communicate (eg. transmission speed, and type of transmission error correcting), then allow the computers to communicate over the dialled link. An internet connection is then in place from the user's computer over the phone line to the ISP's system and into the internet. (b) For a cable-connection facility (over either a telephone connection or a broadband cable facility), where the computer is essentially on-line to the ISP continuously (via a cable modem), the internet connection is from the user's computer, via the cable modem, along the phone line or cable facility, to the ISP's system.

Internet Protocol   See *IP*.

internet service   A service that is available over the Internet. eg.: *FTP, e-mail, HTTP*.

Internet Service Provider (ISP)   (also IAP, Internet Access Provider) An organisation that has a computer system with a link to the *internet*. A person wanting to connect to the internet needs to establish an *internet connection* to their ISP (by a dial-up modem or permanent link) to gain access to the internet. The ISP acts like a "gateway" with hundreds, or even thousands, of people connecting up, and passing through to the internet.

internet telephony   See *VoIP*.

internetwork   A number of networks connected together.

interpreter   A language-translator program which examines user-written program source code one line at a time, interprets that line, converts it into machine code, and executes it. Some versions of BASIC are used this way. Compare: *compiler, high-level language*.

Intranet   A computer network very similar to the *Internet* except that it is a private network usually restricted to within one organisation. It is often established on an existing LAN infrastructure (cabling, hubs, etc.) with information readily available for inhouse personnel to access via a *Web browser*. The information made available typically includes such things as: company documents, policy, procedures, technical standards, manuals, directories, etc.

INWW   Internet Names WorldWide. Also see: *ICANN*. http://www.internetnamesww.com/

I/O   Input/Output.

ion deposition printer   A type of (page) printer that projects a beam of charged particles (ions), rather than a beam of light as with other page printers, to produce an image on a dielectric drum. Toner is then attracted to the charged surface, and transferred to the paper through cold pressure fusing when brought in contact with it. (See also *page printer, laser printer, LED printer, LCS printer, printer*.)

IP   Intellectual Property.

IP   Internet Protocol. A part of the two-layer TCP/IP protocol (see). Also see: *IPv4, IPv6*.

IP address   The address that is used to uniquely identify a station, or node, on a TCP/IP network to enable the stations to communicate to each other. The (IPv4) address is of the form a.b.c.d where each of a, b, c and d are numbers within the range 1 to 256 and each separated by a dot. For example, 256.43.29.1. Also see *TCP/IP, IPv4, IPv6*.

IPL   Initial Program Load. A now less commonly used term to refer to the operation of moving the operating system into memory. On microcomputer and personal computer systems this is the same as the boot operation.

ips   inches per second. Measure of the number of inches of magnetic tape that can be processed by a magnetic tape drive device per second.

IPSec (Internet Protocol Security Protocol)   A standard which defines protocols for IP encryption, and is one of the main protocols used for Virtual Private Networks (VPN). IPSec uses keys for encryption and authentication.

IPv4   The version of IP that was designed and implemented in the mid-1970s, and in common use through the '80s and '90s. It utilises a 32-bit IP address space. Also see *IP address*.

IPv6   The version of IP intended to replace IPv4 in the late '90s, and provide new features, and greater functionality and flexibility. It is proposed to utilise a 128-bit address space. Also see *IPv4, IP address*.

IPX   Internet Packet Exchange. A Novell NetWare communications protocol. Also see *SPX*.

Iridium   A consortium of companies (originally sponsored by Motorola) with a network (or constellation) of earth-orbiting satellites, initially about 70, and providing a world-wide mobile phone service. First implemented in 1998.

IRQ   Interrupt Request Line. A line, or channel, in a personal computer which carries a signal from a device to the CPU to indicate that data is coming to the CPU for processing.

IS   Information System (see).

ISA   Industry Standard Architecture (see *'bus, ISA'*).

ISDN   Integrated Services Digital Network. A telecommunications system offered in Australia by Telstra based on digital signals which allows the simultaneous transmission of data, voice, video, graphic images and electronic mail over the same wires. Used in Australia more commonly by corporates and government in the late-80s and 1990s for communications between branch sites. The key ISDN products on offer included Microlink and Macrolink, with communications

capacity (bandwidth) offered in multiples of 64kbps. These products are being phased out, and Telstra's new On-Ramp product is being implemented. The ISDN service is being progressively changed to conform to the *ETSI* standard.

ISO   International Standards Organisation. An organisation base in Paris which develops standards for international and national data communications. http://www.iso.ch.

ISO/OSI   The ISO Open System Interconnection (OSI) model. See *OSI.*

ISP (Internet Service Provider)   (see)

ISYS   A text storage and retrieval software product (ie. search engine) first developed in Australia in 1987, and still very popular in the late '90s (and early 2000s).

IT   Information Technology (see).

IT&T   Information Technology and Telecommunications (similar to *ICT*).

Itanium processor   A 64-bit (*CPU*) *processor* from Intel, is the first model of Intel's next generation IA-64 CPU architecture. Originally codenamed Merced in the early days of development (1999) and introduced in early 2001.

Iterra Digital   A satellite system utilising a fixed or portable dish (up to 6.4m diameter) to provide multiple telephone lines to remote areas. Also see *MiniSat.*

ITU   International Telecommunication Union. Headquartered in Geneva, Switzerland, is an international organisation within which governments and the private sector coordinate global telecom networks and services. http://www.itu.int

iTV   interactive TV (also internet TV). Two-way communications between the TV viewer and various service providers. Provides the opportunity for the viewer to do such things as: respond to offers that are presented on the TV; and place orders for goods (eg. pizza or other take-away food). Various experiments took place world-wide in the 1980s and '90s, and was trialed in Orange, NSW, in early 2001. Also see *WebTV*.

IVR   Interactive Voice Response. A type of automated telephone answering system. It is the technology where a (computer-based) spoken voice is presented to a telephone caller offering one or more options. The caller chooses an option and replies by hitting a key on their telephone key-pad. This can lead to further options being presented, also requiring feedback from the caller. Also see *CTI.*

- J -

Java   A computer programming language developed by Sun Microsystems Incorporated for use over networks, in particular the *internet*. Many web sites utilise Java. Also see: *Java applet*, *ActiveX.*

Java applet   A small program that can be downloaded over the Internet to run inside an *Web browser.*

JavaStation, Sun   Sun Microsystems' implementation of the *thin client* (see).

JAZ disk drive   See *'disk drive, JAZ'.*

Jini   A technology developed by Sun Microsystems for simple inter-connection of various electronic devices. Launched in 1999 with pilot and prototype devices demonstrated since. Also see: *Firewire, Bluetooth.*

joystick   Input device which employs a moveable lever to control cursor movement on the display screen.

JPEG   Joint Photographic Expert Group. A file format for storing colour images, including some compression, and commonly used for 24-bit colour images. See also *MPEG.*

JTAPI   An API standard developed by Sun Microsystems for use with Java-enabled applications and CTI systems (see).

jumper   A small removable wire, block or plug that electrically connects two pins on an *integrated circuit* board. These have largely been superseded by *dip switches* (see).

- K -

K5, K6, K7   Families of processors developed by *AMD* (see), in competition to Intel's processors.

kb   kilobit. Often used for data communications speeds as kbps (kilobits per second).

kB   See *kilobyte.*

Kermit protocol   A file transfer protocol.

kerning   The amount of (horizontal) space between two letters along one line of (printed) text, especially with regard to certain combinations that should be closer together to create visually consistent spacing (such as the letters VW compared to MN or AW).

kilo-   The SI unit prefix for 10^3 (ie. 1,000 or thousand)

kilobyte (kB)   Approximately one thousand bytes (kilo meaning 1000 or 10^3), or exactly 1,024 bytes (derived as 2^{10}). Kilobyte has been in very common use for quite some time. In the 1980s the old 5.25 inch floppy diskettes were common 360 kilobyte capacity. Also, the DOS operating system still has a base memory size of 640kilobytes. A page of A4 typed text is very roughly 5,000 bytes or 5kB in size. This entire book only consumes nearly 300kB of disk space. Data communication speeds of 9.6 kbps (9600 baud) were common in the late '80s for dial-up

services, but now 33.6kbps or 56kbps are more common. See also: *byte, megabyte, gigabyte, terabyte, petabyte, exabyte.*

- L -

LAN   Local Area Network (see).

landscape   Landscape format, or orientation, refers to the orientation of a printed page or computer screen display where the width is greater than the depth. Most computer screens have traditionally been this format. It is derived from pictures of landscape which are usually horizontal in format. See also *portrait.*

language-translator program   A program that translates a computer program written in one language into another language. In particular, translating a high level language program into machine code for execution by the computer.

LAN Manager   An integral part of IBM's OS/2 which adds networking capabilities and support to the basic functions of OS/2.

laptop computer   A type of computer so named because it is small and light enough to be carried around, and used on a person's lap.

large-scale integration (LSI)   A measure of the number of logic gates (several thousand) on a single chip.

laser printer   A type of non-impact (page) printer that utilises a laser beam and mirrors to build up a pattern of electrostatic charge, representing the image to print, on a drum one line at a time, and toner is attracted to the drum. The paper passes in contact with the drum surface picking up the toner which is then fixed, or sealed, to the paper. (See also: *page printer, LED printer, LCS printer, ion deposition printer, printer.*)

LCS printer   A type of (page) printer that utilises a row of liquid crystal shutters (LCS), instead of diodes or a laser beam. A powerful bulb provides the light source, and pulses of electricity open and close the shutters to write the image onto the drum one line at a time. Toner is attracted to the drum surface and the paper passes in contact with the drum picking up the toner which is then fixed, or sealed, to the paper. (See also: *page printer, laser printer, LED printer, ion deposition printer, printer.*)

leased line   A (public) telephone line from one site to another, via any number of telephone exchanges, which is reserved for the exclusive use of the leasing customer as a semi-permanent and on-going connection between computer equipment. Also called *private line.*

LED   Light Emitting Diode.

LED printer   A type of (page) printer that utilises a row of light emitting diodes (LED), with one LED for each pixel in the row, to create an image on a drum one line at a time, and toner is attracted to the drum. The paper passes in contact with the drum surface picking up the toner which is then fixed, or sealed, to the paper. (See also: *page printer, laser printer, LCS printer, ion deposition printer, printer.*)

LEO   Low Earth Orbit satellite. See *'satellite, LEO'.*

letter quality (LQ)   (see)

LF   Line Feed. An ASCII or EBCDIC control character, also a printer panel button, that moves the cursor, or print mechanism, to the corresponding position on the next line (without a carriage return).

LIFO   (Last In First Out) An accessing method where the last item entered (into a list) is the first item out.

LiIon (Lithium Ion) battery   See *'battery, LiIon'.*

LIM EMS   Lotus/Intel/MicroSoft Expanded Memory Specification. See *expanded memory.*

line driver   A computer communications device that ensures reliable transmission of data over an extended distance by conditioning the digital signal. (The commonly accepted maximum distance for RS-232 communications using standard data cable without such a device is about 15 metres; and with such a device, depending on transmission speed and cable, can be up to about 6.5 kilometres.)

line printer   A type of printer with a printing mechanism capable of printing an entire line at a time.

Linotronic   A brand of typesetting equipment. See also: *imagesetter, phototypesetting.*

Linux   A version of the Unix operating system developed over time by many enthusiasts worldwide. Originally created in the early '90s by Linus Torvalds (when he was a student at the University of Helsinki). Through the late '90s and into 2000/01 is gaining mainstream acceptance.

LIP (Lithium Polymer) battery   See *'battery, LIP'.*

LISP   (LISt Processing)   A programming language which grew out of the artificial intelligence field, developed to handle data structures in the form of strings and lists.

Local Area Network (LAN)   A type of computer network where two or more computer devices are linked together to allow individual stations on the network to share resources and exchange files and information. Typically within the immediate locality (room, office, building or group of buildings), and with moderate to high transmission speeds (100 kbps to 50 Mbps). The computer

http://www.hotkey.net.au/~brain/

devices on the network can include various computer types, workstations, printers, telephones, scanners. A particular LAN system can be completely described by specifying some or all of: (a) the networking software or network operating system (eg. Novell's Netware, some versions of Windows, Tapestry, 10NET, IBM PC LAN); (b) the network access method or protocol (ie. CSMA, token-passing); (c) network topology (ie. star, bus, tree, ring); and (d) network media or cable type (ie. twisted pair, data cable, coaxial cable, optic fibre). For some particular LAN systems one or more of these are pre-defined. See also various LAN products: Ethernet, ARCNET, Starlan, Token Ring.

Lotus Domino   The server component of the Lotus Notes environment.

Lotus Notes   A platform for developing and deploying groupware applications including electronic mail and messaging. An application development environment and document database management system from Lotus.

low-level language   A programming language which requires the programmer to have a detailed knowledge of the computer. Programs written in a low level language generally take longer to write, but are faster to execute. Includes: machine language, assembler.

LQ   Letter Quality. See *'print quality, LQ'.*

LSI   Large Scale Integration (see).

LU 6.2   Logical Unit 6.2. Software that is part of IBM's SAA. It provides an interface between application software and the hardware on a network. It is functionally similar to NetBIOS. Also see *APPC.*

- M -

MAC   Media Access Control. Synonymous with *network access method* (see).

MAC   Apple Macintosh computers. See also *MacOS.*

machine code   A computer program which is in the native language of a particular computer, or CPU. See also: *high-level language*, *compiler*, *interpreter, object code.*

machine independent   A product is described as machine independent where it will readily operate with a number of different computer systems.

machine language   The (low-level) programming language used by a computer to perform operations, comprised entirely of binary code; it varies from computer to computer. A computer program written in a higher level language must be converted to machine language (by a compiler) before execution. See also *machine code.*

machine readable encoding   A method of recording alphanumeric information which can be read and interpreted by a machine or computer. Such methods include: magnetic stripe, bar code and other optical recognition methods.

MacOS   (pron. mac-oh-ess) The operating system for Apple Macintosh computers.

macro   Combination of commands or keystrokes that can be collectively executed as a single command.

Macrolink   An *ISDN* service offered in Australia by Telstra. Also see *ISDN, Microlink, OnRamp, ETSI.*

magnetic core memory   A type of computer memory with small magnetic cores (doughnut shaped metal rings) with wires running through them. The cores can be magnetised in different directions to represent data.

Magnetic Ink Character Recognition (MICR)   A data input method in which information is represented by special magnetic ink characters that can be read either by special machines directly into the computer or by humans. eg. the odd-shaped characters along the bottom of cheques.

magnetic stripe   The band of magnetically encoded information on the back of many financial institution credit and debit cards.

magneto optical (MO) storage   A means of storing information onto a disk storage device utilising laser beam technology. Information is recorded and stored magnetically; but is actually written, and read, using a laser beam.

mail-merge   The process of combining varying information (such as name and address details) with a document (such as a form letter) at the time of printing to create personalised correspondence.

mainframe   Generally refers to a large-scale computer capable of supporting many (hundreds) of display terminals, and providing access to vast quantities of information. See also: *personal computer*, *workstation*, *minicomputer.*

MAN   Metropolitan Area Network. See *Local Area Network.*

Management Information System (MIS)   A computer system that supplies information in a useful form to aid in decision-making. Also a term used by many people to refer to a database system, information system (IS), or decision support system (DSS).

Manufacturing Automation Protocol (MAP)   A type of computer communications, initially developed by General Motors, to allow different types of computers to communicate with each other. See also *TOP.*

MAP   Manufacturing Automation Protocol (see).

mass storage See *'storage, mass'*.

MAU Multistation Access Unit. A wiring concentrator, or hub, used in Token Ring networks.

MB See *megabyte*.

MBASIC The Microsoft BASIC programming language.

Mbps megabit per second.

MCA Micro Channel Architecture (see '*bus, MCA*').

MCF Meta-Content Format. A file format for the storage and interchange of information from disparate formats or systems.

MCGA (IBM) Multi-Colour Graphics Array A video display system standard. See *Video Standard, MCGA*.

MDA (Monochrome Display Adapter) A video display system standard. See *Video Standard, MDA*.

media, communications The physical material used for the transmission of information. Such as: RS-232 type data cable, coaxial cable, optic fibre, twisted pair (basic telephone cable).

media, storage The physical material on which information is recorded and stored, such as: magnetic tape, disk, punched card.

mega- The SI unit prefix for 10^6 (ie. 1,000,000 or million)

megabyte (MB) Approximately one million bytes, or exactly 1,048,576 bytes (derived as 2^{20}). Two hundred (200) A4 pages of text will use roughly one megabyte of storage space. Megabyte is in very common use because the capacity of hard or fixed disk drives in the early 1990s was measured in these terms and hundreds of megabytes was a common size. Floppy diskettes in the late 1980s and most of the 1990s were most common in sizes of a megabyte or two (eg. 1.44MB, 2.88MB). Also, memory in various computer systems (personal computers, workstations and larger systems) in the mid-1990s was common in either tens or hundreds of megabytes. Further to this, data communications speeds at megabytes per second are becoming more common. See also: *byte, kilobyte, gigabyte, terabyte, petabyte, exabyte*.

memory, base See *'memory, conventional'*.

memory, computer The part of a computer system that temporarily stores information such as programs, data, etc. Generally, computer memory is *volatile* (ie. the contents of memory is lost when power is removed). However, this is not so with *flash memory*. Compare *disk storage*. See different types: *buffer, disk cache, virtual memory, 'memory, conventional', 'memory, expanded', 'memory, extended', RAM, ROM, PROM, EPROM, WOM, semiconductor memory, bubble memory, magnetic core, non-volatile, volatile, SIMM, DIP, SIPP*.

memory, conventional The RAM memory in a personal computer, up to 640kB in DOS. Also called *base memory*.

memory, DIMM (Double In-line Memory Module)

memory, EDO (Extended Data Out) A type of contemporary PC memory that was considered to be the standard (in mid-1997) for mass market memory.

memory, expanded RAM memory which can be added to a personal computer on an expansion board and provides up to 32MB of memory (depending on the type of PC and its processor). Can be used by the applications software that supports it, including many word processing and spreadsheet packages, to facilitate the handling of much larger files. Many expanded memory boards conform to the LIM EMS 4.0 specification. No longer in common use. See also *EMS*.

memory, extended The computer memory in PCs above one megabyte which can be directly addressed by the processor. Can be used for such things as a RAM disk, or disk cache.

memory, flash A type of computer memory which is non-volatile (ie. retains its contents when power is removed).

memory, FP (Fast Page memory)

memory, non-volatile Computer memory is regarded as non-volatile if it does not require power to maintain its contents. Non-volatile computer memory will retain whatever is stored even when the power supply is disconnected. Also see *'memory, volatile'*.

memory, RAM Random Access Memory.

memory resident program A program which sits in memory (RAM) along with any others. It does not require disk access to initiate execution and therefore is invoked much more quickly. Also called: *co-resident, RAM-resident, pop-up*. See also: *TSR*.

memory, SDRAM (Synchronous DRAM) A type of contemporary PC memory that is considered to provide improvements in data transfer speeds between memory and CPU over Fast Page Mode (FPM) and Extended Data Out (EDO) RAM memory technologies.

memory, SIMM Single In-line Memory Module. A module of computer memory chips which is typically used to provide additional memory — either extended, expanded or conventional — and which has its connections in a single line. It is a collection of individual computer chips (integrated circuits), particularly memory chips of the DIP or SIPP type, that are installed onto their own small circuit board to form a module. The edge of the board includes a number of connections permitting the module to be plugged into another device, typically a system board of a personal computer. The edge connections can be either an edge connector to plug into a

connector socket, or a row of pins (like the edge of a comb) to connect into SIPP-type sockets. See also: *'memory, DIMM', DIP, SIPP, SEC, PGA.*

memory, volatile   Computer memory is regarded as volatile if it requires power to maintain its contents. Volatile computer memory will lose whatever information is stored when the power supply is removed. Compare: *'memory, non-volatile'.*

menu   In association with computer equipment (such as application software, and peripheral device display panels), a list of commands, actions, or other items from which the user can make a selection. Each selection could perform some action, or bring up another menu.

menu-driven   The attribute of application software where the user is provided with a menu of options from which to make a selection.

menu interface   See *'interface, menu'.*

MEO   Medium Earth Orbit (satellites).

Merced   A Pentium processor from Intel. See *Itanium.*

MFM   Modified Frequency Modulation. A disk data encoding technique for data stored to disk. See also *RLL.*

MHz   megahertz. A measure of frequency as cycles per second. Often used in reference to computer processor speed or bus speed. Early microprocessors (1970s) typically operated at about 4 or 8 MHz. PCs through the '80s increased speeds to 33MHz and even 50MHz; then to the hundreds in the early '90s (eg. 100, 133, 166) and multiple hundreds (333, etc.) by the late '90s, and over 1GHz in the early 2000s. See also: *system clock.*

MICR   Magnetic Ink Character Recognition (see).

Micro Bee   A particular brand of personal computers used in schools and the home in the late 1980s. (The Micro Bee organisation pioneered the design and building of microcomputers in Australia, and concentrated on the sale of them to schools.)

Micro Channel Architecture (MCA)   See *'bus, MCA'.*

microcode   Generally synonymous with operating system.

microcomputer   A generic term used to describe a small-scale computer system, typically the early 8-bit CP/M based computers and their variants in use through the '70s, prior to the introduction of the *PC* in the early '80s. It is also used by some people to refer to the contemporary personal computers. It has processing capabilities less than a minicomputer. See also: *personal computer, workstation, minicomputer.*

microdisplay   A computer display screen about the size of a thumb-nail. Under development by various companies in 1998 and likely to be used in a range of consumer and communications products. Possible applications could be in cell phones (to read e-mail); digital cameras (viewfinder); and the futuristic wearable computer.

microfloppy diskette   See *'diskette, microfloppy'.*

Microlink   An *ISDN* service offered in Australia by Telstra. Also see *ISDN, Macrolink, OnRamp, ETSI.*

microprocessor   A certain type of integrated circuit (chip) which is used as a central processing unit (CPU) in a computer (the first one was reported to have been made in 1971).

Microsoft   The U.S. registered trademark of Microsoft Corporation. http://www.microsoft.com

micro switch   See *'dip switch'.*

MIDI   Musical Instrument Digital Interface.

mid-range computer   Synonymous with *minicomputer.*

millennium bug   (syn. *Y2K, Year 2000 Bug*) A term that fell into more common use in the late 1990s referring to a problem with the handling of dates in computer systems. In the 1960s, '70s, '80s and earlier '90s many computer systems stored a date value using only two digits to represent the year (eg. 97 to refer to 1997). When some systems either stored, or referred to, any year after 1999 it was possible for them to assume that the early 1900s were referred to instead of the early 2000s. For example, the year 2002 would be stored as 02 and many computer systems could not properly handle it. In simple terms, the fix for this was to change the computer systems to store the date, and to handle the date in calculations, using all four digits. In 1998 many businesses started to realise the enormity of the problem and addressed it in earnest.

In reality at the turn of the decade, it was a problem for some installations; but most systems worldwide continued without a problem.

millisecond (abbr. ms)   See *'second, milli-'.*

MIME   Multipurpose Internet Mail Extensions. Also see *VPIM.*

minicomputer   A generic term used to describe a computer in the larger-scale category, but which has less processing capabilities than a mainframe. It is typically a multi-user multitasking machine capable of supporting tens of users and more. See also: *personal computer, workstation, mainframe computer.*

minifloppy diskette   See *'diskette, minifloppy'.*

MiniSat   A satellite based telephone service offered by Telstra (launched in April 1997). Utilises the Inmarsat satellite system and a portable terminal (about 2kg in weight) with a detachable

flat-panel antenna to provide phone, fax and data services anywhere in country. Data transmission is initially limited to 2.4 kilobits/sec. Also see *Iterra Digital.*

mips   millions of instructions per second. A measure of computer processing speed.

MIS   Management Information System (see).

MMS   Mobile Satellite Services.

MMX   (Multi Media Extension. ™ of Intel Corporation) Intel's Multimedia enhancement technology introduced in 1997 in conjunction with the Pentium processors. Basically, an MMX processor is intended to handle multimedia applications measurably faster than a non-MMX processor.

mnemonic code   Instructions for a computer which are alphabetic abbreviations that are relatively easy for the programmer to remember.

MNP   Mobile Number Portability. The principle where a mobile phone user can switch between phone carriers (eg. Telstra to Optus or vice versa) and keep their existing mobile phone number. Prior to this, a change of carrier meant changing the number as well. Due for implementation in Australia in 2001.

MO (magnetic optical) storage   See *magnetic optical storage.*

modem   A communications device that connects directly between one of the computer's input/output ports and a telephone line socket. It converts the electronic digital signals output from the computer into modulated analogue signals for transmission over the telephone line to a remote computer, and vice versa. The remote computer also needs a modem to demodulate the analogue signal, converting it back into digital form. A modem MOdulates and DEModulates signals, hence its name. Also see *NTU.*

modem, external   A modem which is housed in its own case, and sits somewhere close-by the computer. It is connected to the computer by a cable. It will generally have its own power source, power switch, and *modem indicator lights* (see).

modem indicator lights   An external modem generally has indicator lights to show the status of a connection and any transmission. The lights, and their typical labels and meanings are shown below.

Label	Meaning	Comment
OH	Off Hook	Indicates the modem has essentially "lifted the telephone receiver" off the hook to obtain a dial tone.
CD	Carrier Detect	Indicates that the local modem is receiving a signal from the remote modem (ie. it detects a carrier signal).
RD	Receive Data	Indicates that the modem is Receiving Data.
SD	Send Data	Indicates that the modem is Sending Data.

modem, internal   A modem which is housed within the computer's system case, and is connected to the computer internally without needing a separate cable.

modem speed   The speed at which a modem can communicate, typically measured in bits per second (bps) or kilo- or mega-bits per second (kbps or Mbps). In the '80s and into the '90s, dial-up modem speeds varied from 300 bps at the lower end of the scale, to 1200 bps, and 19.2kbps. By the late '90s speeds were up to 33.3 kbps and even 56 kbps. Over the same period, faster speeds were achievable of leased, or dedicated, lines especially if there were data-only lines (such as Telstra's DDS service).

modulation   (data comms) The process of combining the information signal with the carrier signal. See also: *modem, carrier, demodulation.*

monochrome display (also: *mono display*)   A computer display screen which displays information in only one colour - typically either green on black, amber on black, or white on black.

monospaced typeface (or font)   See *fixed pitch typeface.*

Moore's Law   Gordon Moore, one of the founders of Intel, stated in 1971 that processing power would double about every 18 months.

motherboard   The main circuit board of a microcomputer or personal computer. It usually sits in the bottom of the system unit chassis and contains the microprocessor, memory chips, and chips for input, output and storage. Also known as a *system board.*

mouse   A computer input device that is used to control the position of the cursor on the display screen, and to make selections. Compare: *stylus pen, puck.* Also see: *graphics tablet.*

MPEG   (Moving Picture Experts Group) A technology standard originally developed for digital movies. It defines the way in which information (video, audio, etc.) is stored, typically on CD, and then read back. See also *MP3, MP4, JPEG.*

MP3   (MPEG-1 Layer 3) A variation of the *MPEG* standard (introduced in '97) which includes a method for high compression, allowing such things as audio music tracks to be stored as relatively small files facilitating electronic transmission (eg. over the *WWW*). A standard CD digital audio music track taking about 50MB of disk storage can potentially be compressed to around 4MB. Walkman-style devices can store MP3 formats for audio playback. MP3 player software plug-ins are available for *Web browsers.* See also *MPMan.* http://www.mp3.com.au

MP4   A secure distribution format (from the company GMO) for the electronic distribution of music. A step up from *MP3.*

MP/M Multi-Programming Monitor. A multiuser, multitasking operating system used on microcomputers; basically upgraded from CP/M.

MP/M-86 An upgrade of MP/M to run on the Intel 8088/8086 16-bit chip computers.

MRP Material Requirements Planning or Manufacturing Resource Planning.

ms (millisecond) See *'second, milli-'.*

MSDLC Microsoft Data Link Control. A networking protocol utilised with some variations of Microsoft Windows.

MS-DOS (Microsoft Disk Operating System). The versions of the DOS operating system from Microsoft that were widely used on IBM-compatible personal computers and clones in the '80s and early '90s. In 1980/81 Microsoft licensed MS-DOS to IBM for its first *personal computer* — the *IBM PC* (which went on to become a de facto standard). Also see *PC-DOS, Windows.*

MTA Message Transfer Agent.

multiplex To transmit more than one signal over a single communications channel, or line, simultaneously.

multiplexor A communications device that multiplexes several channels together to allow the one channel, or communications line, to carry signals for more than one device.

multiprocessor A computer system operating with multiple *processors* instead of just one. The purpose is to distribute the processing work load, and reduce the time taken to perform tasks.

multiscanning monitor (also *multisynchronous*, *multisynch*) A monitor capable of supporting a range of video display standards, generally by providing a range of scanning frequencies, which result in a variety of screen resolutions.

multisynchronous monitor See *multiscanning monitor*.

multitasking The state where several programs or applications are running concurrently on a computer system. For example, a communications transmission, such as facsimile or electronic mail, while simultaneously running a spreadsheet or word processing package.

multiuser The feature of a (computer) system that allows more than one terminal to be connected at any one time, thereby allowing more than one person to access the computer system and its resources at any one time.

mux See *multiplexor*.

- N -

NAK Negative AcKnowledgement (data comms). A control character which is sent by a device to indicate that the previous transmission was in error, and that the device is ready to accept re-transmission.

nanosecond (abbr. ns) See *'second, nano-'.*

narrowband (data comms) Classifies (data comms) transmission equipment as having a relatively narrow bandwidth (range of frequencies that it can handle) and at low transmission speeds. Typically in the range of 50bps to 64kbps (ie. 64,000bps). Earlier uses of the term referred to even slower transmission rates of 2,400bps or less, and even to the band of (sub-voice grade) 50 to 150bps. See also: *broadband*.

NC Network Computer. See *thin client.*

NC Numerical Control (see).

NCP Network Control Program.

near letter quality (NLQ) (see)

near-typeset quality print Print output that is similar in quality to that produced by commercial typesetting equipment, as produced by various page printers, such as laser printers.

NEAT New Enhanced AT.

Net, The See *WWW (World Wide Web)*

NetBEUI NetBIOS Extended User Interface. An enhanced version of the NetBIOS protocol (used by LAN Manager, LAN Server, Windows for Workgroups and Windows NT).

NetBIOS Network Basic Input/Output System. A non-routable network operating protocol used to interface application software and networking software to hardware on a PC-based LAN. It is functionally similar to LU 6.2. Also see: *IPX, SPX, NetEUI.*

Net PC (also *Network PC*, see) The concept of a slimmed down PC that requires less administration and management effort to maintain and support. Also see *thin client*.

NetPC This term (with no spaces) is believed to be Hewlett-Packard's trademarked term for their version of the Network PC. Also see *thin client*.

Netscape Communications Corporation The company that produced *Netscape Navigator* and *Netscape Communicator* (see).

Netscape Communicator A software product from Netscape that incorporates the functionality of several products including *Netscape Navigator* (see).

Netscape Navigator A popular *Web browser* (see). Also see *plug-in.*

NetWare A Network Operating System from Novell, quite popular in the mid to late 1990s. Also see *Novell.*

network The physical interconnection of computers, components and/or systems. See also *Local Area Network*.

network access method   The method by which a device on a network gains access to, or control of, the network. Also referred to as *Media Access Control protocol*. Access methods include: CSMA and token-passing.

Network Computer (NC)   A thin client computer (see). Compare *networked computer.*

network database structure   See *'database structure, network'.*

networked computer   A computer that is networked. Compare *Network Computer.*

network operating system (NOS)   (see NOS)

Network PC   The specification (and product) from Microsoft-Intel that is one implementation of the concept of a *thin client* PC (see).

network server   See *'server, network'.*

Network Station, IBM   IBM's implementation of the *thin client* (see).

Network Terminating Unit (NTU)   (See)

Newton (MessagePad), Apple   A hand-held (*palmtop*) computer from Apple, running the Newton-OS operating system. Apple Computer announced in early '98 that it would discontinue further development of the product. See also *palmtop*. http://www.apple.com

NFS   Network File System. A distributed file system protocol that allows non-local networked computers to use the files and peripherals of another networked computer. Primarily (but not only) used in Unix.

NiCad (Nickel Cadmium) battery   See *'battery, NiCad'.*

NiMH (Nickel Metal Hydride) battery   See *'battery, NiMH'.*

NLQ   Near Letter Quality. See *'print quality, NLQ'.*

no brainer   A term used to refer to a line of thinking, or an exercise, where the answer is so obvious that it should require little or no thought.

node   A device, connection or switching point on a network. Can be a personal computer, workstation, server, or some other computer device.

non-contiguous   See *fragmented file.*

non-impact printer   A type of printer that produces a printed impression without physically striking the paper.

non-repudiation   See *'security — non-repudiation'.*

non-volatile memory   See *'memory, non-volatile'.*

NOS   Network Operating System. The software that operates a LAN system. It is often deployed by running it on a file server, and allows users at networked computers or network computers to login by specifying a username and password. It typically provides the interface between applications software and the network resources (such as disk storage, printers, tape backup device, etc.). Various network operating systems have included Novell NetWare, some versions of Windows (Windows for Workgroups, Windows NT), Banyan Vines, AppleTalk, Microsoft LAN Manager, IBM PC LAN program.

Notes, Lotus   See *Lotus Notes.*

Novell   A company that specialises in *Network Operating Systems* software. Through the 1990s NetWare was a key product which, by early 2000s, was supplemented by other key products such as: GroupWise and ZENWorks.

NPT   Non-Programmable Terminal. A terminal that has no programmability (a VDU). Compare *Programmable Terminal.*

ns (nanosecond)   See *'second, nano-'.*

NTU (Network Terminating Unit)   A type of modem. Typically it is used to connect a computer system to some type of data-specific telecommunications network (such as DDN), as opposed to the Public Switched Telephone Network.

null modem (cable)   A device that is used to directly connect two computers (DTE devices) together over short distances (generally up to 50 feet). It emulates the physical connections of a DCE device (modem) by cross-connecting some connections, and shorting others together.

number systems   The various number systems in common use on computer systems include those to base: 2 (binary), 8 (octal), 10 (decimal) and 16 (hexadecimal). See details for these below, and the table in the Appendix.

number system, binary   The base 2 number system, representing numbers using combinations of the digits 0 and 1. Information is handled within the computer in binary form. The binary equivalent of the decimal numbers 0 through 20 are shown in the table in the Appendix. (Positional values from right to left are: 1, 2, 4, 8, 16, 32.) See also character encoding systems: *ASCII, BCD, EBCDIC.*

number system, decimal   The base 10 number system, representing numbers using combinations of the digits 0 through 9.

number system, hexadecimal   (abbr. hex) The base 16 number system, representing numbers using combinations of the digits 0 through 9 and the letters A through F. The hexadecimal equivalent of the decimal numbers 0 through 20 are shown in the table in the Appendix. (Positional values from right to left are: 1, 16, 256, 4096.)

number system, octal The base 8 number system, representing numbers using combinations of the digits 0 through 7. The octal equivalent of the decimal numbers 0 through 20 are shown in the table in the Appendix. (Positional values from right to left are: 1, 8, 64, 512.)

Numerical Control (NC) The automatic computer control of machine tools, drafting machines and other operations, using pre-recorded information providing the instructions for the machine operation. The pre-recorded information is typically transferred from the computer where it is prepared to the machine by a storage medium (such as paper tape, floppy disk). See also: *direct numerical control.*

- O -

OASIS Organisation for the Advancement of Structured Information Standards.

object code See *program object code.* See also: *program source code, program run code.*

object-oriented images Object-oriented images, or graphics, are different to bit-mapped images in that they are composed of mathematically described objects. See *bit-map.*

OBR Optical Bar Recognition (see).

OCR Optical Character Recognition (see).

octal See *number system, octal.*

ODBC Open Data Base Connectivity. A standard used to define the rules for systems in accessing each other's databases.

OEM Original Equipment Manufacturer. Refers to an organisation that (legitimately) takes someone else's own hardware and/or software, and builds up a 'system' for re-sale in a specific use or application.

Off Hook (OH) See *modem indicator lights.*

off-line (1) When a device (such as a printer) is taken off-line it will not accept data from the connected computer. A device is usually taken off-line by pressing the ON-LINE key (or button or switch), and the ON-LINE indicator light goes out. See also *on-line.*

off-line (2) Refers to equipment or processes that are performed not directly linked to the computer system, such as some input or output operations where information is handled separately from the computer. Off-line output operations include decollating and bursting.

off-line (3) In relation to the *Web*, this means not connected to the Web, such as when Web browsing off-line (viewing Web material that has been saved to disk for viewing when not connected). (See also *on-line.*

off-the-shelf software Software that is produced in quantity, and can be purchased for installation and use on a computer system with little or no modification. This is how most software exists for use today.

OH (Off Hook) See *modem indicator lights.*

OLAP On-Line Analytical Processing. A technology employed to help analyse large amounts of information and is related to *data warehousing.*

OLE Object Linking and Embedding. A system (devised by Microsoft) that allows a stored document to contain elements (such as a spreadsheet table or a graphics image) that themselves are edited using a different editing program. The resulting document is a compound document.

OLE DB The use of *OLE* with DataBases. A set of *ActiveX* interfaces that provide various applications with uniform access to data that is stored in diverse information sources (such as in various databases, spreadsheets, etc.). See also *ADO.* See: http://www.microsoft.com

OLTP On-Line Transaction Processing.

OMR Optical Mark Recognition (see).

one-time password See *'password, one-time'.*

on-line (1) When a device (such as a printer) is 'on-line' it will accept data from the connected computer. A device can usually be put on-line from the off-line state by pressing the ON-LINE key (or button or switch), and the ON-LINE indicator light is then lit. See also *off-line.*

on-line (2) Refers to equipment or processes that send information directly to a computer for immediate processing and return of results. Such as on-line database services (videotex).

on-line (3) In relation to the *Web*, it means to be connected, and potentially viewing Web content live. For a dial-up connection to an ISP, this means potentially incurring connection charges for every minute of connection time. (See also *off-line.*)

OnRamp An *ISDN* product from Telstra, launched in mid-97 based on the *ETSI* ISDN standard to eventually replace Telstra's earlier (proprietary) *Microlink* and *Macrolink* services (introduced in 1988).

operating system (OS) software A set of integrated programs that ultimately controls and supervises the specific operations of a computer system's hardware components — including: keyboard, display, disk drives, printer, network card, sound card, modem, etc. It acts as an interface to the computer hardware by providing services to other programs and to the computer user. Some operating systems include: CP/M, MP/M, MS-DOS, PC-DOS, OS/2, Windows, BeOS, Linux, Unix, Xenix, VMS, and MVS. See also *disk operating system, Windows.*

Operating System/2 (OS/2) The multitasking operating system first introduced by IBM (and Microsoft) in 1987 on some of the range of PS/2 computers.

operator, computer See *computer operator*.

Optical Bar Recognition (OBR) A data input method in which a series of bars which represent alphanumeric characters are scanned and interpreted. Same as bar codes.

Optical Character Recognition (OCR) The automatic identification and interpretation of alphanumeric characters by means of light sensitive (scanning) devices. Scanning devices and OCR software can be used to input existing printed text into a computer.

optical (laser) disk A disk storage medium, utilising optical storage technology, capable of high storage capacities (about 600MB plus). Comes in several sizes, including 5.25 inch for use with personal computers. See also *compact disk*.

optical (laser) disk drive The device used to read information from a compact disk, and in some cases write information to the disk.

optical disk, erasable A disk storage medium, utilising optical storage technology, which can be written to many times over. Unlike CD-ROM and WORM which can only be written to once. See also: *optical disk*, *CD-ROM*, *WORM*.

Optical Mark Recognition (OMR) A data input method in which a series of pen or pencil marks on a special card or form are scanned and their position, or existence and non-existence, is interpreted by the computer. For example, computer-scored examination answer sheets, and some surveys.

optical recognition The ability of a scanner device to scan a machine-readable image on a printed surface and interpret the image. Includes: *optical mark recognition*, *optical bar recognition*, *optical character recognition*.

orphans and widows See *widows and orphans*.

OS/2 Operating System/2 (see).

OSF Open Software Foundation.

OSI (Open System Interconnection) model A model, developed by ISO, which describes and defines data communications between computers, and between computers and terminals. It is intended to facilitate data communications between equipment from different vendors. The model describes communications in seven successive layers from the user interface (layer 7 - the application layer) through the internal workings of the computer to the physical cable which interconnects the devices on the network (layer 1 - the physical layer).

outline font Each character of a font is designed and stored only once to define its outline or shape. This information is stored as complex curve-fitting equations so that an output device (using a language such as PostScript) can produce any point size and style from the outline definition of the font. Compare *bit-mapped font*.

output device A device that is used to produce computer output in a form which can be read by humans or other machines. Including: printers, plotters, film recorders and imagesetters.

overclocking The practice of configuring a computer so that the processor runs faster than its rated processing speed (eg. setting a 50MHz CPU to run at higher speeds such as 100MHz or higher). This practice can be detrimental.

- P -

PII, PIII, P4 See *Pentium*.

packet A small collection of information, including data and control characters, which is transmitted on a packet-switched network. The packet typically includes some header information to describe its origin and destination, and some tailer information.

Packet Access Device (PAD) A communications device which serves as an interface between a computer, or terminal, and a packet-switched network.

packet switching A method of routing standard size groups of information, called packets, around a network. (As opposed to alternative routing techniques: *circuit switching*, *message switching*.) See also: *X.25*, *Austpac*.

PAD Packet Access Device.

page composition software Computer software that is used to compose a page of printed output by providing a means of positioning and manipulating both text and graphics.

page description language (PDL) See *PostScript*.

page orientation Refers to the orientation of a printed page, and is usually regarded as either portrait or landscape. See also: *portrait*, *landscape*.

page printer A type of printer which, in general terms, prints one page at a time by using electrostatic forces to create a full page image on a drum or belt. The charged image on the drum attracts toner which is passed onto a sheet of paper when brought into contact with it, and then sealed in place. Includes: *laser*, *LED*, *LCS* and *ion deposition printers*.

page, Web See *Web page*.

Paint (file format) A basic file format used on the Apple Macintosh, stores black and white bit-maps at 72dpi.

PalmPilot TM of 3Com. See *palmtop*.

palmtop (computer) A small computer about the size of the human palm, incorporating an LCD screen and some form of pen or stylus for user interaction. Early versions were monochrome,

with colour screens introduced in 1999. The Windows CE operating system is often used. Various brands/models include: Psion, PalmPilot, Philips Nino.

paperless office   The concept of utilising document imaging, storage and retrieval technologies to remove the need for hard-copy paper records in the office.

paper tape (also *ticker tape*)   The paper strip used to store information (computer programs and data) in use in the late '60s and '70s, but now rarely used. The tape is about one inch wide, and long enough to store all of the information required which could have been as short as a metre, or as long as many metres. Characters are stored on the tape as a row of punched holes across the tape, with a row of finer sprocket holes down the length of the tape to drive the tape through the reader device. The information is punched into the tape using a *paper tape punch* device (typically found on a teletype terminal). The tapes are read using a *paper tape reader* device. Also see: *reel tape, cartridge tape.*

paper tape punch (device)   The computer output device to store information on paper tape by punching holes in prescribed positions, as well as sprocket holes.

paper tape reader (device)   The computer input device that reads information from punched paper tape.

parallel communications   The transmission of information, typically between a computer and its printer, where all bits of each byte are transmitted simultaneously along separate but parallel wires or connections. Compare: *serial communications.*

parallel interface   A type of interface (on a computer or peripheral equipment) that performs parallel communications. Also see *Centronics, ECP, EPP.*

parallel port   See *'port, parallel'.*

parity bit   A bit in a character that is set to either 0 or 1 to achieve odd or even parity.

parity check   A method of verifying data transmission in which a parity bit is included with transmitted information to ensure that the condition of either even parity or odd parity is maintained. See *'parity, even', 'parity, odd'.*

parity, even   The condition in data transmission where each transmitted character, comprised of several bits, must have an even number of 'on' bits.

parity, odd   The condition in data transmission where each transmitted character, comprised of several bits, must have an odd number of 'on' bits.

Pascal   A high-level programming language which utilises structured programming concepts.

password   An alphanumeric code that restricts access to a system to only those with knowledge of the correct password. A password is usually associated with a User Profile, User Name, or Account Name. It is common practice for every individual person to have their own unique User Name for access to any particular system, and their password is expected to be known only by themselves. It is poor security for users to divulge their password to others.
The requirements for a password to contain certain characters, or be of a certain length can differ from system to system, and are often configurable by the system administrator. It is good practice to enforce criteria such as: (a) to be at least 6 characters in length, and no more than 10; (b) must contain at least one numeric character; (c) password must be changed periodically (say monthly); (d) must be different to the previous password (or the previous three passwords); (e) must not be a regular word or name. Also see *security*, *dictionary attack.*

password, one-time   A *password* that is required by a system to gain access; but which is only valid for one occasion, typically for a period of about 30 seconds. It relies on a high level of security involving the use of password generating equipment. Two example products are Secur-Id and DES Gold Card. Such products are about the size of a credit card and require the user to enter a PIN number to gain access, after which a password is generated and displayed on its small LCD display. The host system to which access is required has a similar password generating algorithm and can determine what password to expect during a particular window in time. The user has a limited time to enter that password into the host system to successfully gain access.

PC   (1) The abbreviated form of Personal Computer, as used in reference to IBM's product the IBM Personal Computer, or *IBM PC* (see). (2) The generic term for *personal computer* (see).

PC   Programmable Controller (see).

PC, desktop   Almost any type of PC that will sit on a desk, that is too big to be readily transported, and not powerful enough to be classified a server, or workstation.

PC, laptop   A type of computer that can literally be used on your lap. Is generally about the size of a thick writing notepad. They tend to have a built-in keyboard very similar in layout to a desktop PC's basic keyboard without a separate group of keys fro a numeric keypad. The screen tends to be some sort of LCD-type display, and built into the lid that opens up to reveal the unit's keyboard.

PC/AT, IBM   See IBM PC/AT.

PC/XT, IBM   See IBM PC/XT.

PCB   Printed Circuit Board (see).

PC-DOS   Personal Computer Disk Operating System. The IBM version of the MS-DOS operating system specifically for use on the IBM brand of personal computers. Also see *MS-DOS.*

PCI bus   See '*bus, PCI*'.

PCL   Printer Control Language.

PCMCIA   Personal Computer Memory Card International Association. An association of companies which devised a standard to initially provide memory for notebook-type computers on a small credit-card size card (known as a PCMCIA card) that plugs into a slot in the side of the notebook. The standard was initially developed in the early '90s, and was implemented in notebook computers by late 1993. The cards now come in three Types. Type I cards are primarily memory cards (SRAM, DRAM, ROM and flash). Type II cards address communications and input/output functions like fax/modem or LAN access. Type III cards provide functionality equivalent to a removable hard disk.

PCS   Personal Communications Services.

PC-TV   A developing technology which enables both personal computer and television functionality to be delivered within the same set of equipment. It is anticipated that a PCTV will be able to receive, display and support broadcast TV, video, Internet-based services and conventional computer-based desktop applications. It could be a PC that also provides television viewing; or a TV that provides Net surfing and/or other PC functions. TV functionality on a PC was introduced with the *TV tuner card*. External PC-TV set-top boxes plug into the computer and accept video games consoles, cable TV, etc.

PCX   (file format) An early file format for storing images, and commonly used by software such as early versions of Windows Paintbrush.

PDA   Personal Digital Assistant. A type of small portable computer (hand-held).

PDE   Portable Data-Entry unit.

PDF   Portable Document Format. A file format from Adobe Systems Incorporated. The *Adobe Acrobat* software is used to create these files, and the freely available *Acrobat Reader* software can be used to view, read and print them. http://www.adobe.com/acrobat

PDL   Page Description Language. See *PostScript*.

PDP-7, PDP-8, PDP-11   A family of minicomputer systems from DEC in use in the '70s and '80s. See also: *DEC, VAX*.

peer-to-peer network   A (LAN) network which has no dedicated server, and the resources of each workstation on the network can be configured to be shareable with the other workstations.

Pentium   Intel Corporation's implementation of the successor to the Intel 80486 processor.

Pentium II   ("Pentium two") A later variation of both the Pentium and Pentium Pro processor, includes the capabilties of Intel's MMX media enhancement technology. Is based on Intel's P6 architecture, employs a Single Edge Contact (SEC) cartridge (see), and incorporates Intel's Dual Independent Bus architecture (see). It is a true 32-bit processor with external 64-bit bus. Is said to be a consolidation of the MMX and the Pentium Pro products. Became available for *notebooks* in early '98.

Pentium III   ("Pentium three") A later variation of the Pentium processor, available in early '99. Includes a number of new features including an embedded serial number.

Pentium 4   ("Pentium four") A later variation of the Pentium processor, released in November 2000.

peripheral device   Any device distinct from the computer which can provide input to, and/or accept output from, the computer.

persistence   (video display systems) To eliminate display screen flicker, manufacturers often use medium to long persistence phosphors on the screen. Long persistence phosphors continue to emit light for a longer period.

personal computer (PC)   A generic term used to describe the common office, or SOHO, computer of the '80s and '90s, including various desktops, portables and towers. It is a relatively small-scale computer system, typically the range of 8-bit, 16-bit and 32-bit DOS-based and Windows-based machines, and functionally similar computers. In the '80s and early '90s was typically a single-user single-tasking machine, but by the late '90s was more commonly multitasking and/or multiuser. See also: *DOS, Windows, microcomputer*, *workstation, minicomputer*.

personal computer uses   By the late '90s a *PC* could be used for one or more of the following: *word processing*, *spreadsheets*, various charts, graphs, graphics, drawing, sketching, *database*, information storage and retrieval, to communicate over phone lines with another computer, access to the *Internet*, view images or movies from *CD-ROM* or *DVD*, play various computer-based games, *surf the Web*, view TV channels, tune to a radio station, view video (from a VCR or camera), edit images (photos or video), create or edit music. Each of these functions requires special software, and some require specific *expansion cards*. See also *'software, specific purpose', 'software, general purpose'*.

Personal Information Manager (PIM)   A relatively new category of application software which is very flexible and quite powerful, and basically capable of managing 'personal information' in free form. Applications for PIM software include: tracking and time management, document outlining, text retrieval, text database, hypermedia functions.

Personal System/2   See *PS/2*.

peta-   The SI unit prefix for 10^{15} (ie. 1,000,000,000,000,000 or million billion).

petabyte (PB)   Approximately one million, billion bytes (derived as 2^{50}). Petabyte is rarely used if at all (in the late 1990s) as storage devices, memory or transmission speeds have not yet reached this order of magnitude. See also: *byte, kilobyte, megabyte, gigabyte, terabyte, exabyte.*

PGA   (1) Professional Graphics Adapter. A video display system standard. See *Video Standard, PGA.*

PGA   (2) Pin Grid Array. The packaging technology used with many processors for interconnection to the motherboard. See also *DIP, SEC, SIP, SIMM,..*

phototypesetter   (publishing) Synonymous with *imagesetter* (see).

phototypesetting   (publishing) Producing a page image on photosensitive paper or film, typically output from a phototypesetter such as the Linotronic devices.

pica   (1) A unit of measure equal to one-sixth of an inch, or 12 points. (2) A size of letters in typewriting, having 10 characters to the inch, the equivalent of 12-point printing type.

picosecond (abbr. ps)   See *'second, pico-'.*

PICT   (file format) The oldest generic file format used on the Apple Macintosh. PICT files can store a mix of bit maps, and resolution-independent objects. See also *file format.*

PICT2   (file format) An extension to the PICT format. PICT2 files can store a mix of bit maps, and objects, with many colours and grey shades. See also *file format.*

Picture-In-Picture   (PIP, see)

PIM   Personal Information Manager (see).

ping   Packet Internet Groper. A program that is used to determine if a particular IP address exists, and is alive. It operates by sending a message out over a network to another device and waits for a response.

PIP   Picture In Picture. A "window" or small picture viewed on a visual display unit or TV screen at a shrunk size compared to the normal viewing area of the screen, and located "within" another full-screen image.

piracy, software   See *software piracy.*

pitch, print   Refers to the number of (*fixed pitch*) characters printed per unit length across the page. Typically 10 cpi or 12 cpi (characters per inch) for most (fixed pitch) printed computer output.

pixel   (picture element) The smallest part of a displayed image (on a display screen), or output image (on output devices such as a laser printer), that can be individually controlled. A number of pixels collectively form characters and/or images. See also *resolution.*

PKI (Public Key Infrastructure)   A technology that is used to ensure the security of electronic transmission, and includes a set of services for managing *public keys.* It provides: *authentication, data privacy* (ie. confidentiality), *data integrity* and *non-repudiation.* The main group developing standards for PKI interoperability is the PKI working group of the Internet Engineering Task Force (IETF). Also see: *security.*

PKZIP   Utility (shareware) software from the company PKWARE Incorporated for *zipping*, or compressing, one or more files to produce a much smaller file requiring less disk space to store it. Also see *zip, WinZip.* http://www.pkware.com

PL/1   A high level computer programming language, said by some people to be like a combination of Cobol and Fortran.

platter   The rigid circular component of a disk drive which rotates, upon which information is stored. Disks can comprise one or more platters, and information can usually be stored on both the top and bottom surfaces of each platter.

PLC   Power Line Conditioner (see).

PLC   Programmable Logic Controller. See *programmable controller.*

plotter   Output device used to generate hardcopy output, usually of graphical information such as engineering drawings. Various printer technologies (including: laser, electrostatic and colour ink jet) have taken over much of the market that plotters held throughout the 1980s.

plotter, drum   A type of plotter that draws an image onto paper or film mounted on a cylindrical drum.

plotter, flat bed   A type of plotter that draws an image onto paper or film mounted on a flat table.

plug and play   The concept whereby a peripheral device can be connected to a PC that is already running, and be automatically detected by the PC without having to perform any configuration, or power reset.

plug-in   An optional software program used to provide additional capabilities to other software. For example, plug-ins are available for use with a *Web browser* (such as Netscape Navigator) to extend the capabilities of the browser in a specific way. eg. ability to play audio samples, or view movies.

point   The smallest unit of typographic measurement, with 12 points to a pica and 72 points to an inch. Also refers specifically to the height of printed characters. Most printed matter is either 10-point (such as the text in this glossary), or slightly larger at 12-point.

POP   Point Of Presence. The equipment that a service provide has at a particular location so that a remote computer user can dial-up from their PC. An Australia-wide ISP would have a POP in

major cities so that a user does not have to dial-up over a long distance and incur high long-distance (STD) call rates.

pop-up program   See *memory resident program.*

port   A physical socket, or other interface, on a computer where a peripheral device or communications equipment can be connected.

port, parallel   A *port* on a computer that's used for *parallel communications* with another device, typically a printer.

port, printer   The printer port on a computer is usually the *parallel port.*

port, RS-232   A port on a computer for *serial communications* according to the RS-232 standard.

port, serial   A port on a computer for *serial communications*. Can be configured for communications to either a DTE device (eg. serial printer, mouse, etc.), or DCE device (eg. modem). On a PC is also referred to as a COM port.

portal   A *Web site* that provides a mix of information, services and links to other web sites. Portals aim to have web users return frequently, and even make the portal site the user's *home page.* The portals do this by, for example, (a) providing a useful tool or service that people will want to keep using (esp. a good web *search engine*); (b) providing usefully indexed information; (c) establishing itself as a default home page (so that when users start a web session they start at the portal site's page); (d) running eye-catching and useful advertising.

portal, enterprise   A type of *portal* that primarily supports a particular enterprise (on their *intranet*) and perhaps their trading partners.

portrait   Portrait format, or orientation, refers to the orientation of a printed page or computer screen display where the depth is greater than the width. Many printed pages (A4, quarto, foolscap, etc) are this format, and some computer screens for graphics and electronic publishing work are also this format. It is derived from portraits of people which are usually vertical in format. See also *landscape.*

PostScript   (Developed and trademarked by Adobe Systems Incorporated.) A type of programming language (actually a page description language) which provides a standard means of instructing a range of printers, and other output devices including electronic typesetters, to print both graphics and text. A computer program generates a purely text-based description of an image (which can itself include text, etc.). The resulting PostScript file can then be sent to an output device which interprets the file and produces the output. See also *EPS (Encapsulated PostScript).*

POTS   Plain Old Telephone System.

Power Line Conditioner (PLC)   Equipment which ensures the provision of a conditioned (regulated and filtered) power supply.

PowerPC   A microprocessor from Motorola, used in Apple Mac computers and other systems.

ppm   pages per minute. A measure of the speed with which page printers produce printed output.

PPP   Point to Point Protocol. A TCP/IP communications protocol for establishing a link between two computer systems.

Presentation Manager   A graphical user interface (GUI) which forms an integral part of IBM's OS/2. It is much like the product Windows, and the Macintosh GUI.

primary storage   See *'storage, primary'.*

printed circuit board (PCB)   A board made of insulating material onto which a printed circuit (electrically conducting paths) is fabricated. It typically has other electronic components mounted on it (such as integrated circuits), with the printed circuit forming the electrical connections.

printer   See various types: *band, daisywheel, dot matrix, electrostatic, laser, inkjet, ion deposition, LCS, LED, page, thimble, thermal transfer, thermal wax transfer.* Also see: *NLQ, LQ, draft quality.*

printer buffer   Hardware that stores information to be printed, thereby freeing up the computer for other activities. It is typically computer memory located either in the printer, in the computer, or in a separate device which links the computer to the printer. It is extremely useful for large print jobs that would otherwise tie up the computer until printing is completed. Compare *print spooler.*

printer port   See *'port, printer'.*

printer sharer   A device which can link several computers to one or more printers, and allows several computer users to share communal printers.

print quality, draft   A quality of printer output usually associated with dot matrix printers. Relatively low quality print output that is usually relatively quick to produce compared to NLQ or LQ output.

print quality, LQ (Letter Quality)   Relatively high quality print output with fully formed characters similar to that produced on a typewriter.

print quality, NLQ (Near Letter Quality)   Relatively medium quality print output, typically made from a number of dots as with a dot matrix print head, but approaching the appearance and quality of letter quality print.

print spooler   Software and/or hardware that provides print spooling capabilities. It can be a program within the computer, an expansion board for a computer or a printer, or a separate hardware device.

print spooling   A technique whereby several lots of information to be printed can be temporarily stored in a queue until the printing device is available. As a result, the computer or terminal is freed up for other activities.

private line   See *leased line*.

process control   The automatic control of a process (typically a continuous manufacturing operation) by some form of computer-based equipment.

process monitoring   The monitoring of a process (typically a continuous manufacturing operation) by some form of computer-based equipment; often for the purpose of gathering information related to the process for subsequent evaluation and reporting (for the reporting of such things as: production output, production performance, reject rates, machine downtime).

processor   See *CPU*.

program   A set of instructions or statements, written in a particular computer programming language, that tells a computer system what to do. It can be stored in one, or many, disk files. It can include: arithmetic calculations, test conditions, labels to mark a location in the program, branches to other points in the program, a set of instructions within a repeated loop, etc. See also: *program source code, program object code, program run code, software*, *application software package*.

programmable controller (PC or PLC)   A computer-controlled unit consisting of a microprocessor, input and output modules, and a power supply, used to monitor and control machinery and processes.

programmable read only memory (PROM)   A type of semiconductor computer memory which is non-volatile, and is used to store a program permanently in a piece of computer hardware. See also: *EPROM, ROM*.

Programmable Terminal (PT)   A terminal (like a VDU) that has programmable features. Compare *NPT*.

programmer   A person who writes computer programs.

programming language   A set of written instructions and codes that are used to create computer *programs* including: high-level languages such as: Visual Basic, C, C++, Visual Basic, Fortran, Algol, Cobol, Basic; and low-level languages such as assembly language and machine code.

program object code   The form of a computer program which is output from a compiler or assembler and is such that it can be processed to produce executable machine code, or *program run code*. It typically originates as *program source code* in a high level language before putting it through a compiler to produce the object code. See also: *program source code, program run code*.

program run code   The form of a computer program which can be executed without requiring any other translation, interpretation or manipulation. It can be produced from object code. See also: *program source code, object code*.

program source code   User-written computer program, in human-readable form and typically stored in a text file, prior to translation by the computer compiler into machine-executable form. See also: *program object code, program run code*.

PROM   Programmable Read Only Memory (see).

proportional (typeface)   Some typefaces (such as Times Roman and Helvetica) use proportional spacing where the slimmer characters (such as the letters 'i' and 'l') are given less horizontal space; and the wider characters (such as the letters 'm' and 'w') are given more. (This text is printed using a proportional typeface.) See also *fixed pitch (typeface)*.

protocol   A formal set of rules, conventions and procedures used in computer communications to control the formatting and relative timing of information between communicating devices. For example: IBM SDLC, IBM BSC.

protocol converter   A device to convert from one communications protocol to another.

protocol, communications   A formal set of rules that defines the communications between computer systems. See: *TCP/IP, SLIP, PPP, FTP, HTTP, SMTP*.

protocol, file transfer   See *file transfer protocol*.

prototyping   The process of producing a computer program, or information system, in a simplified or scaled down version in a much shorter time frame than normal. The resultant article is a prototype of the intended one, and is used for evaluation purposes and further development, and perhaps also for immediate urgent use.

proxy server   A server that essentially provides an interface between one or more users behind a firewall, and the many web servers out on the Internet. When a user requests a web page, the responding web server sends the requested page to the proxy server's IP address as requested. The proxy server then forwards the web page on to the requesting user's PC. This way, the IP address of the user's PC is never advertised or divulged beyond the proxy server. Proxy server functionality can be included with firewall devices, and can also incorporate caching services.

ps (picosecond)   See *'second, pico-'*.

PSTN (Public Switched Telephone Network)   The standard, common telephone network. Also referred to as POTS (Plain Old Telephone System).

PS/2   Personal System/2. The range of computers introduced by IBM in 1987 most of which were based on the Micro Channel Architecture (MCA).

public domain software   See *freeware, shareware.*
public key encryption (or cryptography). See *encryption.*
Public Key Infrastructure (PKI, see)
Public Switched Telephone Network (PSTN)   (See)
puck   Manually controlled input device, similar to a mouse but which generally includes a window and cross-hairs; used with a *graphics tablet* and often used specifically for digitising graphics images.
pull technology   See *push technology.*
punched card (also *punch card*) A rigid paper card, rectangular in shape (about 19 cm wide by 8 cm deep), punched with rectangular holes to represent information. The one most commonly used was known as the 80-column Hollerith Card with 80 characters of information per card. Commonly used to input information into (mainframe) computers through the 1960s, and no longer in common use. (Different types of punched cards have existed with slightly different characteristics.)
punched card reader   The computer input device to read information from a deck (collection) of punched cards.
push technology   The concept whereby an information or service provider distributes information or services without specific requests to do so. Converse of pull technology.

- Q -

QBE   Query By Example (see).
QDOS   An early operating system (from Seattle Computer Products), later acquired by Microsoft to become MS-DOS.
QIC (Quarter Inch Cartridge)   A tape storage format. Common QIC tape sizes/formats include QIC-80, QIC-WIDE. Storage capacities are in the order of megabytes. Also see: *DAT, DDS, helical scan.*
quasi-DTP   Used in reference to word processing software which has some of the functions and features of desktop publishing software.
Query By Example (QBE)   A method of selectively obtaining information from an information system. The user enters the selection, or query, conditions in appropriate fields on the computer screen. See also: *Structured Query Language.*
query language   See *database query language.*
Quicktime   A video format from Apple Computer. See also *MPEG.*
QWERTY   Refers to the layout of the keys on a (typewriter-type) keyboard. The six letters Q W E R T Y are the first six alphabetic keys across the second row of the keyboard.

- R -

RAM   Random Access Memory (see).
RAM disk   A portion of RAM that is set aside for exclusive use, as though it were a disk drive, for the storage of files. This portion of memory is set up to appear to be a real disk (with a boot record, file allocation table, directory, and locations to store files). It can result in increased performance of the system; but a loss of power will lose the contents of the RAM disk. It is useful for scratch files and work files that some application packages use, and for storing frequently used files that do not necessarily change. A RAM disk can be created in user RAM, extended memory or expanded memory. Also called: *virtual disk, apparent disk.*
Rampant Information Technology Syndrome (RITS!)   (see)
RAM-resident program   See *memory resident program.*
Random Access Memory (RAM)   A type of semiconductor computer memory, in one or more chips, where computer programs and data reside during program execution. The programs and data can be readily changed. This memory is volatile memory and the contents are lost when the system is powered off. See also: *shadow RAM.*
RAS   (file format) Sun Microsystems' Raster Image File format for storing images.
raster device   A device that generates an image from thousands of tiny dots. The image is typically built up by placing the dots across the page one line at a time, such as with a number of printers — laser, inkjet, thermal — and with display screens. Compare: *vector device.*
raster scan   Line-by-line sweep across an entire display surface to generate elements of a display image (as in television screen displays).
RDBMS   Relational DataBase Management Software/System. A specific type of DBMS (see). Also see *'database structure, relational'.*
RD (Receive Data)   See *modem indicator lights.*
README file   A text file stored on disk, along with application software, which is typically used to record any last minute changes to the software, or additions or alterations to the supplied documentation.
Read Only Memory (ROM)   A type of semiconductor computer memory in one or more chips (integrated circuits) where firmware, bootstrap instructions or other information is stored.

Information stored in ROM is regarded as permanent and does not change, even when the power is disconnected (ie. non-volatile memory). See also: *EPROM*, *PROM*.

read/write head See *'head, read/write'*.

real time Where the processing of information is fast enough to either: provide immediate answers or information, or to control or modify a process, with no apparent delay.

record A collection of related data items. A number of records which contain the same type, and arrangement, of data items can make up a file, which itself can be accompanied by other files to comprise a database. The business office analogy of a number of records within a file is a number of similar forms within a folder in a drawer of a filing cabinet. See also: *data item*, *file*.

record locking A protection procedure where a record within a file or database which is being used by one person, or application, can be locked to prevent concurrent access by another user or application. Compare *database locking.*

reel tape A form of magnetic tape used for performing backups and copying information between computer systems, especially on mainframe and mini-computer systems. No longer in widespread use because of cartridge tape technology (see). Common format/size was half-inch. Also see *paper tape*.

relational database structure See *'database structure, relational'*.

removable disk See *'disk, removable'*.

repeater A device used on a LAN to amplify and regenerate the electrical signals to allow them to cover greater distances.

report writer A type of fourth generation (programming) language that is user friendly and allows information to be readily searched for, and extracted from, an information or database system. Synonymous with *query language*.

rescue disk A *bootable disk* (such as a bootable floppy disk) which is kept in case of problems with a computer's hard disk drive, or other system problems. The rescue disk will facilitate powering on the computer system, and trouble-shooting the problem. The sort of problem that can cause this situation is a virus that has damaged the hard disk drive's contents, or a problem powering up the hard drive. See *boot disk*.

resolution An indication of the quality of a display screen or output device, measured by the number of pixels.

(1) A given screen resolution of 640 by 350 pixels, for instance, means 640 picture elements horizontally by 350 lines vertically.

(2) The resolution of various laser printers is typically 300 dpi (dots per inch) or even 600 or 1200, while film recorders and imagesetters produce in the order of 4,000 and more lines of resolution.

resolution, screen The more common screen resolutions of recent times have been: 640x480, 800x600, 1024x768. Also see: *video display system standards.*

response time The elapsed time between the input of information into a system, or a message sent over a network, and a reply received back.

restore See *backup and restore.*

reverse engineer The process of producing a copy of an original product (such as a 'compatible' personal computer) by analysing an 'original' in fine detail.

RGB monitor An RGB (red-green-blue) monitor is one which uses a cathode ray tube with three electron guns, one for each colour.

ring topology See *'topology, ring'*.

RIP Raster Image Processor.

RIP Routing Information Protocol. A simple routing protocol. More advanced routing protocols include: OSPF, IGRP.

RISC Reduced Instruction Set Computing. A new generation microprocessor instruction set typically comprising about 55 to 140 instructions instead of 300 to 500.

RITS! Rampant Information Technology Syndrome. A set of signs or symptoms indicating an undesirable condition, problem or quality resulting from information technology developing in an unchecked and unrestrained manner, and on a widespread basis. (First para-phrased by Robert B. Brain in *Computers in Business and at Home,* Colonial Pioneer Publishing, 1989.)

RJ11 connector The connector commonly used in telephone systems utilising 4 pins and 4 wires to inter-connect the hand-piece cable to the phone body, and the incoming phone cable to the phone body.

RJ12 connector A common connector used in telephone systems utilising 6 pins and 6 wires.

RJ45 connector The connector commonly used with twisted pair cabling for data transmission applications utilising 8 pins and 8 wires (4 wire pairs).

RLL Run Length Limited. A disk data encoding technique for data stored on disk. See also *MFM*.

robot A programmable machine that can be physically modified, and instructed, to perform a variety of tasks. It is most useful for dangerous, heavy, uncomfortable or boring tasks, especially in manufacturing applications in heavy industry.

ROM Read Only Memory (see).

root directory See *'directory, root'*.

RPG   Report Program Generator. A high-level computer programming language. Developed by IBM in the '60s, and specifically tailored for AS/400 systems.

RS-232   Interface standard for serial data communications, as set by the EIA, that defines the wiring connection and the electrical signals that are used. It corresponds to the OSI model's physical layer (layer seven).

RSA   (Rivest-Shamir-Adelman) The RSA public-key algorithm utilises a digital key to encrypt/decrypt information. Also see: *PKI, encryption.* http://www.aus.rsa.com

RSVP   Resource Reservation Protocol. An Internet protocol developed by the Internet Engineering Taskforce which is designed to enable smooth multimedia transmissions on the Internet. Also see *RTP, RTCP.*

RTCP   Real-Time Transport Control Protocol. An Internet protocol used with RTP to provide control over the transmissions. Also see *RTP, RSVP.*

RTF   (file format) Rich Text Format. A file format for specifying text formatting and document structure. The resulting file is in plain ASCII format and is person-readable.

RTFM   See *RTM.*

RTM   Read The Manual. An expression sometimes used by computer support people in answer to a question about how to do something.

RTP   Real-Time Transport Protocol. An Internet protocol that enables audio and video content to be transmitted over the Internet. Also see *RTCP, RSVP.*

RTS   Request To Send (data comms). A modem signal (in RS-232 communications) that is sent to a DCE device (modem) from a DTE device (computer) to indicate that the DTE is ready to transmit.

run code   See *program run code.* See also: *program source code, program object code.*

- S -

SAA   Systems Applications Architecture. A set of specifications from IBM which describes how users, applications programs and communications programs all interface. It aims to achieve both a standardised interface and compatibility across IBM's products, from PCs to mainframes. It includes specification of APPC.

sans serif   A typeface that doesn't use serifs (from the French word *sans* meaning with-out), such as Arial (which this particular piece of text is). See also: *serifs.*

satellite, GEO   Geostationary Earth Orbit satellite. The orbit of a satellite around the earth such that its position relative to a specific point on the earth's surface does not change. Telecommunications satellites are typically deployed so that their area of coverage on the earth does not change with time. These sit some 37,000 kilometres above earth. Compare: *LEO.*

satellite, LEO   Low Earth Orbit satellite. A LEO satellite sits about 1,000 kilometres above earth. Compare: *GEO.*

saturated cabling   See '*cabling, saturated*'.

scan lines   The lines of dots (*pixels*) across a display screen image. The number of scan lines on a screen, and the vertical *resolution* indicate the same thing.

scanner device   An input device in which a light source scans a page surface and the variations in the light reflected from the surface are interpreted to produce a resultant image. The scanned image can be displayed on the computer screen and can often be stored to disk in a variety of graphics file formats.

schema   See *database schema.*

SCSI   Small Computer Systems Interface. A popular device interface, used in particular for disk drives, tape systems, CD-ROMs, and some scanners and printers. See also: *ESDI, ST-506/412.*

SD (Send Data)   See *modem indicator lights.*

SD   Single-Density (see).

SDLC   Synchronous Data Link Control. An IBM standard communications protocol.

SDRAM memory   See *'memory, SDRAM'.*

search engine software   Software that searches files or databases and classifies or indexes information for ready retrieval. Also known as text retrieval software.

search engine, Internet   A facility that searches Internet web sites, and either classifies, or indexes, the information available to make it easier for a Web surfer to locate information. Some popular Internet search engines from the hundreds that exist on the Web include: Alta Vista, Excite, Yahoo!, HotBot and ANZWERS.

SEC   Single Edge Contact cartridge. A packaging technology developed by Intel for use initially with the Pentium II processor. The cartridge components are mounted on a substrate and then completely enclosed in a plastic and metal cartridge. The cartridge connects to a motherboard via a single edge connector instead of multiple pins. See also *DIP, SIP, SIMM, PGA.*

second, micro- (µs)   A millionth of a second, or 0.000001 seconds, or 10^{-6}. See also *SI System.*

second, milli- (ms)   A thousandth of a second, or 0.001 seconds, or 10^{-3}..

second, nano- (ns)   A billionth of a second, or 10^{-9}.

second, pico- (ps)   A trillionth of a second, or 10^{-12}.

secondary storage   See *storage, secondary'.*

sector   A pie-shaped division, or arc, of each track of a disk medium. It is the smallest piece of a disk that information can be written to and read from. Computer disks are comprised of many tracks, each of which is divided into several sectors (floppy disks typically have 8 or 9 sectors per track, high density floppies 15, and early hard disks 17). Information on the disk can be regarded as being located in a particular sector of a particular track. A sector on a disk formatted by early DOS versions is 512-bytes. See also: *cluster, track*.

sectored, hard   A disk with several index holes, typically between 11 and 17, to indicate the location of the sectors on the disk. See also: *'sectored, soft'*.

sectored, soft   A disk with a single index hole to indicate the location of sectors on the disk. Most personal computers use soft-sectored disks. See also: *'sectored, hard'*.

Secure Socket Layer   SSL (see)

security, pillars of   The pillars of e-Security are considered to be: *authentication*, *data privacy*, *data integrity* and *non-repudiation*. Also see: *spoofing*.

security — non-repudiation   Being able to ensure that a message that is claimed to have originated from a sender has in fact originated from that sender and not by an imposter.

security — data privacy   Being able to ensure that data cannot be viewed or interpreted by others.

seek-time   The time required to move the read/write mechanism of a direct access device (disk) to the desired track in order to perform an operation.

semiconductor memory   A type of computer memory where electronic circuits are etched onto the surface of a silicon wafer. See also *integrated circuit*.

serial communications   The transmission of information - typically between a computer and its peripheral devices, or between two computers - where the information is transmitted one bit after another, in one of three modes: simplex, half duplex or full duplex. See also: *RS-232, current loop*. Compare: *parallel communications*.

serial interface   A type of interface (on a computer or peripheral equipment) that performs serial communications.

serifs   The short lines that are used to cross and dress-up the ends of a character's main strokes. Typefaces that use serifs include: Times Roman and Courier. The text of this publication is a serif typeface. See also *sans serif*.

server   A station on a network which acts as the *network server* by making resources available. On a peer-to-peer network a workstation becomes a server by making its resources (eg. disk drive, printer) available to another workstation. See *'server, network'*. Other types of servers include: *application server*, Web, Mail, News, Proxy, Calendar.

server, database   A server on a LAN which specialises in providing access to one or more databases. In the past have typically run a DBMS such as DB2, Oracle, Sybase, dBase, Paradox, FoxPro.

server, dedicated (LAN)   A network server which is dedicated to providing services to the network, and is not used for other applications. A LAN without a dedicated server is a 'peer-to-peer' network.

server, file   A server on a LAN which specialises in providing access to computer files (ie. file services).

server, network   A computer on a (LAN) network which makes its resources (such as attached disk drives, printers and modems) available to the workstations on the network. See also *'server, dedicated'*.

server, print   A server on a network which specialises in supporting printing to one or more printers from stations on the network (ie. printer services).

SET (Secure Electronic Transactions)   A technical specification for securing credit card transactions over open networks such as the Internet. SET uses encryption techniques; and facilitates a credit card transaction between 3 parties — the buyer, the merchant, and the bank.

shadow RAM   A technique whereby some computer instructions, such as system BIOS or video BIOS, are copied from ROM into fast RAM to provide faster operation through RAM memory accesses rather than slower ROM access.

shareware   Computer software which is regarded very similarly to *freeware*. It can provide the same or similar functions to commercially available software; but carries no guarantees for performance, and can have little documentation available. It is generally made available in either of two forms — in a complete form ready-to-use, or in a restricted demonstration version (which might stop running after a trial period of several days). The user can evaluate the software and then choose to register as an authorised user with the software author or distributor, and pay a nominal registration fee. After registration, the authorised user is generally given an access code which enables the product to function fully. Shareware is available over the *Internet* from *Web sites*, from *bulletin board systems*, on disk from retail outlets, and from commercial organisations who charge a nominal fee to cover: promotion, selection, testing, copying, organising and any additional documentation.

Shielded Twisted Pair cable (STP)   See *cable, STP*.

S-HTTP   Secure Hypertext Transfer Protocol.

SI System (Système International d'Unitiés) The internationally adopted system of (metric) units which has several basic units (eg. metre, kilogram, second, ampere, etc.) and which also has several prefixes to indicate multiples of these units.

In particular: kilo- for thousand or 10^3, mega- for million or 10^6, giga- for billion or 10^9, tera- 10^{12}, peta- 10^{15}, exa- 10^{18}. See also: *byte, kilobyte, megabyte, gigabyte, terabyte, petabyte, exabyte*.

Also: milli- for a thousandth or 10^{-3}, micro- for a millionth or 10^{-6}, nano- for a billionth or 10^{-9}, pico- for a trillionth or 10^{-12}. See also *'second, milli-'*.

signature (publishing) A group of printed pages, most commonly 4, 16 or 32, folded from a single sheet of paper stock that is bound together with others, then trimmed by guillotine, to make up a book or magazine. See also *imposition*.

SIMM memory See *'memory, SIMM'*.

Simple Mail Transfer Protocol See *SMTP*.

simplex communications Computer communications in only one direction, either sending or receiving, but not both. See also: *full duplex, half duplex*.

Single-Density (SD) See *diskette, 'Single-Density'*.

Single Edge Contact (SEC) cartridge See *'SEC'*.

Single-Sided (SS) See *'diskette, 'Single-Sided'*.

SIPP Single In-line Pin Profile. The arrangement of the pins, and the mating socket, as found on a computer chip similar to the conventional DIP chip but with the legs protruding from the chip in a single line, instead of two lines. See also: *DIP, SIMM, SEC, PGA*.

slide maker See *film recorder*.

slideshow A presentation comprised mainly of projected slide images. Various application software packages - graphics packages in particular - can facilitate the preparation and execution of such presentations.

SLIP Serial Line Internet Protocol. A communications protocol designed to support IP over serial connections.

smartcard A technology that utilises a card much the same shape and size as a credit card. Introduced in late '97 and '98, the smartcard contains an embedded chip which can store various information including security features.

The card can communicate with a smartcard reader in different ways. The contact version has electrical connectors that make physical contact with the reader, whereas the contactless version contains an antenna coil to communicate over a short distance with a receiver/transmitter.

smart park A facility on printers where two different paper types can be loaded into the printer for different printing jobs, and the paper to print onto is selected at the touch of a button. Typically, the two paper types are cut-sheet letterhead, in a cut-sheet bin feeder, and continuous fan-fold.

smart terminal See *intelligent terminal*.

SMTP Simple Mail Transfer Protocol. A TCP/IP protocol that routes *e-mail* messages between network hosts. It is the standard protocol for transmitting *e-mail* messages over the *internet*. SMTP servers route SMTP messages through the internet to the appropriate mail server.

SNA Systems Network Architecture. An IBM model for computer network communications, and is said to be IBM's implementation of OSI.

snail-mail The regular postal system. So called because it is relatively slow in comparison to *e-mail* which can get an electronic mail item over a great distance in only seconds.

sneaker-net The method that was in common use before the proliferation of computer networks, to get files from one PC to another. The files to be copied or moved are firstly copied to a floppy disk, and the user then physically transports the disk across to the second PC (requiring the use of sneakers — shoes). This was necessary in order to share files, or to use the scarce and expensive (laser) printer to print the file.

SOAP Simple Object Access Protocol.

SOE Standard Operating Environment (syn. *SWE, disk image*). The collection of software on a PC that is essentially the same across all PCs within a company. It means that all PCs in the company are easier to support and periodically upgrade, and users can move from one PC to another without re-training.

soft font A font that is stored internally in a computer on disk and can be downloaded to a printer. Many different soft fonts can be stored in the computer and only the few required fonts downloaded to the printer, thus saving on available printer memory.

soft sector See *'sectored, soft'*.

software A set of computer programs (one or more), procedures, rules and associated documentation. Software falls into various categories including: operating system software and application software. Often used interchangeably with the term *program*. See also: *program, application software package*.

software, anti-virus Computer software that can help to guard against attack by a computer *virus* (see). There is a variety of different software packages available, utilising various methods to detect computer viruses, and to block them or remove them.

software distribution   The process of delivering software to a PC by electronic means. Within a business, this process typically involves having a basic SOE (or SWE or disk image) for each PC and then updating that by sending updates across the LAN environment directly to the PC. This alleviates the need to manually visit each PC to apply the updates.

software, general purpose   Software for various application areas such as *word processing* or *spreadsheets*, where the software package requires no programming or specific configuration and can be used for a variety of purposes. Compare: *'software, specific purpose'*.

software license   The purchasing of a *software* product usually only entitles the purchaser to use the software on a licensed basis, without taking any ownership of the software itself. That is, the original creator of the software, or the distributor, maintains ownership of the product and licenses the purchaser to use the product. See also *freeware, shareware.*

software license compliance   The purchase of a *software license* is usually limited to a specific number of copies of the product (in most cases this is just one copy). Unless granted a license to do so, the purchaser is not entitled to make any copies of the product, except for the purposes of *backup*. Even so, some software licenses do have special conditions which permit the purchaser to make one copy of the product on a second PC. Illegal duplication of software is called *software piracy*.

software metering   The process and associated software for the monitoring of software that is in use by PCs on a LAN. It can track which software products are being used, and the number that are in concurrent use. It is intended to assist companies in maintaining *software licensing compliance*.

software (package)   The collection of computer programs (software) that provides the computer user with the facility to perform some function, or to create, change, print or transmit an item such as a document, electronic mail, spreadsheet, database of information or graphic. A software package is usually procured comprising: one or more disks containing the software, some printed documentation including the installation and setup instructions, a license to use the software, and some proof of the license purchase. The software itself is typically comprised of many individual computer files which are stored on a computer's hard disk drive. Key application software categories include: *word processing, spreadsheet, communications, graphics, desktop publishing.*

software piracy   The illegal duplication of software, whether for personal use, corporate use, or for sale. See also *software license compliance.*

software, specific purpose   Software that has a very specific use. For example, a payroll software package can only be used for payroll processing purposes. Likewise for each of: accounting, fixed assets, inventory control, purchasing, manufacturing planning, CAD, etc. Compare: *'software, general purpose'*. See also *application system..*

SOHO   Small Office Home Office.

source code   See *program source code*.

spacing   For printed matter there are two types: *fixed*, *proportional* (see). See also *kerning*.

spam   Unwanted and/or unsolicited *e-mail*. Analogous to the junk mail that arrives in our letter-boxes.

specific purpose application software   See *'application software, specific purpose'*.

spoofing, site   A technique generally used in computer hacking activities. It involves a computer system monitoring, or eavesdropping, network traffic that is passing to another computer system, or Web site, and picking up enough information about the other system so that it can masquerade as the other system. As a result, future traffic intended for the original monitored site can be received by the monitoring system. This technique can be employed to gather information, such as credit card details, or to send information. Also see *security.*

spooling   A technique of sending information to a relatively slow device (such as a printer) where the information is temporarily stored in a queue until the device can process it.

spreadsheet, electronic   A computerised version of the paper spreadsheet (or worksheet) that was in use on physical desks prior to the introduction of the computerised version. It is a tabular arrangement of rows and columns with the facility to enter, display, and manipulate numbers, text and various formatting, and to perform various calculations on the data, and print the contents. Fairly popular and common spreadsheet software packages include: Lotus 1-2-3, Microsoft Excel, and Quattro Pro.

SPX   Sequenced Packet Exchange. A NetWare communications protocol providing peer-to-peer and client/server interaction, and utilising NetWare's IPX protocol. (see)

SQL   Structured Query Language (see).

SS   Single-Sided (see).

SSL   Secure Socket Layer. A low-level protocol that enables secure communications over the Internet (typically between an Internet server and the user's *Web browser*). A web server can establish a secure session with a web browsing client using SSL to negotiate encryption keys, and to ensure message authentication.

ST-506/412   A common device interface standard used in particular for disk drives in the IBM PC-XT and PC-AT computers. See also: *ESDI, SCSI, IDE.*

Standard Operating Environment (SOE, see)

Starlan A relatively inexpensive local area networking system, developed by AT&T, using CSMA/CD access and star topology.

Starlight A device developed over several years by Australia's Defence Science and Technology Organisation (DSTO) essentially to provide a digital airlock between multiple networks. This security device is a pizza box sized switch that can sit under a computer user's monitor. It allows the computer user to access both a secure network and non-secure network concurrently, without security risks. Was planned for production in early '99.

star topology See *'topology, star'*.

station Synonymous with *node*.

storage device A device that is used to store information or data, including both temporary storage (memory) and permanent storage (magnetic tape, various floppy disks, hard disks and optical disks - CD-ROM, WORM and erasable versions).

storage, mass A computer storage facility that can store large amounts of data, readily accessible to the computer (eg. memory, disk, magnetic tape).

storage, primary Computer memory, usually internal to the computer, including random access memory. Can also include disk storage which is internal to the computer (enclosed in the same cabinet).

storage, secondary Computer storage facility, often external to the computer, and is typically the permanent and non-volatile storage devices including magnetic tape, and various disk devices (magnetic and optical). Also called *auxiliary storage*.

STP (Shielded Twisted Pair) cable See *cable, STP*.

streaming tape See *cartridge tape*.

structured programming A method of writing computer programs that emphasises the systematic design, and management of the software development process. This type of programming improves the quality of programs, and makes them easier to read.

Structured Query Language (SQL) A programming language for the querying and manipulation of relational databases originally used on mainframe computers, and now becoming more widely available for personal computers. It is a non-proprietary language standardised by ANSI, said to be a 4GL, and is supported by many database software products. See also: *query by example, 'database structure, relational'*.

style, typeface One of the variations within a family of typeface. eg. roman, bold, italic, small caps, strikethrough, subscript, superscript, outline, shadow.

stylus pen A hand held input device resembling a pen, and used with a *graphics tablet* (see).

suite A collection of programs, as in a database or information system.

Surf the Net See *'web surfing'*.

Super VGA See *SVGA*.

SVGA (Super VGA) A video display system standard. See *'Video Standard, SVGA'*.

SWE Standard Workstation Environment. See *SOE*.

symbol library See *clip art*.

symbol set A unique collection of all of the characters within any one font. A symbol set is defined with a particular application, or group of applications, in mind. Some specific symbol sets include: IBM-US for IBM PC applications, line draw, and bar code. Used synonymously with *character set*.

synchronous transmission Data communications in which the information is transmitted in blocks at a fixed rate, and with the transmitting device and receiving device both synchronised. See: *BSC, SDLC*. Compare: *asynchronous transmission*.

syntax The rules which regulate the precise spelling, layout, and sequence of options in a programming language and for computer commands that are entered into a computer.

sysop system operator. Commonly used in reference to the operator who maintains a Bulletin Board System (BBS).

system The combination of people, devices and methods interrelated for the purpose of achieving a common goal. (1) A *personal computer system* can include hardware, peripheral hardware, and a collection of software. (2) A *mainframe system* can be only a collection of software, such as an information system.

system analysis The examination and analysis of a process, method, procedure, or business activity to determine the functions that are performed, and what must be accomplished, with the aim in mind of solving a business problem or improving business operations with the aid of a computer system.

system analyst Person who is trained in, and works in, systems analysis, and who works with the computer users to help determine their data processing needs.

system board See *motherboard*.

system clock Synchronises the timing of all tasks within a microprocessor (fetching and executing instructions, moving data, etc.) by sending out electrical pulses, or clock signals, at the clock speed. See *clock speed*.

system design The process of designing an information system, including describing the hardware, software and operating procedures. Functional and technical specifications can be produced, and cost/benefit analysis performed.

system development The process of creating an information system from the descriptions prepared in the system design stage, including the finalising of procedures and preparation of documentation.

system disk See *boot disk.*

system implementation The process of testing the information system created in the system development stage, converting from the old system to the new one, and training the users on the new system.

system life cycle The life span of an information system. The life cycle consists of: (a) system analysis, (b) system design, (c) system development, (d) system implementation, and (e) system maintenance.

system maintenance The on-going process of monitoring a system, including the recording of any problems, and planning and carrying out any required modifications.

system software The programs that are used to control and supervise the operations of a computer system. Typically includes: operating system software and utility software.

system unit The cabinet, in a personal computer system, that houses the motherboard, any ancillary boards, and storage devices.

- T -

tape See *cartridge tape, reel tape.*

TAPI An API standard developed by Intel and Microsoft for use with CTI systems (see).

TB terabyte (see)

TCO Total Cost of Ownership.

TCP/IP Transmission Control Protocol / Internet Protocol. A standard protocol for the communication and interconnection of differing computer systems, originally developed by the U.S. Department of Defense. It is now the basis of a vast majority of networks, including the Internet. Discrete protocols utilised include: *SLIP, PPP* (see). Also see: *DHCP, FTP, Ping, Telnet.*

TCSC Thin Client/Server Computing (see).

Technical and Office Protocol (TOP) A type of computer communications, initially developed by Boeing. Not to be confused with the LAN product TOPS. See also *MAP.*

tech wreck See *dot-com.*

telepresence The use of various equipment (including TV cameras, computer systems and telecommunications facilities) to extend one's presence to a remote location.

Teletex Telecom's implementation in Australia of a universal means of transferring text information between different computer and word processing systems.

teletext An information service similar to videotex but transmitted as part of the television video signal instead of via telephone lines. A teletext decoder unit is required to be able to display this information.

teletype (terminal) An early computer terminal that displayed text by typing it onto a continuous paper feed, and included a *paper tape punch/reader.*

tera- The SI unit prefix for 10^{12} (ie. 1,000,000,000,000 or million million).

terabyte (TB) Approximately one million million bytes, or exactly 1,099,511,627,776 bytes (derived as 2^{40}). Terabyte is now coming into use; but is not yet in common use (in the late 1990s). See also: *byte, kilobyte, megabyte, gigabyte, petabyte, exabyte.*

terminal A device, generally the combination of a monitor and keyboard, that allows the input and output of information; generally does not contain a processing unit. Also called a *workstation.*

TFT Thin Film Transistor. One particular format for colour liquid crystal displays in notebook computers. Also see *DSTN, HCAD.*

thermal transfer printer A type of non-impact printer that creates printed characters by selectively heating the pins of a 'dot matrix' type print head in close proximity to the paper. The heat darkens the paper in dot shapes that form a character matrix not unlike the dot matrix printer. (See also *printer*).

thermal wax transfer printer A type of non-impact printer that creates printed characters by selectively heating the pins of a 'dot matrix' type print head in close proximity to a wax-coated plastic ribbon. The thermal print head can contain hundreds, or even thousands, of heating elements. The ribbon is sandwiched between the paper and the heating elements, and wax is melted onto the paper. (See also *printer*).

thimble printer A type of impact printer that uses a print wheel which resembles an (over-size) thimble to produce letter quality output. It has a number of separate arms like the spokes on the wheel of a daisywheel printer. The arms each have a fully formed character which is pressed against the ribbon and paper by a small hammer. Very similar concept to the daisywheel printer. (See also *printer*.)

http://www.hotkey.net.au/~brain/

thin client A compromise between a *dumb terminal* and a *PC*. A relatively simple, pruned-down personal computer on a network and which relies on a host computer system (eg. file server, mid-range or mainframe system) for the storage of information and its executable programs. A thin client is generally able to access several different types of host systems concurrently (eg. a file server, Web server, mid-range system). It typically comprises a PC-type keyboard and screen (VDU) with a much smaller system unit box containing some memory and a network interface (ethernet or token ring interface). Some thin clients also contain other PC-type components (such as hard disk drive).
A principle aim of the thin client is to reduce the cost of ownership of desktop systems, and return the management of them to the centralised IT department (similar to the older days of mainframe systems and dumb terminals). This technology was introduced in mid to late-97 and initially included products from various companies: IBM Network Station, Microsoft (and Intel) Net PC, Sun JavaStation, and Oracle NC.

Thin Client/Server Computing (TCSC) The computing architecture that includes both *thin clients* and one or more *servers*. In 1998 the software company Citrix Systems introduced Independent Computing Architecture (ICA). This allows MS Windows applications to be accessed by users from a variety of different computer types. All processing is performed on the server, and the information transmitted between the server and the thin client includes screen images, and keyboard and mouse commands. This means that the thin client can be a low powered unit (perhaps even a 286-based PC).

third generation language (3GL) A high-level computer programming language (as opposed to low level language like assembler or machine code), including: Cobol, Algol, Fortran, Pascal.

TIF Tagged Image File (file format). A method of storing bit-mapped images in various resolutions, numbers of greys, or colours. It is a common file format for scanned images (photographs).

time sharing A mode of operation where several computer users each have (shared) access to a central computer via separate terminals. The computer responds to the instructions of each user in turn, and it appears to each user that they have exclusive access to the computer.

time slice The mode of operation where a computer executes one set of instructions for a short while, and then suspends that one to execute another waiting set of instructions, and so forth. This ensures that each set of instructions, or program, that are waiting for execution each receive some attention and each makes progress towards completion.

TIO Telecommunication Industry Ombudsman. In Australia, the office of the TIO provides a telecomms dispute resolution service for consumers and small business. http://www.tio.com.au

TLD Top Level Domain. The last, or most significant, portion of a domain name. eg. com, org, asn, edu, gov. In late 2001 several additional TLDs are being introduced including: biz, pro, info. Also see *domain name*.

token passing protocol A technique for controlling access to a computer network (network access method). Nodes on the network are connected in a ring formation and a 'token' (a special message) is passed from node to node around the ring. A node device may transmit onto the network by seizing the token, inserting a packet onto the ring, and retransmitting the token. See also: *network access method*, *CSMA*.

Token Ring An implementation of the token passing network access method, developed by IBM. It is, however, typically a logical ring, physical star, using a wiring concentrator or MAU (Media Access Unit). A Token Ring network is a LAN which conforms to the IEEE 802.5 standard. See also *HSTR*.

TOP Technical and Office Protocol (see).

topology The physical structure, consisting of paths and switches, that provides the interconnections for communications among nodes or stations on a network. Different topologies include: bus, ring, star, tree. See also: *network access method*.

topology, bus A computer communications network topology in which stations (nodes) are located along a single communications cable.

topology, ring A computer communications network topology in which all stations (nodes) are connected around a ring, and messages are routed through each station. Typically uses a token-passing protocol.

topology, star A computer communications network topology in which all stations (nodes) on the network are connected to a central node; typical of a PABX, and some LANs which use a star topology to bring the cables to a central location where they are connected together in a bus or ring manner within a hub.

topology, tree A computer communications network topology in which the stations (nodes) on the network are connected in a hierarchical fashion.

TOPS A local area networking system.

TPC-C A benchmarking methodology from the Transaction Processing Performance Council, intended to provide an indication of the relative performance of computer systems, in particular database systems. The third version was introduced in mid-1992, and the fourth version is expected to be released in late 1998.

track The concentric circle of finite width on a magnetic disk where information is stored. Computer disks are comprised of many tracks, each of which is divided into several sectors. Information on the disk can be regarded as being located in a particular sector of a particular track. Also see: *sector, cluster.*

track ball An input device that uses the movement of a hard sphere, rotated by hand, to control cursor movement on the screen.

tree topology See *'topology, tree'.*

TRS-80 An *operating system* for microcomputers in use in the '70s. See also *CP/M.*

TSAPI An API standard developed by AT&T and Novell for use with CTI systems (see).

TSR Terminate and Stay Resident. A memory resident program (in DOS) which will execute, then terminate and stay resident in memory for subsequent instant execution. Is typically invoked with a hot-key. See also *memory resident program.*

TTY (Telephone Typewriter) An early type of computer terminal.

turnkey system A system supplied in a complete form, ready to use.

TV tuner card An expansion card that can be installed in a PC to provide the capability of receiving and viewing analogue free-to-air TV signals. Some cards can also provide the ability to record video input, edit it, store it, and e-mail it. These cards became popular in late 1998.

Type 1 cable Shielded two pair twisted wire for data transmission.

Type 2 cable Shielded six pair twisted wire for voice and data transmission.

Type 3 cable Unshielded Twisted Pair (UTP) wire for voice and/or data transmission. Also refers to standard telephone wire. Also see *UTP, STP, Category 5 cable.*

typeface Refers to the printed design of characters. A typeface is a family of type that has a common, unified underlying design, regardless of size and style (style refers to: italic, bold, etc). Some typefaces are: Courier, Helvetica, Times Roman. See also *font.*

- U -

ULSI Ultra Large Scale Integration.

Unicode (ISO-10646). A 16-bit character set that utilises a double byte (a *DBCS*), and hence has 256x256 possible characters (65,536). This character set is intended to be language-independent and contains all of the characters in common use, with capacity for additional ones in the future. Also see: *character set, ASCII.*

Uninterruptible Power Supply (UPS) Equipment which ensures the provision of a continuous, regulated and filtered power supply. It connects in-line with the conventional power supply and in the case of power failure or faltering it switches in to maintain an acceptable supply of power. Small versions for use with personal computer systems can incorporate a battery for backup power supply as well as electrical and electronic circuitry; while much larger versions can incorporate a power supply generator.

Universal Resource Locator (URL) (see)

UNIX An operating system, available in several variations, in widespread use for technical and scientific applications on minicomputers and workstations. It has been around since the late 1960s, is hardware independent, and is available for a wide variety of hardware platforms including personal computers.

Unix98 The generic name for a Unix product that complies with Version 2 of the single Unix specification (devised and agreed in early '97).

Unshielded Twisted Pair (UTP) cable See *cable, UTP.*

upload The process of transferring information from one piece of (computer) equipment to another, in particular up to a larger or more powerful device from a lesser one (such as minicomputer to mainframe, or personal computer to minicomputer). Files are uploaded from a personal computer to a mainframe. Compare: *download.*

UPS Uninterruptible Power Supply (see).

URL (Universal Resource Locator also Uniform Resource Locator). The unique *Internet address* of a resource on the Internet. On the *WWW* it is the address of a *Web page* (which is stored as a disk file), and can also indicate a particular location within the *Web page*. Is typically of the form in this example:

http://www.company.com.au/path/file.htm#bookmark.

where: *http* specifies the protocol to use for the transmission, and in this example is the HyperText Transfer Protocol Internet service;

www.company.com.au identifies an Internet server, and is a full *domain name*, with the letters *com* indicating a company (as opposed to *net*, *gov*, *edu*); and the last two letters being the country identifier (*au* for Australia in this example), except that Web sites in the USA don't use the country code (the country codes conform to the ISO Country Codes standard) (also see *domain name* for further details)

path is the name of the folder/directory (or folder and sub-folders) to indicate where the page is stored;

file is the name of the file within the folder, and is usually of the type HTM or HTML;

#*bookmark* indicates the name of a bookmark, or anchor, within the file at a specific location which is to be displayed.

URL, absolute   A full *URL* (see), including the domain name, path, filename and bookmark if applicable. Also see *domain name.*

URL, relative   A portion of a *URL* for a Web page or other WWW resource, with respect to the Internet address of the current page. For example, the relative *URL* for any *Web page* which is in the same folder (or directory) as the current page being viewed, is simply the *filename* (eg. SAMPLE.HTM).

USB   (Universal Serial Bus). See *'Bus, Universal Serial'.*

user-friendly   A term generally meaning that a particular hardware item or software product is relatively easy to use.

user interface   See *'interface,* user'.

utility software   Software used on a computer system for ancillary and housekeeping functions, including: disk formatting, disk maintenance, disk backup, file conversion, file repair and file recovery.

UTP cable (Unshielded Twisted Pair)   See *cable, UTP.*

- V -

VAN   Value Added Network.

vapourware   Products, either hardware or software, which are talked about as coming or pending but which do not materialise.

VAX   A family of minicomputers from DEC in widespread use in the '80s. Also see: *PDP, DEC.*

VCPC   Visual Connected PC. A technology from Intel.

VDU   Visual Display Unit.

vector device   A device that generates an image using lines, or vectors. A pen plotter is a vector device that creates its output image using a pen to draw lines. Compare: *raster device.*

vertical market software   Software that is designed to handle the unique needs of specific markets (businesses), such as medical offices, newsagents, real estate offices, hotel management.

VESA   (Video Electronics Standards Association). See *'bus, VL'.*

V.FAST Class   A proprietary (interim) standard released by Rockwell International to provide users with the ability to transmit data at fast speeds (up to 28.8kbps) over the standard PSTN (or up to 115.2kbps with compression). It is based on the V.34 standard.

VGA (Video Graphics Array)   A video display system standard. See *Video Standard, VGA.*

videoconference   Conducting a conference of people utilising computer-based technologies, where there are at least two conference participants a large distance apart (typically in different cities, or even different countries). The conference utilises at least a simple camera and TV monitor at each location, interconnected by special equipment, and communicating with the other location over some type of telecommunications link (typically ISDN). The TV monitor is used to display the person or persons at the other location. The camera is usually a small desktop unit that often sits on top of the monitor, and captures video images of the person(s) to transmit to the other end.

videoconference, desktop   A *videoconference* conducted utilising desktop PC equipment. This can be accomplished utilising a special adapter card in the PC, with a video camera mounted somewhere around the edge of the PC's monitor.

videoconference, point-to-point   A *videoconference* conducted between only two locations.

videoconference, multi-point   A *videoconference* conducted between more than two locations, typically three or four.

video display system standards   Defines the way in which information is displayed on a computer screen, especially in terms of the screen *resolution*, but including other parameters. Various video standards for personal computer equipment, roughly in order of development (and capability), include: *CGA, MDA, Hercules, EGA, PGA, MCGA, VGA, IBM 8514, SVGA, XGA.*

video standard, CGA   IBM Colour Graphics Adapter video standard. An early (de facto standard) video display system from IBM for personal computer systems in common use in the mid-1980s, is not as good as EGA or VGA. Also see *video display system standards.*

video standard, EGA   IBM Enhanced Graphics Adapter video standard. A video display system standard from IBM for personal computer systems, considered better than MDA and CGA, but not as good as VGA. Also see *video display system standards.*

video standard, Hercules (Graphics)   The Hercules Computer Technology organisation produce a range of video display cards for use in personal computers, including the Hercules Graphics Card, HGC Plus and Hercules VGA cards. Also see *video display system standards.*

video standard, IBM 8514   IBM's video display system introduced with their PS/2 computers in April 1987 that was claimed to bridge the gap between personal computers and technical workstations. Comprises 8514 monitor, and 8514/A interface card. Supports 1024 by 768 *resolution*, and 256 simultaneous colours. Also see *video display system standards.*

video standard, MCGA IBM Multi-Colour Graphics Array video display system standard. A video display system for personal computer systems introduced by IBM with the introduction of their PS/2 computers. Also see *video display system standards*.

video standard, MDA Monochrome Display Adapter video display system standard. An early video display system standard for personal computer systems. Also see *video display system standards*.

video standard, PGA Professional Graphics Adapter. A video display system standard from IBM for personal computer systems that did not become widely used. Also see *video display system standards*.

video standard, SVGA Super VGA. Depending on the implementation, screen scan rates and numbers of colours, SVGA *resolution* on the screen varies from 640-by-480 to 800-by-600 to 1024-by-768 *pixels*. Also see *video display system standards*.

video standard, VGA Video Graphics Array. A video display system standard for personal computer systems, introduced by IBM with their range of PS/2 computers. It is considered better than each of MDA, CGA and EGA, and was in very common use through the '90s. Depending on the implementation, screen scan rates and numbers of colours, VGA *resolution* on the screen varies from 640-by-400 to 640-by-480 *pixels*. Also see *video display system standards*.

video standard, XGA A video display system standard. Also see *video display system standards*.

Videotex An interactive information service utilising computer systems and a communications network. Launched by Telstra (Telecom Australia) in 1986 and popular for a few years until the early 1990s.

V/IP See *VoIP*.

virtual disk See *RAM disk*.

virtual memory A technique of providing the facility of additional computer memory without increasing the amount of real (physical) memory. This makes it possible to run larger programs, and to handle larger amounts of information. As required, the contents of physical memory is automatically and temporarily swapped (stored) to disk, making room for additional information to be swapped in and processed. See also '*memory, expanded*' and '*memory, extended*'.

virus A computer virus is a little computer program that can get onto a PC, and cause some annoying behaviour or some damage to files or programs. It can also proactively cause damage to *Web sites* (eg. *DoS* attack, see) and to other people's computer systems. Also see '*software, anti-virus*'. There are thousands of different viruses, and variations of viruses, in existence. The damage they cause varies from virus to virus.

Visual Connected PC (VCPC) (see)

VL-bus The VESA Local bus. See *'bus, VL'*.

VLSI Very Large Scale Integration.

VOD Video On Demand.

voice mail A form of electronic mail that accepts, stores and sends messages in the form of the human voice.

Voice over IP See *VoIP*.

voice recognition The capability of a computer to accept input in the form of the spoken word.

voice response See *IVR (Interactive Voice Response)*.

voice synthesis The capability of a computer to respond in a simulated human voice.

VoIP Voice over IP. The transmitting of (human) voice over a data network utilising the Internet Protocol (IP). The data network is typically the *Internet* (commonly referred to as *Internet telephony*.) Introduced in mid-97. More commonly this is utilising the Internet for telephone calls that would otherwise go through a conventional telephone network. Is reputed to be significantly cheaper.

volatile memory See *'memory, volatile*.

volume A physical storage device such as magnetic disk or tape; typically has its own *volume label*.

VPIM Voice Profile for Internet Mail. A protocol that allows disparate voice mail systems to interoperate or exchange messages over the Internet. Also see *MIME*.

VPN Virtual Private Network.

VSAT Very Small Aperture Terminal. A Telstra service which provides private high-traffic volume satellite communications for difficult to reach locations in Asia. (also see *Inmarsat*)

- W -

W3C World Wide Web Consortium. http://www.w3.org

wait state A condition that occurs when the computer's CPU makes a request to read information from RAM and the RAM cannot respond fast enough, so that the CPU is forced to wait for one or more consecutive clock cycles. Techniques to reduce wait states include: RAM cache. See also: *system clock, clock speed*.

wait state, zero A condition where the RAM can respond fast enough so that the CPU does not wait for subsequent cycles, and there are no wait states.

WAN   Wide Area Network (see).

WAP   Wireless Application Protocol. A technology for mobile phone networks that allows users access to internet-type information. Introduced (in Australia) in late 2000.

warm boot   See *'boot, warm'*.

WCDMA   Wideband Code Division Multiple Access.

Web, The   See *WWW*.

Web browser   Software that runs on a PC (or thin client PC) used for *Web surfing* (see) over the *Internet*, or an *Intranet*. Popular Web browsers include: Netscape's Navigator, and Microsoft's Internet Explorer (IE).

Web home page   (1) A *Web site's home page* is the one *Web page* at a *Web site* that is regarded as the introductory page for visitors, and which can contain links to other Web pages. It is usually named index.html, default.html or home.html.

(2) A *Web user's home page* is the one particular *Web page* that a user likes to start from, and continually return to as their "home base". It is typically a useful page that has useful links to other *Web sites*. It might be a page at the ISP's *Web site*. *Web browser* software usually has a setting to specify the user's preferred *home page*.

Webmaster   A person who designs, implements, administers or manages a *Web site*.

Web page   The collection of information that is stored as a single document and retrieved for viewing by a *Web surfer's Web browser*. It is the basic element of the *WWW*, as each *Web page* is stored on a host's computer system as a *disk file*, and of the type *HTM* or *HTML*. It can contain text, graphics, and/or a combination of multimedia information (motion video, audio, etc.). However, any non-text information is actually stored in separate *disk files*.

When retrieved and displayed by a *browser*, a *Web page* is typically the width of the screen, and longer than the screen requiring the user to scroll downwards to view all information. A typical *Web page* will contain text (including the *HTML* tags), and *hyperlinks* (ie. hot links) to other files that can each contain a graphics image, or some sort of program or applet. The *hyperlinks* can also link to other points (a bookmark or anchor) within the same *Web page*, or to other *Web pages* at the same *Web site*, or to other *Web sites*. A Web page can be viewed alone in a *browser*, or it can be viewed within a *frame* in another Web page. Also see *Web home page*.

Web page frame   A potentially scrollable window within a *Web page*. The contents of another Web page can be displayed inside the frame. Frames are commonly used in multiples as a *frame set* (see).

Web page frameset   Two or more *Web page frames* within one *Web page*. Each frame can display separate *Web pages*. A common use is for a narrow left-hand frame to display a list of items representing an index or table of contents, each of which has a *hyperlink* to another *Web page*, and the wider right hand frame displays the contents of one of these index items.

Web page hotspot   See *Web page image map.*

Web page image map   On a *Web page*, a single image (or picture) can appear to be just one picture, but actually have a number of *hyperlinks* to other Web pages. Eg. a Web page displaying a map of Australia could have a *hyperlink* for each state and territory so that when the user passes the mouse cursor over a particular state, and then clicks, the *Web page* for that state is displayed. The portion of the image that has one *hyperlink* assigned, and will return one particular *Web page* is called a *Web page hotspot*. The image map is the HTML definition for the *hotspots*, and the *hyperlinks*.

Web page meta tag   An HTML tag that must be placed inside the <HEAD> section of an HTML Web page. It includes information about the Web page, some of which is picked up by *search engines*.

Web presence   The condition where an organisation is represented on *the Web*, usually by having a *Web page* at somebody's *Web site*, but not necessarily their own. In the simplest form an organisation's *Web presence* could be a single Web page which provides basic information about the organisation, including contact address details, and its available goods or services.

Web server   The computer equipment that stores one or more *Web pages*, and provides access to them for incoming *Web surfers*. Also can provide links to enable access to information on other systems, including via a *CGI gateway* .

Web site   A collection of *Web pages* hosted on a *Web server*. The address for *Web surfers* to gain access is the *URL (Universal Resource Locator)* (or an *IP address*)*.

Web site home page   See *Web home page.*

Web surfing   The act of surfing the *Internet*, or using a computer with *modem* and *browser* software to seek out information over the *Internet*, and to retrieve and display the information locally. To view a *Web page* from a *Web site*, the entire *Web page* disk file is downloaded over *the Web* to the *Web surfer's* PC.

The first stage in Web surfing is to set up a PC with appropriate software, set up a modem for connection to an *ISP* over some type of connection (*PSTN* or *ISDN* telephone service, cable service, or microwave or some other wireless service), and an account with the ISP (an ISP will help with all this). The next stage is to establish the connection via the modem over the connection to the ISP, and thence into the *Net*. The first page of information to come back and be displayed is

often a *home page.* Then it is possible to follow a hyperlink to another *Web site,* or enter a *URL* to surf to another *Web site,* or to enter search criteria for a *search engine* to retrieve relevant *Web site* details. Also see *Internet, URL.*

WebTV   (1) A technology utilising set-top boxes that allows users to view *web pages* on a television set. Essentially, internet access using the TV as a simple computer.

WebTV   (2) A proprietary online service (from WebTV Networks) designed to transmit through existing telephone lines to television sets. Also see *PCTV.*

WebTV Networks   A US-based company that produces technology and equipment that allows customers to connect to the Internet utilising a television, set-top box and remote control.

Wide Area Network (WAN)   A computer network where the computers are more geographically dispersed than with a local area network.

wideband   (data comms) The transmission rates from 64kbps to 2Mbps. Also see: *narrowband, broadband.*

widows and orphans   An orphan is the first line of a paragraph which is separated from the rest of the paragraph (been left behind) by a page-break or column-break. A widow is the last line of a paragraph which has left the earlier lines of the paragraph behind on the previous page or column. Some packages automatically control widows and orphans.

WIMP   Window, Icon, Mouse, Pull-down menus. A generic term for a graphical user interface that uses windows, icons, a mouse and pull-down menus. Generally considered to be more productive than a purely keyboard-and-screen driven interface.

Winchester (hard) disk   The particular fixed disk technology that was developed at IBM in 1973 under the code name Winchester; is the most commonly used type of fixed disk in use in personal computers. See *fixed disk.*

Windows   A *graphical user interface* environment from (and Trademark of) Microsoft Corporation. Some versions of Windows are referred to as an *operating system.* Early incarnations included Windows 2, and Windows 3. These were followed by: Windows 3.1, Windows 3.11 (Windows for Workgroups), Windows 95, Windows 98, Windows NT, Windows 2000, Windows ME, Windows XP.

Windows 2000   The version of Microsoft's Windows released at about the same time as Windows ME (early 2000), and marketed to the corporate user community.

Windows 3.x   The versions of Microsoft's Windows including 3.1 and 3.11 in popular use in the early to mid 1990s. Succeeded by Windows 95.

Windows 95   The version of Microsoft's Windows following Windows 3.x, announced in 1995 and readily available in 1996.

Windows 98   The version of Microsoft's Windows following Windows 95 (on sale in Australia in June '98), and code-named Memphis during its development.

Windows CE   A version of Microsoft's Windows for use on small devices such as palm-top and hand-held computers.

Windows ME   The version of Microsoft's Windows released at about the same time as Windows 2000, and marketed to the home and small business user.

Windows NT   A *network operating system* and *graphical user interface* from Microsoft. Available in four different editions: (1) NT Terminal provides user access to a Windows NT Server from an unintelligent desktop machine. (2) NT Workstation provides user access to a Windows NT Server from a regular PC. (3) NT Server runs on a *server* and delivers typical file server functionality (eg. file and print services, *application serving, e-mail,* etc.). (4) NT Enterprise edition (released in late 1997) delivers clustering technology.

Windows XP   The version of Microsoft's Windows scheduled for release in late 2001.

Winsock API (Application Programming Interface)   The set of programs that is used to provide an interface between application programs and a computer's network access services.

Wintel (platform)   Refers to the combination of Microsoft's Windows and Intel's processors. Throughout most of the '80s and '90s Microsoft's Windows software products and Intel's processors dominated the PC world, seemingly hand-in-hand. The vast majority of PCs had both an Intel processor and a version of MS Windows.

WinZip   Utility (shareware) software from the company Nico Mak Computing Inc. for *zipping,* or compressing, one or more files to produce a much smaller file requiring less disk space to store it. Also see *zip, PKZIP.* http://www.winzip.com

Wireless Application Protocol   See *WAP.*

wiring closet   An enclosure, or cabinet, within a building where the ends of data cable runs are terminated, and inter-connected. Also see *horizontal cabling, data cable.*

WLAN   Wireless LAN. A *LAN* environment utilising radio frequency equipment to enable communications between the LAN clients and any servers on the LAN.

WMF   (file format) Windows Meta File. A format for storing images.

word   A unit of data which occupies one memory location; generally equal to two bytes.

word processing   The activity of using a computer and appropriate computer software to enter and store text material into the computer, and to view, edit, rearrange and print it.

word processing system The combination of computer hardware and software that is used for word processing tasks.

word processing system, dedicated A computer system intended primarily for word processing activity only. For instance, the minicomputer systems that have several workstation terminals for word processing operations; and the newer generation of typewriters which have computer system features such as screen display and electronic document storage.

word processor The software (computer program) that is used for word processing tasks.

workgroup A collection of (personal) computers in the one office, department or business enterprise that are networked together. See also *groupware*.

worksheet See *electronic spreadsheet*.

workstation (1) Until the early 1980s referred to a computer terminal. (2) Now in common use to refer to a very high-powered (generally single-user) computer, commonly running a version of the Unix operating system and being used for technical, engineering or scientific applications. See also: *personal computer*, *minicomputer*, *mainframe*. (3) A computer (a node) on a (LAN) network which is not the host or server; also called a *client*.

World Wide Web (WWW) (See)

WORM Write Once Read Many. Compact Disk very similar to CD-ROM. Blank disks can have information stored on them by a special device, appended after previously recorded information, but only once. They can be read many times over. Very good for archiving information. See also: *compact disk, CD-ROM, erasable optical disk*.

WP Word Processing (see).

write-protect notch A small cut-out in the edge of the jacket of a 5.25" diskette (*minifloppy*) that, when covered (with a write-protect tab or similar item), prevents the disk drive from writing any information to the disk, but allows information to be read from the disk. Later disks such as the 3.5" diskette also have a write-protect feature utilising a small square hole near one corner of the disk jacket, and a slide which either covers the hole, or slides away to reveal the hole (the write-protect state is with the slide revealing the hole).

write-protect tab A small piece of adhesive tape that can be placed over the write-protect notch of a 5.25" diskette (*minifloppy*) to prevent writing to the disk.

WWW (World Wide Wait) An expression used by some people to refer to the World Wide Web, but suggesting that one needs to spend much time waiting for a response across the Web.

WWW (World Wide Web) One of the services that uses the infrastructure of the *internet* to facilitate sending and receiving information. The information is in the form of documents, generally in HTML. This is primarily *Web surfing*, and utilises a *graphical user interface*. It can be said the WWW is essentially an extremely large library that spans around the globe, and is usually open all day everyday. Founded by Tim Berners-Lee who invented it in 1989 while working for the European particle Physics Laboratory. Also see *Internet, web browser*.

WYSIWYG What You See Is What You Get (WYSIWYG pronounced as one word — wizzy-wig). Used in reference to computer displays, in particular in desktop publishing and word processing applications, and means that what you see on the screen is exactly what you will get on the output. Through the '80s this feature was not very common; but by the late '90s WYSIWYG is pretty much the norm.

- X -

X.25 A CCITT standard governing the interface between data terminal equipment (DTE) and data communications equipment (DCE) for terminals operating in the packet mode on public data networks. Used in Australia to define the interface to Austpac.

X.400 Message Handling System. An international standard for electronic mail systems.

x86 A family of microprocessors from Intel that started shipping in 1981. See *80x86*.

XGA A video display system standard. See *Video Standard, XGA*.

XHTML A variant of HTML (a revised version of the HTML 4.0 specification) that incorporates key features of XML.

XML eXtensible Markup Language. A language for describing sets of data.

Xmodem protocol A public domain communications protocol developed primarily for use with microcomputers to send and receive non-text (binary) files. Was a de facto standard for asynchronous file transfers using personal computers.

XON/XOFF protocol A type of (communications) protocol using the XON and XOFF control characters to control data transmission by instructing a terminal to start transmission (XON) and end transmission (XOFF). (Referred to as a flow control system.)

- Y -

Y2K Year 2000 (also written Y2000, Y2k). See *millennium bug*.

Year 2000 bug See *millennium bug*.

- Z -

Z80, Zilog An 8-bit microprocessor used, amongst other things, in a number of CP/M microcomputers in the late '70s.

ZA (Zinc Air) battery See *'battery, ZA'*.

ZAW (Zero Administration for Windows)

zip file A generic term referring to a file that has been compressed using utility software such as *PKZIP*, or *WinZip*. This software can take one or more files as input, and zip them to produce a much smaller file as the output. This is achieved by removing blanks from the file, and various compression algorithms. The resulting output file is sometimes referred to as an archive file. Also see *PKZIP, WinZip*.

Zip Disk drive See *'disk drive, Iomega Zip'*