

# CACTUS

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We can connect a PDA to a computer by USB, infrared beam or radio and find that appropriate software on each machine has updated our calendars, address books and task lists and stands ready to transfer music and movies from a file format suitable to our computer to the quite different file format required by our PDA. With equal ease we can translate and move Word and Excel files.

The transfer of data from one part of a computer to another has always been a complex task in which speed is traded against accuracy and the time required for error correction. Much more complex therefore is the transfer of information from one machine to another of a different type.

Difficulties arise when machines are updated, when file formats are changed or data needs to be exchanged between machines for which the manufacturer has not provided suitable software. For example, many of us have experienced the frustration of finding that the new operating system that we have just installed does not include a driver for an old, but faithful printer. If we wait long enough, a third party may write a suitable driver, but usually we just go shopping for a new printer.

A file transfer protocol is a set of rules determining the format and content of messages transmitted between different devices that may use different speeds, different word or block lengths and different codes for controlling the flow of data. Such software also includes error checking and correcting routines.

In the late Seventies, I used Apple II computers to measure and collect data describing how students use computers to learn mathematics. I transferred the collated files to a university mainframe so that SPSS software could be used to analyse the data. Most of the research grant was absorbed building a modem using discreet components. Then the IT staff printed several metres of FORTRAN code that compiled the

transfer protocol software that lay at the heart of the mainframe's terminal software. All I had to do was write complementary software for the Apple II so that the machines could talk to each other.

These days, the transfer software is built into your modem or into the devices themselves. When you store digital photographs on your iPod, both your camera and your iPod have their own transfer software built in. Simple transfer software is built into your graphics calculator. The complementary software which you install on your computer expects a particular data pattern, but still needs to talk to the calculator about speed, flow control and error checking.

One set of problems arises when manufacturers of devices do not provide software for your computer. For example, it took some time before Apple provided a Windows version of iTunes for Windows users who were buying iPods.

Third party software is notorious for catering only for recent versions of software. Several impressive products enable computer users to connect their PDA and Smart Phone devices but they seldom cater for outdated versions.

Other problems arise from an increasing awareness of copyright and security issues. A major Australian retailer is providing music that you can download but play only on Windows Vista Certified or PlayForSure digital music players.

Most file transfer problems arise simply because of the passage of time. New operating systems often fail to recognise old peripheral devices and data from old software versions.

The resulting upgrades usually cost much more than the new operating system so many of us wait to see how much can be gained before taking the plunge. Eventually our desire for new software will encourage us to upgrade our system. Upgrades involve a steep learning curve so schools need to wait until after their senior students have finished a semester's assessments before expecting them to come to grips with new systems and software.

## Connectivity

Casio graphing calculators once included software and cables for Windows or Macintosh platforms. When Apple moved to System 10 and used USB connectors, Casio did not update their Macintosh software or the serial connectors. When schools needed to upgrade their computers they had difficulty connecting their Casio calculators. Some schools used the calculator emulators available from the Casio website whenever a screen needed to be printed. Other schools purchased expensive adaptors to link their old serial connectors to USB connectors. Computers running System 10 could then be forced to slowly emulate the System 9 environment. Now that the Intel Macintosh no longer emulates System 9, the only way to connect a Casio to an Intel Macintosh is by setting up each computer to run Windows using a program such as Parallels. It is likely that most schools will settle for one in each classroom.

Given that few Macintosh users are enthusiastic or experienced users of Windows, there are a few pitfalls. You will not want to read all of the documentation that comes with a Casio fx-9860G but the information you need is extremely well presented in the two PDF files included on your CD. You will need to read the chapter about connecting the unit to a personal computer and the whole PDF about using the FA-124 software.

Even then, you may miss an important warning to users of Windows XP. As you install the FA-124 Casio software onto your computer you will be welcomed to the "Found New Hardware Wizard". This wizard helps you install the CESH502.USB software driver but warns you that the software has not passed Windows Logo testing to verify its compatibility with Windows XP. A regular Windows user recognises that this ubiquitous message can safely be ignored and clicks on the "Continue Anyway" button. However, a less confident user is likely to choose the "STOP Installation" button. If you do, you will not be given another opportunity to install that driver using the wizard. You will have to install the driver manually and there is a good chance that you forgot to write down the name of the driver.

I installed the FA-124 software within a variety of emulation environments but whenever I launched the software and tried to copy a screen dump, nothing seemed to happen. In

desperation, I followed the same procedure using a proper Windows machine and I met the same problem. Eventually I found the icons for the screen dumps that I had successfully downloaded were placed behind the FA-124 window instead of arranged neatly down the right-hand margin of the screen where a Macintosh user would expect to find them. It is not just the machines that need to adjust.

The amount of cooperation between Apple and Microsoft with regard to network connectivity has been surprising and welcome. It has been claimed that the release of Leopard (Mac OS 10.5) has been delayed to ensure that it is completely compatible with Vista.

## File compatibility

However, connectivity is only the first step. Far more important is file compatibility. There is a good chance that you have received email attachments with suffixes .docx and .xlsx that have been prepared using Office 2007. At the time of writing, these files cannot be read using older versions of Office. While suitable converters may have become available, you are likely to feel pressured to upgrade your software. Out of consideration for others, it is a good idea to save your files in the old format before emailing them to email lists or members of your community organisations.

Macintosh users will have to wait for the universal file version of Office 2008 promised for release later this year. To be fair, Microsoft has stayed with the same format from 1997 and such patience is rare in this industry. What has changed slowly is the ability of recent versions of Office to read very old file formats.

Over many years, hardware and software upgrades can generate difficult problems. An acquaintance asked me if I could retrieve text files from a CP/M floppy disk. I found my old CP/M card, and fitted it into an AppleII. With this I was able to read the CP/M files and save them to a 3.5" Prodos diskette. An ethernet capable Macintosh 610 was then used to read the Prodos diskette and send the files to other machines. Had the files been stored in one of the popular CP/M word processor formats I doubt if I could have helped with file translation. That is why it is so important to store essential information in long standing formats such as text.

### Archiving complete systems

While it is difficult at the time to pick out which machines and software are best representative of their era, schools should keep at least one machine of each type in a small museum. If the machines are kept in good condition you may be surprised how often they prove useful.

While we may not have the desk space to clutter our homes with many old machines, old hard disks do not take up much space. When you install the next major upgrade to your system, seriously consider copying your hard drive to a new, and probably larger hard drive. Install the upgrade onto your new drive. Then fit your old hard disk into an external drive case and you still have your old system intact, complete with the appropriate software and treasured data files from that era. Your hard drive is also less likely to crash if you replace it for each system upgrade.

### Housekeeping

The other important task is one of good housekeeping. Most of us have terabytes of old data files stored on old diskettes. While they do not take up much space, throw out those files that you will never read again because they will continue to unnecessarily bloat your archiving efforts.

Your most urgent data files are those used with your PDA because the operating systems and their software are evolving very quickly and because most of your data files will be lost if your battery fails. Back up your ebooks as text files or PDF files. Suitable converters are readily available from the Internet. Convert your Office files to their computer equivalents, store them on your hard disk and then back them up with your other Office files. Daily changes to your address book, and calendar will adequately backup that data but if you travel far from your computer you should think about backing up important files to a non-volatile card.

It is not that long ago that our university library resolved to store all documents in paper form only. After that came film materials, video and DVDs. Now they are seriously faced with the digital data issues canvassed in this article. I wonder about the future of electronic libraries that spend thousands of hours scanning books to the Microsoft Reader (LIT) format. These files are not easily converted to text and are theoretically protected from indiscriminate

distribution. How long before Microsoft has to change that format to tighten security? Other libraries are content to use text formats that can be copied indiscriminately.

For long-term storage, upgrade all of your data files to the latest version of the relevant software. Further backup your word processor files as text (TXT), or, if the formatting is vital, use RTF, the Rich Text Format. Spreadsheets should be backed up as Symbolic Link (SYLK) files. These formats are more likely to remain readable for many years. Keep your PDF files together so that they can be upgraded for each new version of your reader.

A friend spent many years researching historic records and storing the treasured information using a very large relational database. Recently he suffered a minor stroke and could not remember his password. When I searched for password reading software, the types of intrusive software available horrified me. If any of your data files are password protected, keep a file of the passwords, or preferably, remove the passwords altogether. There is no point in password protecting files. People who steal databases can read everything. The only way to keep important records secure is to store them on external drives that you only connect to your computer while the Internet is disconnected.

Arrange your files into a meaningful file structure and back them up regularly. CDs do not last forever. From time to time I backup essential files to a large and relatively new archive hard drive. When System 10.5 is released later this year I will copy the archive drive to a new and larger drive. The present archive drive will become my new system disk with 10.5 installed and the old System 10.4 hard drive will be stored in a cool, dry, metal cabinet to preserve that system's environment, its associated software and matching data files for as long as possible.

Start your own housekeeping process today. Both popular platforms, and the corresponding versions of Office, are upgrading this year. There may be some very old files that you will not be able to read after you update. If last year's teaching gems are allowed to remain in their present format they are already well on their way to becoming unreadable by future generations of machines, operating systems and software.

