



Sixteen Bits October 2005

PC Users Group (ACT) Inc
27 Mulley Street
Holder ACT 2611

Welcome to Sixteen Bits online

If you would like to read off-line, [Click HERE](#) to download, unzip to a folder

you choose, then double click the index.htm file.

If you prefer - you can read as a PDF file. The internal links will not work in this file which you can download [HERE](#)

Phone 02 6287 2922
Fax 02 6287 2933

Table of Contents (Click the link on the left)

Meeting Notes	Main Monthly Meeting.
President	From the President.
Editor's notes	Editorial.
Meeting dates	Meeting dates for 2005/2006.
Software reviews	Members' reviews of interesting software plus promotional material
Freeware discussion	Learn from, and/or contribute to discussion.
Digital SIG	Discussion about editing and manipulating digital media.
Backup strategy	A marathon and monumental article you should read and retain
CMOS failure	Another PC saga
Humour	More goodies from the net.
Help	PCUG Help Directory and handy links.

We hope you enjoy this edition of *Sixteen Bits*. We are always on the lookout for items for the next edition. If you have anything to contribute - please send it to pcug.editor@pcug.org.au. The nominal cut-off date for submissions is the 15th of each month. All submissions gratefully received. Please send us feedback as to what you might like to see published in your magazine.

For more news of **events to come** - don't forget to check the **PCUG Calendar** at: <http://www.pcug.org.au/members/calendar/>

CTL-A to Select All in current window.

[NEXT](#)

PC USERS GROUP (ACT)

November 2005 MONTHLY MEETING

The final Main Monthly Meeting presentation for 2005 will be held on Tuesday 1st November commencing at 7:30 pm in Lecture Theatre 3, Manning Clark Centre, Australian National University, Acton. Visit the PCUG website at <http://www.pcug.org.au/activities/mmm.htm> for a map of the Manning Clark Centre. The monthly meetings are free. Members, friends and the public are welcome to attend. Stay for refreshments and good company after the meeting! Inquiries to 02-6287-2922 or email pcug.mmm@pcug.org.au .

NOVEMBER 2005 - "FLIGHT SIMULATOR"

In May 2004, the PCUG Air Show was presented by club member and Flight Simulator enthusiast, Roger Lowery. The meeting was so well attended and enthusiastically enjoyed by the audience that Roger has agreed to make a similar presentation this year. Roger will use the simulator to demonstrate modern, real world, hi-tech developments. The audience will gain an insight into how senior commercial airline pilots go about their daily business of getting passengers safely across the country and around the world. This is a fascinating "must see" demonstration for members of all ages. If you fly a plane, would like to fly a plane, fly as a passenger, or just wish to better understand this exciting hi-tech world, then don't miss this presentation! Find out how much computing power you need for Flight Simulator and why it has such a large following around the world. Roger will also demonstrate the characteristics of a wide range of commercial, military and general aviation aircraft, all of which are available for Microsoft's Flight Simulator. So don't delay, note this presentation in your diary right now and, don't miss it!

[Index](#) [Next](#)



Hello again,

Terry tells me he needs a page pres.htm and he needs it now! Well, I'm here to tell you that I am no longer the President since I did not stand for re-election, but am now the Immediate Past President (I even apparently have an IPP Email alias). I will be joining the new committee at their first meeting on Mon 24th Oct, and (if I have my way) almost the first item on the agenda will be the election or appointment of the new President. So, assuming that most members do not bother to read the minutes of the committee meetings, I will repeat my yearly summary that I presented at the AGM, plus some notes on the financial results for FY05. We tried to post the minutes on the web within a week or so of the meetings, and you can find them at www.pcug.org.au/members/committee - you may need to scroll down a little....

So here's the report:

More by Luck than Judgement! At least from my perspective.....

Towards the end of last year we were desperate to move premises. We were being pushed by the landlord to sign a 3 year lease, and we had investigated dozens of potential alternatives with no (even ½ way suitable) results. We were on many waiting lists, but the best we were offered was in Spence – South Yass from this Southerner's perspective. Then in the nick of time we were offered the rooms in Holder – we could easily have been searching for another 2 years. One third of the Belconnen rent, and a lot of other good things going for it. A real piece of luck.

Then before we left Belconnen, Madeline decided that the grass was greener elsewhere. And after quite an extensive search we were able to offer Karen a job as our Office manager. This turned out to be one of the best things that has happened to the group for a long time and she has already become a great asset.

Then with the help of Peter Harris (the member who founded the PCUG), now a solicitor, and his Barrister friend, we were able to negotiate a reasonable Belconnen lease exit fee. Down from \$20,000 plus to about \$2,500. So we owe Peter, who did quite a lot of work for the group Pro Bono, a big vote of thanks. Another member, Peter Reeves, did extensive work on the lease and other paperwork to get us going looking for legal support.

The move from Belconnen to Holder was a huge success thanks to the armada of members who turned up on the day with trucks, trolleys, and enthusiasm. So much so that we were able to cancel the two removal trucks and crews. I mentioned the firm concerned in Sixteen Bits magazine as they were so good about the last minute cancellation.

So let's run quickly through a few more of the high points before I get to stuff that we had hoped to do – but will now be left to the committee that you elect this evening.

1. TIP passed a significant milestone – it survived and prospered for 10 years thanks to the dedicated band of Administrators. We were able to give ALL members a free Dial-up TIP account for Email, and to introduce new dial-up plans - a low use \$5/month - and to change the 'normal' plan to virtually unlimited time and download for \$9.50 per month. On the broadband side we doubled and then re-doubled the download limits, introduced low use and unlimited plans, and TransACT came to the party and brought in increased download speeds for the same price. And we were also able to offer extra 'real' Email boxes as well as alias addresses.
2. Thanks to reduced costs with the move we were able to make some modest reductions of membership fees, by providing a discount for Seniors and introducing Household and Individual memberships. Also on the financial front, we finally joined the 20th century and took up Internet banking. Had to change banks to do it – get BPAY and Merchant facilities organised, and that eventually allowed us to reintroduce Web payments for renewals– mostly due to the efforts of Owen Cook who wrote the appropriate scripts and who spends a good proportion of his time looking after members.
3. The Web site has been improved in many areas thanks to our very competent Web Serf Maxine Deakins. Trevor Frew and Terry Bibo have done a great job with the revamped 16 Bits magazine re-incarnation into an interactive Web magazine, and Mike Dinn produced a good Web Calendar and I urge members to contribute to it and of course to use it. I am also very happy that we have reached an agreement with the Silicon Kid to host his very good looking web based database which (when completed) will be a great resource for members and computer users in Canberra.
4. The main monthly meetings this year have been varied and very successful thanks to Terry Yan and his willing helpers, and specially to the speakers from the group who gave their time and expertise to keep us informed. Thanks to Terry: – a repeat Flight Simulator evening is lined up for Nov, and a speaker for next Feb. And in between we will be having a Christmas Party.
5. We joined the Australian Seniors Computer Clubs Association which also gives us access to \$17,000 of MS software and training materials every 18 months, as part of Bill's Ultimate Potential program.
6. At the centre – the cleanout and sorting after the move still continues. 20 years of accumulated equipment has mostly been disposed of – but there is more to go. We are almost ready to go with

the building modifications thanks to a huge amount of preparatory work by John Hodge particularly, but also to Rod Peters and others. We are lucky to have a builder member, Allan Baden, willing to supervise, and various tradesmen members willing to contribute their time and experience.

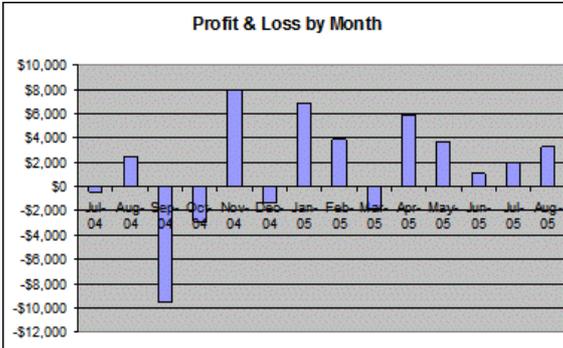
7. Finally on the Plus side I wish I could mention all the volunteers who give up their precious time for the group. One unsung group is that of the Library volunteers who give a lot of time to teaching Senior Citizens at the Woden Library, I think they are on their 8th continuous year of support. I do want to single out Peter Watney, and Gary Potts who have been covering Tuesdays and Thursdays (and many other days) at the Centre, and specially Ann Byrne who has put in a huge number of hours there as well. And last but by no means least – Gordon Urquart, one of the great ‘quiet achievers’ who has been doing the membership secretary and many other jobs for years, and this year has almost single handed done the majority of the ‘Help in the Home’.

Now to the stuff that we hoped to do, or things that I feel the new committee should worry about:

1. Despite our efforts this year (and those of previous committees), group and TIP membership continues to decline. Perhaps the rate has reduced a little and we are picking up some new members. But I recommend that the new committee do a financial projection to try to find the numbers where we will start to lose money again – despite the reduced costs. I would have loved to find a volunteer experienced in PR who could raise the group profile within the Canberra community. The days of our regular radio show are long gone, but members make the club and we need more!
2. I see that it was mentioned in the magazine for April that we “hoped that the Centre building modifications would be starting soon”. The fact that they have still not started is entirely my fault – I waited far too long to ask for help and when that did come from John Hodge and Rod Peters – I raised rather unrealistic expectations on when the work might get started. But hopefully it will get underway soon.
3. Following on from the building modifications will be the completion of the training room and networking. The training room setup has the potential to be the group’s second biggest asset (after TIP) for members, and I feel bad that we have not run courses for so long. There has been some informal training run – but a full schedule of reasonably priced classes for all levels of experience should be a high priority – as should the recruitment of a volunteer training manager to kick it along.
4. We held an on-line poll to find the best night for main monthly meetings. Mondays are really a problem as there are so many public holidays on Mondays and the end of the month is quite a variable as well. In the event – the first Tuesday of the month got the Guernsey, but unfortunately that clashes with the HAGSOC meeting (can’t win ‘em all). But the idea of the on-line poll was well received and the new committee might consider more of this type of consultation with members.
5. Somehow the new members’ functions slipped through the cracks this year – hopefully they can be restarted soon.
6. I hope that we will soon have a simple on-line system for members to receive a User Name and Password (or a User name reminder if they have forgotten it). This will enable the member area of the web site to be restricted to members, and also the new committee to hopefully reach more of the members via Email. Many members do not inform the group of new Email addresses if they move ISPs, and they often do that several times after they leave TIP! It would be much easier to administer PCUG addresses for all members.
7. It would be a great improvement if the Help system listing could be greatly expanded – we have a huge amount of expertise within the group, but the concept of ‘Users Helping Users’ is rather difficult if people who could help with a particular problem can’t be contacted. And if the list could be expanded it would really help centre staffers who are on the receiving end of most of the ‘curly ones’. So don’t be shy – flaunt your knowledge. Volunteering can result in a nice warm glow.
8. An on that note – I had hoped to start a system of positive rewards for our great volunteers. Perhaps it could be in the form of reduced fees for TIP or membership, proportional to the number of hours spent working for the group. Something easy to administer would obviously be a goal – but it’s one that I hope the new committee will consider.

I have received a lot of very nice personal feedback by phone and Email from members over the last 12 months and that is really appreciated. As I have said before – I have received instructions from ‘she who must be obeyed’ not to continue as President next year – but I will do my best to provide a smooth handover and continuing background information to the new committee. So we’d better get on with electing them, but before we do – I’d like to give particular thanks to our committee members who are not standing for re-election this year, and even bigger thanks for those who are standing for re-election to serve the membership for another year.

And if you got this far - here are some PowerPoint slides I showed to illustrate the financial position:



These are the raw 'Bottom lines' for Jul 04 through Aug05

But if you take the averages before and after the move.

Averages

- Average Profit Jul 04 through Mar 05
\$565 per Month
- Average Profit Apr 05 through Aug 05
\$3,191 per Month
- About the difference in rent
- BUT

BUT

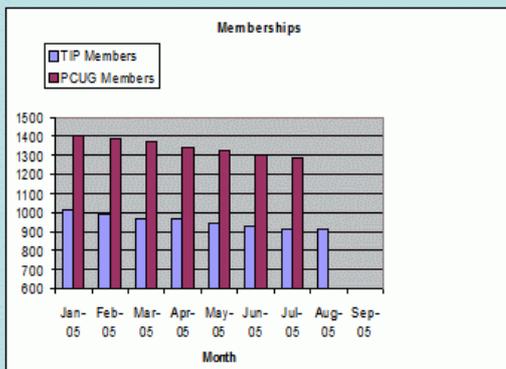
- Membership and TIP fees reduced from the first of June
- We have not made any major purchases or replaced equipment.
- Investment account is more than the liability to members – so some of that account could be considered as provision for replacement
- BUT

And

BUT

- If membership continues to decline the apparently (quite rosy) picture could rapidly change

Membership



1495 PCUG members in Jan 04
Between Jan & June 05 PCUG lost 160 and gained 40 members

1457 TIP members in Jan 02
1160 TIP members in Jan 04

So that's the finances in a nutshell.

COMMITTEE NOMINATIONS OCTOBER 2005

TERRY *	BIBO	COMMITTEE
ANN *	BYRNE	SECRETARY
JOHN	FRANKLIN	COMMITTEE
TREVOR *	FREW	COMMITTEE
BRIAN	HICKEY	COMMITTEE
COLIN	HOLMES-CLARKE	COMMITTEE
DEREK	JORDON	TREASURER
ALLAN *	MIKKELSEN	VICE PRESIDENT
JOSEPH	TANDL	COMMITTEE
PHILLIP	VEERMAN	COMMITTEE
PETER	WATNEY	COMMITTEE
SUSAN	WHITE	COMMITTEE

And just in case you were wondering - here's the new committee who were elected unopposed. We should really thank (particularly) those with the asterisks who have kindly agreed to do it all over again for another year.

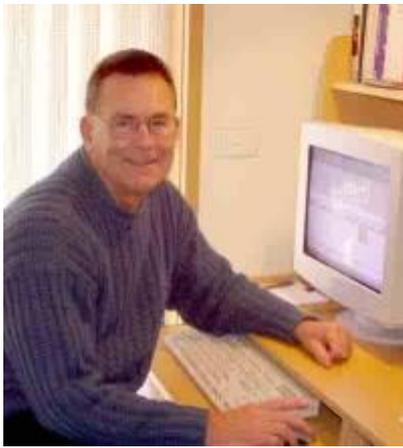
In my case, she "who must be obeyed" must be - by the group as well as myself :-))

Have a great year - JohnS

11th Oct 2005

[Index](#)

[Next](#)



From the editor's desk

The PCUG passed another milestone this month with the passage of another Annual General Meeting. John Saxon has spelled out the details and they make interesting reading. What John does not reveal is the outcome of the meeting. All the motions that were put to the assembled members were passed unanimously - possibly a world first, and a new committee was elected unopposed.

That committee has big boots to fill. The changes to the group over the past twelve months have been

substantial, and much of the work planned has yet to be finalised. We have a strong complement of volunteers to maintain the pace set this year, but we do not have a president. John has set the pace and provided an example of the caliber of individual we need to continue the momentum he has established. Let's hope that the first meeting of the new committee produces an enthusiastic volunteer. We owe John a big vote of thanks for his effort and dedication over the past twelve months.

Backups are in the news again, and you will find a wealth of information and advice in Mike Boesen's article. I recommend that all of you readers archive this article and use it as your standard reference material for the future.

Enjoy your computing.

Terry Bibo

[Index](#)

[Next](#)

PCUG Meetings 2005/2006

The Main Monthly Meeting will be held on the first Tuesday night each month during 2005/2006. The planned dates are:

1 November 2005	December
No meeeting in January	7 February 2006
7 March 2006	4 April 2006
2 May 2006	6 Jun 2006

The meetings will commence at 7:30 pm, and are normally held in Lecture Theatre 3, Manning Clark Centre, Australian National University, Acton.

The monthly meetings are free. Members, friends, and the public are welcome to attend. Stay for coffee, tea, biscuits and good company after the meeting!

E-mail inquiries to <mailto:pcug.mmm@pcug.org.au> or phone 02-6287-2922

Terry Yan

[INDEX](#)

[NEXT](#)

Software Reviews

Winbackup 2.0

A powerful yet user friendly backup program for home user to big business

Task Commander

Promotional material. Launch your favorite programs with just one menu click

Synchromat 3.

Promotional material. An automatic synchronization utility for PCs

[Index](#)

[Next](#)

WinBackup 2.0

Reviewed by Terry Bibo

Backups are an essential chore in PC operation and maintenance. We must take it for granted that, sooner or later, our PC is going to crash through mechanical or system failure, or by infection from malicious software. There are various procedures for backing up, and almost limitless strategies depending on your requirements and your knowledge of how to meet those requirements. The requirements of a home PC user would be less demanding than those of a small to medium business (SMB), and far less than those of a large corporation. All worthwhile backup programs on the market these days will meet the essential requirements of home users, SMBs, and corporations. The only difference is in how they do that. My criteria for critical assessment are functionality and user friendliness. I have waxed enthusiastic in these pages over currently available backup software and made my recommendations. But times change, and with the changes come advances in presentation that can make a big impact. I make no apology for reviewing [Uniblue Systems' WinBackup 2.0](#) enthusiastically.



The immediate appeal was the intuitive simplicity of layout without omitting any appropriate information. The Menu bar is reduced to three items and the Toolbar and its component Navigation Bar have no more than essential icons. And yet, all information pertinent to the job and each phase in the job is plainly presented, throughout the routine of backing up or restoring, in the familiar Windows XP format of the Tasks and Job Summary panes. Anyone moderately familiar with backup procedures will easily walk through the routine without needing the help file. But, for those who have to learn, there is an excellent printable PDF manual and an even better Help file with instructional videos running under Macromedia Flash Player. For all its simplicity, WinBackup 2.0 adheres to the convention of backing up to all common media from hard drives, through USB drives and removable drives, to CD and DVD, and digital tape or local area network.

To create a new backup, simply click on 'Create New Job' in the Tasks pane and follow the logical path of 'Select Files', 'Save To', 'Job Settings' and 'Run Backup'.

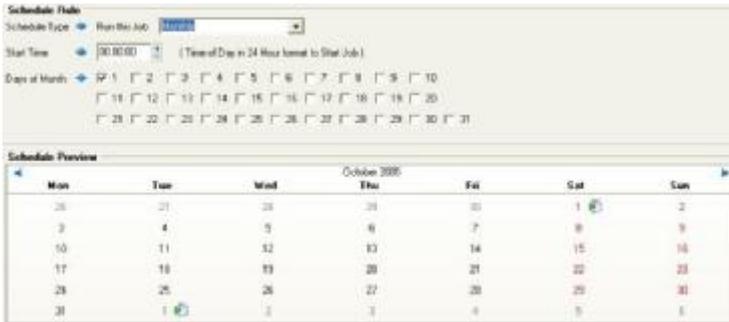
The needs for defining backup type, compression, filtering and security are addressed, and the choices are plainly presented. In terms of training employees in a business environment, there is no likelihood of misinterpretation and the concept should be easily grasped. This is the standard pattern of presentation throughout the program and is a commendable approach.

The levels and values for verification, compression and security are well treated in the help files.

The backup archive is written to a file with a .w2b extension and is a proprietary



format incompatible with the more popular .zip format, which I would have preferred as an independent recovery avenue



All of this leads to a fast and efficient approach to initial full backups and subsequent incremental backups, which are saved as Backup Jobs with a meaningful name for updating, and which can be conveniently scheduled to run on a regular basis.

Jobs can be defined by importance or frequency: full backups to be done weekly perhaps and incremental backups daily. An incremental backup will only backup files that have been added or altered since the previous backup, whether that be full or incremental, and is a fast and convenient way of preserving data integrity. But, in restoration, each incremental backup will have to be restored independently after the full backup to reach the last good state.

To assist in setting up an initial backup strategy there are a number of shortcuts provided to suggested popular backup jobs. These appear along with regular drive entries in a familiar Windows Explorer frame when 'Select Files' is chosen to nominate what files and folders to backup.

The present list is: Internet Explorer, Microsoft Outlook, Microsoft Windows, Mozilla, Mozilla Firefox, Outlook Express. Selecting any one of these will automatically include all sub-folders and their full complement of files. Any individual file or folder can be unticked to prevent it being included in the backup.



An important feature of WinBackup 2.0 is in being able to ensure uniqueness of archives holding essentially the same data. If an audit trail of 'Widget Sales' is to be kept, then each backup can be appended automatically with a Date and Time stamp, or other option, at the time of backup. So backups made on 01/09/05 and 01/10/05 would be filed as: 20050901Widget Sales.w2b and 20051001Widget Sales.w2b.

When 'Run Backup' is clicked on the Navigation Bar it opens a status screen showing backup progress and a log of events.

Restoring a backup is as simple as its creation, and follows exactly the same procedure for the selection of jobs, folders and files. Backups can be restored to the original location or a new folder, or even to another PC if desired, making transfer of data between laptop and desktop PC a simple procedure. A single file can be opened directly within the restore process by double

clicking on it.

Restoration can be refined to Missing Files Only, in which case only files that exist in the archive file but not in the target file will be restored; and All Files, in which case all files in the archive directory will replace files in the target directory without checking on whether the files are older or newer.

It is all too easy! Anyone wanting to buy a very capable backup program would have to seriously consider the advantages WinBackup 2.0 offers over its competitors.

Resort Labs has just released Task Commander version 2.5.

Use Task Commander to launch your favorite programs with just one menu click while freeing up valuable Desktop and Quick Launch space. Control the windows of your running applications via the intuitive interface of Task Commander.

The dynamic Hot Launch Menu automatically configures itself to your requirements and displays each application's running state so that any program can be launched by a single mouse click. It is accessible from the Windows Taskbar as well as the toolbars of Windows Explorer and Internet Explorer.

Use the Advanced Task Switcher to switch between programs and to manipulate whole groups of windows in any running applications. You could, for example, close or minimize all instances of Internet Explorer or MS Word that are currently running.

Task Commander also monitors and displays total CPU loading as well as loading for each application.

Changelog for Version 2.5:

- New Hot Launch Menu feature. You can now specify program categories as submenus.
- New Advanced Task Switcher feature. You can specify the "Stay on Top" property for any currently running programs.
- New Hot Launch Menu feature. Programs can be launched with the "Stay on Top" property preset.
- New feature. Shut down or restart your PC from the program's tray menu icon and from the Advanced Task Switcher.

Task Commander version 2.5 is fully compatible with Windows 98, Windows ME, Windows 2000, Windows 2003 and Windows XP.

For more information on Task Commander, please visit:

<http://www.resortlabs.com/taskcommander.php>

You can download the latest FREE trial version at:

http://www.resortlabs.com/taskcommander/tc_setup.exe

Usov Lab Releases Synchronat 3.

New Tool Makes Two-Way Synchronization Brainlessly Simple.

Synchronat 3.0, as the name suggests, is an automatic synchronization utility for PCs. The major advantage of the program is that it automatically performs true two-way synchronization. This is what it means.

Most synchronization utilities work in the following fashion - they take one source (folder, disk, CD, USB drive, etc.), compare it with another source and then "synchronize" them - make target folder identical to source folder. This often means that the target folder will lose unique data if it's not present in the source.

Synchronat 3.0 is different. It takes any number of sources, for example four different folders, finds the differences in each and performs two-way synchronization, so that all these four sources will contain the same data and no changes are lost. To do this the program utilizes a unique file comparison algorithm with a metadata file.

Additionally, the algorithm does not depend on the PC clock (system time). This prevents data loss when the older file erroneously replaces a newer one due to wrong date/time settings and also makes correct propagation of file deletion possible.

Synchronat 3.0 is especially handy when working with removable storage media - USB drives, flash drives, removable hard drives, MP3 players, digital cameras, etc. The program also allows users to update or backup files over LAN or the Internet.

Synchronat 3.0 is distributed electronically over the Internet; free evaluation version is available at <http://Synchronat.com>. It costs \$22.22 to register, \$10 instant rebate is available for second copy.

System Requirements: Windows 98/2000/XP/2003/Vista

Product PAD file: <http://synchronat.com/download/synchronat.xml>

Screenshots: http://synchronat.com/download/screenshot_small.gif

Download link: <http://synchronat.com/download/synchronat.exe>

Web: <http://Synchronat.com>

Freeware discussion

Paint Shop Pro Tutorials

As if you had nothing better to do for a week....

Spend your time here.

<http://www.psplinks.com/>

PC Auditing

Last June we looked at Belarc Advisor, Sandra Lite and Everest. Since then other programs have come to light, and you might like to look at these. They are not for computer novices though, so if you don't have the urge to see inside your PC and be overpowered by the baffling details, don't bother.

[SIW \(System Information for Windows\)](#) is described by its author as 'a utility that displays detailed specs for motherboard, BIOS, CPU, devices, memory, video, disk drives, ports, printers, operating system, installed programs, processes, services, serial numbers (CD keys), users, open files, system uptime, network, network shares, as well as real-time monitors for CPU, memory, page file usage and network traffic. It displays currently active network connections, passwords hidden behind asterisks, installed codecs, and more. A standalone tool that does not require installation.'

Its two outstanding advantages to my way of thinking are that it does not require installation but can be run from a USB drive, and it reveals hidden passwords for those who forget their email client details.

[CPUZ](#) is primarily interested in CPU, Mainboard, Memory and System, and is reviewed at http://www.benchmarkhq.ru/english.html?cpuz_e.html

[PCwizard](#), from the same stable, resembles Everest but is particularly strong on memory and USB ports and USB devices connected. It actually shows what speed the port is capable of and what speed the USB device is capable of.

Recommended Freeware

At the September monthly meeting I introduced what I consider to be a very worthwhile collection of diverse programs that make life easier and safer for the PC user.

The list of files is available on my homepage at <http://www.pcug.org.au/~tbibo/>

[INDEX](#) [NEXT](#)

Digital SIG -- October 2005

Image Recall

I have used a program that works pretty well in finding and recapturing images that might have been deleted, sent to the trash or lost on a HD. Take a look at Image Recall. It should be on the web.

<http://www.imagerecall.com/>

You can download a test version that might save you. I like the program and have saved many a card and in one instance not too different from yours - content on a HD.

Not a suggestion of Kodak

Talk to you soon.

Ron Baird

NeoDownloader Has Come to Save You from Browsing Troubles. Experience New Web Reality!

Neowise Software, the leading developer of task automation tools, announces the newest major version of their renowned award winner NeoDownloader. This powerful multithreaded tool for automatic downloading of pictures, audio and video files now features the unique Web Spider technology that guarantees a fast and steady download for both high and low bandwidth. With its improved interface, new image viewer and media player, NeoDownloader expands the horizons of your web experience by improving your Internet browsing habits.

Each download job, which you trust to NeoDownloader, starts with a profile where you can set file types, size limits, resolution, and scanning depth. The program scans the site of your interest and picks out only the files that match you profile. The download is fully automated but you can control it through the download progress window and fine-tune its performance. The download can run simultaneously with scanning or after full scanning of the site is completed. Downloaded files become instantly available in the image preview zone of the program window. NeoDownloader is very flexible and provides you with various settings to optimize its work.

"The newest major version integrates all the best ideas of the Neowise creative team as well as the most recent scanning technologies," says Alexey Surkis, CEO of Neowise Software. "We paid especial attention to the scanning engine, which lies at the heart of NeoDownloader. The unique Web Spider technology makes it work faster and more stable and supports a wider range of web links. Some improvements are made in the user interface and project settings, which our customers have already welcomed with enthusiasm. The new version includes a collection of project templates and sample projects to get started fast. On the whole, users will find the newest version very functional and manageable."

A host of extra features will make you enjoy your new web experience. The built-in image viewer and media player provide instant access to downloaded files. Drop basket and a set of hotkeys help you to launch a project from any application. The download library replicates source sites and organises files in an easy-to-use way. The password list secures automatic log into

password-protected websites. There are many ways to accommodate the program to your specific needs and enjoy browsing that always hits the bull's eye.

NeoDownloader v2.0 Features at the Glance: - Downloads pictures, audio and video that match user preferences; - Filters for file type, size, resolution and URL keywords; - Settings for the scanning depth for internal and external links; - Up to 10 simultaneous connections; - Support for password protected sites; - New project profile settings; - Drop basket facility to download from other applications; - Built-in image viewer featuring slideshow and wallpaper setting support; - Built-in media player.

Availability and Pricing NeoDownloader runs under Windows 98, NT 4.0, Me, 2000, XP platforms and costs \$39.95 (USD) for a single-user licence. Free lifetime technical support and minor upgrades are extended to all registered users. A fully functional evaluation version is available as a free download at <http://www.neowise.com/ftp/NeoDownloaderSetup.exe>.

About Neowise Software Neowise Software specialises in task automation tools and scanning technologies since 2000. Our flagship product NeoDownloader, formerly known as Express Web Pictures, has brought a string of international awards and is used in business and personal systems worldwide. Among other products are RoboTask, a general task automation tool, and Express Thumbnail Creator for professional web galleries. More information about the company and products can be found on the company's website <http://www.neowise.com>.

Product page link: <http://www.neowise.com/neodownloader/>

Download link: <http://www.neowise.com/ftp/NeoDownloaderSetup.exe>

Web: <http://www.neowise.com/>

Email: alexey@neowise.com

[INDEX](#) [NEXT](#)

IMPLEMENTING A BACKUP STRATEGY ON A WINDOWS PC

Last updated on 9 October 2005

CONTENTS

[1. Introduction](#)

[2. Causes of problems and their prevention](#)

[2.1 Viruses, trojans, worms and spyware](#)

[2.2 Hard drive physical faults](#)

[2.3 Hard drive file structures](#)

[2.4 Missing or corrupt system files](#)

[2.5 Unintentional deletion of important files](#)

[3. What to backup](#)

[3.1 Backing up the registry](#)

[3.2 Backing up Email stuff](#)

[3.3 Backing up selected files from the master drive](#)

[3.4 Backing up the whole master drive as a compressed image](#)

[3.5 Backing up a compressed image of a partition or partitions from the master drive](#)

[3.6 Backing up the whole master drive as a Clone on another drive](#)

[3.7 Backing up a partition from the master drive as a Clone on another drive](#)

[4. Where to backup](#)

[5. Recovery](#)

[5.1 Recovery of deleted files](#)

[5.2 Recovery when the PC is functioning slowly or erratically](#)

[5.3 Recovery when you can't boot into Windows normal mode](#)

[5.4 Recovery when you can't boot into Windows safe mode](#)

[5.5 Recovery when you can't boot into normal mode or safe mode and UBCD4WIN and Recovery Console are of no use](#)

[6. Closing comments and recommendations](#)

[6.1 Comments](#)

[6.2 Recommendations](#)

[Appendix 1 - Running Microsoft SFC \(System File Checker\)](#)

[Appendix 2 - Restoring registries saved with ERUNT](#)

[Appendix 3 - Notes on Table 1 \(Backup device options\)](#)

[Appendix 4 - Using the Windows Recovery Console](#)

[Appendix 5 - Running the utility CHKDSK](#)

[Appendix 6 - Reinstating the master drive from a compressed image or a clone on a backup drive](#)

[Appendix 7 - The Ultimate Boot CD for Windows \(UBCD4WIN\)](#)

1. INTRODUCTION

1.1 Caveats

This article is based on my experience with PCs that have Windows operating systems. If you have a different type of operating system, some of the principles will apply, but the software referred to in the article will not be

applicable.

I have tried to cover a lot of aspects relating to backup and recovery strategies. There are bound to be some errors and omissions. Part of the reason for that is that the operating system I am most familiar with is Windows XP. My recollection of the details of older operating systems is imperfect and I am not using these older systems on any PC. Please notify me of any errors and make suggestions for improvement of the article. I will amend the contents in the light of any feedback that I receive. As I make corrections I will post an up to date version [on this web page](#).

1.2 Need for a backup strategy

Sooner or later most PC users will experience problems in accessing data or applications on their PC or booting their PC. These problems can range from minor ones (e.g. the unintentional deletion of important files) to major ones (e.g. the PC will not boot at all). Therefore it is prudent to have a robust and failsafe backup strategy in place so you can recover from a problem situation easily and with minimal or no loss of information. This takes some amount of forethought and it is best to do that thinking now rather than wait until you are experiencing problems.

Many of the lesser problems could be solved easily by restoring files or a healthy registry from a backup (that is, IF it exists). Major problems can be overcome by reinstating an image or clone of the master drive (again, IF such backups exist). However, without backups some types of severe problems may require the user to reinstall the operating system and applications. In that event there would be loss of documents, pictures, emails and other important files. Reinstalling operating systems and applications takes time, but the loss of important information can sometimes be disastrous.

The risk of experiencing problems varies considerably between users. The risk of problems is low if all these conditions apply:

- your computer is in good condition and constructed with reliable components
- you have a hardware or software firewall that protects you from unwelcome intrusions from the outside Internet world
- you have applications that give good protection against malware (viruses, trojans, worms, spyware)
- you don't spend much time on the Internet
- adolescents who are into games and surfing the web are not users of the PC
- you are the sole user of your PC
- you use only a few well-established applications and they are all very well behaved
- you don't try applications with unknown pedigrees
- your "friends" don't send you emails and attachments with nasties embedded in them
- you never delete files unintentionally

However, there will be many users for whom the risk of problems will be moderate to high. I am one such user. I keep my registry clean by using a number of registry cleaners. I have good software that provides protection against malware. I use a software firewall. However, I know that sooner or later I am going to put my PC in a state that means that either the registry is klutzed and/or the hard drive will not boot normally. Fortunately I implement a backup strategy that will guarantee that I can recover easily in the event of trouble. In spite of all the fiddling that I do with software I have never yet got to the stage of having to do the dreaded "Format C:" thing. If I had to do that it would take me at least a week to reinstall all the applications that I have installed.

The type of backup strategy that is appropriate for you will depend on your particular circumstances: your risk exposure, what hardware you have or are able to afford, what software you have for PC maintenance, what operating system is installed and so on. While there is no single backup strategy that is ideal for all PC users, the following suggestions may be useful to you when you are developing and implementing a backup strategy that meets your particular circumstances.

Before looking at possible elements of a backup strategy, let's look at some common problems and how they might be prevented from being problems in the first place.

2. CAUSES OF PROBLEMS AND THEIR PREVENTION

2.1 Viruses, trojans, worms and spyware

To reduce the likelihood of having a need for recovery from a problem condition you must have adequate protection against viruses, trojans, worms and spyware (collectively referred to in this article as "malware"). The importance of having such protection cannot be overstated. Such protection is also important if you are to implement an effective backup and recovery plan. For example, restoring your PC using a backup that contains applications that were infected with malware before the backup was made is not a good outcome.

To prevent infection by malware you need appropriate anti-malware software, a hardware or software firewall, and to implement any security updates when they become available for your operating system, Email application, web browser application and other applications that are targeted by malware (e.g. word-processing).

2.1.1 Anti-virus, anti-trojans, anti-worm software

There are many applications that provide protection against viruses, trojans and worms. Some are freeware and others costware. Of the freeware applications [Avast 4 Home](#) is excellent and widely used. It provides protection against viruses, trojans and worms. It is also available in the "[Pro](#)" [version](#) - this is not freeware, but provides additional protection against malicious scripts and has a more complex set of configuration options. Another good widely used freeware product is [AVG](#) - it also provides protection against viruses, trojans and worms. Other freeware applications are available. There are some freeware applications designed for prevention of only certain types of malware. For example, Emisoft's [a-squared](#) is designed for detection of trojans only. However, a single application that provides protection against viruses, trojans and worms would be more practical for most users and probably does as good a job as having separate applications.

There are many good costware applications that provide protection against all three of these problems including those marketed by [Trend Micro](#), [ESET](#) (Nod32), [Zone Labs](#), [Kaspersky](#) and [McAfee](#). [Norton Anti-virus](#) is also quite widely used and well-regarded by many, but I prefer not to use it.

Whatever the application you use, it should be one that loads automatically when you boot your PC and resides in memory so that all applications are scanned just prior to them running. It should also be one that automatically scans incoming Emails and their attachments and Internet downloads. Ideally it should also scan outgoing Emails and attachments so that in the event that you do have a nasty on your PC, you do not pass it on to other folk.

Whatever application you use, it is essential that its database of "signatures" or "definitions" that enable it to detect virus, trojans and worms is updated regularly - ideally every day - and that you install updates of the application itself when they become available. Good quality applications can be configured for automatic updating.

For people who have Windows XP, 2000 or Server 2003, Microsoft releases regularly an updated version of its Malicious Software Removal Tool. You can also run the tool from [this Web page](#) or download it to your computer. This tool detects certain viruses.

2.1.2 Anti-spyware software

Certain types of spyware can make undesirable changes to settings within your registry, system settings, operating system, Email application and Internet browser. There are many applications which can provide protection against spyware. [Microsoft Antispyware](#), [Spybot Search and Destroy](#), [Spyware Blaster](#) and [Ad-Aware](#) are examples of widely used freeware products.

While it is not free, Sunbelt's Counterspy gets consistently high ratings in reviews. It is an even better-performing product than Microsoft Antispyware because it uses all the Microsoft Antispyware definitions (at least till 2007) plus Sunbelt's own definitions. Other non-free products include those of [Trend Micro](#), [Symantec](#), [McAfee](#) and [Zone Labs](#).

Whatever anti-spyware application you use it is essential that it prevents both benign and malicious applications from making changes to your system without your consent. The anti-spyware product

should be of a type that is loaded automatically at boot time and is memory resident. Such anti-spyware then operates all the time so that you will be notified when any application tries to make questionable changes to your PC. You can then allow or prevent the change being made.

2.1.3 Firewalls

"Firewalls" operate all the time that you are on the Internet so as to isolate your PC or network from uninvited intrusions from Internet hackers. There are a number of good free software firewalls, including [Microsoft's XP Firewall](#) and Zone Lab's [Zone Alarm free version](#).

There are also many costware software firewall products including Zone Lab's [Zone Alarm Pro](#), McAfee's [Personal Firewall Plus](#), AVG's [Anti-virus plus firewall](#) and Symantec's [Personal Firewall](#).

Another type of firewall is one implemented in hardware. These are integral components of some (but not all) ADSL routers or router/modem devices that are used to connect to the Internet. I don't have a hardware firewall as I believe that my software firewall (Zone Alarm Pro Version 5) gives me quite adequate protection. The [Whirlpool article](#) on ADSL modems and routers gives comprehensive information about hardware firewalls in such devices.

2.1.4 Regular security updates for your operating system, Email client and web browser

From time to time the makers of your operating system, Email application (e.g. Outlook Express) or web browser (e.g. Internet Explorer) may issue security updates. These are intended to enhance the ability of the applications to resist attacks by Internet hackers. They should be installed after they become available, although some PC users prefer to wait for a while to make sure that an update does not have any unintended negative outcomes (and so requiring a rollback or update of the update).

On my stand-alone PC system I use [Zone Alarm Pro](#) as a software firewall, [Avast Pro](#) for protection against viruses, trojans worms and malicious scripts, and Sunbelt Software's [Counterspy](#) for protection against spyware (with an occasional double-check for spyware using [Spybot Search and Destroy](#)). This set of applications seems to provide adequate protection against malware. With a broadband connection, updates for Avast and Counterspy are installed automatically without me needing to do anything. The updates are sent to me just about every day and sometimes twice a day.

If you don't want to have the bother of managing a number of different anti-malware applications there are also a number of "security suites" available. These products claim to provide protection against all types of malware. Examples are suites sold by [Zone Labs](#), [Trend Micro](#), [Symantec](#) and [McAfee](#). If you are prepared to pay the cost involved, you may find that installing one of those suites is the easiest way to get comprehensive protection. I prefer the approach of selecting the "best of class" for each type of anti-malware product.

While the best anti-malware applications can be configured to run all the time as memory resident applications, I have found that it is also worthwhile running a full ad-hoc scan for malware prior to making a backup of a complete hard drive or a clone of it. For some applications (e.g. Avast) the most comprehensive checking can be achieved through a "boot-time" scan. For Avast that can be done through scheduling a boot-time scan, with the option of "Archive checking" ticked. Archive checking ensures that all archives such as those created with XP's System Restore are also checked.

If you have any doubts about the extent to which your current protection against malware is adequate, there are some web sites that offer an on-line check of your system. For instance, Symantec offers a [free on-line "security check"](#) as does [Trend Micro](#). It is worthwhile using on-line checking by such reputable developers from time to time because the malware signatures and definitions they apply are fully up to date. However, it is possible that some of the lesser known products will detect potential "problems" on your system that are insignificant (e.g. some types of "cookies") in order to promote the virtues of their costware products..

2.2 Hard drive physical faults

Some problems with hard drives that lead to loss of data or inability to boot are caused by physical faults. No backup strategy will be completely effective if either the hard drive from which you are backing up stuff or the hard drive (or other device) to which you are writing the backups is physically defective. Such defects are infrequent, but can be within the device's mechanical components, on its circuit board, or in the connecting

plugs, sockets and data cables. The faults may be intermittent and some can be associated with very cold weather and very hot weather, or overheating of a hard drive due to inadequate ventilation.

Most modern drives have SMART ("Self-Monitoring Analysis And Reporting Technology") implemented in the drive's firmware. SMART monitors the temperature and other health attributes of your hard drives. If your drive/s have SMART you can implement a small freeware application such as [HDD Health](#) so that it runs all the time in the background. HDD Health can be configured so that it will notify you if it detects problems or based on past performance of the drive, predicts that there will be problems in the future.

Inside your PC, connecting plugs, sockets and data cables for hard drives and optical drives can sometimes be a source of problems. However, if such gear was problem-free when first installed, it is unlikely that problems will develop later, so it is probably a good idea to leave things alone. The probability of problems developing is increased the more that such gear is unconnected and reconnected. If you have reason to believe that there are problems with such gear and you are confident about opening up your PC, at least check that the cables connecting the motherboard to your hard drive/s, floppy drive and CD or DVD drives are correctly seated, power cables are fully inserted, and there is no erratic behaviour of a device when the power plug connected to it is gently wiggled. On some occasions in the past when I had been swapping a hard drive in and out a lot, I experienced particular problems with the cylindrical sleeves inside the power plugs that are inserted into the hard drive power socket (the plugs with four wires: two black, one red and one yellow). The problem was that a couple of the sleeves had become expanded through rough handling and were making poor contact. This was quickly fixed through judicious levering of the sleeves with a jeweller's screwdriver to close them up a tad so that they gripped the prongs in the socket better.

If you have a backup drive connected by a USB or Firewire cable make sure that the cable is in good condition and inserted correctly. If the device is connected via USB cable and it is capable of "High Speed" USB 2.0 data transmission (sometimes referred to as "Enhanced" USB 2) make sure to use a USB socket on your PC and a USB cable which meets the specifications for USB 2.0 High Speed data transfer. Not all sockets and cables are capable of doing that (see details in my article [here](#)).

If you are backing up to a device on a wired or wireless network, make sure that the cabling and wireless system are fully functional.

2.3 Hard drive file structures

Some problems with hard drives are caused by faults in partition tables, file and folder structures, indexes and security descriptors. So if you backup your hard drive or selected parts having such faults, you risk carrying over the faults to your backup.

If you are having problems with your hard drive, it's worth running the Windows utility CHKDSK. This utility checks the integrity of a hard drive's file system and if the /R option is used, it will attempt to fix any errors. See [Appendix 5](#) for more about this.

2.4 Missing or corrupt system files

Another type of problem that would be carried over to a backup drive if it were to exist on the master drive is corrupt system files. Therefore, if you are having any problems with your PC, then before making a backup of a whole drive or making a clone of it there is value in checking the integrity of your system files first.

In Windows 98, XP and 2000 and this can be done using the Microsoft's System File Checker (SFC) utility. Details about how to run SFC are provided in [Appendix 1](#). I'm not aware of an equivalent utility for Windows Me or 95.

In some cases the corrupt or missing files are the NTLDR and/or NTDETECT.COM files, preventing the PC from booting. Fixing this problem is [discussed later](#).

2.5 Unintentional deletion of important files

Another type of problem is loss of files of data through inadvertent deletion. If you are aware of this in time then such files may possibly be recovered through the recycle bin. If the bin has been emptied, there is a real possibility of irreparable loss. However, in some circumstances, even files that have been deleted and that are no longer in the recycle bin can be recovered. Fixing this problem is [discussed later](#).

3. WHAT TO BACKUP?

Having given consideration to the things that could limit the effectiveness of backing up, the next issue is what things you might backup. Depending on your particular circumstances, you may want to backup one or more of these things:

- The registry
- Email stuff - address book and/or emails themselves
- Data files (for example: documents prepared in Word and Excel; databases; tax returns)
- Folders containing pictures, music, and movie-type files
- A partition of a drive or the whole drive, backed up as a compressed image.
- A partition of a drive or the whole drive, backed up as a bootable drive

3.1 Backing up the registry

In my view making frequent backups of the registry is the most important element in any backup strategy. The desirable frequency will vary from user to user.

3.1.1 Windows 95 registry backups

When Windows 95 boots normally, it backs up the registry files USER.DAT and SYSTEM.DAT automatically. If the registry becomes corrupt, these files might be used to reinstate the registry to the last good boot condition. The files could be copied manually to a backup folder somewhere. This is not a straightforward matter. [This article](#) and [this article](#) provides details.

3.1.2 Windows 98 and Me automatic backups

For Windows 98 and Me, when you boot your computer successfully, the Windows application [SCANREG](#) creates a backup of system files and registry configuration information (including user account information, protocol bindings, software program settings, and user preferences), keeping five back versions. To save such files to a backup folder you could do that manually. SCANREG can be used to restore any of the backed up versions. Details about how to restore back versions are provided [here](#) and [here](#).

3.1.3 Windows 2000 registry backups

Windows 2000 includes functionality for creating and restoring registry backups. This can be accessed through Start/Programs/Accessories/System Tools/Backup tab - check the "System state" option. Details are given [here](#).

3.1.4 Backups of the registry using Windows System Restore and similar applications

Windows [System Restore](#) is a free utility within XP and Me. It can be used to create "Restore Points" which contain a snapshot of the registry and copies of certain dynamic system files.

There are other costware applications that can be used to create similar types of restore points. An example is Symantec's (used to be Roxio's) [GoBack](#). This can be used for Windows 98, Me, 2000 and XP systems.

If System Restore or a similar application is available for your operating system it can be used to restore the registry (plus some of the system files) to an earlier condition. However, it's interesting to note what Lars Hederer, author of the [ERUNT](#) application says about the System Restore functionality in respect of the XP operating system:

"In Windows NT and 2000, the registry is never backed up automatically, and in XP it is backed up only as part of the bloated and resource hogging System Restore program which cannot even be used for a "restore" should a corrupted registry prevent Windows

from booting. It has also become impossible to copy the necessary files, now called "hives" and usually named DEFAULT, SAM, SECURITY, SOFTWARE, SYSTEM in the SYSTEM32\CONFIG folder, to another location because they are all in use by the OS. And though the registry in an NT-based Windows is less likely to become corrupted than in other versions, it can still happen, and for these cases NT is simply missing an option for easy registry backup and restore as there is in Windows 9x/Me, to get the system up and running again in no time."

The effectiveness of using System Restore to reinstate a registry depends on the existence of a restore point that is recent enough and appropriate to your needs. System Restore reinstates more than just the registry and that may not be what you want to have happen. I have found that on occasions, System Restore has not been able to restore the points that I attempted to reinstate. This is possibly due to my inappropriate use of this application. However, I feel that I cannot rely on System Restore as a guaranteed way of reinstating an earlier version of the registry and so I have disabled it (and in so doing, incidentally reclaimed a significant amount of hard drive space).

My view is that for just backing up the registry these freeware applications are a better choice than System Restore or similar applications:

- for NT, 2000 and XP systems [ERUNT](#)
- for Windows 95, 98 and Me [ERU](#)

3.1.5 Using ERU or ERUNT to backup and restore registries

For Windows 95, 98 and Me operating systems, a better approach than manually saving registry backups is to use the Windows utility named [ERU](#) (Emergency Recovery Utility). This freeware utility backs up the relevant files into a folder and on a drive that you specify. You can then use the associated utility ERD to reinstate backups to your hard drive. [This article](#) provides a good description of the functioning of ERU and ERD.

For Windows NT, 2000 and XP an excellent freeware application that can be used to create backups of the registry automatically or on an ad-hoc basis is [ERUNT](#) (Emergency Recovery Utility NT). This invaluable utility is the creation of Lars Hederer. [This article](#) of mine provides details about how to install and use ERUNT and to how to recover backed up registries using the associated utility ERDNT. The installation of ERUNT also installs ERDNT, copies of which are included automatically in the backup folders that ERUNT creates. For making backups of the registry I would use ERU in preference to System Restore on an XP system.

I run XP Pro on my PC. I have configured ERUNT so that it makes a registry backup each day at the time of the first boot. This requires absolutely no action on my part - it all happens automatically during the boot process. My [article](#) explains how to set this up. In addition, prior to installing any application that has any chance of making changes to my PC that I might regret later, I make an ad-hoc backup of my registry manually using ERUNT. Making such ad-hoc backups is a matter of making a few mouse clicks and typing in the name of the backup folder to be created; that all takes about 20 seconds.

Backups of registries created using ERU and ERUNT are normally written to the master hard drive in a folder located under the C:\WINDOWS\ folder, but they could be written to another device if you prefer. However, there are important benefits in putting the backups under the C:\WINDOWS\ folder because those folders would be accessible if you ever need to use the Windows Recovery Console (this is all explained [below](#)).

If you ever need to reinstate a registry saved with ERUNT, there are four ways of doing that. The ways are listed in [Appendix 2](#).

3.2 Backing up Email stuff

Some users like to backup their Email address book and emails to make sure that they are not lost in the event of a problem with their PC. If you are using Outlook Express as your Email application, there is a very easy way to do all that and to reinstate saved backups. This is done using the freeware application [Outlook](#)

[Express Freebie Backup](#). This application works with all versions of Windows (I think). The backups are sent to a folder of your choice.

Of course the application can be used later to restore any backup that it created.

I do not have experience and knowledge relating to backing up stuff created by other Email applications.

3.3 Backing up selected files from the master hard drive

One approach to backing up is to make copies of only selected folders of files or individual files that are the outputs from applications (e.g. word processing documents, spreadsheets, databases, pictures, music files, tax returns (!) and so on), but not the actual applications themselves, and not the PC's registry and other system files.

Their rationale is that if a hard drive becomes corrupt or unusable, the operating system and/or applications can be reinstalled, and then the files that comprise the products of the applications can then be reinstated from the backup. In some circumstances this can be a relatively quick and easy operation and can be an effective approach for people who use few PC applications.

However, there are disadvantages with this approach:

- In the event of a hard drive becoming corrupt or unusable, reinstalling an operating system and applications can be a complicated and time consuming operation. The amount of trouble involved is of course dependent on the skills of the user and the number and type of applications involved.
- It requires the user to remember what to backup and when to do it (and to actually DO it). This problem can be overcome largely through use of a good backup application such as [SyncBack](#) (see below).

Copies of folders of files and individual files could be made if and when the user remembers using Windows Explorer or a substitute (and much better) freeware explorer such as [Xplorer2](#) or [PowerDesk](#). However, an easier method is to automate the backing up process using an application such as [SyncBack](#) (freeware), or [EZback-it-up](#) (freeware) or [Second Copy](#) (costware). SyncBack, for example has very comprehensive functionality but can be used in either "Expert" or "Easy" mode. The way it works is this:

- You set up one or more named "profiles" which specify folders of files or individual files or types of files that you want to be backed up.
- In each profile you can specify rules for making the backup (e.g. whether or not to include sub-folders; whether or not to update files that have been changed since they were last backed up, how to treat files and folders that are in the source location but not already in the backup location, etc).
- Filters can be specified in each profile to control what types of files are backed up and what types of files are NOT to be backed up.
- The target location for the backups are specified in each profile

It is very easy to make backups by "running" the profile or profiles. This is a matter of a few mouse clicks. Even simpler, you can set up a schedule for each profile so that it runs every N minutes, or runs at boot time, or once a day or once a week or at a particular time or whatever. This overcomes the problem of forgetting to make backups.

While this type of application may meet many requirements, it has some limitations and drawbacks:

- The user must make sure that the backups made will not be lost if the master hard drive becomes corrupt or unbootable. Unless the backups made are written automatically to a second storage device (e.g. another hard drive) by the backup application, the user should undertake an additional manual step of copying the backups to a second storage device (e.g. another hard drive or a CD). This requires exercise of the user's memory and some discipline.
- You may have to create a new profile or to modify an existing profile when you create new folders or change folder structures or install new applications. That is not difficult, but again requires that you remember to do it.

- You may miss including in a profile something that is essential.
- It takes some amount of planning, exercise of memory and discipline (I fail on all these).

3.4 Backing up the whole master drive as a compressed image

There are backup approaches that overcome all the limitations and drawbacks relating to backing up only selected files or folders.

It is possible, for instance, to back up the whole master drive as a compressed "image". The image is in a format that means that the complete master drive can be recreated later from that image. The image can consist of a single large file or can be generated as a set of somewhat smaller files. I'll assume it will be saved as a single file. This file (or set of files) can be copied to another device just like any other file/s. It occupies somewhat less space than the files from which it was generated. For example, 90 Gb of files on my master drive take up only 70 Gb as a compressed image (using the Normal compression rate within Acronis True Image).

If there is space on the master drive for the image file it could be written to the master drive. However, that would mean that the image may not be accessible in the event that the master drive becomes corrupt or damaged. So it makes sense to write the image of the master drive directly to another internal or external drive or to a networked drive, or to move or copy it to another drive after creating it. If that is done you will need to have such a second drive.

Of course you also need an application that will create the backup image and (if and when required), to restore the image as a bootable drive.

If you have neither a backup drive nor an appropriate backup application, those requirements can be implemented for less than \$250 (AUS). For instance, Acronis [True Image](#) costs about \$80 and a big, fast, good quality hard drive (e.g. 160 Gb Maxtor "Diamond Max 10") would cost less than \$110. However, unless you have a backup drive on a network, it is also desirable (but not essential) that the backup drive be detachable from the PC. If the backup drive is in a removable caddy (see [below](#)), the caddy would cost about \$25. Or if the drive is in a good quality, powered and ventilated external enclosure the cost would be between \$60 (USB enclosure) and \$100 (Firewire enclosure).

There are a number of applications that can be used to create backup images and to reinstate the images when required. Examples are Acronis [True Image](#) and Symantec [Ghost](#) (which incorporates what used to be called Powerquest's Drive Image). Both these applications allow you to view the contents of a saved image as if it were another drive. This would be useful in the event that you have deleted some files from your master drive or they have become corrupt after the compressed image was created. The application that was used to create the compressed image can be used to access all the files in the image in an Explorer type user interface, and you can then copy any of them back to the master drive. Note that at the time of writing this article, Acronis had just released Version 9 of True Image. While the latest build of Version 8 appears to be a very stable product, I have had reports that the initial release of Version 9 may have a few bugs to be sorted out.

Creating an image of the master drive is very easy - run the application, identify what drive is to be imaged, indicate what folder on what device (hard drive, CD or DVD) the image is to be written to, select a compression ratio then hit Go. Go and have tea or a walk or join the couch potatoes for a while. True Image also allows you to choose between making a whole new image or making incremental changes to an existing image (that is, adding information that updates what was saved as a prior image).

Creating an image can usually be done in the Windows environment. It is important to close any applications that could affect the creation of the image (e.g. incoming Emails, scheduled malware scans). To ensure that does not occur I run the freeware application [EndItAll2](#) prior to starting the creation of an image. I leave my software firewall (Zone Alarm) running because I have a permanent broadband connection.

When you first start making backup images, it is sound practice to "verify" the integrity of a few images created. This is particularly important if your backup device is in an external enclosure. I suggest that you undertake a verify operation on the first two or so images that you create so that you have complete confidence that the images created will be recoverable if/when you need to use them in the future.

Applications like True Image and Drive Image include verification functionality.

Depending on the space you have for storing backup images, the frequency and magnitude of changes that you make to your applications, and the extent to which you are paranoid, there could be value in keeping more than one image. For example, you might create one image, then an additional new image say three weeks later. Then after a further three weeks delete the first image and create a new one, so that only two images are ever kept - the rolling image approach. The advantage of having two rolling images is that if the most recent image does not contain exactly what you want to recover, or if it has corruption in it of some sort, having an image made prior to that could be of some benefit. However most users would only ever keep a single image, with the prior image either being deleted or else updated using the incremental Imaging approach (if the imaging application supports that approach).

If the image is created onto CDs or DVDs, the incremental backup method is particularly useful, because the existing CDs or DVDs are maintained and only the incremental stuff is written to an additional CD or DVD.

If your master drive were ever to become unbootable and less radical fixes fail to correct the problem, then a saved image can be used to recreate the whole master drive with all of its contents exactly as they were at the time the image was created. Backup applications such as True Image and Drive Image/Ghost also have functionality for creating a bootable CD "rescue" or "emergency" boot CD. Using the CD you can then boot your PC into the backup application's interface and reinstate the image onto your master drive or onto another drive.

Imaging a drive can be quite fast. Using Acronis True Image on my 2.8 GHz Pentium 4 PC with two Maxtor "Diamond Max 10" drives connected to the ATA/IDE bus (ATA-100), I can create a full backup comprising 90 Gb of files in about 35 minutes. Creating the same backup on the same drive in an external USB 2.0 High Speed enclosure takes twice as long.

The frequency with which an image is created depends on the user's needs and the frequency and magnitude of changes made to applications and data on their master drive. In view of the fact that creating a full image or an increment to an existing image only takes a short time, it is not an onerous task to do that. However, it is also possible to add uncompressed copies of selected folders and files onto the backup drive on which was written the compressed image of the whole master drive. These added folders and files would not be written into the image; they would simply be additional folders and files that are visible to any explorer application. That could be done daily or more frequently if required using an application such as Syncback. This is the process described [above](#). This would mean that in the event of a problem with the master drive, the backup drive would contain an up to date version of just about everything of importance to the user, either in the image file or in the additional uncompressed files. This could be done on a set schedule (Syncback has scheduling functionality), or less regularly. You could, for instance, ensure that your whole My Documents folder was kept up to date on the backup drive. However, if you decide to keep copies of selected folders or files using an application such as Syncback, keep in mind that malware acquired since the clone was made might then be transferred in files that are written to the backup drive.

3.5 Backing up a compressed image of a partition or partitions from the master drive

Most users have only one partition on their master drive. If that is your situation, skip this section.

It is possible to make a compressed image of a selected partition of the master hard drive rather than the whole drive. This is done in the same way as creating a backup of the whole drive. The contents of such images can be viewed in the same way as can the contents of whole drives.

Again, make sure to do enough verifications of any images made to give you confidence that images are being created OK.

3.6 Backing up the whole master drive as a Clone on another drive

In the event of there being a major problem with the master drive, having a compressed image of your whole master drive enables you to recreate it. For instance:

- If the image was written to a non-bootable drive, your PC could be booted using the backup application's boot CD. Then the application could be used to unpack the image from the non-bootable drive back onto your original master drive (replacing all its contents) or onto a third drive. The drive written to can then

be used as your master drive.

- If the image was written to a bootable drive which also has the backup application installed on it, that drive could be booted into Windows and the application used to unpack the image onto another drive. Then that (written-to) drive could be used as your master drive.

Those processes are a tad involved. There is a simpler way to achieve an outcome of a bootable drive that contains the full contents that were on the backed-up drive at the time it was backed up. This approach involves creating a "clone" of the whole master drive on a second drive, rather than making a compressed image of it. This cloning can be done through applications such as [True Image](#), Drive Image/ [Ghost](#), [Drive2Drive](#) (for Windows 95, 98 or Me only) or [CasperXP](#) (for XP and 2000; also includes Drive2Drive). Drive Image/Ghost uses the term "copy" rather than a "clone".

A clone is what the name suggests: after cloning, the backup drive's contents will be exactly the same as the contents on the master drive, including its boot system. Therefore your PC could be booted using the backup (clone) drive. The clone drive will have ALL the functionality of the master drive from which it was cloned (at the time of the cloning).

The master drive and the cloned drive do not need to have identical capacities. However, the backup drive needs to be at least large enough to contain all the contents of the master drive. It can also be a larger drive than the master drive. Being a clone, the space taken up by files will be the same as on the source drive - that is, there is no compression

The benefit of the cloning approach is that if the master drive becomes unbootable and simpler fixes have not been successful, the backup drive can be used to boot the PC and it can be used immediately in place of the old master drive. There is no need to unpack anything. You will need to ensure that the backup drive is seen by the PC as the primary drive that will be used to boot the PC. This may require some fiddling with jumpers on the hard drive to ensure that either "cable select" is selected (and the right drive is connected to the right cable connector) or the "master" and "slave" jumpers are set appropriately. In some PCs (e.g. ones that have a mix of parallel ATA drives and serial ATA drives), the PC's BIOS configuration may need to be set so that the backup drive is given boot precedence over any other drive in the PC. However such changes are reasonably easy to implement.

After booting into Windows, what used to be the backup drive will then be the new master drive. Once that you are CERTAIN that your new master drive is functioning perfectly, you could then run whatever diagnostic applications you might have on the drive that used to be your master drive to see if it can be fixed without the need for reformatting. If appropriate, and as a final resort, you could repartition and/or reformat that old drive. If the old drive is healthy in a mechanical sense and you wanted to use it again as the master drive, you could clone the backup drive back onto it, change the cables and/or jumpers and/or BIOS settings, and reboot using the old master drive.

As with compressed images, a limitation of the approach of cloning the whole master drive is that its contents will become out of date. However, it is possible to use an application such as Syncback to keep the contents of selected files and folders on the master drive up to date also on the backup drive. You could, for instance, ensure that your whole My Documents folder was kept up to date on the backup drive. This is similar to the process described [above](#) except that the backed up files will overwrite the equivalent files that are on the backup drive. This backing up could be done on a set schedule (Syncback has scheduling functionality), or less regularly.

However, if you decide to update selected folders or files using an application such as Syncback, keep in mind that malware acquired since the clone was made might then be transferred in files that are updated onto the cloned backup drive. Because I have a large capacity backup drive, I avoid that type of possible (albeit remote) problem by adding a full compressed image to it about every week, keeping two rolling images. That way if I ever need to, I could revert to either the original non-updated clone, or to either of two more recent images. However, this approach is really not required for most PC users.

3.7 Backing up a partition from the master drive as a Clone on another drive

Most users have only one partition on their master drive. If that is your situation, skip this section.

A variant of the cloning approach is to clone a partition or partitions from the master drive onto a backup drive,

rather than cloning the WHOLE drive.

This approach might be useful in this type of situation:

- In the boot partition on the master drive the user has installed the full operating system plus the software, drivers and utilities needed for the operation of all hardware, networking, email, and Internet operations, plus utilities that would be useful in the event that the PC becomes flaky or inoperable. This small partition can be regarded as a bare bones system which does not change much over time.
- All the other applications and data files are located in one or more other partitions on the master drive.
- The boot partition is cloned to the backup drive and only occasionally updated.
- The other partitions on the master drive are backed up to the backup drive quite regularly as compressed images.

The approach may also be useful in the event that the user has a backup drive that is not large enough to hold a clone of all the contents of the master drive.

There may be variants to this approach that suit some user's particular circumstances. However, while this approach may save time in creating the compressed images, it is not one that appeals to me because of its complexity, and because I would have to do a major reorganisation of my single-partition master drive into a multi-partition master drive.

However, if this approach or a variant appeals to you, some of the backup applications mentioned above will facilitate it: Drive Image/Ghost and Casper are examples of such applications.

4. WHERE TO BACKUP?

So much for what to backup. Let's now have a look at where to put the backup/s.

Backup devices onto which backups could be written shown in Table 1, together with an assessment of their advantages and disadvantages. Explanatory notes about content with a number in parenthesis (e.g. (1)) after it are in [Appendix 3](#).

Table 1 - BACKUP DEVICE OPTIONS

Target backup device	Advantages	Disadvantages
Master hard drive (e.g. put the backed up stuff from Drive C onto Drive C)	<p>Easy</p> <p>Very fast</p> <p>No additional hardware required</p>	<p>Files may be inaccessible if the master drive crashes or becomes unbootable</p> <p>Backup is not totally isolated from possibility of infection by malware (1)</p>
Thumb Drive (<i>aka</i> Flash Drive, Pen Drive)	<p>Easy</p> <p>Very fast</p> <p>Files not lost if master drive crashes or becomes unbootable</p> <p>Drive can be unplugged easily so that it is then completely isolated from possibility of infection by malware</p>	<p>Additional cost if drive does not already exist</p> <p>Small capacity</p> <p>Ties up an expensive device (in terms of \$ per Mb) which is much more applicable for other purposes.</p>
Network drive	<p>Easy</p> <p>Very fast</p> <p>Files not lost if master drive crashes or becomes unbootable</p>	<p>Backup is not completely isolated from possibility of infection by malware (1)</p>
Other internal drive in stand-alone PC	<p>Easy</p> <p>Very fast</p> <p>Files not lost if master drive crashes or becomes unbootable.</p>	<p>Backup not completely isolated from possibility of infection by malware (1)</p> <p>Additional cost if drive does not already exist (2)</p>
Drive in removable caddy (<i>aka</i> "mobile rack") (9)	<p>Easy</p> <p>Very fast</p> <p>Files not lost if master drive crashes or becomes unbootable</p> <p>Drive containing backup can be removed easily so that it is then completely isolated from possibility of infection by malware</p> <p>Drive can be stored in a safe location or off-site</p> <p>If the backup is a clone of the master drive or an active primary bootable partition from the master drive, the PC can be booted directly from the drive in the caddy. (10)</p>	<p>Cost of hardware (3)</p> <p>Small fan in the caddy's cradle could be a tad noisy (4)</p> <p>In some caddies, the plug at the rear of the caddy might not mate tightly with the socket at the rear of the cradle. (5)</p> <p>Requires a vacant CD/DVD type bay on the PC.</p>

<p>Drive in an external enclosure that has a Firewire interface to the PC</p>	<p>Easy</p> <p>Reasonably fast (6)</p> <p>Files not lost if master drive crashes or becomes unbootable</p> <p>Drive containing backup can be disconnected easily so that it is then completely isolated from possibility of infection by malware</p> <p>Drive can be stored in a safe location or off-site</p> <p>If the backup is a clone of the master drive or a bootable partition from the master drive, and the PC's BIOS supports booting from a Firewire device (very few seem to be able to do that), it may be possible to boot the PC directly from the drive in the enclosure. (11)</p>	<p>Cost of hardware</p> <p>If there is a fan in the enclosure, it can be a tad noisy (7)</p> <p>Most PCs are unable to boot from a backup drive in a Firewire enclosure the enclosure has both Firewire and USB interfaces it is possible that this disadvantage can be avoided if the PC can be booted using the drive connected as a USB device. (11), (12)</p>
<p>Drive in an external enclosure that has a USB interface to the PC</p>	<p>Easy</p> <p>Reasonably fast (6) if operating at USB 2.0 "High speed" rate</p> <p>Files not lost if master drive crashes or becomes unbootable</p> <p>Drive containing backup can be disconnected easily so that it is then completely isolated from possibility of infection by malware</p> <p>Drive can be stored in a safe location or off-site</p> <p>If the backup is a clone of the master drive or a bootable partition from the master drive, and the PC's BIOS supports booting from a USB device, it may be possible to boot the PC directly from the drive in the USB enclosure. (11)</p>	<p>Cost of hardware</p> <p>If there is a fan in the enclosure, it can be a tad noisy (7)</p> <p>Slow if the drive is only working at the USB versions 1 or 1.1 rate (8)</p> <p>Slow if USB 2.0 sockets or cables not to the USB 2.0 standard (8)</p> <p>Not all PCs are able to boot from a backup drive in a USB enclosure (12)</p>
<p>CD, DVD</p>	<p>Fairly easy</p> <p>Files not lost if master drive crashes or becomes unbootable</p> <p>CDs/DVDs can be stored so that they are isolated from possibility of infection by malware</p> <p>Can be stored in a safe location or off-site</p>	<p>Slow.</p> <p>Slow.</p> <p>Slow.</p>

The notes in [Appendix 3](#) explain some aspects of the table.

5. RECOVERY

5.1 Recovery of deleted files

In the best-case scenario, recovery of a corrupt or deleted data file is simply a matter of copying an earlier version of the file back onto the master drive. Hopefully, all that is involved is extraction of that file from wherever and in whatever form it was backed up. It may also be possible to recover the file from your Recycle bin.

If the Recycle bin has been emptied, then it may still be possible to recover the file by using an application such as [PC Inspector File Recovery](#). This is a freeware application which can be used to identify any files that are still recoverable even after they were deleted and erased from the recovery bin. The operation of the File Recovery application relies on the fact that when a file is deleted it remains on the hard drive and a flag is set indicating it has been deleted. When other files are saved to the hard drive, they may or may not over-write the space that had been occupied by the deleted file. Whether or not such a deleted file can be recovered depends on the extent to which the space it occupied has been over-written by files saved subsequent to its deletion.

5.2 Recovery when PC is functioning slowly or erratically

A less welcome scenario is where you are still able to boot into Windows normal mode, but your PC is functioning slowly or erratically or closing slowly or doing other undesirable things. One or more of these steps might be tried in an attempt to recover from this situation, probably in the order shown:

- If you have a general system fix-up application such as Symantec's [Norton SystemWorks](#), run its diagnostic and fix-it modules (e.g. in SystemWorks, run Win Doctor and Disk Doctor).
- Do a thorough scan for malware, using as many anti-malware applications as you have. If the option is available in your anti-malware application, schedule such scans as boot-time scans.
- Run the Windows CHKDSK utility, with the /R option. See [Appendix 5](#) for more information.
- Run SFC (System File Checker) if it is appropriate for your operating system. See [Appendix 1](#) for instructions.
- If you think that the problem may be a consequence of installing some new piece of software or a major upgrade to an existing piece of software, then:
 - If you have a suitable operating system see if you can use System Restore or a similar type of application to recover an earlier created Restore Point.
 - If that does not work, or you do not have such an application for your operating system then the problem might possibly be fixed within Windows by restoring your registry to an earlier version that has been saved. If you have saved backups of your registry using ERU or ERUNT, then you can restore a saved version of the registry very easily by using ERD or ERDNT. Details are provided in this [article](#) of mine about ERUNT and ERDNT and in [this article](#) about ERU and ERD.
 - If your operating system is Windows 98 or Me you could also see if restoring an earlier version of your registry using the Microsoft utility [SCANREG](#) will fix the problem.
- If none of those steps fixes the problem and you have a compressed image or clone of your master drive you could reinstate the master drive to the state it was at the time of the creation of the image or clone. Before doing that, make backups of data and documents and Email files. This will enable you to update such files after the image or clone has been reinstated.

5.3 Recovery when you can't boot into Windows normal mode

An even less welcome scenario is where your PC will not boot at all into normal Windows mode, or none of the fixes listed above have worked. In that case:

- If your operating system is XP, you may be able to reinstate the "last known good configuration". To do that hit <F8> soon after you boot and just before the normal Windows splash screen would appear. Select "last good known configuration" and hit Enter and then reboot. If this works it will lead to the information in the registry key HKLM\System\CurrentControlSet being restored. It does not change other registry entries and does not solve problems caused by missing or corrupt drivers or files. However it may be sufficient to enable you to boot into normal Windows mode so that you can then attempt the types of fixes listed above in Section 5.2.
- If you do not have an XP system or the step above did not work, try to boot in Safe Mode. If that is possible then one or more of these steps might be taken, probably in the order shown:
 - Do a thorough scan for malware, using as many anti-malware applications as you have. If the option is available in your anti-malware application, schedule such scans as boot-time scans.
 - Run the Windows CHKDSK utility, with the /R option. See [Appendix 5](#) for more information.
 - If your operating system is Windows 98 or Me you could see if restoring an earlier version of your registry using the Microsoft utility [SCANREG](#) will fix the problem.
 - If you have an XP or 2000 operating system, see if you can use System Restore to recover an earlier created Restore Point. Do that through this sequence: Start, All programs, Accessories, System tools, System restore. If you have some other application similar to System Restore, see if it can be used to recover an earlier created Restore Point.
 - If that does not work, or you do not have such an application then the problem might possibly be fixed within Windows by restoring just the registry to an earlier version that has been saved. If you have saved backups of your registry using ERU or ERUNT, then you can restore a saved version of the registry very easily by using ERD or ERDNT. Details are provided in this [article](#) of mine about ERUNT and ERDNT and in [this article](#) about ERU and ERD.

5.4 Recovery when you can't boot into Windows Safe Mode

The worst scenario is being unable to boot in either Windows normal mode or in Windows Safe Mode, or the fixes tried in Safe Mode have not worked. In that case you could try these fixes:

- If the operating system is XP or 2000 and the PC screen mentions a problem with NTLDR or NTDETECT, then you may be able to repair those files. This involves copying a healthy version of the files NTLDR and NTDETECT.COM from the folder i386 on your operating system's installation CD or from a specially prepared boot floppy disk, onto your master drive's root directory. See [this article](#) for information about how to do that.
- If you have a UBCD4WIN CD (Ultimate Boot CD for Windows - see [Appendix 7](#)) then you can boot your PC using that CD. Once you are in the UBCD4WIN environment, you can run a Windows Explorer type of application that will enable you to examine files and folders on your hard drive and to run a number of very useful utilities. For example, you could use the explorer type application to copy files and folders to another hard drive. This may be useful if you wanted to save copies of say, recent documents or databases or data files prior to reinstating an out of date compressed image onto your master drive, or prior to copying an out of date clone from a backup drive onto your master drive.
- If you have made backups of your registry using ERU or ERUNT, then the explorer type application would also enable you to navigate to the folders containing those backups. You could then run the registry restore applications ERD or ERDNT by simply double-clicking the file ERD.EXE or ERDNT.EXE. Details about restoring a registry using ERD.EXE or ERDNT.EXE are provided in this [article](#) of mine about ERUNT and ERDNT and in [this article](#) about ERU and ERD.
- In the UBCD4WIN environment you would also have access to a number of very useful utilities and diagnostic applications (see [Appendix 7](#)).
- If you do not have a UBCD4WIN CD and you are a relatively experienced PC user, and you have a

Windows 2000 or XP operating system you could try the "Windows Recovery Console". Some information about using the recovery console is given in [Appendix 4](#). "Console" is a misnomer because it is simply a DOS-type of operating environment. Through use of specific commands that the user has to type in, the user can get limited access to some folders on the hard drive (specifically, the \WINDOWS\ folder) and to run a number of Windows utilities (e.g. CHKDSK, FIXMBR, FIXBOOT). However, be aware that unlike the UBCD4WIN environment, the recovery console environment will not allow you to access all the folders on your hard drive, so accessing and copying data files to somewhere else is not an option.

- If you are in the recovery console environment and you had used ERU or ERUNT to make backups of your registry in a folder somewhere under the folder C:\WINDOWS\ then you will be able to navigate to the backup folder using the CD command. You can then reinstate a registry by running the ERD or ERDNT application. Details about reinstating a registry this way are provided in this [article](#) of mine about ERUNT and ERDNT and in [this article](#) about ERU and ERD.

5.5 Recovery when you can't boot into normal mode or safe mode and UBCD4WIN and the Recovery Console are of no use

In some circumstances use of the utilities available through the [UBCD4WIN](#) CD or the Windows Recovery Console environments will not lead to a successful outcome. Some users may feel that the processes involved in using those utilities are too complex. If the user has created a compressed image or a clone of the master drive onto another drive, then the problem of not being able to boot the master drive in normal Windows mode or Safe mode can be remedied in a relatively straightforward way. This involves reinstating the image or clone from the backup drive back onto the master drive. A brief overview of how this might be done is given in [Appendix 6](#).

6. CLOSING COMMENTS AND RECOMMENDATIONS

6.1 Comments

The approach that meets my needs and for which I have the right hardware and software is this:

- About every month I create a clone of my master drive (120 Gb containing about 90 Gb of files) on a big (250 Gb) backup drive in a removable caddy. Time taken for 90 Gb of files - 35 minutes
- I then store the caddy in a safe location well away from my PC.
- Every week or 10 days or so, I add to that backup drive a compressed image of the whole master drive. If there are already two images on the drive, I delete the older of the two images before creating a new one. Time taken for 90 Gb of files - 35 minute

That way, if required, I could recover any or all of the master drive's contents knowing that at worst, I will have lost a week's information. If required, I could also boot using the backup drive as the boot drive. This approach required a little expenditure for a backup drive and backup software. However it is just sooo easy to implement. Moreover, I don't have to remember what I have and have not backed up and I don't have to remember to modify any backup schedule when I add applications to my PC - I simply backup the whole master drive.

If I had been unable to implement the caddy approach (e.g. if I did not have a spare bay in my PC into which the caddy's cradle (rack) has to be installed) I would have implemented the same strategy with the backup drive being in an external USB 2 High Speed enclosure containing a fan.

In addition:

- If I ever make an installation of an application that I have any reservations about and/or may wish to negate later, I create a new compressed image of my master drive on my backup drive. Again, if there are already two images on the drive, I delete the older of the two before creating the new image.
- I have my XP Pro system create a backup of my registry automatically every day using ERUNT. The number of backups is limited to the seven most recent days (seven is an arbitrary number - you can set

this to whatever number you like). In addition, before doing anything that has any risk of fouling up my registry, I make an additional ad-hoc registry backup using ERUNT.

- I have prepared a [UBCD4WIN](#) CD which I can use to boot my PC in the event that it ceases to be bootable in normal mode or Safe mode (and actually used in in such circumstances).

6.2 Recommendations

My approach may be unsuitable in terms of your needs and circumstances. However, whatever your situation, give consideration to these recommendations :

- All PC users should have a backup strategy and should implement the strategy rigorously.
- The effectiveness of any backup strategy can be undermined by the existence of malware so you also need to be implementing an effective malware protection strategy with regularly updated anti-malware applications..
- Implement security updates that Microsoft and other application makers release their operating system, web browser, Email application and other applications.
- Check your master drive (at least occasionally) for:
 - physical faults (use CHKDSK or other various utilities)
 - file structures, indexes, security descriptors (use CHKDSK or other various utilities)
 - missing or corrupt system files (use SFC if appropriate for your operating system)
- All users should back up their registry every day. If it is suitable for your operating system, install ERU or ERUNT so that this is done automatically at boot time.
- Prior to the installation of any new application or a major update of an installed application, generate a Restore Point using System Restore or an application of a similar type if one is available for your operating system. In addition, if suitable for your operating system also create an additional ad-hoc registry backup using ERU or ERUNT.
- Depending on your needs and circumstances, make regular backups of one or more of these objects:
 - selected files and folders
 - the registry
 - compressed images of whole drives
 - bootable clones of whole drives
- Make such backups on a regular basis, with frequency determined by the extent of risk for your particular circumstance. Note that the best time to make a backup is when your PC is functioning really well, NOT when it is sick.
- Give consideration to the following types of backup devices:
 - Master drive (in my opinion, only recommendable for making temporary backups which are to be transferred to some other device).
 - Other internal drive (better, but not totally isolatable).
 - Other drive on a network (even better, particularly if totally isolatable).
 - Removable devices (best of all) such as:
 - thumb drive (but very limited capacity, and is expensive per Mb)
 - CD or DVD (secure but VERY slow)
 - drive in a powered and ventilated USB2 or Firewire enclosure (secure and reasonably fast -

better than all the above)

- drive in a removable caddy (secure and very fast - in my opinion, the best of all if you have a vacant CD/DVD drive bay available, and an appropriately-sized backup drive)
- Before taking drastic action such as reinstating an image of the master drive or reinstating a clone from a backup drive onto the master hard drive:
 - Try any fix-up utilities that you have (e.g. Norton Utilities' Win Doctor)
 - Check for malware
 - Try reinstating Restore Points if that option is available
 - Run SFC (System File Checker) if it is appropriate for your operating system
 - Run the Windows utility CHKDSK with the /R option
 - Reinstall backup/s of the registry
 - When appropriate, consider running FIXMBR or FIXBOOT or fixing the NTLDR and NTDETECT.COM files. Note that while SFC and CHKDSK will always result in good or benign outcomes, the same may not be true for these other fixes. Implementing such fixes in an inappropriate circumstance or manner could lead to unfortunate unintended outcomes. Therefore these fixes should only be implemented if there is diagnostic information or error messages that indicates appropriateness and you are aware of usage and effects of their command line options.
- Be prepared:
 - If you have a backup application such as Acronis True Image that has functionality for creating a bootable "rescue" or "emergency" CD, then make sure that you create such a CD immediately after you install the application. Put the CD in a safe place.
 - If you have a Windows 2000 or XP operating system make sure that you have a Windows installation CD or a set of the Microsoft "Setup Disks for Floppy Boot Install" in case you need to use functionality in the Windows Recovery Console.
 - If your XP installation CD is SP1 and you have updated your XP system to SP2, you need to have both CDs in a safe place. Ideally, it is best to have an "XP including SP2" installation CD or to have a slipstreamed equivalent made from the SP1 CD plus the SP2 update CD, in case you ever need to run SFC (System File Checker)..
 - Prepare or have prepared for you a [UBCD4WIN](#) bootable CD. This means that in the event that you are ever unable to boot your PC into normal mode or safe mode, you can get access to your master drive, copy any recoverable document and data files to another device, reinstall registry backups made with ERU or ERUNT, and to run a number of diagnostic utilities.
 - Make sure that you PC's BIOS is configured so that the CD or DVD drive is given a higher priority than the hard drive in the boot sequence. To determine easily if the BIOS is already set this way, boot the PC, put the Windows installation CD in the CD or DVD drive, and see if booting from the CD is presented as an option during the boot process.

The final suggestion about making backups: as they say about voting "do it early and often".

Mike Boesen

9 October 2005

APPENDIX 1 - RUNNING MICROSOFT SFC (SYSTEM FILE CHECKER)

The Windows SFC (System File Checker) will run on Windows 98, XP Home, XP Pro.

To run SFC on a Windows 98 system:

- hit the Start button,
- hit Run
- in the "Open:" panel type "sfc" (without the quotes) and hit OK
- select "Scan for altered files" when the SFC dialogue box is displayed

If SFC determines that a Windows 98 system file needs to be replaced you will be asked to insert your Windows 98 installation CD. If you are running Windows 98 SP1, use the SP1 installation CD.

Instructions for running SFC on an XP system are provided in [this article](#). If SFC determines that an XP system file needs to be replaced, it will ask you to insert the XP installation CD. If you have updated your XP system to an SP2 level but do not have an installation CD that incorporates the SP2 version of XP (i.e. you have separate SP1 and SP2 CDs), you will need your original XP CD plus the SP2 update CD. Some people have had problems with SFC not being able to find the SP2 CD. The article suggests workarounds for such problems.

I have used SFC in two ways without any problems at all on my XP Pro system:

- Using a Microsoft CD that has XP Pro with SP2 included already.
- Creating a "slipstreamed" CD using [Autostreamer](#). This freeware application can be used to create a CD that combines the stuff from an original XP SP1 CD and the SP2 update CD.

In running SFC on my XP Pro system I use a procedure that runs much faster than running SFC and accessing the XP CD or CDs. You may wish to try it:

1. If you have an installation CD for XP with SP2 incorporated, go to step 4.
2. If you have an XP SP1 CD and an SP2 update CD, create a slipstreamed ISO format file using using [Autostreamer](#). The version of Autostreamer that I used was 1.0.33. It combines the stuff from the two CDs into one ISO file. (An ISO file is an image of a CD.)
3. Use you favourite CD/DVD writing application to create a CD from the ISO file. This CD is equivalent to the CD for XP with SP2 incorporated. You can now put your your XP SP1 CD and the SP2 update CD in a safe place - in future simply use the slipstreamed CD whenever you need to use an XP installation CD.
4. The files that SFC accesses on the CD or CDs when it is running its checking process are located in a folder named `\i386\`. Therefore copy the folder `\i386\` from the CD referred to in step 1 or step 3 onto your C: drive as `C:\i386\`
5. Using your favourite registry editor (e.g. Reg Edit), find these registry entries:

`HK_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Setup\SourcePath`

`HK_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Setup\ServicePackSourcePath`
6. Write down the values shown for these entries in case you want to revert back to them later (I did not need to do that). You will probably find that the present values indicate the drive letter of your CD or DVD drive. If you leave the stuff in the `C:\i386\` folder (see step 4) on your drive (recommended), there will be no need to revert. This is because after you make the changes in step 7, when XP looks for files that it knows are in a `\i386\` folder somewhere, it will now look in the folder `C:\i386\` and therefore will not try to find it on a CD.
7. Change the values for BOTH registry entries to to `"C:\ "` (without the quotes, and DO NOT type in `C:\i386\`)
8. Save the changes to the registry and reboot
9. After you PC has booted, hit Start, Run, and in the "Open:" panel type `"SFC /SCANNOW"` (without quotes) and then hit return.

The SFC utility should now run without requesting the insertion of any CD. It will run MUCH faster than it would if it had to access files from an `\i386\` folder on a CD. At the end of its run, you will not get any report - the SFC dialogue box simply disappears. If any changes are required, SFC will make them without telling

you. This lack of feedback is not nice.

APPENDIX 2 - RESTORING REGISTRIES SAVED WITH ERUNT

There are four options for using ERDNT to reinstate a backed up registry that was created by [ERUNT](#):

- If feasible, boot into Windows normal mode, then in Explorer, go to the appropriate folder containing the registry backup that you want to reinstate, and run ERDNT.EXE which is located in the folder. Then reboot.
- If normal mode cannot be achieved, boot into Safe mode, go to the appropriate folder containing the registry backup that you want to reinstate, and run ERDNT.EXE which is located in the folder. Then reboot.
- If neither of those modes can be achieved, if you have a Windows 2000 or XP operating system boot your PC using the Windows installation CD and get into the Windows Recovery Console. Then use the CD command to go to the appropriate folder containing the registry that you want to reinstate, and run ERDNT.EXE which is located in the folder. Then reboot. This method requires that you have saved your registry backups in folders located under the C:\WINDOWS\ folder.
- A better option than the Windows recovery console, is to boot using either a Bart PE CD or better still, a [UBCD4Win](#) (Ultimate Boot CD for Windows). Such CDs can be created by you or for you using your PC and the XP installation CD. However, creating such CDs is not for the beginner.

These four options are explained in Lars Hederer's README.TXT file that is installed on your PC when you install [ERUNT](#). In my [article](#) I also explain the options and describe how to limit the number of automatically created Registry backups to a number of your choice.

The use of ERUNT has saved my bacon on quite a number of occasions. On some of those occasions, I have been unable to get into Windows normally or in Safe mode, and the UBCD4Win CD has been of tremendous value on those occasions.

APPENDIX 3 - NOTES ON TABLE 1 (BACKUP DEVICE OPTIONS)

1. Isolation

Backing up stuff from the master drive onto the master drive is not the best strategy because in the event that the master drive is unbootable, you may not be able to get access to the backup image. In addition, the backup could possibly be accessible by malware. A better option is to backup to another drive installed in the PC, or on a drive in another PC that is networked. However, backups on such other drives that are permanently running in a PC or on a network might possibly be also accessible by malware. While this may have a very low probability, an alternative approach that guarantees isolation from malware is to backup to a device that can be unattached from the PC after the backup is made. Such devices are thumb drives, drives in USB and Firewire enclosures, drives in removable caddies, and CDs or DVDs.

2. Cost of an additional drive

The cost of hard drives continues to fall. Currently (October 2005) a good quality 160 Gb 7,200 rpm parallel IDE/Ultra ATA 133 drive would be about \$110 (AUS).

3. Cost for a drive in a removable caddy

In addition to the cost for a drive to put in a removable caddy, a caddy and the cradle (*aka* "rack") into which the caddy is inserted would cost about \$25 (AUS). The cradle needs to be mounted in a

bay of the same type as the bay that holds your CD or DVD drive. This is as easy as installing a CD or DVD drive. These caddy and cradle setups are referred to by different names, such as "mobile rack". The mobile component is the caddy that contains the hard drive. The caddy can be slid in and out of the cradle or rack which is permanently mounted in the PC.

4. Fan in caddy's cradle could be noisy

To ensure that there is a cooling airflow over a drive inside a caddy, the caddy or the cradle (*aka* "rack") should have at least one fan. This is particularly important for modern, fast (7,200 rpm) drives because they get very warm in enclosed spaces. In some caddy setups, because the fan/s have to be small, it/they may be a tad noisy, especially if the PC is on the desk close to your ear.

Some caddy setups have three small fans - two in the cradle and one in the caddy. I don't like those at all because of the noise. In any case, I think that one fan in the cradle is quite sufficient, providing that:

- The PC case has an adequate hot air exhaust system. Ideally this should be accomplished through a good exhaust case fan as a supplement to the fan in the power supply unit. PCs that have a lot of heat producing components may also require a good intake case fan which sucks air into the PC's innards.
- The structure of the cradle and caddy is such that air is forced to flow from the outside the front of the PC case, into the front of the caddy, across the drive and out the back of the cradle into the PC's case's innards. Some caddy units are not designed properly to ensure that happens. "Laser" brand caddies are very well designed in terms of maximising the effectiveness of airflow.

The cradle fan will be on all the time even if the caddy is not inserted. In my cradles I have added a micro switch so that the cradle fan only comes on when the caddy is fully inserted. Hence, there is no fan noise at all when the caddy is not inserted. Contact me if you want details.

3. Mating of caddy socket and cradle plug

In some caddy arrangements I have seen, the caddy seemed to slip into the cradle with very little insertion force being applied and that was of concern to me. The caddy has a 50-land Centronics style socket that mates with a 50-land Centronics style plug in the cradle. My preference is for the caddy's socket to mate with the cradle's plug only after a bit of pressure plus a nice "thunk" indicating that the mating has been effected and the lands in the plug and socket are in firm contact. Therefore, for the sockets on all my (3) caddies, I raise the profile of the lands (flat bent springy metal strips) very slightly (about 0.3 mm). The high-tech instrument I use to do that is a number 9 darning needle carefully inserted under each land in turn. Takes about 5 minutes for this operation. Contact me if you want details.

6. Speed of Firewire and USB 2 drives

Making backups or clones to a drive in a Firewire or USB enclosure will take considerably more time than it takes for the same drive mounted internally or in a caddy. In my experience, backing up to a drive in an external High Speed rated USB 2.0 enclosure takes about twice as long as a backup made to an internal drive or a drive in a caddy. I understand that Firewire enclosures are a tad faster than High Speed USB 2.0 enclosures, although not by much.

You can buy an enclosure that has both USB and Firewire interfaces. However, the cost is higher for this dual interface. It MAY be possible for your PC to boot from a drive attached via USB - check the BIOS options. However, I'm not aware of motherboards with a BIOS that facilitates booting using a Firewire-connected drive.

7. Fans in enclosures

Modern fast drives get quite warm in enclosed spaces. Therefore if the drive is in a USB or Firewire enclosure it is advisable that the enclosure has an exhaust fan. The temperature of a drive in an external enclosure cannot be monitored via SMART, so it might be cooking without you ever knowing. Once you finish a backup operation, you can disconnect the external enclosure and

turn it off - all the fan noise then miraculously disappears!

8. Speed problems with USB drives

A drive in an external USB enclosure will operate VERY slowly if any of the following conditions apply:

- the USB enclosure does not have USB 2.0 "high speed" firmware, or
- the USB cables and sockets used to connect with the PC are not to USB 2.0 "high speed" specifications, or
- the PC's BIOS is not configured for USB 2.0 "high speed" operation, or
- there is no "high speed" or "enhanced" USB device driver visible in Device Manager

More details about these matters can be found in this [article](#) which I wrote about USB sockets and cables.

9. Hard drive caddy

The term "hard drive caddy" refers to a hardware device that has two components: (a) a cradle (or "rack") that is installed in one of the PC's CD or DVD drive bays, and (b) a caddy that can be inserted into and extracted from the cradle.

The cradle is connected inside the PC case to power and to either the parallel IDE/ATA (PATA) interface in the same way as a CD drive or DVD drive, or to the serial ATA (SATA) interface. Most caddy arrangements are of the parallel variety.

A hard drive is placed in the caddy. The caddy has a Centronics style socket at its rear that mates with a Centronics style plug at the rear of the cradle. This socket/plug connection provides power and the PATA or SATA interface lines to the hard drive. The PATA version is available with [80-pin Ultra ATA cabling](#).

10. Booting from a backup drive in a caddy

If the backup drive is in a removable caddy and contains a clone of the whole master drive or has an active primary bootable partition cloned from the master drive, then that drive can be used to boot the PC if it is inserted into the cradle before switching on the PC. However, you will need to ensure that the drive will be recognised as the boot drive.

This may require some fiddling with jumpers on the hard drive to ensure that either "cable select" is selected (and the right drive is connected to the right cable connector) or the "master" and "slave" jumpers are set appropriately.

In some PCs (e.g. ones that have a mix of parallel ATA drives and serial ATA drives), the PC's BIOS configuration may need to be set so that the drive in the caddy is given boot precedence over any other drive in the PC. Having a mix of parallel and serial ATA drives can be a pain. The speed gains for serial ATA drive is marginal at best and my advice is to stick with parallel ATA drives.

11. Booting from a drive in an external enclosure

If the backup drive is in an external enclosure (USB or Firewire or dual USB/Firewire) and contains a clone of the whole master drive or has an active primary bootable partition cloned from the master drive, it may be possible to boot your PC from that drive in its enclosure instead of booting using the master drive. Note that:

- If the backup drive is in an external Firewire-only enclosure, and the PC's BIOS does not support booting from a Firewire-connected device, the drive would need to be removed from the enclosure and connected to an internal power cable and drive cable in your PC. Most PCs will NOT support booting from a Firewire device.

- If the backup drive is in an external USB-only enclosure, or an external enclosure that has dual USB and Firewire interfaces, and the PC's BIOS can be configured to boot using a USB-connected device, then the PC could be booted from the drive as a USB device without removing it from the enclosure. If the PC's BIOS can NOT be so configured then the drive will need to be removed from the enclosure and connected to an internal power cable and drive cable in your PC. Many PCs will NOT support booting from a USB device.

12. Booting from a drive on the USB interface

The fact that a PC's BIOS indicates that it will boot from a bootable drive in a USB device may not be totally dependable. My ASUS PC's BIOS indicates that it can boot from a USB device. While my USB enclosure functions perfectly as a read/write USB device, I cannot get it to boot as a hard drive - it gets to the Windows splash screen then reboots. The same hard drive can be used to boot the PC when it is in a caddy or if it is connected directly to the [ATA](#) (aka IDE) cabling.

This failure as a boot drive when in the enclosure may be a problem with the particular USB chipset that is in my Shintaro enclosure: Genesys Logic GL811E. I have noted complaints about particular makes of USB chipsets on some forums (but not for the GL811E). However, the information about what are good and what are inadequate chipsets is sparse and scrappy, so knowing what USB chipset is used in an enclosure is not helpful. It's a matter of trying after buying. The fallback procedure is to remove the drive from the USB enclosure and connect it to the ATA cabling inside the PC or swap it for your master drive.

APPENDIX 4 - USING THE WINDOWS RECOVERY CONSOLE

- The Windows Recovery Console is a DOS type environment for PCs that have a Windows 2000 or XP operating system. This environment enables you to run a number of Windows utilities by typing commands as a DOS-like command line. This is not for beginners because the commands consist of a utility name plus one or more optional bits. A number of the utilities can be very useful in fixing some types of problems. However, misuse of some utilities could lead to an unrecoverable loss of data on the hard drive being operated on.
- If you have a Microsoft Windows CD-ROM, you can get to the Windows Recovery Console by booting from that CD. Press any key when you see the message "Press any key to boot from CD". At the "Welcome to Setup" screen, select "r" to open the Windows Recovery Console. Note that for the PC to boot from the CD, your BIOS needs to be set so that the CD drive will be tried as a boot device prior to trying the hard drive.
- The recovery console environment can also be entered by using floppy disks created using a free Microsoft program called Setup Disks for Floppy Boot Install. The XP Pro version is WinXP_EN_PRO_BF.EXE and it can be downloaded from Microsoft (search for WinXP_EN_PRO_BF.EXE in Google). The version that works with XP Home, 2000, NT, Me, 95 and 98 is WinXP_EN_HOM_BF.EXE and it can also be downloaded from Microsoft. Running the downloaded application enables you to put the Windows setup application on a set of six floppy disks. To run the recovery console, boot from the first floppy, and then swap disks as prompted until you reach the "Welcome to Setup" screen. Then select "r" to run the Recovery Console.
- To get information about all the utilities that can be run through the recovery console type HELP and hit Return. To determine the syntax for a utility, type its name, a space then "/" (without the quotes) then hit Return. For example: CHKDSK /? [Return]
- Of the many utilities that can be run, these three in particular may enable you fix some types of problems:
 - CHKDSK (e.g. use "CHKDSK C: /R" without the quotes to check and repair the C drive). This utility takes a long while to run, so be patient.)
 - FIXBOOT (e.g. use "FIXBOOT C:" without the quotes to write a new partition boot sector on the C: partition). This may solve problems such as the one indicated by an error message referring to

"unmountable_boot_volume")

- FIXMBR (writes a new Master Boot Record)
- The recovery console will also allow you to get into the folder C:\WINDOWS\ and any subfolders within that folder. If you have used ERU or ERUNT to create backups of registries and placed the backups in such subfolders, you will be able to get into the registry backup folders and to reinstate a registry by running ERD or ERDNT. To get to the appropriate folder you will need to be able to use the recovery console's commands CD (change Directory) and DIR (show contents of a Directory). Details about reinstating a registry this way are provided in this [article](#) of mine about ERUNT and ERDNT and in [this article](#) about ERU and ERD.
- If you load the recovery console from floppy disks, the CHKDSK utility may complain that it can't locate AUTOCHK.EXE. When it asks for that file's location, inform it that it is located in the folder C:\WINDOWS\SYSTEM32\

APPENDIX 5 - RUNNING THE UTILITY CHKDSK

When you are in Windows normal mode or safe mode, to run CHKDSK say, for your C drive:

- hit the Start button
- hit Run
- in the Open panel type "CHKDSK C: /R" (without the quotes) and hit OK
- If there are any open files on the drive (as is normally the case for a master drive), Windows will inform you that CHKDSK will run at the time of next booting
- exit

The "/R" option will repair any errors automatically. If you don't want errors repaired but only reported, leave out the "/R" bit.

CHKDSK will undertake a faster but less comprehensive check if you replace "/R" with "/F"

CHKDSK can also be run within the [UBCD4WIN](#) environment and in the [Windows Recovery Console](#).

APPENDIX 6 - REINSTATING THE MASTER DRIVE FROM A COMPRESSED IMAGE OR A CLONE ON A BACKUP DRIVE

If the backup was saved as a compressed image, then:

- Connect the backup drive to the PC.
- Boot your PC using the recovery CD that you generated when you originally installed the backup application (e.g. Acronis).
- Select the image to be reinstated from the backup drive, and select the master drive as the target on which the image will be reinstated, and start the restore process.
- Note that the ALL the existing contents of the master drive will be lost.

If the backup was created as clone of the master drive:

- Connect the backup drive to the PC.
- Either:
 - Boot your PC using the recovery CD that you generated when you originally installed the backup application (e.g. Acronis), and then clone the backup drive back onto the master drive or

- Boot the PC using the backup drive as the boot drive, run the backup application as it is installed on the backup drive, clone the backup drive back onto the master drive, then reboot using the master drive.
- Note that the all the existing contents of the master drive will be lost.

An image or clone that has been reinstated in one of those ways may be a bit out of date. If you had saved up to date copies of say, recent documents or databases or data files onto the backup drive or onto CD or DVD, they could then be reinstated on your refreshed master drive.

APPENDIX 7 - THE ULTIMATE BOOT CD FOR WINDOWS (UBCD4WIN)

The Ultimate Boot CD for Windows ([UBCD4WIN](#)) is a bootable CD that can be used to boot your computer into a Windows type environment. It incorporates functionality of another boot CD - the [Bart PE](#) CD. However it has more open source applications available to the user.

Once made, the CD can be used to boot your computer into a Windows type environment. All the functionality of the environment and its utilities are contained on the CD - no functionality is drawn from the operating system or applications that are on the hard drive. While the CD has to be made on a PC that has a Windows XP operating system, once made it appears to be able to boot any Windows PC, irrespective of what operating system is installed on that PC.

This CD is created in much the same way as the Bart PE CD, but with the Bart PE applications ("plugins" - that is, utilities) being replaced by another larger set. There are utilities on the CD that would enable these and other processes to be undertaken:

- View files and folders in an explorer type of environment
- Copy and delete files
- Check hard drives for problems
- Run CHKDSK
- Examine and fix the MBR (master boot record)
- Recover deleted files
- Run Administration Tools (Device manager, Disk management, Computer management)
- Browse and manipulate files and folders using a Windows Explorer type interface
- Use network tools
- Examine system information (using System Information for Windows)
- Edit the Registry

UBCD4WIN will handle network drives. Unlike the Windows Recovery Console, the UBCD4WIN environment provides full access to all files and folders on all the hard drives in a PC or on a network.

A very complete set of step by step instructions for making the UBCD4WIN CD are [here](#).

[Index](#) [Next](#)

CMOS Failure During Bootup

In the Beginning *Jim Tobler*

I have an old W98 computer down the coast, mainly to access weather predictions, and to interface with my Magellan 'Color' GPS. As described previously, although the computer based software works well, and the GPS works well, bringing them together can be rather frustrating. Recently while I was working on that struggle the computer began to add a few more problems.

During Bootup the computer would begin the POST test, and when it got to finding and testing the floppy drive, it would get no further. It would just keep making the floppy light up and try to read it over and over and over. No beeps were issued and the screen never got to opening the Display Card. (That stuff you see on the screen first when the bootup starts.)

I found that by pressing the Reset button over and over and over, I could occasionally 'jag' a boot and then everything worked perfectly. The shot then, was to leave the computer on permanently.

To an amateur fixer upper like me, this said - Floppy Disc Failure.

I had a spare Floppy so I installed it and got the same result. I removed all Floppies and the computer still wouldn't boot. It stayed at the same place in POST. Less noisy now, and no flashing lights. Still no beeps.

As it was getting harder and harder to 'jag' a boot with Reset, I started looking on the Web for other possibilities, and sent Merv an email about it.

The web informed me that it could be:

- Unseated memory chips (but should have given three beeps)
- Unseated video card
- Power supply failure
- Hard disk failure

Could have been a few others, - I added CMOS battery failure, 'cause it only costs \$3 to try it out.

Subsequently I took the memory card and video card out, polished them with an ink eraser and reseated them a few times. I tried a new power supply.

Nothing changed for the better.

Round about this time the Reset button trick stopped working, and I got a message about HDD failure. I also got a reply from Merv telling that he thought that the CMOS had failed.

I was able to test the HDD in my home computer and found that it was indeed 'failed'.

All the 'Reset' pressing probably was the reason, or maybe it was on the way out and contributed to the original problem.

Fixing it up - Part A

By now I was convinced that Merv was right, as I had got nowhere doing all my amateur fixer stuff.

From the Web I gradually got the message that BIOS chips are made by firms like Award and AMI but they are Motherboard specific. The motherboard makers put what they require into the chip. So to fix the problem by 'Flashing' instructions into the chip, you have to identify your motherboard maker and model, as well as the BIOS chip maker. Then with a bit of luck you find the right 'flash' program on the motherboard maker's site.

In my case Gigabyte had a 'flash' program that looked appropriate to my computer. This was called - 6vxc7_fa_fb_fc.zip. When you unpacked that you got 3 further Zip programs these were called 6vxc7_fa.zip,

6vxc7_fb.zip, and 6vxc7_fc.zip. Each one related to the date of the flash update file. From memory a=1999, b=2000 and c= 2002. My BIOS chip had a 1999 sticker on it and the computer was put together in 2000, so I reckoned the 'fb' file was the one for me.

Further investigation revealed that to get the 'flash' file into the BIOS chip, I had to get the computer booted up to where it would load a floppy 'rescue' disk, or find someone with an EEPROM programmer. No luck on both counts.

Fixing it up - Part B

Round about this time my daughter bought herself a laptop, and gave me back the old desktop that was a twin to the computer with the problem.

For \$7.50 I purchased an IC chip remover from DSE. Despite some ominous crunching sounds I was able to remove the 'dud' BIOS chip from the coast computer and the 'good' BIOS chip from the spare computer.

Swapping and booting confirmed that Merv had picked it in one. I was also able to reconfirm that the coast HDD had died.

Further research on the Web revealed that it was possible to 'flash' the dud chip via a 'hot swap'.

Hot Swap BIOS Flash

The basic requirements for a 'Hot Swap' are:

- Plenty of desk space
- Two identical motherboards (computers)
- Two monitors
- Two keyboards
- Two mice
- Two BIOS chips (the GOOD one and the DUD one)
- The correct 'FLASH' program
- An IC chip remover (ideally plastic)
- Another computer connected to the Web for 'handholding' advice.
- Enough guts to do it - or insufficient brains to consider the possible result of 2 'dud' BIOS chips.

I dipped out on 2 keyboards, 2 mice, plastic IC remover, desk space, and not sure on which aspect of the last requirement I met. When I found that I HAD to use the metal IC gadget, I thought that I qualified on the 'insufficient brains' bit.

I had to keep swapping the keyboard and mouse over to the computer on the Web during the process, to make sure I was on the right track.

The process involved:

A. putting the good BIOS chip into one of the computers, plus a W98 'rescue' bootup floppy and getting to the DOS prompt.

B. putting the floppy with the 'flash' program into drive A:.

(This floppy now had two programs on it as a result of unzipping 6vxc_4x_fc.zip, they were:

- 6VXC-4X.FC and
- Flash852.exe)

C. removing the GOOD BIOS chip* and put the DUD one into the socket on the motherboard, while it is still running and connected to the 'lectric'.

This is where the 'guts'/lack of brains bits comes in. With the computer still switched on, and the metal tongs on the IC tool, the fear of 'shorting' something out is pretty high. The chip socket is very close to the edge of the case, and I found I didn't have enough room to get anything made of plastic into a position where I could lever the BIOS chip out. The only thing that would get it out was the metal remover tool.

D. running Flash852.exe. (various entries on the Web made me apprehensive about what to type into Flash852, but when it loaded it put up a reasonable graphical screen that wasn't too hard to use.

E. typing '6vxc7-4x.fb' into the LOAD section of Flash852 and pressing Enter.

(I found it was sensitive to upper and lower case - in DOS mode I had to use Shift to get lower case.) The unzipping had changed '_' to '-' in the final file.

After Flash852 had done its stuff, I found that the computer would do a normal boot.

As you can imagine this was a great relief.

Conclusion

The coast computer now has the GOOD BIOS chip in it with a new HDD. The spare computer has the Flashed BIOS (ex-dud) chip in it with its original HDD.

I think I'll keep 1 spare mouse, 1 spare K/B as well as the spare monitor for future emergencies.

I don't know what 'cooked' the BIOS. Maybe the HDD was failing early on and did it.

But it is a 'chicken and egg' situation. Quite possible that the BIOS problem, and innumerable reboots jiggered the HDD.

I don't want to do that again. (If I do I'll use this diatribe as a 'cheat sheet'.)

I have no idea how Merv worked out what the problem was.

I'll get out of your way now.

[INDEX](#)

[NEXT](#)

More humour from the net

For those who love language:-

1. Those who jump off a bridge in Paris...are in-Seine.
2. A backward poet writes...inverse.
3. A man's home is his castle, in a manor of speaking.
4. Dijon vu - the same mustard as before.
5. Practice safe eating - always use condiments.
6. Shotgun wedding: A case of wife or death.
7. A man needs a mistress...just to break the monogamy.
8. A hangover is the wrath of grapes.
9. Dancing cheek-to-cheek is really a form of floor play.
10. Does the name Pavlov ring a bell?
11. Condoms should be used on every conceivable occasion.
12. Reading while sunbathing makes you well red.
13. When two egotists meet, it's an I for an I.
14. A bicycle can't stand on its own because it is two tired.
15. The definition of a will? (It's a dead giveaway.)
16. Time flies like an arrow. Fruit flies like a banana.
17. In democracy, your vote counts. In feudalism your count votes.
18. She was engaged to a boyfriend with a wooden leg but broke it off.
19. A chicken crossing the road is poultry in motion.
20. If you don't pay your exorcist, you get repossessed.
21. With her marriage, she got a new name and a dress.
22. When a clock is hungry, it goes back four seconds.
23. The man who fell into an upholstery machine is fully recovered.
24. You feel stuck with your debt if you can't budge it.
25. Local Area Network in Australia: ... the LAN down under.
26. He often broke into song because he couldn't find the key.
27. Every calendar's days are numbered.
28. A lot of money is tainted - It taint yours and it taint mine.
29. A boiled egg in the morning is hard to beat.
30. He had a photographic memory that was never developed.
31. A plateau is a high form of flattery.
32. A midget fortune-teller who escapes from prison is a small medium at large.
33. Those who get too big for their britches will be exposed in the end.
34. Once you've seen one shopping centre, you've seen a mall.
35. Bakers trade bread recipes on a knead-to-know basis.
36. Santa's helpers are subordinate clauses.
37. Acupuncture is a jab well done.

[Index](#)

[Next](#)

PCUG Help Directory

The people in this directory are volunteers, so please observe the times given. The Help Directory is designed to help individual users and should not be used as a substitute for corporate support calls to vendors. This service is provided for members only.

Please quote your membership number to the helper. Additions or amendments to this directory should be sent to editor@pcug.org.au

Region	Subject	Name	Email	Phone	Days	Times
	Home Installation Team (HIT)	John Telek	tweek@pcug.org.au	0418605930	All days	Any decent time
Chifley	WinXP, PC hardware, Connections	John Saxon	jsaxon@pcug.org.au	6161 1524	All days	9am to 7pm
Dickson	WinXP, Mozilla, Office XP	John Agnew	jfa@pcug.org.au	6249 7911 0411147321	All days	9am to 9pm
Fisher	MS Word, Excel, Lotus WordPro, Agent	Derek Jordan	Derek.Jordan@tpg.com.au	6288 7810	All days	Any decent time
Flynn	Flight Simulator	Roger Lowery	bandrlowery@optusnet.com.au	6258 1583	All days	Any decent time
Hall Village	Noteworthy Composer	Andrew Purdam	apurdam@pcug.org.au	6230 2231	All days	Any decent time
Hawker	Home Installation Team (HIT) Internet connections, software and hardware.	Gordon Urquhart	gordonu@pcug.org.au	6254 5480	All days	Any decent time
Holt	FrontPage, Publisher, Internet Explorer	Gary Potts	gjpotts@pcug.org.au	6254 2818 0402342818	Mon Wed Sat	9:00am to 12:00 noon
Macquarie	Linux	Rod Peters	rpeters@pcug.org.au	6251 2580	All days	9am to 7pm
O'Connor	Digital Photography, Paint Shop Pro, Paint Shop Album	Jeff Colwell	jeffmeg@webone.com.au	6247 7756	All days	9am to 8pm
Page	Free software - installation and advice	Terry Bibo	tbibo@pcug.org.au	6255 2168	All days	9am to 7pm

[Some handy links](#)

Committee Members	http://www.pcuq.org.au/members/committee/index.htm
Monthly Calendar	http://www.pcuq.org.au/members/calendar/
Special Interest Groups	http://www.pcuq.org.au/activities/sigs.htm
Members' Services & Charges	http://www.pcuq.org.au/member_info/services.htm

[Index](#)