

MEMBERS NOTICE BOARD

Please use this Notice Board to benefit other members.



FOR SALE

Printer

Hewlett Packard DeskJet 895 cxi
with manual and installation disks
£50

Contact: Rosemary West
Tel. 294210

west_rosemary10@hotmail.com

Support local Isle of Wight Businesses

Dennis Parkes Computers

How to price one of our systems

First of all you need to decide which base unit or computer that you want and then add to it all of the bits that you need. If for example you want a Pentium 4 then you start with that and add a CD-Rewriter, sound card and speakers. If you want to have Internet access then just add for a modem. Then just add your monitor and choice of operating systems

17" Monitors from £68,
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Call for latest prices on all products.
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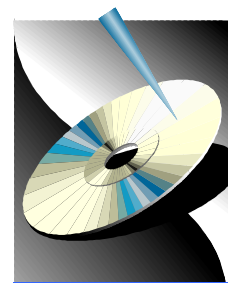


Printer Inkjet cartridges and Toner cartridges for all makes of Printers.

Also inks and toners for all makes of photocopying machines.
New and used photocopying machines (b/w & colour) available at competitive prices.
Contact: Dave Baldwin, 43 Park Road, Ryde, PO33 1HH
Tel/Fax: 01983 618618
Mobile: 07768 994838
Email: office@islandcopiercoltd.co.uk

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HOT KEY

ISLE OF WIGHT PC USER GROUP

MONTHLY JOURNAL

Issue 125 - April 2002



Dennis Parkes, Paul Phillips and Peter Deacon at "Building a Computer" meeting

Dennis Parkes was in good form as he demonstrated how to put an AMD 900 Duron computer together. Starting from an empty case, Dennis showed all the various components and handed around to the members floppy sticks of memory, ISA and PCI cards together with examples of what a processors looks like. He then went on to assemble the components starting with the motherboard. Dennis fitted the memory first to the motherboard, then the processor and secured the fan to the top of the CPU. He then fitted the necessary brass mountings to the case before fastened the motherboard with the appropriate screws. Dennis then attached the power leads from the power supply to the board and then placed the floppy drive, ISA and PCI drive, CDROM drive and hard drive into the case. He then attached the ribbon cables to the board, ensuring the red line on the cables lined up with pin 1 on the board and then the computer was powered up. A very interesting talk that was enjoyed by a well attended meeting.

In This Issue

Future Meetings	2
Editorial	4
Web Sites	6
Building a PC	7
Colour Management	8-9
Hardware Upgrades	10-11
Miscellaneous	12
File Associations	13
Prize Puzzle	14-15
Notice Board	16

FUTURE MEETINGS

3rd April	Net Meetings & Instant Message Systems	Dennis Linzmaier
17th April	Spreadsheets	David Broughton
1st May	World Wide Disability E-Mail Groups/ Talk on Computability	Pat Davidson John Austin
15th May	File Organisation for Dummies	Dennis Linzmaier
5th June	Internet Connectivity & related subjects	Jonathan Thornton
19th June	Computer Graphics for Dummies	Bob Groom
3rd July	Information Structure	Ian Moth
17th July	Website Creation & Uploading	Mike Bayliss and David Broughton
7th August	To be announced	
21st August	Annual Barbecue	

Suggestions for subjects and speakers are always welcome.

Is there a subject that particularly interest you?

Even if you don't know a speaker, the Committee may be able to find one.



Derek Tigg and Liam Thom at the "Building a Computer" meeting at Riverside

As each side in the game plays moves alternately, the parity of the position when it is FW to move will not change -- that is, with one exception: that exception is a move through the barn where a piece moves from 1 to 5 or 5 to 1. Thus, a move through the barn by F, W or C will change the parity of the position.

Consider the possible ending positions. For example, F is on square 11, C on square 12 and W on square 13. It is C to move (which it can't do) and the parity is even. So when it is F or W to move, the parity is odd. So you could not hope to win in this position if the parity was even when it was your turn to move. The parity must be odd when it is the turn of FW to move if you want to catch the chicken on an even square.

However, the chicken can always avoid getting trapped on squares 2, 4, 6, 8, 10, 12, 14 and 18 because there is more than one way of avoiding entering these squares.

That leaves squares 16, 21, 22, 20, 24 & 25 where the chicken can be trapped. Of these, I have never been able to trap the chicken on squares 21 and 25, so I advise that you don't try. (I can play the side of the chicken and allow myself to be trapped on 21 or 25, but I cannot play FW and win that way.)

This leaves squares 16, 20, 22 & 24 as ending positions for the chicken and implies that we need odd parity when it is FW to move. This is option 1 from the start position. If you choose option 2 then you are starting with even parity and you have to play so that one (or three, but not two) of the pieces (F,W or C) must go through the barn to change the parity.

When you have odd parity for FW to move, the chicken, now fearing doom, will do its utmost to get through the barn to swap the parity back. You have to prevent it, though if it does succeed you must chase it through yourself to restore the odd parity.

The tactics are then to set up a barn barrier with F and W and counting squares that the chicken can travel to prevent it getting past your barrier. Keep that barrier closed and move down the board watching at each stage to prevent the chicken fluttering past and you will be able to catch it on one of the squares 16, 20, 22 and 24.

How does the computer do it?

How does the computer work out the best move? The answer is that it uses a database which contains every possible board position with every possible move from that position with the value of that move. The value of the move is how many further moves to the ending point where the chicken is captured. It then chooses the move with the largest value, or, if more than one with the same largest value, it chooses from among them randomly (differently random for each game).

The database is not as big as it might seem. But where does it get the information to construct the database? Well, it could get it from another program that previously worked it all out. In fact, in this case, computers now being so much faster than they were, it works out the whole database contents between the time the program is loaded into memory and the time you see the first screen, which is less than half a second on most modern computers, so you don't notice it.



PRIZE PUZZLE CORNER

APRIL 2002

by David Broughton



My friend and I went into a shop, both to buy a widget. My friend gave a £10 note and received two coins in change with his widget. I, on the other hand, was eligible for a 20% discount. I, too, offered a £10 note and also received two coins as change. What was the undiscounted cost of the widget? Note: the coins available for use are £2, £1, 50p, 20p, 10p, 5p, 2p & 1p. The £5 note was not used.

Please send your answer to me, David Broughton (see page 3 for addresses) to reach me by Wednesday 1st May 2002 to be entered into the prize draw.

The Farmer-Chicken-Wife Puzzle/Game



This computer program (FCW.EXE) was on the February CD Cover Disk. Many members had a go but only Peter Woollerton sent in the secret code word and so won the £5 book token. Well done, Peter. It is not known how many other members tried and failed to catch the chicken (or how many succeeded but did not send in the answer). Many found it too difficult to beat the computer, even though you could swap sides to see how the computer would catch the chicken if you were in control of the chicken. This is not too surprising because computers can be made to be very "intelligent" with this type of board game.

It is difficult to show a solution due to a random element that allowed the computer to make moves that could not always be predicted. The random factor was used when there was more than one equally best move. (The best move is that which delays the capture of the chicken longest.) But although I cannot publish a solution, I can give some helpful hints how you can do the puzzle for yourself.

The chicken can only be caught on board squares that have two exits. In the diagram these are all the even numbered squares plus squares 21 and 25. (Squares 1 and 5 have three exits owing to the existence of the barn.) Notice that almost every move on the board will move from an odd-numbered square to an even-numbered square or vice versa; that is, every move will change the parity of the position. The parity of the position is either odd or even according to whether the sum of the squares occupied is odd or even.

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Letter of the month

For those members that haven't seen this letter on the iwpcusers e-groups we are reproducing Ingrid's appreciated letter for all members to read.

From: "Ingrid" <ingrid@alpenhome.freemove.co.uk>

To: "John Atkin" <kermit1940@btinternet.com>

Subject: Re: IWPCUG

Thank you for your e-mail. I have not re-newed my subscription because I have great difficulties getting to the meetings in Newport. I do own a car and drive quite happily for most of the time but recently the joints of my ankles have also been affected by arthritis and there are days when I would rather not drive. I am hoping that with the summer-time and warmer weather, my problems will subside and I will be able to travel again. As I am unable to join the meetings I had hoped that the IWCUG-Newsgroup would be more active to enable members who are in a similar situation to mine, to keep up with Group activities but alas, that is not so; although I must say that Brian is doing a superb job with the "Hotkey" Newsletter; it can't be easy to constantly have to find new material that is of interest to all members. I did join the comp. club in the first instance quite a number of years ago as an utter novice in the use of computers. In the beginning I was told "you'll soon pick it up as you go along" but I did not find that to be the case. I found the group very intimidating as it seemed to consist mainly of a group of men in their senior years who were holding forth in a language that was incomprehensible to me. I left then but was encouraged by friends to join again. I am a lot more confident now but found in re-joining that the situation had not altered much. New-comers still find it very difficult to make contact in the group. It takes a lot of courage, especially for women, to walk into an already established group. I meet a lot of older Ladies who are very eager to learn to use computers, mainly to keep in touch with their often far-flung families. These ladies are venturing into a technological world that is terribly scary and completely alien to them. They need a lot of encouragement and reassurance when they join an already well established club. When I look around me at the club meetings, I again see a great number of very knowledgeable men and a few equally "computer-wise" women but no novices. I did notice that one or two ventured in but never stayed for more than one or two meetings. Maybe a "buddy system" could be put into operation, where new members are greeted by a designated "befriender"? And teamed up with someone they can relate to until they are more at ease with the group and are less afraid to show their ignorance of even most basic "computer knowledge".

Sorry for this epistle but you asked for my thoughts on the matter.

Regards,
Ingrid

Our Chairman, Roger Skidmore replies

We do try to be a friendly club but a hesitancy to mingle and chat can sometimes be confused with stand-offishness. I don't think there is anyone who doesn't want to be friendly but sometimes it does take a bit of effort towards new members and people we don't know yet. The moral is, if you see someone who looks uncertain or ill-at-ease, then make the effort and introduce yourself! They would probably love to have a chat with you. Existing members can be just as apprehensive of new members, but have the advantage of being on home ground.

Roger Skidmore

ASSOCIATE WITH WHOM OR WHAT

By Wayne D. Ebert



Your computer has no idea what the file extension .rtf after the file name means, but Windows does recognize that this is a type of file. Now what to do when the user double clicks on the file to open and view the contents? Though Windows knows the .rtf is a file extension it must consult the file association listing to determine which application will open and display the contents of the file. To assist us humble users, Windows first displays a graphic image, then the file name and extension. There are many graphic images and thousands of file types, but this image indicates which application is associated with this file type.

To determine which application is associated with which file type, double click on the My Documents icon. Click on View menu, then on Folder Options from the drop down menu. Next click on the File Types tab. Scroll down the Registered File Types fields to Rich Text Format and click on it. In the lower portion of the display the File Type Details area shows which extensions and applications are associated with the .rtf file type. In this instance the application associated with Rich Text Format (.rtf) files on my computer is Windows Word with the graphic of a page with a blue W in the upper left. Consequently when a file with an .rtf extension is double clicked Windows Word will open and display the file's content. This association was established when Word was installed along with the other file types Word can open and display such as a file with a .doc extension. As each application is installed their associations are established. However, you can change the associations and use that frequently ignored Right Click button to Edit the file using an alternate application. If you already have a shortcut for the alternate application you want to use, right click on the shortcut and select Properties. Make a note of the displayed file path. Then Double click the My Documents icon, Click View and select Folder Options and click on the File Types tab. Scroll to the file type you want to Edit and click on it. Click the Browse button to locate the application file you want to use to open and Edit. Confirm the path from your note. Clicking on this path will enter it in the Application Used to perform Action field. Click OK and close the remaining windows. The file will still open in the original application. If you want to Edit this file, Right Click and select Edit from the menu. The alternate application will open with the file. This additional shortcut is useful for graphic images to first view the image/ picture and then Edit the image with an application with additional features.

In summary, file associations are convenient shortcuts but can create system and file problems if used improperly. If Windows tries to open a file in a program that can't read it, you'll get an error message. Confirm the application opens the file type before you associate it. If you have a file type question, visit <http://www.whatis.com/> to review the file types listed by their extensions. You'll also find current IT-related word definitions here.

COMPUTER QUIP

If you put tomfoolery into a computer, nothing comes out of it but tomfoolery. But this tomfoolery, having passed through a very expensive machine, is somehow ennobled and no-one dares criticize it.

Pierre Gallois



Avoid This Fake Microsoft Security Patch

Microsoft doesn't send out security patches by email. To my knowledge, it never has. Still, a number of people have been fooled by an email purporting to be from the "Microsoft Corporation Security Centre" and carrying the subject line "Internet Security Update".

The fake email mostly uses the format and language of real security bulletins to offer an attachment (Q216309.exe) that's supposed to be a cumulative patch that eliminates "all known vulnerabilities" in Internet Explorer.

Of course, it's not a security patch at all; it's the W32.Gibe worm, which uses Outlook and its own internal SMTP engine to propagate. You can get all the gory details--- and removal instructions--- by searching your favourite security site. For example, go to <http://securityresponse.symantec.com/> and search for w32.g i b e.

Remember: Microsoft doesn't mail out patches. You have to get them via Windows Update or by going to <http://www.microsoft.com/security/> and manually downloading them. That latter site is also a good place to check to see if any supposed patch from Microsoft is real or not.

Just For Grins

Reader Julio Mora --- who works in IT--- sends along this "funny but true user story:"
I'm a tech at my place of employment. We do huge backups of user data every night but of course if a user has a file open or they just created a file and never saved it and it crashes, it would not get backed up.

A user called and said that she needed a file restored... The tech looked in our web backup but gave up after looking at the previous day, and going back a couple of weeks. He called the user who informed him that she had just created the file that morning and never saved it; her app crashed and she lost her work and wanted the files restored from backup.

The tech explained that file recovery is only done on files that had been created and saved the day before.

The user then said "Ok then I'll call you tomorrow, thank you" and hung up the phone.

Our thanks to the Fred Langa newsletter for this info- <http://www.langa.com>

H U M O U R



~Web Sites~

Windows XP Tips and Tricks

www.techtv.com/screensavers/supergeek/story/0,24330,3338109,00.html
(A good Site to check out if you are thinking about installing XP)

Resources for People With Print Disabilities

w3.one.net/~hamilte/disab/index.html
(This site serves people with print disabilities: vision impairments, dyslexia and learning disabilities)

More Info on Windows XP

www.microsoft.com/windowsxp/default.asp
(Find out more about Windows XP with demos, tours and articles)

ScreenHunter 1.1 - Freeware

<http://www.wisdom-soft.com/>
(A screen capture tool that saves the screenshot as a .bmp or .jpg file without having to open Paint or PaintShop Pro)

DID YOU KNOW?

A really quick way to view all the details on what is in a folder, such as size, files, location, attributes, when it was created and more, is to highlight the folder and press Alt+Enter in Windows Explorer.



or video editing, but not necessary for most "grass-roots" users.

They cost a lot: 50% to 100% or more than Ultra DMA drives of similar capacity and a SCSI drive may not be noticeably faster for the work most of us do most of the time.

Removable cartridge drives appear to be losing ground. Syquest apparently went belly-up and Iomega's profits have been affected by the competition. Cartridges are not cheap and they are slower than UDMA drives. High-Capacity Floppy drives and media cost about the same but have the advantage of backward compatibility (i.e. they read and write to traditional 3.5-inch floppy diskettes). CD-R/DVD drives are now a good choice as prices have dropped.

Be careful when you read advertisements as drives advertised as "OEM" or "bare drive only," is common practice for some mail order dealers which means that these hard drives normally don't include any cables, instructions, software (drivers and utilities) or mounting hardware. The inclusive version comes in full retail packages, which normally cost more.

You can usually download drivers and utilities from the drive maker's Website but unless you're comfortable dealing with hardware and have some know-how, the retail package is your best bet. The instructions and installation utility alone can be invaluable. If installing hardware is scary for you, ask about having the drive installed or seek help from a knowledgeable User Group member. I have found that utilities such as Seagate's Disc Wizard make installation virtually painless if you follow the directions!

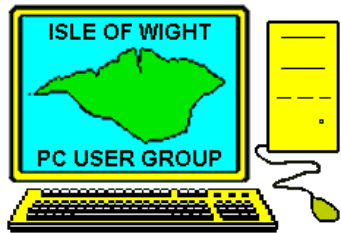
If you have a computer built in 1997 or before, its BIOS likely won't support a UDMA drive larger than 8.4GB; most systems built after about mid-1998 include such support. OnTrack's Disk Manager may correct this, but the easiest way to avoid problems with older computers is to go no larger than 8.4GB. Also, if you run Windows 95 or Win98 with FAT32, you must divide the drive into partitions of no more than 2.1GB. PartitionMagic from PowerQuest is the best tool for this job.

Not so incidentally, hard drive manufacturers have some of the best, most helpful Websites around. Go to: Seagate, <http://www.seagate.com/>; Western Digital, <http://www.wdc.com/>; Maxtor, <http://www.maxtor.com/>; IBM, www.storage.ibm.com/hardsoft/diskdrdl.htm; or Fujitsu, www.fujitsu.com/harddisk.html.

Hope this helps you expand your computer horizons and gives you room to grow!

Ken

(Author's Note: I want to give credit to Earthlink Network, <http://www.earthlink.net/>, source of much of the information contained above. Its site deserves regular visits because it contains a lot of useful Web-oriented information that is updated frequently.)



The Isle of Wight PC User Group

welcomes all owners and users of IBM Compatible Personal Computers.

It is a group which seeks to exchange ideas and seek new information.

Our meetings are informal **on the first and third Wednesdays of each month at The Riverside Centre, Newport, 7.30 - 9.30 pm.**

The first Wednesday has usually a formal talk whilst the third Wednesday is more informal, geared to the new user and aims to help out members with specific problems.

Membership is £12 per year.

Visitors are welcome.

This journal, "HOTKEY", is produced every month.

If you would like to know more about us, either come along to one of our meetings or contact one of our Committee Members on one of the numbers on page 3.

Club's Website - <http://www.iwpcug.org/>



Upgrades That Make Sense

Adding Drive Storage Space

by Ken Fermoyle

Women say: "You can't be too thin, too rich, or have too many silk blouses." A computer corollary might be that a system can't be too fast, have too much RAM or too much hard disk capacity.

One could argue the first premise in both cases.

Being too thin might mean anorexia, which isn't good, and a computer can have a faster, more expensive CPU (central processing unit) than its owner needs. There can be no argument, however, that you no longer need to be rich to afford lots of RAM and drive storage space. (I haven't priced silk blouses lately.)

The entry level for RAM now is 128MB and many new machines offer 256MB. Going to 512MB or more may be indicated for servers or some high-end tasks, but is probably overkill for most of us right now.

Running out of storage space often is one of the first limitations you run into with an older computer, especially in these days of ever-bigger software programs. Fortunately, remedies today are easy, inexpensive and varied.

- Large-capacity Ultra DMA (Direct Memory Access) drives can replace, or be used in addition to, existing hard drives in many computers.
- SCSI (Small Computer Systems Interface) hard drives are expensive, very fast, come in many varieties but require a special interface board.
- Removable-cartridge Zip and Jaz drives from Iomega can be mounted internally or externally (connected through a parallel port).
- High-capacity drive, such as the 120MB Super Drive, can replace traditional 3.5inch floppy drives,
- CD-RW (rewriteable compact disk drives) are now up to 20write/10rewrite/40read and all have burn proof technology to avoid buffer underruns.

All have good and bad points. Ultra DMA drives these days provide huge capacities (Western Digital and Maxtor have produced 120Gb hard drives) but are value for money (as little as 5 to 10 cents per megabyte), generally easy to install and are as fast as some SCSI drives. They double disk read and write speeds of earlier DMA drives from 33.3MB per second to 66.6MB/sec. (Some UDMA drives that support 133MB/sec are now available and require an 80-pin cable instead of the 40-pin cable standard for 66MB/sec drives. The two cables are pin-compatible, but the 80-pin version has added ground wires to reduce crosstalk.) UDMA also allows data transfers to take place with very little CPU involvement, which can mean better overall system performance. SCSI drives come in a bewildering number of categories: Wide, Fast-Wide, Ultra Wide and the latest Ultra 2 LVD (Low Voltage Differential). They need SCSI boards of varying types (and prices) to provide maximum performance. Frankly, I feel that SCSI drives are great for servers, game-players, multimedia or high-end graphics work and heavy-duty publishing

HOW TO BUILD A PC

By Dennis Parkes



This "How To" assumes that you have a basic knowledge of what each component is and that you are competent with computers.

1. Remove the case and lay the computer on it's side so that the open area is facing upwards.
2. Remove the motherboard from its protective wrapping and place on a hard surface.
3. Locate the CPU (Central Processing Unit) socket and pull the lever to the upward position.
4. Remove the CPU from its protective wrapping and place in the CPU socket (you will notice that one corner of the socket has a pin missing. Line this up with the one on the CPU).
5. Gently return the lever to the storage position (you should feel a little resistance).
6. Check that the CPU is securely in place. Remove the fan from the box and attach it to the top of the CPU (note, most fans will only go one way round).
7. Remove the memory from its protective wrapping and attach to the board.
8. Retrieve the bag of screws from the case.
9. Find 4-6 brass coloured mountings and line the board up with the case. Attach the mountings where the holes correspond and place the board in the case and screw into brass mountings.
10. Attach the power leads from the PSU (power supply unit) to the mountings on the board (making sure that the black leads go together in the centre).
11. Attach the COM, PS/2 and LPT connectors to the board and the plates to the case.
12. Place the video card into the first PCI slot (the one closest to the PSU).
13. If there is a network card, place this in either the last ISA slot (furthest from the PSU), or the last PCI slot (furthest from the PSU).
14. Attach the case lights to the board (as detailed in the motherboard manual).
15. Place the floppy drive into the top 3.5" slot and screw into place.
16. Attach the floppy ribbon cable to the board (making sure that the end with the least connectors is attached to the board), then attach the other end to the floppy, with the knobbly bit facing down. NB. If the floppy light is on constantly when the compute is switched on, try turning this cable up the other way.
17. Place the hard drive into the bottom 3.5" slot and screw into place.
18. Attach the IDE ribbon cable to the primary IDE port on the board (making sure that the end with the least connectors is attached to the board) and then attach the other end to the hard drive, with the knobbly bit facing up.
19. If the computer is going to have a CD-ROM or CD Rewriter drive, then place it into the top 5.25" slot and screw into place.
20. Attach the second IDE ribbon cable to the secondary IDE port on the board (making sure that the end with the least connectors is attached to the board), then attach the other end to the CD-ROM drive, with the knobbly bit facing up.
21. Attach the power to each of the devices (not forgetting the CPU fan).
22. Check that all of the leads are secure, attach the leads to the back of the case and switch on.



There's probably nothing wrong with any of the components in your set-up, it's just that they don't know how to talk colour to each other. The problem is that all the components between camera and printer handle colour slightly differently. Very often they're built by different manufacturers, which doesn't help. But the biggest problem is that printers generate colour in a fundamentally different way to how cameras and scanners pick it up and monitors display it.

A digital camera works in roughly a similar way to your eyes. They respond to a mixture of the three main colours in visible light: red, green and blue (often written as RGB). Normally a file from a digital camera is in RGB.

A computer monitor works the same way in reverse: it shines red, green and blue light in different mixes which your eyes and brain perceive as colours. This is called additive colour, because you add two or more colours to make another. An equal mixture of red, green and blue makes white light or if you wind the intensity down, progressively darker shades of grey until you reach black. Unequal mixes of the three colours make other colours: red plus blue makes the purplish colour magenta, blue plus green makes a pale turquoise called cyan and red plus green makes yellow.

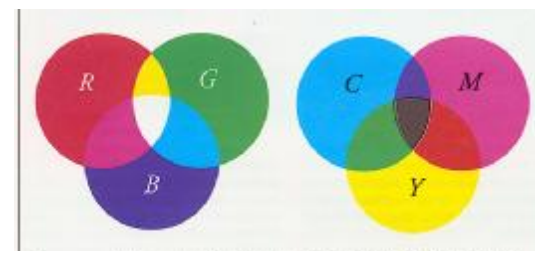
Printed colours work differently. White paper can only reflect light that falls on it. This means that you have to print with inks that absorb colour as it hits the paper and bounces off. This is called subtractive colour, because it works by taking light away, not adding it together. The three colour inks are magenta, cyan and yellow (or CMY). Magenta absorbs green light and allows red and blue to reflect from the paper, cyan absorbs red light and reflects green and blue and yellow absorbs blue light and reflects

red and green. The more ink you print, the darker the image, while equal quantities of CMYK (cyan, magenta, yellow, black) give progressively darker shades of grey until they read black.

The range of colours produced by each system or device is called its colour gamut. Whatever system or product you're using, there will always be some colours outside the gamut that cannot be reproduced. A colour monitor tends to fall over on orangey-yellows.

The different gamuts of additive and subtractive colours are the main reason why printed colours usually look duller than those you see on a computer screen. To convert the RGB colours from scanners, digital cameras or monitors into the CMYK subtractive colours of print, you use a colour separation program. This is often built into printer drivers, colour manipulation programs such as Photoshop. If you have a copy of Adobe Photoshop, the software is supplied with an excellent control panel program called Gamma.

As part of the conversion process the colour separation program takes colours that are outside the CMYK gamut for the particular printer and converts them into colours that it can handle. Colour separators are usually pretty good but they still might not give you the results you expected because they don't know the colour gamut of the device you started with, such as your digital camera. For this reason, colour printer drivers are often supplied with adjustment controls that let you alter the overall contrast or brightness, tweak the relative strengths of colours and to make sure that neutral greys don't have a colour cast. If you have a digital camera and a scanner, you may need to set up different adjustments for both.



What's needed is an automatic colour management system. This works by defining a standard set of colours, called a reference colour space and applying correction profiles to bring the colour characteristics of input and output systems into line. The idea is that any input device (normally a scanner or digital camera) can be corrected so that, say, its idea of 50% red matches the "real" 50% red of the reference space. This might mean adding 2% red to the scanner's 50% red value. This process is repeated and calculated for all the possible values of each colour from dark to light and the resulting correction table is written into a little program called a **profile**. Output devices work the other way round: a printer might produce over-dense results, so a profile might have to subtract say 4% from the reference colours 50% red in order to get a true 50% red on the printer. The use of a reference colour space means that you can easily mix and match different types and makes of input or output device in the reasonable hope that your printout will match both your monitor image and your original digital pic. A group of manufacturers have formed a steering group called the International Colour Consortium to define and standardise the way colour management profiles are written. The ICC 2.0 standard for profiles is the standard for Windows PCs. As long as you have a profile for your camera or scanner, your monitor and your printer, you should be able to get correct colour no matter what combination of makes and models you put together. Colour monitors are notoriously variable and special calibration systems are available for these, which both adjust the brightness settings to make them look more like paper and write individual ICC profiles for your system. If you don't have Adobe Photoshop, it's still worth setting up your monitor properly using something like the

Pantone Personal Calibrator program. Many monitor manufacturers can supply ICC 2.0 colour profiles for their devices, either with the driver software or from their web sites.

To do anything serious with digital photographs on a computer you must be able to display 24 or 32 bit colour through your monitor, which gives a full range of photographic tones. The characteristics of any monitor change as it warms up, so leave it switched on for half an hour before attempting to adjust it. You also need to pay attention to room lighting. Try and position your monitor where direct sunlight cannot fall on the screen and there isn't a window behind it to glare into your eyes. Ideally you should work in fairly subdued lighting.

Assuming you have contrast and brightness controls on your monitor, first turn both of them up to maximum (ie brightest and most contrasty). Then turn the brightness control down until the black margin around the main display just turns to a true solid black. You're aiming to get the screen as dull as possible without being at all hard to read in your normal room conditions. Then wind the contrast down until black on white text looks natural.

If you find that your photographs have a consistent colour cast or exposure problem, it may be because there's a slight mis-match between the CCD (colour calibrated device) and the camera colour compensation. In this case it may be worth creating a standard adjustment that you can apply to every image. The better colour printer menus include controls for fine-tuning the colour balance of the printing inks. Use these by all means, but if you've set up your monitor properly and adjusted the image on-screen, there ought to be little need to tweak the printer.

Our thanks to What Digital Camera for these extracts