

Cave Photography Group

Newsletter 2 (March 2001)

Here we are with the second CPG newsletter already. We are off to a running start, with over 80 subscribers including many from overseas. We have plenty in store in this issue which we hope you will find of interest. Articles include experiments with large flash bulbs, motivation to get out and take more underground photographs, tips on setting up your shots in the dark, and locating the flash guns again afterwards! Plus our regular digital column, which this time round covers some of the ways that you can save your digital images. It is good to see some articles from new contributors in this issue, but we hope that in the coming issues we will be able to bring you material by an even larger range of our readers. This newsletter is the voice of the CPG members and we hope you will share your experiences with us all. So why not put pen to paper, or fingers to keyboard, and send us an article for the next issue? We cannot produce the newsletter without your input.

We have plans to produce the next newsletter in full colour, and the printing quality will be good enough to enable us to reproduce photographs. We are therefore looking for pictures to include. This is an excellent opportunity for you to show your work to a wider audience. Issue two is the last one we are planning to distribute for free, so we hope you will join the CPG and continue to receive the newsletter. Details of the future newsletter format and membership information can be found in the news section. If this is the first issue you have seen then you can read issue one on our website (address below). This newsletter is produced for you, so please let us know what you think of it, and what you would like to see covered in future editions.

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Cave Photography News

Joining the CPG and Details of Future Newsletters - By Footleg

The Cave Photography Group has now produced two editions of our newsletter and distributed them at no charge in order to generate interest in the group. Now the time has come to formalize membership of the CPG and put the newsletter on a more stable footing. The first newsletter attracted a good deal of interest, and an offer from one of our readers, Chris Wood, to print future editions of the newsletter in full colour at a non-profit cost which makes this possible. This will enable us to include full colour photographs in the newsletter, which I am sure you will agree is a definite step in the right direction for a cave photography organisation.

In order for it to be worth our while producing a colour printed newsletter, we have decided that it will not be possible to continue to distribute an electronic copy of the newsletter free over the internet. We hope that the majority of our readers will prefer to receive a real printed copy rather than a virtual one once we are publishing a colour photographic newsletter. This is also partly because of copyright concerns which some photographers have regarding the publication of photographs on the web site.

Individual membership of the CPG will cost £12.00 per year and this will include regular editions of the newsletter for the year. Due to the fact that we are UK based we regret that we will have to charge overseas members a higher membership fee to cover the additional postage costs for sending the newsletters out. We are also intending to distribute the newsletter through regional caving retail outlets as a way of generating further interest and increasing our membership base. Copies of the newsletter will be available for £2.95 per issue through various caving shops. We will not be selling individual copies of the newsletter directly ourselves, but hope to retain a small number of back issues for sale to members who join the group in the future.

You will find a membership form with this newsletter, or on the CPG website. Please fill one out and return it to us promptly with your membership fee to ensure you receive the next edition of the newsletter due for publication in June 2001.

Spring Photographic Field Meet

- By Richard Rushton

There is just time to remind you all about the CPG photographic field meet that is due to be held in the Yorkshire Dales over the weekend 24th and 25th of March. This will be based in the Dalesbridge Centre (between Settle and Ingleton) on the Saturday when we will be holding talks and slide shows etc. On the Sunday we will be venturing underground (subject to access restrictions on account of the current Foot and Mouth disease outbreak) in an attempt to put all our newly acquired skills to the test.

In addition to talks from Dave Gibson, Footleg and myself we also hope to have some international cavers attending, with slides of Canadian and other foreign caves.

We are also in the process of trying to set up a preview of the film 'Highest & Deepest' with Sid Perou. Those of you who attended the field meet last year will remember the discussion held by 'Chips' Rafferty about the planning of this project. If this year's event is anything like the field meets that we have held in previous years (hosted by the BCRA special interest group CREG) it should be a really good weekend.

We intend to hold a mini salon on the Saturday for you to show your work - for which we will award a prize for the best image (print, slide, film or other are all eligible). This is an ideal opportunity to show your work to a small and select audience before you enter it into the national BCRA conference photo salon. If you are intending to come to the field meet weekend and haven't already contacted me then please do so.

You can write to me at the address on the front of this newsletter, you can phone me on 01756 794538 or e-mail me at cpg-meetings@caves.org.uk. Don't miss out - come along and have a great time!

STOP PRESS!

We have checked with the Dalesbridge Centre about the current situation regarding the Foot and Mouth disease outbreak, and they have assured us they will be open for business as usual due to the fact that they have an entrance directly off the main road and do not have any land used for livestock farming. Contact Richard if you have any questions.

Other CPG Field Meetings - by Footleg

In addition to the annual spring field meeting, the CPG is planning to organise a number of informal weekend meets. The format of these weekends will be simply to get together with the aim of doing some cave photography. This will give us the opportunity to share ideas and meet other like minded souls. The organisation of these weekends will be subject to demand, and will consist of just booking bed space in a suitable caving hut and possibly arranging for access to particular caves where permits are required. Novice photographers are welcome and there will be the opportunity to have some photographic instruction underground from more experienced photographers. However you should have some previous caving experience as there will be no formal leading of caving trips. You are free to turn up and do your own thing underground if you desire of course.

The first of these weekend meets was provisionally mentioned in the last newsletter for the weekend of 19-20th May 2001 to be held in Devon. We are currently waiting to see when the restrictions on caving due to the Foot and Mouth disease outbreak will be lifted. If you are interested in attending then please contact me or Richard (details on the front cover) so that we can let you know the latest plans and sort out accommodation.

If there is an area of the country which you would like us to organise a weekend meet in then get in touch. I am happy to organise a meet wherever there is enough interest and look forward to the chance to meet some more of our readers.

It's All Dark Down Here!

– by Richard Rushton

One of the things that distinguishes a cave photographer from his 'exclusively above ground' counterpart is the fact that he generally cannot see what he is taking the picture of. I know that he will have his 'cap lamp' on, his eyes open and will be able to look into the scene in front of him. He can use his imagination to form a picture of what he thinks the camera will capture, but ultimately he will not know what the camera actually saw until he gets the prints or slides back from the processors. To some extent this can be part of the charm of cave photography, but on the other hand it can be a bloody nuisance.

Most of the modern camera manufacturers have spent a great deal of time, effort and money in improving the camera viewfinder so that the image in the view finder is large, clear and sharp. But how many of us take our modern £500+ all electronic (and very fragile) SLR's underground with us on our photographic trips? For those of us who use a second hand, mechanical camera underground, which was probably new in the 60's or early 70's, life is more difficult. Even if our camera did have a large and bright view finder image, the caving environment is still difficult to see through the view finder.

I generally use flash guns to illuminate my subject and scene. These guns will only give out their light over a very short period of time and usually at the time of actually taking the picture. At this time the mirror on my SLR flips up and I cannot see anything of the scene in front of the camera (even if it wasn't so dark) – I don't even know if my flash guns have actually fired! After every shot there is the phrase uttered by the photographer 'Did that gun go off?' – to which a reply of 'Yes - it's just bloody well blinded me!' is taken as a good result. Even when you know that a flash gun has fired, there is still some element of doubt as to how well it has illuminated a given area. Sometimes, in large chambers or long passages, I even have difficulty in locating the guns, which makes setting up the shot difficult, so as to avoid flash breakthrough (flash looking back at the camera) or subject placement, so as to be correctly illuminated.

So – am I about to tell you about some electronic gismo that will instantly make your life a joy of simplicity? Unfortunately not! There are some electronics which can help in locating flash guns or in letting you know that they have fired or not. You could take 'modelling lamps' underground that will illuminate the subject and scene in the same ratio as your guns – but this can be rather impractical for large chambers.

Ultimately, I am of the opinion that the imagination and skill of a good cave photographer in 'seeing' what he cannot see through the viewfinder is what raises him and his photographs above the mediocre snaps, taken on the fly, to the great picture that you would be proud to hang on your wall.

Sub note: I apologise if my use of colourful language in the above article or my exclusive reference to the masculine gender of the photographer has offended any of the readers.

Infrared Filters

- by David Gibson

People sometimes use fogged B&W film as an infrared filter to allow a 'dark' flash gun on the camera to trigger remote slave units. Using this technique, you might find that your slave units are somewhat less sensitive than usual. There are two possible reasons for this – one is that the infrared light is partially attenuated by the fogged film; the other is that the overall light energy reaching the slave is lower (this only applies if the slave is sensitive to visible, as well as IR light). I read, recently, that chromogenic B&W films, such as Ilford XP2 do not attenuate IR light to the same extent as conventional silver halide film, so they might make better IR filters. On the other hand – do not attempt to view the sun through a fogged chromogenic film during a solar eclipse.

The CPG is Alive!

– by Richard Rushton

As you will all know (because you're reading it) the Cave Photography Group has issued two newsletters so far in our short existence and we have had interest shown from all over the world. It looks like (as we suspected) the caving photography world wants a group to disseminate information, publish news and articles and to organise meets - look out for the Dales field meet later this month.

As with all new borns we have started off small and we are just finding our feet. We want to grow quickly to meet the needs of the photographic caving world, but we don't want to over stretch ourselves and come crashing down. So if we aren't doing what you want just yet, please be patient, but please let us know.

At the moment the CPG has no official funding and is not linked to any major organisation, however we feel that to tackle some of our current aims and to improve the quality of our newsletter we should find ways of securing a steady income. To this end we are considering a membership fee for the group which will be used entirely to fund group activities (including the publication and distribution of the newsletter). We are also considering joining one of the national caving organisations, which should offer some degree of support, protection and is likely to make some aspects of administration easier (we hope!).

At the moment there are only a few of us co-ordinating the activities, however we do have an ever increasing band of volunteers (like ourselves) who are willing to put a little time and effort into making the group a success. We are interested in receiving newsletter articles and pictures for publishing on a web gallery or for publication in the next generation newsletter (submission details can be found on the letters page).

We welcome all your views on where you want the group to go from here and what areas you want us to concentrate on. Please feel free to contact myself if you would like to express your views or if you feel that you can contribute in any way to the continuing success of the Cave Photography Group.

Readers' Letters

Issue 2 of the newsletter, and our first reader's letter. I hope that more of you will follow suit for the next issue and let us know what you think of the newsletter and our ideas for the CPG. This newsletter is written for you, so please tell us what sort of articles you are interested in reading (or better still write an article and send it to us!)

Dear Editor,

I was interested to read Richard Rushton's article on *Short Pitch Composition* in the first CPG newsletter. Personally I consider pitch pictures to be the most difficult type of underground shot (though admittedly I've never tried taking photos in sumps!) and would like to add a few comments to Richard's remarks.

On the whole I agree with nearly all of what Richard says, in particular with his comments on 'bum shots'. The oddest example of a bum shot I ever saw was in Ben Lyon's book *Venturing Underground* where, on page 39, there is a back view on someone crawling off down a low passage. What makes this picture is the caption, which includes the sentence 'Passage was virgin when picture was taken'; the mind, as they say, boggles! Anyway, I would agree that photos looking down a pitch are generally better than ones taken looking up.

However, Richard stresses the importance of eye contact; actually I'm not convinced about this. In principal, I agree, it sounds like a good idea to maintain eye contact, but in practice when I'm climbing a rope I tend to get my head down and go for it, glancing up occasionally to see how much further it is ... hence I tend to regard pictures with someone looking up at the camera as somehow artificial.

I certainly agree with Richard on one point, and that is the necessity to keep an eye on the safety of yourself and your friends. I still break out in a cold sweat when I think of the time I was trying to photograph the main shaft of Gaping Gill, rigged in the north-west corner of the open hole where a short descent gains access to a traverse on two ledges, each about 15 cm wide, one on each side of a 'minaret'-shaped passage about three quarters of a metre wide ... without a floor, and with some 84m or so of fresh air between the caver and oblivion. Wanting to change my position, I reached round to adjust my cow's tail only to find that somehow, what with juggling around with the camera and flashgun, etc, I'd forgotten to clip into the traverse line ...

Good luck with the new publication, and in answer to the questions 'would you like to see pictures in future issues, and would you be prepared to pay for this?', my answer is 'yes' to both.

John Forder

PS Just for the record, the GG pictures were crap – definitely not worth dying for!

Letters can be posted to the Editor at 29 Gledhow Park Grove, Leeds LS7 4JW or emailed to cpg@caves.org.uk

A Useful Little Gizmo For Locating Your Flash Guns In The Dark

– by Richard Rushton

As I have mentioned in my article above, it can be difficult to find the location of a flash gun in a large chamber or long passage. All my flash guns are matt black and I tend to place them in concealed shadowy areas, which further exacerbates the problem of re-locating them when I am back at the camera position.

To help in locating the guns I have built some small LED lamps that can be positioned with the gun and that can easily be seen over great distances. The light output of these LED's is relatively low (compared with the flash its self) so they don't tend to register on the film – although long 'Open Shutter' shots would probably register them. If I am taking a shot using back light subjects I can easily position the camera so that flash 'breakthrough' is avoided. Also the position of the flash burst can be controlled. I have had shots where the back light was positioned behind the groin area of the subject, leading to a flash breakthrough between his legs, rather than the strong head silhouette I was attempting to produce.

To build one of these simple devices you could use low current LED's, with a series resistor (to limit the current) a simple switch and a 9V (square type) battery. The LED does not need to be the high current, bright LED's that people are experimenting with for caving light and the lower the current draw the longer it will last on one battery. I have found that a miniature sliding switch is generally robust enough to survive the same conditions as your flash gun and does not usually accidentally get turned on (as a toggle switch might). This type of subject has been covered in numerous articles in the Cave Radio & Electronics Group (CREG) journals.

If building LED lamps is too much of a chore then there are alternatives that can be bought 'off the shelf'. Lock illuminating key rings or novelty toys might fit the bill. My advice is to go for the cheapest and smallest device you can find – that way, when you lose it, it won't break your heart.

Submission of Articles

The deadline for articles to be included in the next issue of the newsletter is 30th April 2001. We are always looking for articles and photographs for the newsletter. We can handle word processed articles in all Microsoft Word formats for IBM compatible PCs, Rich text format (RTF) or plain text. Articles should be between 250 and 1000 words in length. The editor reserves the right to crop articles to fit the page layout. Articles can be emailed to the editor or sent by post (addresses at the front of the newsletter). If you wish us to include illustrations or images then please email or phone the editor first to ensure that we can deal with the file formats you intend to send us. Please do not email large attachments to the editor without informing him first, and obtaining an email address from him which can cope with larger amounts of data. Alternatively you can mail articles on floppy 3.5" disks, CD-ROMs or iOmega 100MB Zip disks to the editor.

Big Bulbs-R-U's

– by Glenn Jones

Frustrated by excessive faffing and poor results when trying to photograph large cave passage, Glenn Jones and Andy Pryke embarked on a programme to produce a reliable and powerful light source for photographic projects in France last summer.

Andy (Pryke) and myself had purchased a case of 80 Meggaflash PF50 flash bulbs with which to have fun – and fun we had! Before setting off for darkest France, we thought that we should run off a test film to understand the PF50s characteristics. The PF50s are a clear bulb and the four tests were designed to understand what effect (if any) using the clear bulbs would have on daylight film, and if we needed to add a blue correction filter in some way. The test film used was Agfa CT Precisa 100ASA slide film.

Andy had previously calculated a guide number for 100ASA film of 94 indicating that at f4 a distance of some 23.5 metres should be illuminated.

Yordas Main Chamber (large chamber in the Yorkshire Dales) was chosen to undertake the tests. A yellow oversuit was hung on the back wall of the chamber (as a control for a known colour) and 23.5 metres were measured back to where the flash gun was placed on a tripod. All tests were made with the camera (located on a second tripod) on B at f4, with the PF50s being fired manually (see below for details of bulb firer).

Four test exposures were made:

1. Clear PF50
2. PF50 covered with one coat of Vitrail transparent blue glass paint
3. PF50 covered with two coats of Vitrail transparent blue glass paint
4. Clear PF50 with Cokin + 1 blue (80C) filter (A022) on camera

Results:

Test 1: Good light coverage for about two thirds distance. Whilst yellow oversuit and back wall were illuminated, there was noticeable light drop-off for the last third of the distance. There is a slight orange colour cast to the image, but the colour of the oversuit looked OK.

Test 2: approx. 70% loss of light, floor is coloured blue!

Test 3: approx. 90% loss of light, floor is very blue!!

Test 4: No image captured!

Conclusions:

Use the bulbs clear! The colour cast is no worse than using a warm-up filter for surface exposures and the effect is quite pleasing. Andy recalculated the guide number of 94 to show illumination for 15.5 metres. The blue glass paint coating is flammable - an interesting after effect!

NB: Be very careful when changing these bulbs - they get very hot! Disconnect the bulb holder from the bulb firer when changing bulbs - you really don't want one of these going off in your hand...

Bulb Firers:

Although we had a prototype Firefly bulb firer, we decided that to achieve the results we expected in France, we would require at least 4 reliable firing devices. Surprisingly, it proved impossible to find a source for ES (E27 Edison screw) lamp holders locally, the fallback plan was to buy a number of cheap spotlight fittings from B&Q at around 5 UK Pounds a go. These were modified by cutting off the reflector and wiring a Duracell PP3 battery in series with the bulb holder and a push switch. (Important note: it is vital that the power source is isolated when screwing in a new bulb. A PF50 going off in your hand will do serious damage. We used a non-locking 'push to make' switch). Two firers had push switches installed in the base of the unit (for hand held operation by the 'model'), while the other two had the switches connected by 10m fly leads for remote(ish) operation.

The circuits of all four units were tested for continuity with a meter, and (due to the cost of PF50s) just one unit was tested with a bulb. The results, (as in test 1) were both dramatic and reassuring.

And so to France...

The purpose of this exercise was to capture sequential images of large passage for future AV projects. We had story boarded the sequence of images required, and the large fossil passages of the Gournier provided the location. All images were captured using the tripod mounted camera on "B" using Andy's re-calculated exposure chart. Due to the size of the passage communications between camera operator and the model were difficult or impossible. We used a series of whistles to indicate "shutter open", "fire flash" and "close shutter" commands to the amusement of a party of French cavers that we asked to wait behind the cameras and trailing cables. "Merde, what ees that?!" (Cheap two way radios are the way forward here!).

Results:

Without exception, all bulbs fired and all images were terrific. There was no noticeable colour degradation from using the clear bulbs although there was a slight colour difference between the different film stock (Agfa and Fuji) which came down to personal preference. The amount of effort required to capture the images, (unpacking the gear, setting up camera on tripod, composing image and focusing, positioning the bulb firers, packing up, moving to the next location, ad nauseum) was soon forgotten when reviewing the images on the projectors back in the UK some weeks later. These images will hopefully be premiered in Hidden Earth 2001.

Many thanks to Chris Howes, John (at Meggaflash) and Nigel (at Firefly) for their help and advice with this project.

Why Not Get Yourself A Project?

– by John Forder

My wife and I have been taking photos for several years now, and it has become apparent that we do our best work when we have a project to work towards. A number of our pictures have been published in our books, the most popular of which turned out to be our third – but first in colour – *Hill Shepherd*, for which we attempted to document the lives of hill-farmers in the English Lakes and Yorkshire Dales over the course of an entire year. The discipline imposed by the demands of the subject – getting up at 4 in the morning, driving scores of miles in foul weather, for example – enabled us to get a selection of interesting shots that would not have been possible any other way. However, we have now abandoned photographic books, and find that our photography tends to lack focus.

Recently – having not used a camera for months except to take standard family snaps – I felt that I wanted to get snapping again, and decided I needed a project. After giving the matter some thought, I decided to do a photo-essay on the Easegill Cave System.

Why Easegill? Simple, really – there's so much of it, with such a variety of passage shapes and sizes, that the project already spans two centuries – and at the current rate could enter the 22nd century (if anyone wishes to take it on after my demise!)

The original plan was to document a through trip from Top Sink to Lancaster Hole, taking in the small, windy inlet passages; the big, ancient, high-level phreatic tunnels; the stalactite chambers such as Easter Grotto, now sadly despoiled, and retaining but a vestige of its former beauty; the grim fastness of Nagasaki; the odd pitch; the magnificent Main Stream Passage, and so on. To do all this in the course of a single trip would be virtually impossible – to do it well, entirely so.

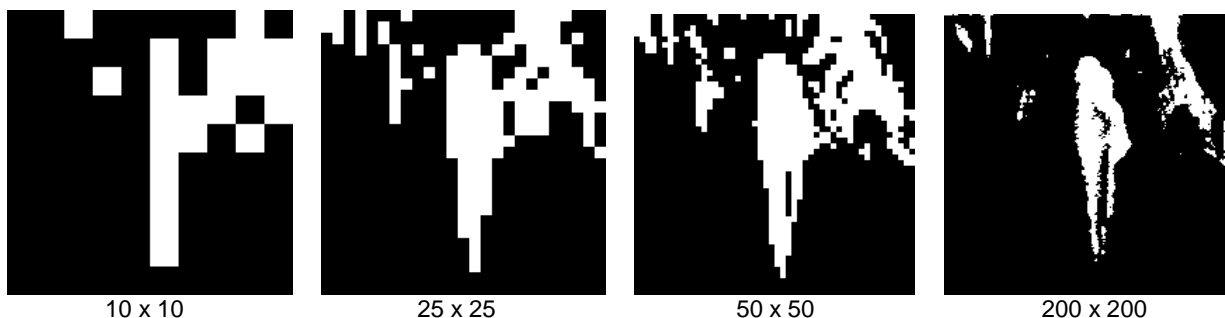
I've made a start by pottering around some of the easy bits of Easegill, with a variety of different people; this might pose problems of continuity, but I'll have to pretend, maybe, that there's a big party of cavers, taking it in turns to pose (getting them all together for a before and/or after shot is going to be a nightmare).

Anyone out there fancy a trip down Easegill?

Digital Corner – How Digital Photographs are Stored – By Footleg

If you have only recently started using a computer to store, process or print digital images then you will most likely have encountered a bewildering number of different file formats for storing photographs. In this article I will attempt to demystify this area of digital imaging, by explaining the differences between some of the more common formats, and looking at which ones are most appropriate for different tasks. But before we look at the different ways a digital image can be saved to disk we need to understand what information is held electronically to actually generate an image.

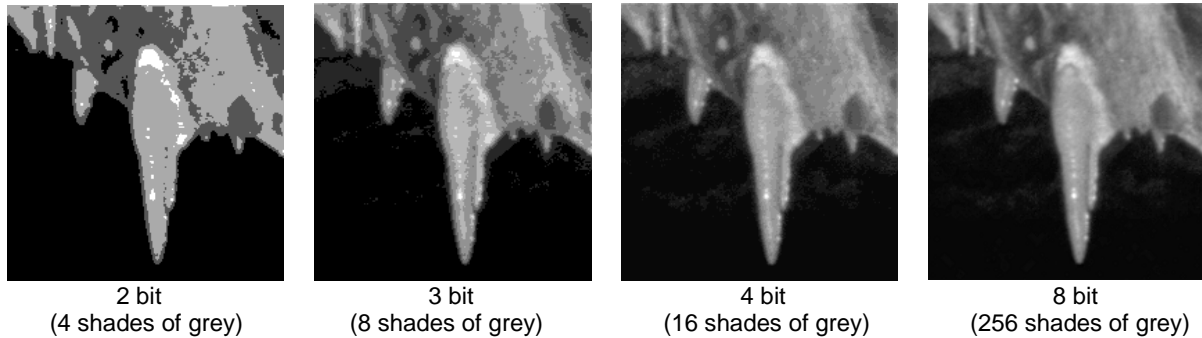
In the last issue I explained that a digital image is made up of a grid of dots of different brightness. These dots are called 'pixels'. In order to generate a 'black and white' photograph we only need to know the brightness of each pixel. We will come onto colour later, but first let's just look a little deeper at black and white to keep things simple. If this is all the information we are going to store, then there are two things which determine the quality of the digital reproduction of a photograph. We can vary the total number of pixels which are stored, and we can vary the amount of brightness information which we store for each pixel. The total number of pixels is what is meant by the 'resolution' of the image. The higher the resolution, the more detail can be captured. Resolution is either quoted in terms of the dimensions of the grid of pixels (i.e. 640 x 480) or as the total number of pixels in the image (i.e. 307200 pixels). Below is an example of an image at several different resolutions to illustrate what affect increasing the resolution has.



The smallest amount of information we can store about the brightness of an image is simply whether the pixel is black or white. In digital imaging terms this would be a true black and white image. It is more common to allow 256 different brightness levels for each pixel. A monochrome image of this type is referred to as a 'grey scale' image in digital imaging terms. This brightness information is referred to as the 'colour depth' of the image.

(continued on page 7)

Due to the way information is stored in binary code in computers, the colour depth is measured in 'bits' where the number of different brightness levels equals 2 raised to the number of bits. So 8 bits equals 256 levels. The previous set of images are all 1 bit images (the pixels are either completely black or white). In the following series of images we can see the effect that colour depth has on the quality of the image.



As you can see, the difference between the 16 shades and 256 shades image is fairly small. If you are looking at a printed copy of this article then you may not see any difference at all. This is because the printer will probably not have been able to reproduce the full range of 256 shades. All that is missing now is colour. This is a simple extension of what we have seen for grey scale images. All we need to do is store three separate brightness levels for each pixel. These three values correspond to the red, green and blue levels for each pixel. Full colour photographs are usually stored with 256 possible levels for each colour component, that is 8 bits per red, green and blue channel, giving a 24 bit image.

So to save an image to disk, we surely only need to store all this information in a file? If only it was that simple! To start with there are many different ways that this information can be encoded. The simplest file formats basically write out the red, green and blue brightness values for each pixel in sequence, along with a small amount of information about the resolution (i.e. how many pixels wide and tall the image is). However, this leads to very large image files. A 35mm transparency or colour negative scanned at 2700 pixels per inch will produce a file of around 25MB in size. There are two ways we can reduce the file size. We can reduce the amount of information that is saved, or we can use data compression techniques to store the information more efficiently. So there are file formats which support different colour depths, and ones which support different type of data compression. To add to the confusion, several file formats support a range of colour depths and compression types!

There are two categories of data compression used for image files, loss-less and lossy. Loss-less compression does not lose any of the information which describes a photograph, it just stores it in the most mathematically efficient way to give the smallest file size without degrading the image. Lossy compression does result in some loss of quality, but can result in significantly smaller file sizes. So the type of compression to use will depend on whether file size or quality is more important to you. There are several file formats which are very widely supported, which means most people should be able to read them on most computers. For loss-less compression I would recommend TIF (Tagged image format), using LZW compression. If you do not have a program which supports this format then you could try TGA (Targa) format, which supports a choice of 24, 16 and 8 bit colour depths using no compression, or RLE (run length encoding) compression. This is not quite as good a compression as LZW used by TIF images, but you should find your files are considerably smaller than when uncompressed. The amount of compression will depend on the content of the image. Large areas of uniform colour will compress much smaller than images with a lot of detail. If small file size is a priority then lossy compression is the one to use, and the JPG (JPEG) file format is the most universally accepted format which utilizes this type of compression. You can set the degree of compression between 1 and 100 to achieve the appropriate compromise between image quality and file size for your needs.

To give you some real world examples, I saved two scanned cave photographs using various compression methods. Both digital images had a resolution of 3700 x 2400 pixels in 24 bit colour. One image was a well lit chamber full of formations, and the other was a single straw against a half black, and half flowstone background. Both uncompressed images produced 26MB files. Using RLE compression made no difference to the chamber photograph file size, but the straw with the large area of black resulted in a 12MB file. Using LZW compression reduced the chamber photo to 18MB and the straw to 8.4MB. Finally using lossy JPEG compression at a quality/size setting of 10 gave 1.7MB for the chamber and just 880KB for the straw. At this level of JPEG compression the loss of quality is very difficult to see, but the reduction in file size is considerable. Using a quality/size setting of 50 gave 570KB for the chamber and 300KB for the straw, although the loss in quality was still very difficult to see.

I hope that this brief overview has shed some light on how digital images are stored, and helped explain the differences between some of the more common file formats. The best way to find out what file format suits a particular purpose is to try saving the image in several different formats and to compare the images and file sizes. In general I would suggest that you use loss-less compression (LZW compressed TIF files are best) for archiving digital copies of your photographs, and lossy JPEG compression if small file sizes are important. If there are any areas you would like to learn more about then please write to me at the usual CPG address and I will try to cover them in a future issue of the newsletter.