

# An Excursion into Stereo Photography



By John Bunyan 2012

“Now, where exactly to begin with the Stereo Project? My starting point had been to explore the ‘Anaglyph’ system and also present stereo pictures side by side which could be viewed with an optical viewer. Beyond that I hadn’t really thought things out.

I had 3 stereo cameras in my collection. I didn’t want to risk the valuable Richard’s Verascope from 1920 and my other vintage (and also French) model needs repair. I also have a British Coronet Stereo camera from 1955 which takes 127 size film (luckily which I have some of) so I decided to run this. My other idea was to pick two sister single lens reflex cameras from my collection with standard 50mm lenses, mount them on some sort of bar and, firing them of simultaneously, take left and right stereo pairs. I chose a Cosina CS2 and Cosina CT10 which, according to the books, were manufactured 3 or 4 years apart around 1980. Nothing could be simpler so I thought. Sawing off and adapting a piece of shelving rail I constructed a rough mounting bracket with some standard 3/8” whitworth bolts and wing nuts – the standard tripod mounting socket on most small cameras.



*The Coronet 3-D Stereo Camera from Birmingham (1955) and the Cosina(s) CS2 and CT10 (c1980)*

I took these cameras up to a picturesque village called The Lee buried in the Buckinghamshire Chilterns. Views across the village green may well be familiar to television viewers since the location featured frequently in ‘Midsomer Murders’.

The Coronet 3-D is an interesting design of camera. No stereo camera is ever going to look beautiful but The Birmingham Camera manufacturers did their best here by combining their expertise in bakelite moulding technology with paint splatter. The final result is basic, interesting but still ugly. Controls are kept to a minimum with no shutter speed or aperture variations, a basic spring loaded shutter tensioning system, and two viewfinders; one eye level and one reflex. Rather than use two independent but synchronised shutters behind the two lenses – an expensive and unreliable method, the Coronet uses a single horizontally traversing sprung metal sliding plate with the exposure slots cut out of it. While it is tensioned back manually against the spring a blanking plate behind the lenses prevents film fogging.



*The Lee, Bucks. March 201. A Stereo Pair Shot on the Coronet 3-D Camera of 1955. The left and right pictures are reversed. .*

While the front controls of the Coronet may be unproblematic, opening up the back reveals a film transport mechanism which can only be described as agricultural. The fresh roll of film is wedged into a rough moulded chamber with the paper leader being pulled across to slot into the take-up spool which itself has to be guided very carefully onto the slotted wind-on lug. Brute force and ignorance are used to push the back plate back on which is only held in place by eyelet poppers!

Looking at the frame viewing window on the back you just know the whole arrangement is going to let in light and sure enough the processed colour film sported a healthy fringe of fogging which managed to ruin one of the four pairs of pictures shot. The other three pairs turned out quite well however. The internal moulding of the bakelite keeps the light from the images from the two lenses from bleeding across to each other and provides what appears to be a ready matched pair of pictures ready to load into a viewer.

Or so you would think. But when I tried to view these pictures they steadfastly refused to form a stereo image. This had me baffled for a week. Then it suddenly came to me. When a lens produces an image on film it inverts the subject – which appears upside down. By turning these films so that the images appeared the right way up I had inadvertently transposed them. The image from the left lens actually appears on the right – and vice-versa.

After a little rapid footwork in Photoshop to crop and switch the pictures round I was able to print out paired images which I could then view in a stereo viewer I had available.



*A stereo pair from the Coronet 3D camera ((1955) with left and right pictures correctly positioned and mounted for card cut-out and use on the 'Cavander Camerascope'. Shown actual size. The Lee, Bucks March 2011.*

The stereo viewer I am using here is an interesting concoction of stamped and hinged metal and glass from 1927 which goes by the sartorial description of the Cavander Camerascope – a name which belies the £2 price tag it sported at a car boot sale. Its evolution is worth describing:

In the '20s cigarette sales were very high with a great deal of competition between brands. The Army Club brand decided to promote itself by including collectable stereo picture card pairs in their packs. Each series consisted of twenty five pairs on subjects such as 'Distant Lands' – travelogue subjects being very popular in an age when most working people could not afford to travel abroad. Early sets were black and white with later sets of pictures being hand tinted. The Cavander Camerascope was the viewer they commissioned the manufacture of to support this project.



*The Cavander Camerascope (1927) shown open, folded closed, and with individual card inserts.*

The width of the viewer is around 5 inches and the individual card dimensions that are inserted into the viewer are 2¼ inches wide by 3 inches high. This is an unusual format for photographs (but not for cigarette cards) but it is not by chance that they are this size and shape. Let's look at some aspects of stereo viewing to see why:

The imperative of any stereo viewing system is to make (or trick) each eye into seeing just the one picture produced for that eye. If this is done successfully the brain will fuse the two views into one and produce an image in which true depth is perceived, in the same way that the left and right eyes do naturally with the subject directly in front of them.

This is most easily achieved with an optical viewer. The simplest configuration for one of these – of which the Camerascope is an example - is to use two matched basic magnifying lenses (x2 magnification is ideal), one positioned over each eye, and lined up to focus on individual pictures. The magnification and limited field of the lenses will mean that each eye only sees more or less what is directly lined up in front of each one. The average distance between the eyes of an adult human is 2 ½ inches. This governs the spacing of the lenses in the viewer. If two pictures are lined up in parallel in front of the lenses it follows that each image can only be 1 ¼ inches wide either side of its centre point otherwise it would overlap with the adjacent image. So each picture is limited to 2 ½ inches in width. 3 inches vertically provides an optimum degree of accommodation that the eyes can comfortably make within the viewer.

Hence the 5 x 3½ inch folded dimensions of the Camerascope. By serendipitous chance the 2¼ x 3 inch dimensions of each inserted card are a perfect size for inclusion in a 20 pack of cigarettes!



*A Classic view of The Lee across the village green as featured in 'Midsomer Murders'. Cosina CT10 SLR 35mm Camera c1984. March 2011*

Once I had worked out the viewing issues between the pictures taken with the Coronet and the Camerascope Viewer I turned to the pair of 35mm films that I shot with the paired Cosina Single Lens Reflex Cameras:



*Left and right views of The Lee Village Green shot on the Cosina CT10 and CS2 SLRs respectively, mounted on a makeshift Stereo Bar. Note the horizontal positions of the foreground posts in relation to the house windows and trees. The left picture shows them shifted to the right in relation to the distant objects while the right picture shows them displaced to the left. This phenomenon is known as 'Parallax'.*

My agenda here was to try and make Stereo viewing a 'Fun' thing rather than just a 'real' thing. – Let me explain:

The boring thing about stereo cameras (apart from the fact that they are rare and thus valuable if you can find and collect them – which is not boring) is that the shooting lenses are set two and a half inches apart. This is because, as I have said, our eyes are set the same. So why is there a problem?

There isn't. Pictures produced with these cameras (such as the Coronet) and viewed correctly will give a very faithful replication of what we will see of a scene with our own two eyes from a fixed position. But life is not like that. In real life we move around. We will move towards and across the path of a scene. This movement informs our perception of the scene and its depth. We will use changes in perspective and parallax movement (where a subject nearer us appears to move relatively faster than something further away) to gain experience of the space. Sounds generated by dynamic aspects of the scene will affect our response. We will use Aerial Perspective (how the thickness of the air atmosphere filters and obscures the definition of distant objects) to evaluate distant scenic features.

None of these real life features can be offered by a static stereo photograph which is why standard stereo picture pairs tend to have a novelty value, but generate little lasting interest. After an initial burst of enthusiasm a newly purchased stereo camera finds itself consigned to a bedroom drawer in favour of a more convenient single shot camera, the results of which can be viewed without cumbersome secondary apparatus.

If you mount two SLR cameras side by side on a bar the distance between the two lenses becomes five inches. This increase from 2 ½ inches opens up a new world. Looking at the results the objects we view gain new solidity. We notice the stereo now. It's not real – it's bigger than real. If we look at just small pictures in the viewer they look amazing. Everything looks new. And it stays new!



The Lee (Coronet)



The Lee shot C



The Lee shot E



*Four made-up cards actual size of The Lee, Buckinghamshire. Top left; from the Coronet Stereo camera. Top right and bottom left; Stereo pairs from the Cosina CT10 and CS2 Single Lens Reflex 35mm cameras. Bottom right – Vertically cropped stereo pair from the Cosinas.*

Returning to the cameras, I did manage to get the results from the paired cameras that I hoped for. But my expectation of it being problem free was sadly very naive:

For a start the two Cosina Cameras were not nearly as compatible as I hoped they would be. The one thing I had managed to get right was the two lenses which were of identical 50mm specification even if they had different brand names on them. Despite looking very similar however the cameras were different in all significant details. To start with they have completely different shutters. The older and heavier CS2 has a traditional horizontal travel cloth focal plane shutter. The CT10 has a vertical travel metal blind focal plane shutter. Each camera has battery driven automatic exposure control by adjusting the shutter. But the problem here is that there is no telling what each camera would decide would be the correct exposure. I wanted them to be identical.

So my bright idea was to put them onto manual shutter control – which for each camera meant setting the shutter to the flash synchronisation setting. This is because (as everyone knows) the default synch setting for a horizontal travel shutter is 1/60<sup>th</sup> second and for a vertical drop shutter, 1/125<sup>th</sup> second. – Of course they would be different for the two cameras. No problem I thought. I will just make a correction on the aperture to get the exposures identical across the two cameras. So I set the CS2 to f11 and the CT10 to f8. These setting should have given identical exposures across the two films in the cameras.

But it didn't. There was almost two stops difference between the two films with that of the CT10 being on the edge of acceptable exposure, and the much denser film from the CS2 showing an ominous quarter of an inch of under exposure on one edge of each frame. This feature is symptomatic of a slowing down of the leading shutter blind as it reaches the end of its travel at the start of the exposure of each frame.

It's not the end of the world. But the combination of these two differences meant that for each paired set of frames I chose, I had to do a lot of correction work in Photoshop. Bringing up the brightness and tonal contrast of the under-exposed film to match that of the other also revealed some slight changes in colour cast that had to be addressed - more time spent. Use of the dodging tool in Photoshop quickly and easily corrected the under exposed edges of the frames from the CS2 however.

Two other issues came to light in operating the two cameras on the stereo bar. One I had anticipated and that was the simultaneous triggering of the two camera's shutters. The two release buttons did not line up conveniently close to each other so I made sure I had one of the cameras connected to a good new cable release (in the picture). I was easily able to hold the stereo bar with one hand and position the cameras while firing one camera directly at the same time as pressing the cable release to fire the other.

The other problem arose when I actually mounted the cameras on the bar. The tripod sockets were in different positions on the two cameras and one of them seated itself at a slight forward angle when I tightened up its locking screw. This was enough to give a slightly different vertical viewpoint between the cameras. To make things worse my rough and ready horizontal line up of the cameras was evidently too rough. Some selective cropping of each shot of the selected pairs was needed to ensure that each view showed exactly the same subject area. If I had designed the stereo bar better and checked the line-up of the cameras with it mounted on a tripod this later corrective work would not have been necessary.

For anyone planning on exploring stereo photography using a camera mounting bar, please take heed and profit from my haste-induced errors. A few minutes thinking about the material and surfaces of a bar or bracket, tripod mounting positions, camera tripod positions and balance will pay dividends. Luck may be needed in obtaining 3/8 inch Whitworth bolts and wing-nuts which have largely been superseded in hardware stores by the much closer pitched M series. Do not attempt to use these with your cameras as they will ruin the tripod sockets.

Just two other minor points here. If you check my earlier photograph of the Camerascope you will see that I have two separate cards in the viewing windows. The actual size pairs that I have included in the diary are mounted on a single double-pictured card. I found slotting individual cards into the viewer fiddly and, since I am hoping to let visitors use the device at Prestwood, I found that a single card arrangement allowed for much easier insertion since they simply overlaid the centre slot section. They also have the advantage of releasing a greater potential picture area for viewing at the centre slot area.

And, concerning the available picture area, it also makes sense to take advantage of the 3 inches of vertical depth available to each picture. Horizontally mounted 35mm cameras are at a disadvantage here since the pictures are horizontal in aspect (it would be easy to construct a vertical mounting bracket which placed a camera either side of the bar). Since the pictures cannot be much more than 2 inches wide for the viewer a horizontal 35mm frame will, of necessity be quite small. I have taken the opportunity with some of the frames to crop them vertically to give overall larger vertical pictures which spread over the bigger 2¼ x 3 inch viewing area

One final tip for anyone printing out cards for viewing. For my first attempt I used a standard business configured black and white laser printer. Despite having a high text resolution the printer had a non adjustable dot for continuous tone images of 72 Dots per inch. This dot pattern was clearly visible under the magnification of the stereo viewer. I would recommend any standard colour inkjet printer with photo quality printing capability set to its highest quality / resolution. Results from these should be good.

## **CONSTRUCTING A HOME-BUILD STEREO VIEWER**

It has occurred to me that not every person that reads this and wishes to make their own stereo photography investigations will have to hand, or easily be able to acquire a Cavander Camerascope or similar viewing device. I guess they are now very rare. Some very early Victorian stereo viewers may still be around and stereo viewing toys sometimes feature in large toy stores. With this issue in mind and with the intention of multiplying the number of viewers available for use at Prestwood I have constructed a home-made viewer based on the Camerascope basic design and I include basic guidelines here for anyone wishing to do similar.

The first thing to find is some magnifying lenses. Two places proved successful: Maplins Electronics Store and W H Smith. I was able to buy magnifying glasses at Maplins with 2 ¼ inch diameter plastic lenses in holders that were easily unscrewed (since they contained a lighting circuit) to release the lenses. The beauty of these is that, if you later wish to restore them to their original holders all the

components can be reassembled. These glasses cost about £5 each and have the ideal magnifying factor of x2.



*(Left to right): The Cavander Camerascope with the combined double image inserts. The Maplins-sourced illuminated magnifiers with 2 ¼ inch plastic lenses. The close-up of the underside shows the lamps and securing screws seated in the retaining ring. A jeweller's screwdriver is needed to loosen these cross-hatched screws.*

The disadvantage of these selected magnifiers is their size at 2 ¼ inches diameter. No lenses over 2 ½ inches could obviously be considered since they would have to overlap to meet the maximum eye span of 2 ½". Butted together the Maplins lenses will just work but – as we will see – when mounted into the card they leave little room for manoeuvre.

I was able to obtain smaller magnifying glasses from W H Smith that were ideal. However they were more expensive and mounted into moulded frames that would need destructive force to prize them out. Also each lens had a secondary x5 magnifier set into the side of each lens which would need masking out when mounted in card.

One way I found of testing the lenses before purchase was to place one over each eye and try and focus on two identical subjects side by side. If you can comfortably fuse the two focussed images into one when doing this then the lenses will certainly work in a viewer. But don't spend too long doing it or you will get funny looks from the shop staff.

I have listed the other items you will need to have below. These can easily be obtained from any craft store, office supplier or model shop:

A medium size cutting mat

An 18" or longer steel ruler

A sharp craft knife

Sharp pencils

A small plastic right-angled set square

A thick sheet of black or dark grey mounting board

A heavy duty hand stapler – preferably with a deep throat.

A set of jeweller's screwdrivers or other tools necessary to remove the lenses from their original mountings.

Plastic or masking tape to cover staples and edges.

Mark off a 5 inch strip from the side of the mounting board with pencil and ruler. Make sure this runs for at least 18 to 20 inches for a safety margin. Cut it from the main sheet using the knife and steel ruler.

Mark off a right angle  $3\frac{1}{4}$ " down the strip and score it across the back to a depth of  $\frac{1}{3}$ <sup>rd</sup> of the board thickness. Fold it in and over to meet the rest of the strip.

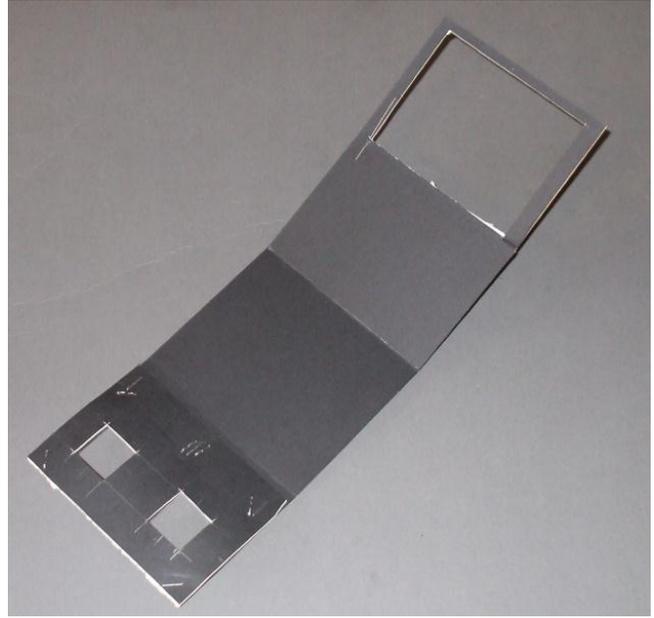
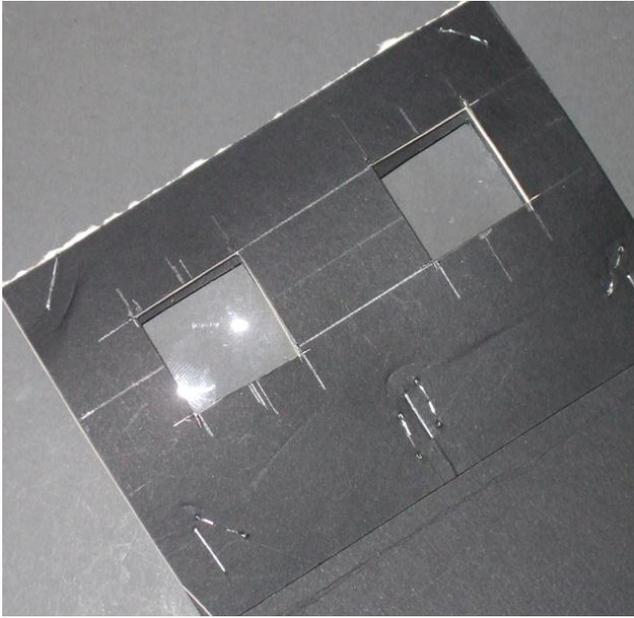
The windows for viewing through the lenses now need to be cut. They do not need to be circular as in the Camerascope and it is much easier to cut simple square apertures that function just as well. It also makes sense to cut through the double thickness of the folded down card rather than through each part singly. That way there are no issues about the registration of the four apertures.

From the folded point mark a thin horizontal centre line  $1\frac{3}{4}$ " below the fold. Create a thin vertical centre line at  $2\frac{1}{2}$ " and, where it meets the horizontal centre line mark off  $1\frac{1}{4}$ " in either direction horizontally. These two points give you the centres for each eye aperture from which you can mark off and cut the one inch square viewing windows through the double folded layer of card.

Now the tricky bit. Place the two lenses between the two card sheets so that their centres line up with the centres of the square windows. Bring the stapler in position and staple round each lens pinning the two pieces of card together to hold the lenses in an envelope. Take care that they do not shift position when you do this and beware of forcing them together so that they overlap. Make sure you position staples to separate the lenses from each other as well as enclose them in the card. Also have some staples near the fold so that it does not open out under pressure from the lenses.

Be very careful with the stapler. Each time you use it check that the exposed forks are fully home and not sticking out otherwise they will scratch you when you bring your face up to test the viewer. Once the viewer is complete all stapled surfaces and scored-folded edges should be covered in tape for personal protection.

Here the disadvantage of the large Maplins lenses becomes apparent. There is no free area within the card envelope to cut a triangular aperture for the nose. This is not serious but the lack of one makes the viewer slightly more uncomfortable to use. If you are using smaller lenses you may be able to cut a rounded triangle out at some point to improve this point.



*(left) The folded card envelope with the two lenses held in place with securing staples. All exposed staples should be checked and covered with tape before use. (right) the completed viewer consisting of 5 folded sections as seen from the inside (the first section has been folded to complete the lens holding envelope).*

Once you are happy with the secured lens folded section mark down from the back from the first fold to  $3\frac{1}{2}$  " and make another horizontal line. Score (as before on the same outer side of the card) and fold inwards. You will find that by folding the first panel at  $3\frac{1}{4}$  " this will give you an inside clearance of between  $\frac{1}{4}$  and  $\frac{1}{8}$  " where the leading edge of the inner folded part of the envelope meets the new fold.

The next task is to find the correct focus point at which to mount the pictures. Using a single picture as a test, angle the viewing lens section at 90 degrees to what will become the bed of the viewer and slide the image along the bed being careful to hold it in the same 90 degree plane. Once you have found the best focus point mark it off on the card bed and score as before on the other side of the card. Fold inwards again.

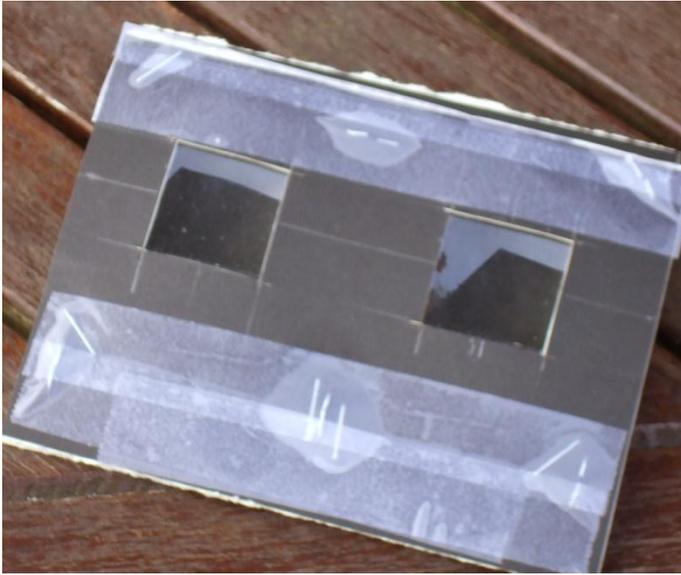
The focus point differs for different people so it does not have to be exact and can easily be varied in use by adjusting the plane of the lens panel and image-holding panel towards or away from the 90 degree plane.

We're almost there now. We just have to make a mask to hold the cards in place and tidy it all up.

Go another  $3\frac{1}{2}$  " along the card and score and fold across inwards as before. This gives us the top edge of the viewing panel that holds the pictures. With the last section folded fully inwards find the point at which it meets the inner fold at the bottom of the picture panel and mark across. Open it out and make a clean cut across.

On the last panel carefully mark out and cut a large aperture which leaves a clean card margin of about  $\frac{1}{4}$ " at the sides and bottom edge, but cuts clean across the point of the last folded section. This will give a 'U' shaped frame to help hold the viewing cards in place.

Your viewer is complete. Trim any nasty corners and cover sharp edges and staple points with tape and you are ready to have fun with stereo.



*(left) The home-built viewer with all staple points taped up for safety in use. (right) The completed viewer set for stereo viewing with a double picture card in place.*



*A stereo pair of photographs of The Lee, Buckinghamshire printed for 'Anaglyph' viewing using red and blue filtered spectacles. Cosinas CS2 and CT10 35mm SLRs. March 2011*

Earlier I mentioned the Anaglyph system. This stereo viewing technique requires a full explanation:

Bearing in mind that the purpose of any stereo system is to present individual images to each eye exclusively, it does not always have to follow that the means to do this are through direct viewing optics. The current Imax cinema system uses polarised light. Viewers use spectacle fitted with polarised filters to reveal and obscure the twin projected images. This system will only work with projected light images however, not those printed on a page.

Up to the minute technologically innovative stereo systems have been developed around High Definition Television which uses alternate pulses of left and right images synchronised with shuttered spectacles, and games consoles which use vertical slits or lenticular systems to show fragments of left and right eye images when the face is a specific distance away from the screen.

The oldest and most basic non-optical system however is the Anaglyph. It is based on the properties of coloured filters. If a red subject is placed upon a white background and viewed through a red filter then it will appear as if it were white and disappear into the background. Similarly with blue, green or any other colour printed onto white paper and viewed with a filter of the same colour. Primary colour filters – red blue and green will also have the property of blocking colours other than their own hue. So a red filter will show up a blue image printed on paper while making a red image printed over the same area disappear. Conversely a blue filter will show up the red image while making the blue image disappear.

In the three images presented here the left image is represented in blue (see the information following for colour revision) and the right in red. To view them you need to construct a pair of glasses with a red filter over the left and a blue filter over the right eyes. Or – for a crude makeshift solution - the filter material could be secured to your own existing set of correction glasses or taped across a pair of old or very cheap broken frames where the lenses have been removed



*The Cock & Rabbit, The Lee, Bucks., March 2011. Cosina SLRs with red / blue stereo Anaglyph.*



*The Lee, Bucks, March 2011. Stereo pair shot on Coronet 3D 127 format camera 1955. Red / Blue Anaglyph system.*

The anaglyph system is a far from perfect way of presenting stereo images however. For a start all colour information is lost from the pictures which have to either be of black and white origin or have the colour stripped from them before being translated into the single primary colours of the filters.

For anyone wishing to do this, the basic steps in Photoshop (\*) are to convert each image to greyscale, then select the 'Duotone' mode to change the black image elements into a specific colour. (That's IMAGE > MODE > GRAYSCALE followed by IMAGE > MODE > DUOTONE when working from the Photoshop Menu bar).

(\* I am using Photoshop version 6. Later versions may have slightly different pathways for achieving this).

From the Duotone Options dialogue box select MONOTONE and click on the filled square. This brings up the colour picker box. Locate a pure red or blue area from the vertical bar to the right and pick a point in the large graduated box right on the top edge at about the mid point along. This will give a de-saturated but pure duotone filter colour free from any black strengthening which will occur if you pick a point any lower. Any black tint to the printed image will reveal it to both colour filters so this must be avoided.

Click OK to close the two dialogue boxes and the image will pick up the new colour. Do a visual check between the computer image colour and the filter colour (remember they will be left / right opposed) and save the image.

I found the most practical way of combining the two images on paper was to print each one individually on the same sheet of paper fed for a second time through the printer. This result was then easily re-scanned to provide a combined image for inclusion in the document. It is probably quite easy to combine the two images in Photoshop if you know all the angles (one method would be to overlay the two images while reducing the opacity of the top image) but I did not want to compromise the integrity of the original tone selections.

And what of the final results? I had realised that they were unlikely to be perfect and I anticipated a little 'ghosting'. By this I mean that when the filters are in operation it may be that they would not render entirely the invisibility of the printed ink of their own colour so a slight residual double image may persist. As it turned out the red filter was extremely good at excluding the red image. But the same wasn't true of the blue (I also tried green but with no greater success). Reducing the saturation level of the blue tone helped but did not entirely eradicate the ghosting.

Only later, when I had seen some anaglyphs (and the viewing spectacles) presented in a completely different exhibition which did not have any significant ghosting, did I eventually realise what the problem was. The trouble with the colour blue (one of the 3 primary light source colours) is that, if you use a primary separation blue filter to make the printed blue image invisible, this filter is so dark that it effectively renders the viewing process unworkable. Certainly it can't match the clarity of the image through the red filter.

I had been unaware of this. It had not occurred to me that the actual filter material used for the blue side of the spectacles was lighter than the blue primary colour and more closely matched the secondary colour: cyan. This filter certainly could not filter the magenta component of the blue ink hence the image ghosting.

When I had thought of red / blue anaglyphs I had thought of exactly that: red and blue printed images. I have now seen the light (excuse the pun) and realise that the blue printed image actually needs to be a cyan image – that's the blue ink without its magenta component. This colour is rendered virtually invisible by the lighter cyan filtered spectacles. The Anaglyphs printed in this journal now have cyan rather than blue left - eye components. The previous ghosting problem has all but been eradicated.

The Photoshop settings for these duotone colours may be of use to other experimenters so I have included those that I finally used here. I found that at full saturation both the red and the cyan colours gave some ghosting when printed so I lightened them up by adding some measure of the other components to the point that gave optimum results.

Photoshop uses a 256 level scale for each colour running from 0 to 255. My best settings:

	LEFT EYE	RIGHT EYE
RED	133	255
GREEN	255	100
BLUE	255	100



*The separated out duotone colours selected for the left and right (respectively) stereo images. The blue left image is seen through the red filter worn over the left eye. The red right image is seen by the blue filter worn over the right eye. The original blue colour shown caused significant ghosting with the viewing spectacles which was eradicated when replaced by cyan printing (see 3<sup>rd</sup> picture).*



Technically successful or not, the Anaglyph system never was, nor ever will be a mainstream or popular method of Stereo presentation. Aside from the fact that it can't render colour in the image the reduction of the images to washed-out primary tones means that the final results will never sport a full tonal range and will appear muddy at the best of times. The primary-coloured filter spectacles also cut out a huge amount of light so the printed results can only be adequately viewed under strong illumination. Most significant of all, and something forming the corner-post of all other successful stereo systems, is that the printed combined images cannot be viewed comfortably in a non-stereo mode. They just look like poor photographs taken through a terrible lens.

But, rest assured, you will find Anaglyph stereo pictures cropping up from time to time in magazines in advertising and editorial promotions which will include a pair of special filtered viewing spectacles free! It's one more novelty (along with the tear-off scent patch) that the media men keep in their armoury of devices to use when times are hard or everyone in the team has run out of other ideas. They are always fun and the spec's are worth keeping.

Photographic Lighting Gels are the best means of obtaining sufficient filter material which is made of durable and largely heat resistant strong cellophane-type film. It does not need to be of optical quality which would be very expensive if purchased as photographic filters which are unnecessary. Gels are available in 20 x 24 inch sheets. Theatre equipment suppliers will also have them, possibly in smaller sheet sizes for use on theatre spotlights. You will need to check the net.

If you explore The Anaglyph Stereo System, I wish you well. I hope my experiences will be of use to you."



*View of 'The Hale', Wendover, Buckinghamshire. May, 2011. Werra Mat 35mm camera.*

As I continued with this stereo project I began to think about exploring other options in stereo photography and viewing. For want of a better term I am going to refer to the next technique as ‘displacement’ stereo.

I have no justification for coining this term. Certainly I would not be the first person to explore the possibilities of using a single one-lens camera for shooting stereo just by moving the camera position in relation to a static subject, but I don’t know of anyone else who has defined it.

The possibilities for this occurred to me following a holiday in Normandy in 1989, long before I started seriously collecting cameras or even thinking about these photographic journals. By chance I had a camera loaded with transparency film and took some pictures of a particularly picturesque country landscape whilst on a walk.

Following one picture I walked a few feet further on and took another of the same scene. Critics will say (quite justifiably) that I was over-shooting. When I viewed the processed transparencies back home I noticed the relationship between the pictures and put them into two cheap single slide viewers - one for each eye. I managed to get a significant stereo effect of a strength that allowed the perception of depth of bushes in the very far distance.

Obviously the subject matter has to be static if there is going to be a time shift while a camera is moved from one position to another. This means that the technique is best applied to landscapes. Foreground hedgerow is also a hazard when lining pictures up. It changes far too much to be resolveable in the viewer. But a shift of a couple of feet between the two pictures will give an incredible amount of depth to middle and far distanced objects and show the landscape in a new way.



*Left and right pictures of Normandy Countryside 1989. Unidentified single camera. From Kodachrome Transparencies.*

I had a two-pole strategy for updating this idea. The first was to purchase some new cheap slide viewers (easily obtained via the net) and mount them together so that they made an easily used stereo viewer.

I did this by laying some Velcro foam onto a thin strip of card and sticking some Velcro hook to the base of each viewer. I was able to easily adjust the angles of the viewers when I mounted them on the card strip

which also had the advantage, because of its flexibility, of being adjustable for each person using the arrangement. By flexing the horizontal and vertical aspects of the viewers in relation to each other every user can find the point at which they can fuse the two images.



*Left: The home-built stereo slide viewer made of two proprietary slide viewers mounted on a flexible cardboard strip using stick-on 'Velcro'. Right: The Werramat German 35mm camera from the '60's.*

The second part of this exercise was obviously to load up a camera with some new 35mm transparency film and start shooting some current landscapes to test out the technique.

One camera I had picked up recently was a beautiful Werramat from the 1960's. This camera was of exceptional precision West German build with an unusual design which incorporated the film advance and shutter tension action in a rotary grip surrounding the lens barrel. In design terms this was an innovation over the conventional method of using a top-plate mounted knob or lever – or even a base-mounted one as with the Kodak Retina Reflex. It leaves the top plate with a visually pleasing sheer brushed metal finish with a recessed shutter release. The conical appearance of the lens however tends to make the camera appear unbalanced. This is quickly rectified by screwing on the lens hood which immediately restores the camera's appearance.



*Left and Right aspect photographs, The Hale, Wendover, Buckinghamshire. Werramat 35mm camera with transparency film.*

In the field the camera is a little unsettling to use initially. The rotary film advance action is rather fierce and I managed to tear the first film I ran through when it jammed in the cassette. About two thirds of the film were recoverable but I had to use a dark bag to retrieve the damaged film. Further films on a subsequent visit loaded and passed through the camera without incident. By then I had worked out how to set the base-plate frame counter and rewind latch – an arrangement made confusing due to the setting point having rubbed off the base of the camera during its former life.

Shooting transparencies is a little more risky than shooting negative film. For a start the exposure has to be exact. Negative film has a great deal of latitude – particularly concerning over-exposure. Slide film on the other hand is very sensitive to over-exposure where the highlights immediately begin to bleach out. The Werramat appeared to have a perfectly reliable coupled exposure meter but, as with most of the older cameras that I test, I preferred to rely on my trusty Weston V which I am at least used to.

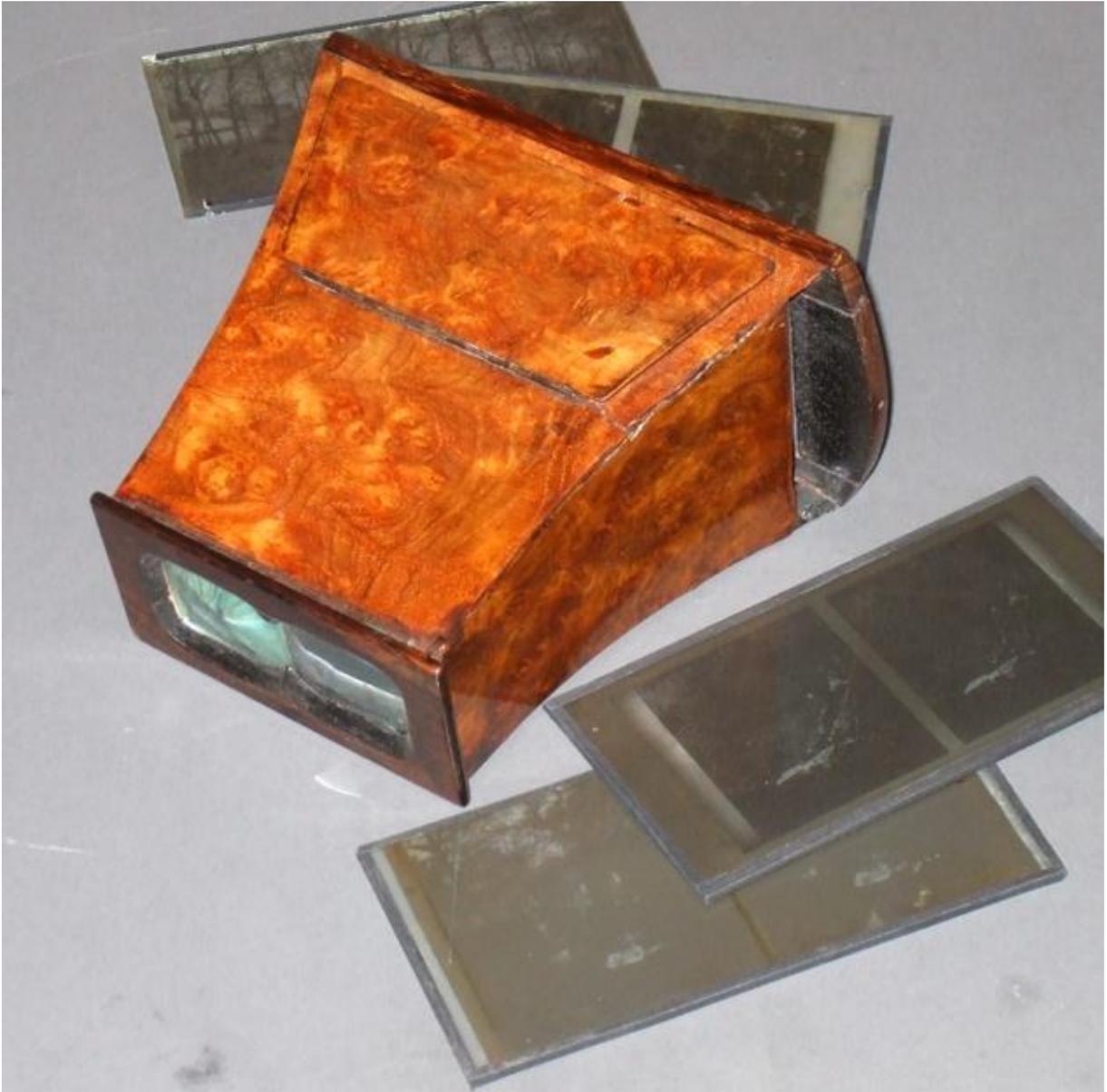
The other feature of slides, particularly if they are going to be viewed directly as slides and not through printed media, is that there is no chance of post production manipulation, such as colour and contrast correction – or most importantly re-cropping – as is the case with prints. Care is needed when doing stereo pairs using this technique to pick reference points in the distance of the view being shot that can be used to fix the boundaries for both pictures. In particular the horizon must be in the same vertical position for the two pictures otherwise it will be very difficult to resolve the pictures into a stereo pair.



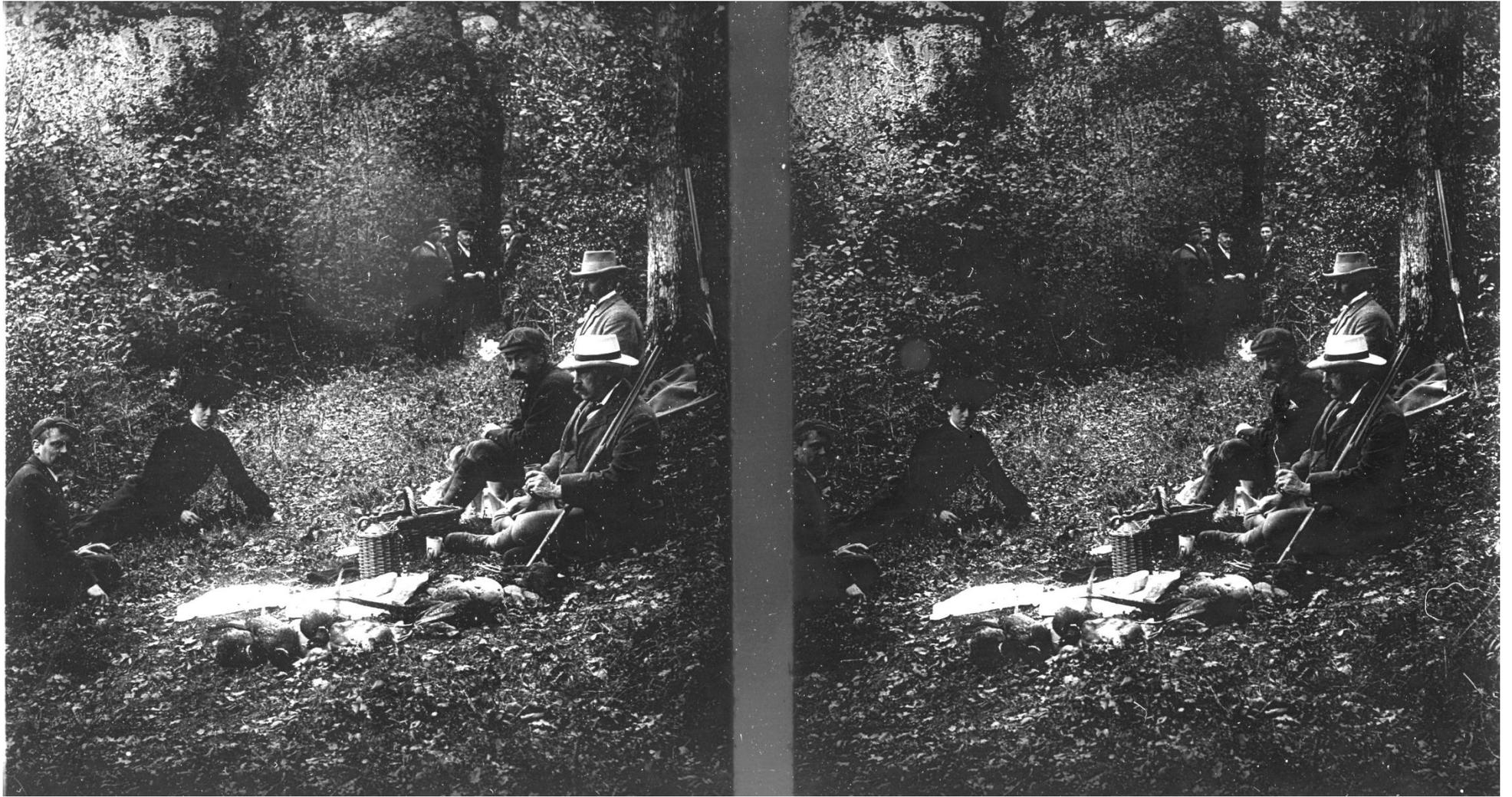
*Wendover, Buckinghamshire. One of a Stereo pair. Werramat 35mm Camera.*

I gave in to temptation beyond reason and attended a camera fair in May, coming away with an absolutely beautiful walnut Victorian stereo viewer and some contemporaneous slides to view with it.

Unlike the Cavender Camerascope, This viewer had optics which opened out to a viewing field of eight centimetres square for each eye. I picked a group of black and white glass transparencies of an Edwardian Shooting Party which worked well in the viewer – which also turned out to be a great hit at my recent display at Prestwood Steam Rally.



*Victorian Walnut Stereo Viewer and Slides. Manufacturer unknown. Circa 1880*



*Black and White stereo Slide of Edwardian Shooting Party. Camera and Photographer Unknown. Glass mounted Sandwich .*

The walnut viewer is also rather versatile. A top plate hinges out with a mirror section to direct light into the body of the viewer so that it can be used to view printed or card-backed stereo pairs in addition to its main function as a transmitted light (or slide) viewer.

I tried this late at night with some printed up colour pairs and found the shadows cast across the viewing field a real hindrance. The problem of course was that I was using a concentrated beam of lamp light to direct down into the viewer. Waiting for daylight and with diffuse cloudy skylight being reflected down into the viewer the results were much better and again the pictures came alive. Being able to view prints 8cm square also meant that the tonal quality of what I was able to print up exceeded that of the much smaller prints that I could make for the Cavender Camerascope.

Let's hear it for the Victorians! They knew what they were doing with stereo.



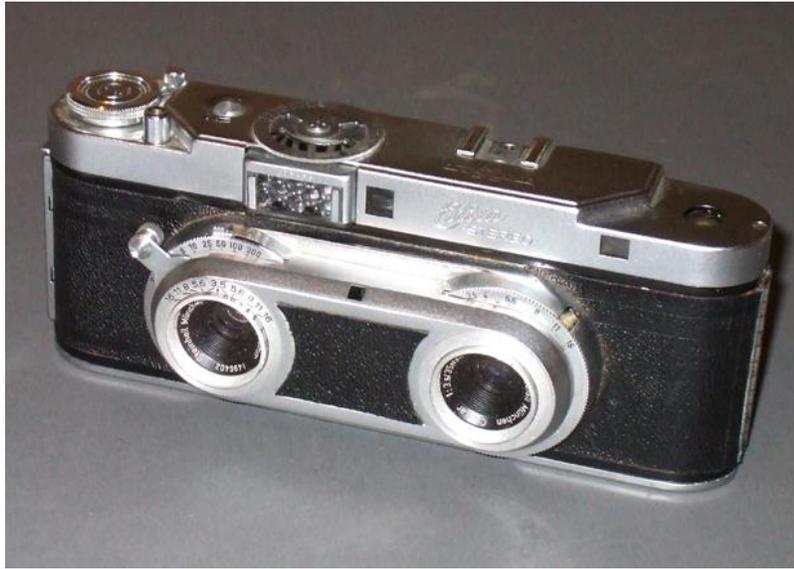
*The Hale, Wendover, Buckinghamshire. Werramat 35mm Camera. June 2011. Stereo pair composited for viewing in Victorian Stereo-scope.*

I thought my excursion into stereo photography would originally end here. But during the course of the project one of my trustworthy camera suppliers Sue (she will be glad to at last get a mention) found me an Edixa Stereo camera in very good condition.

At last I had a stereo camera using a non-obsolete film format – 35mm – and of the precision German manufacture so characteristic of the fifties and early sixties. It has a lens separation of three inches which I hoped would give an enhanced stereo effect and had all of the control missing from the basic Coronet Stereo camera – Variable aperture, a full range of shutter speeds and linked focussing. Everything on it seemed to work fine except the built in exposure meter – but that didn't worry me.

The one thing missing was a rewind knob. Opening the camera up however I found that the spigot and spring which engage the film cassette were still present. I figured that I could load and thread the

camera without problems – the only thing I would need to do would be to unload the camera in the dark. Since I had a cloth dark bag designed for exactly this type of task I wasn't worried.



*The Edixa 35mm Stereo Camera circa 1954*

With our summer holiday in Norfolk coming up I decided to pack this camera, along with the dark bag, and give it a work out. Needless to say the activity did not go as planned and I found out just what the particular problems with this camera were.



*Museum Restaurant, Great Yarmouth, Norfolk, August 2011. Stereo Pair. Edixa Stereo Camera*  
[25]



*Great Yarmouth, Norfolk, August 2011. Stereo Pair, Edixa Stereo Camera.*

Loading and preparing the camera was straightforward. The viewfinder was reasonable giving an accurate representation of the square 24mm format that the camera produced. In use it attracted some interest and admiration from passers by intrigued by the double lens. They didn't realise how old the camera was – in many respects it could pass for a modern 'specialist' digital camera.



*My wife – Helene checks out the 'Sick Man' in a Joke Shop, Great Yarmouth. Edixa Stereo Camera*

But the shutter? Oh dear! Sometimes it would fire, sometimes not. Over the course of several days I realised that it worked more reliably in hot weather, but if it didn't fire I still had to wind the film on since it was coupled to the shutter release and I couldn't try another exposure at the same film position. I grimly resigned myself to a wastage ratio of about 66%.

Then there was the frame separation. With three inches from one frame to the next I wondered how the camera managed the exposures. Surely it would interleave the exposures from one shot to the next to fill the gap – maybe it did it twice? I wasn't sure. After each exposure I tentatively moved the lever wind until it stopped. Sometimes it seemed to travel a longer distance than others. I was vaguely uneasy.

After some fancy finger work inside the dark bag after shooting the first film (and don't think that didn't attract some attention when done at an outside restaurant table in the high street), I retrieved the film cassette intact and trooped it to the local Boots chemist which still thankfully offered a twenty four hour process and print service.

I explained carefully to the young counter assistant that the film needed careful handling since it came from a stereo camera and instead of having a conventional format of 24mm x 36mm on 35mm film it had a format of 24mm square – a bit like the 126 instamatic, so it would need careful cutting so as not to slice through frames and that there may be some frame overlap which would require careful line-up on printing.

She stared at me open-mouthed until I finished, swallowed hard then said that maybe she would go and fetch the manager to deal with this.



*Wroxham High Street, Norfolk, August 2011. Stereo pair, Edixa Stereo Camera.*

When I got the results the next day it was evident that some of my instructions at least had been followed. They had not cut through any exposures. Other than that however it was evident that their automatic scanner had not been up to the task of handling randomly spaced negatives with large areas of nothing in between, then many other exposures, as I feared, overlapping.

Abandoning the washed-out prints I opted for process only for the other films I shot, relieving the evident pain and panic I had caused at Boots if not saving myself much actual money.

I looked for activity and some depth in the subjects I chose to shoot with the Edixa. I anticipated that with its option of fast shutter speeds I could at last shoot some movement and dynamism in the constant flow of people moving up and down Great Yarmouth's main shopping parade. I was right. The picturesque and gaudy seaside atmosphere lent itself well to stereo coverage with many foreground features such as benches and display turrets to accentuate the depth of the perspective the street itself created. I have picked one or two of the best examples here which I have composed specifically for the Victorian Stereo Viewer.

Although the original pictures were square the final results are, as you will notice, frequently portrait in shape. This was necessitated by the overlapping exposures which rendered the sides of many of the frames un-useable. Once they were masked out however, well conformed pairs could be created in Photoshop.



*Roy's Department Store, Wroxham, Norfolk, August 2011. Edixa Stereo Camera*

These are some of the most successful stereo pictures I have managed to capture, despite the problems of the Edixa camera. What makes them good is the capturing of actual people, unaware of being photographed and in movement, frozen in time and the depth of space. Neither the Coronet, nor twin camera shooting really have the capability of operating with the freedom of movement necessary for such documenting of life.

What is evident from these results is that the Edixa is definitely worth getting stripped down, cleaned and repaired. Hopefully the shutter and frame spacing functions will then be reliable. Certainly the lens quality approaches that of contemporaneous cameras of the time such as the Kodak Retinas.



*Wroxham, Norfolk, August 2011. Edixa Stereo Camera.*

Well, that's it for this stereo project. It extended a little beyond what I had originally envisaged, largely because of the acquisition of the Victorian Stereo Viewer and Edixa camera both of which occurred after I started the project.

I have been able to explore successfully the readily available Stereo technologies applicable to the use of standard types of cameras and displayable through a printed medium. Other techniques can only

work through the use of projection, television or (in the case of lenticular stereo) by using specific substrates and post production systems.

And, with the migration of television viewing away from the traditional analogue systems to open ended digital systems, high definition stereo viewing is now available to the consumer. I picked up a DVD display box only very recently, which had a lenticular stereo image on the face of exceptional quality.

The one avenue that I have still to approach concerns the creation of false stereo effects (for want of a better term) – by that I mean the generation of a stereo effect from just one picture. Given that the impression of the nearness of an object is derived from an increased separation between the elements of the left and right views, it therefore follows that by duplicating a single image and stretching and shifting parts of the image graphically in relation to each other across the two images, a stereo effect can be obtained. The result will always be contrived. But that of course is another project.’

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<https://www.westonmeters.info>

2020 Update:

I am posting this journal on my website for the first time, and eight years after completing it to this point. Since then I have purchased a Viewmaster camera, a Russian medium format stereo camera and an American Stereo Realist. I have had good results from the Realist and intend to run the Russian camera as soon as is practical. Results will be documented and posted.