Viewing JPEGs on TV – Part 2

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When John Myers first raised the subject of viewing JPEGs on TV *[2003]*, we did our own checks and came to the same conclusion as John that simply putting images onto a CD wouldn't help as data discs couldn't be read by a DVD player. Hence we both finished up by preparing discs in 'Video CD' (VCD) format, as described in the original article (Part 1, p1).

But that ruled out using *CDBurn* under RISC OS to prepare the discs (or so we thought) and we used Windows application software instead.

Nevertheless, *FSI_Batch* and *JCut/JClean* were invaluable for massaging the JPEGs before burning the VCDs (re-scaling them to stop the 'shimmer', 'squishing' them to PAL/DVD standards, rotating and/or cropping).

There was quite a lot of interesting and welcome feedback from the article. In particular, Bernard Veasey said it was indeed possible to use *CDBurn* to produce what he called 'JPEG CDs'.

This completely foxed us! But, with Bernard's valuable assistance, we've been able to sort out how it can be done, when it works (and when it doesn't...) and various follow-on procedures.

JPEG CDs

In essence, a 'JPEG CD' is simply a collection of JPEG images burnt onto CD-R or CD-R/W, as a conventional *data* disc, using *CDBurn* or equivalent application. The disc can then be read by a DVD player – but *only* if it has a built-in JPEG reader function for CDs.

This was a new one on us, but it turns out that some recently-introduced DVD players do have this feature.

[That had started happening only within the previous year or so of when the article was first published, in 2004, which explains why we'd previously missed it. Well, that's our excuse...

An increasing proportion of DVD players do now have the capability to handle data discs containing JPEGs, while a number of DVD recorders and portable players can accept JPEGs loaded onto compact flash or SD cards, for example, and their contents can even be loaded onto a DVD recorder's hard disc drive, if fitted.]

Points to note when running JPEG CDs are:

– If you use *CDBurn*, the Filename translation standard needs to be selected to ISO Level 2 and Add Joliet extensions needs to be ticked.

– Image names need to be in the form *filename/jpg* (Bernard's *PCType* utility on his website *www.bapfish.org.uk* is very handy for adding the DOS */jpg* extensions, as a drag-and-drop, batch operation).

– Typically, images are displayed by being built up, in strips, from top to bottom. This can take quite a few seconds per image, depending on its resolution/filesize (to be discussed later).

The DVD recorder/player menus may allow individual images taken in portrait format to be rotated by ±90° for viewing 'right way up', but it takes quite a few seconds for the rotation to be done and the image re-displayed. Nor can the result be saved, so the procedure has to be repeated each time. Not very user-friendly...

– The DVD recorder/player menus may allow you to set a preferred time interval between images to run them as a slideshow but, in all probability, the left-right buttons on the zapper will let you override that and step backwards or forwards through the JPEGs.

– Most DVD recorder/players which have JPEG readers can handle and display images in sub-directories but, if you have one which doesn't, all images should be placed in the root directory of the CD before burning.

– Image names may or may not be displayed.

Display quality

Bernard reported that the displayed image quality was quite good.

However, when we tried our own test discs on various players, the results were pretty grotty, with oodles of 'jaggies' and dodgy colour contrast, almost as if only one field of 288 horizontal lines was being displayed, rather than the full PAL frame of 576 lines.

After comparing notes with Bernard and further testing, we realised we were hitting a seemingly contradictory phenomenon in that – the *higher* the source JPEG image resolution - the *worse* the display became!

To quantify that, images from a 1.3 megapixel (MP) camera (1280×960 pixels) don't look at all bad, but 3MP images look noticeably worse, while 6MP images look simply awful.

This was put to a manufacturer who replied it "was to be expected".

Charming: couldn't they have warned us in the user-guides? They also mentioned that other manufacturers' units would probably also exhibit the same phenomenon (maybe using the same chip).

Re-scaling the JPEGs

So we're faced with the general problem that, as the source JPEG resolution increases, the display will worsen. This implies the situation can be improved by scaling all the JPEGs down, before burning them onto JPEG CD. But down to what size?

Logic suggests that rescaling them to match the underlying TV display – 576 horizontal lines in PAL format – might help. So we rescaled a few JPEGs down to 768×576 pixels (retaining the 4:3 aspect ratio), burnt another CD and ran it through the DVD players.

Result: consistently superb display quality, noticeably better than with 1.3MP images and *oodles* better than 3-6MP JPEGs.

But the images seemed to be a little wider than expected and a bit 'squashed', so that immediately led us to wonder if the images were being expanded slightly by the display circuitry, before being displayed, in exactly the same manner as appears to happen with VCDs, SVCDs and DVDs (explained in Part 1, p2).

So we then tried scaling some images down to 720×576 pixels, burnt them onto a CD and ran them through the DVD players.

Result: total success, superb display quality and images looking 'right', i.e. with the correct aspect ratio.

Incidental advantages are that each JPEG filesize is reduced to around 350KB (from c. 2.5MB for a 6MP image), so each will be displayed far quicker – typically in under a second – plus you can get many more onto each CD.

What to use for rescaling the source JPEGs down to 720×576 pixels? The obvious answer is to employ our old friend *FSI_Batch*, in a single pass, using *exactly* the same procedures we discussed in Part 1, pp2-3.

Images in portrait format

We're still faced with rotating source images taken in portrait format by 90° so that they're displayed 'right way up'. Even if the JPEG reader has a facility to rotate the image by ±90°, we've already deduced this is not user-friendly.

But as an alternative, as we need to rescale the images anyway (unless your source images are from a 1.3MP camera and you're happy to accept that displaying them 'as-is' may not give the optimum quality), we might as well rotate them in the pre-processing stage, before burning onto CD.

Last time we advocated using *JCut* or *JClean* for the job, but an Archive reader pointed out that *FSI_Batch* also has an image rotation function, although she couldn't get it to work without screwing up the image aspect ratio – and what was she doing wrong please?

This turns out to be due to the way in which *FSI_Batch* does the job. Specifically, it rescales the images *before* rotating them.

So if you preset the Pixels numbers to *405 by 576* (as discussed in Part 1, pp3-4) and also click on either Rotate *+90°* or *-90°*, you finish up with a correctly rotated JPEG – but the output resolution is now transposed to 576×405 pixels – and the image looks seriously 'squashed'!

However, it's very easy to fool *FSI_Batch* into doing what we want, simply by transposing the preset Pixels numbers to read 576 by 405, and clicking on the appropriate Rotate button (usually +90°), before processing the image(s).

Fig 1 The FSI_Batch window (section)

The settings are shown in Fig 1. These will process a batch of JPEGs, rotate them through +90°, scale them down to the desired 405×576 pixels to improve display quality and, once expanded by the display circuitry (we think), display them with an aspect ratio of 3:4.

An incidental advantage of using *FSI_Batch* to do the job of rotating JPEGs (perhaps from digital cameras), instead of *JCut/JClean*, is that it doesn't use the bugged *SpriteExtend* module in RISC OS 4.0x or earlier, and therefore avoids the troublesome 'banding' problem.

To summarise so far, we appear to be able to do most of our pre-processing, using only *FSI_Batch*, and in only two passes:

– *Batch 1* – rescaling all landscape-format images, from whatever source, down to a common size of 720×576 pixels.

– *Batch 2* – rotating all portrait-format images, from whatever source, through 90° for viewing 'right way up'; plus rescaling them down to a common size of 405×576 pixels.

This will enhance the display quality of JPEG CDs and stop the 'shimmer' in JPEG CD, VCD, SVCD and DVD formats.

Widescreen TVs

To display landscape-format images on a JPEG CD on a widescreen TV, we can go through exactly the same pre-processing procedures which we discussed in Part 1, pp4-5, starting by first rescaling all images down to 960×768 pixels, in a single pass using *FSI_Batch*, and then cropping them down to 960×576 pixels, *individually*, using *JCut.*

Digital camera resolution

John Myers wondered whether – if we're going to rescale all images down prior to burning a DVD or VCD (and now JPEG CDs) – there's much point in using a high-resolution digital camera?

This is worth debating as there's points for and against. A neutral factor is that a digital camera is most unlikely to be able to record at 720×576 pixels, so rescaling will be required anyway.

A definite plus point is that recording at a relatively low resolution – say 1280×960 pixels – allows many more images to be stored on the camera's recording medium and speeds up download.

(Some digital cameras, and many video cameras in 'Snapshot' mode, will record at resolutions down to 640×480 pixels, or even less, but we wouldn't recommend using those settings for anything other than display on a VGA monitor. If scaled *up*, for display on a TV, they will tend to look rather coarse.)

Based on past mistakes, we now tend towards the other extreme and routinely capture images at the highest resolution setting the camera can handle. The primary reason for this is that we never know when the image might be used for purposes other than display on TV or monitor.

For special occasions, we might even opt to select the camera's uncompressed recording

format (usually TIFF or RAW), accepting that the resultant image can be huge (in MB) and may need extra pre-processing, before use.

Perhaps the most common reason is if you want to have a commercial or DIY photographic enlargement or print prepared.

If the original image was 3-6MP, with a *copy* scaled down for display, that would be fine – provided the *original* image has been retained for printing. But a large-format print from an image already scaled down to 720×576 pixels will inevitably disappoint.

Another potential factor to consider is that today's digital cameras don't just record the raw image data; they include other information, mainly textual, and commonly known as EXIF. This is used by relatively recent versions of Windows to generate thumbnails, **Properties** info, and so on; this is a valuable and welcome feature.

At present, under RO 4.0x or earlier, it probably won't be possible to load such files directly into a graphic frame in *Impression*, *OPro*, etc. It may be necessary to first strip out the EXIF info, using a suitable utility such as *JClean* or *JCut*, leaving just the raw image data. However, once stripped out, the EXIF information is lost and no longer available, even if you later upgrade to a version of RISC OS which can utilise it.

(Adjust seems to import JPEGs with attached EXIF info into Impression frames, etc and, reportedly, RISC OS v5.06 is also OK, but we're not sure if this applies to all versions of EXIF.)

Putting both these factors together, we would advocate a 'future-proofing' policy of first putting an archive copy of all downloaded images, *in their original condition*, onto CD-R/W or Zip disc. Then copies can be taken, the EXIF info stripped out if necessary, and the residual images used for DTP, printing, scaling down for burning onto JPEG CD, VCD, SVCD or DVD, etc.

JPEG CD, VCD, SVCD or DVD?

Using the procedures we suggested in Part 1 and this follow-up, we now have a great deal of flexibility on what formats we can use to do the job.

If you wish simply to view your images on TV and don't want the hassle and wear-and-tear of connecting up your camera to the set, then JPEG CDs produced under RISC OS or otherwise are an attractive option – provided your DVD player has a JPEG reader.

Conversely, while DVD, SVCD and VCD format discs cannot presently be produced using RISC OS, our favourite utilities such as *FSI_Batch* and *JCut/JClean* are invaluable.

We feel the SVCD format is a useful half-way house as many more DVD players will run the discs, the JPEG display quality (as stills) is almost as good as DVD, and features such as transitions, titles, captions, background musak and even a commentary can be added as desired.

Ideally you need a PC or Mac to do that but it doesn't have to be a powerhouse. (Movies can be put onto VCD but, if replayed on a relatively modest machine, will appear to be rather 'jerky'.)

The ultimate is of course the DVD format which modern PCs, Macs and DVD players can handle, although again this doesn't require a particularly powerful machine for the editing and burning processes. There's an interesting article in Archive 18.1 p17 about using KinoAMP under RISC OS for viewing MPEG movies on DVD etc.

But in any event, RISC OS running in native hardware or under VirtualRPC can be used for image archiving, sorting, storage/retrieval and all pre-processing.

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