Document Production Column
by Gerald Fitton

I know of half a dozen people who can produce all the documents they want with no more software than that excellent wordprocessor WordWise. Our editor is familiar with that package and has produced many excellent booklets explaining how to make best use of it. The hardware used by these half dozen acquaintances is a 32 Kb BBC Model B computer which they bought ten or twelve years ago together with a printer such as the dot matrix FX80 - a machine which went out of production in the mid 1980s. Most of us who read Archive, even if we know of WordWise, will not be using that combination of software and hardware (though I have a recent letter which extols the virtues using WordWise on the Archimedes as an intermediate format for 'porting' documents from one platform to another); probably we've got a combination of such packages as Artworks, PipeDream and Impression Style and hardware which contains the RISC OS 3.1 operating system as ROM.

What I would like you think about in the next few months is why people upgrade from one hardware/software system to another. I'm going to explore that with you and, I hope, help you to rationalise your strategy for hardware and software upgrades. I shall concentrate on those hardware/software systems for which the first use is document production.

Within my definition of document I include spreadsheets, letters, invoices, and those documents which might be described under headings of DTP and Drawfiles. I specifically exclude games, program development and that hardware & software used for musical or mechanical purposes. I shall cover any kind of document production hardware and software; I shall concentrate on looking at how such a system appears to the user and buyer.

But - before I start on the 'heavy' stuff do let me say a few words about this renamed column.

PipeLineZ to DocLine

In the last edition of Archive how could I help but notice our Editor's comment that, although the contents of PipeLineZ often contains material which would interest 'non-Coltonites', it is difficult to persuade those who don't have PipeDream or Fireworkz to read it! The editor's suggestion is that it might be a good idea to change the name. I agree!

In defence of PipeLineZ I must say that about one third of my Archive generated correspondence is from 'non-Coltonites' and, I have to add, much of that correspondence is of great interest to me, complimentary to PipeLineZ and of great general value. I would like to include more of such correspondence in Archive. My opening paragraphs and the change of title this month is intended to catch your attention and persuade you 'non-Coltonites' that this column is worth reading even if Colton Software's products do feature heavily herein.

Before I launch into my main topic for this month there are a few hangovers from past volumes of Archive which need mentioning. Even there you'll find parts of interest to 'non-Coltonites' which introduce my main theme for this month.

Stamps

The following is part of a letter I received from Mr A G Rimmer. The programs which he mentions are on the Archive monthly disc.

"Thanks for your prompt reply to my letter. Since receiving it, I have bought a copy of Fireworkz, and enclose on disc a copy of a program to choose the minimum number of stamps for any given postage amount (assuming that all the current values of stamps - or at least those listed in your April contribution to Archive - are available). I also include an improved version of a BASIC program that does the same thing (but faster!).

"I recently got PipeDream 3 free from Risc User on paying for a year's subscription to their monthly disc. It seems to have the advantage over Fireworkz that, by using its own printer-driver, you can print letters, etc., much quicker on a dot-matrix printer as compared with painfully slow graphics printing using !Printers. However, for my letters (like this one) I use Lee Calcraft's DeskEdit with a text-only printer-driver."

In an earlier letter Mr Rimmer sent me a PipeDream solution which he created using PipeDream 3 (but which 'works' in PipeDream 4) - that too I include in the Stamps directory of the Archive monthly disc.

You will see that Mr Rimmer uses a range of software from BASIC to DeskEdit, choosing the package most suitable for the application he is working on. In line with the philosophy which I wish to promote, he has my encouragement to continue with this strategy.

Cross Checks

I have received much correspondence on this subject since I mentioned it. Essentially a cross check is a tactic for ensuring that a spreadsheet hasn't made an error. The method is to use the same data for two different sets of calculations which are 'designed' to give identical answers only if there are no mistakes. One problem with binary arithmetic (to which I have referred in an earlier Archive PipeLineZ article) is that most decimal values are truncated and hence stored as approximations - as a result of this truncation the two calculated results which should be identical are, more often than not, only approximately equal. An obvious cross check, testing for exact equality will fail even when there is nothing wrong with the spreadsheet. This is not a characteristic peculiar to the products of Colton Software. The effect can be reproduced with other spreadsheets (as my 'non-Coltonite' correspondents have delighted in telling me) as well as in something as basic as BASIC.

At this stage I must record my thanks to Denis Howard for the inspiration which has led eventually to the formula which, between us, we developed for checking if two values are 'near enough' the same. I have included on the Archive disc a directory called CrossCheck which contains files in PipeDream 4 format. These files will load into Fireworkz. For those of you using a different spreadsheet package the solution is contained in the following lines which are in the form of a PipeDream or Fireworkz custom function:

...function(“same_number”,“first:number”,“second: number”)

...result(if(abs(@first-@second)/(@first+@second)<(1e-16),“OK”,“Error”))

What this formula does is to find the ratio of the difference to the sum of the two ‘equal’ numbers. If we call the ‘equal’ numbers x and y then we calculate the absolute value of (x -y)/(x + y). We use this ratio, rather than just (x -y), so that we can make allowances for ‘large’ and ‘small’ values of x and y. We find the absolute value so that we can ‘get rid’ of negative values. Then we then compare this ratio with the small positive number 0.000 000 000 000 000 1. If the ratio is smaller than this small number then x and y are ‘near enough equal’ for there to be no errors in the spreadsheet.

By the way, PipeDream text files (such as the [ReadMe] explanation of the way in which this Cross Check ‘works’ that you’ll find on the Archive disc) will load into Acorn’s Edit. If you have RISC OS 3 then the easiest method of loading almost anything into !Edit is to hold down the <Shift> key whilst double clicking on the file.

PipeDream to Psion

If you have problems porting files to and from the Psion then the files on the Archive disc in the directory PD/Psion will be of interest to you. The ‘conversion’ process mentions Lotus and other ‘foreign’ formats so it is not a PipeDream only article. Although Ian Williamson uses PipeDream files for his example, if you write to him he’ll do his best to explain ‘how to do it’ with other format files. His address is in the PipeDream format [ReadMe] file on the Archive monthly disc. Load it into !Edit if you don’t have PipeDream.

Computer Systems

Now to the first part of a series which I will develop during the next few issues of Archive, namely the way in which you can rationalise your strategy for upgrading your computer system. I hope that through this series of articles you will benefit from my personal experience of upgrading as I have benefited from comments made to me by other people.

It seems a long time ago but I suppose it can’t be more than 15 years ago that I bought an Acorn BBC model B ‘micro’ computer. It had no hard disc, no printer and the TV doubled as a monitor! Now I have an A540 (before the RISC PC machines this was the ‘top of the range’ machine) and one of the first A440 models to be produced (don’t confuse my A440 with the later A440/1 etc series). I shall buy a RISC PC later when I can (a) afford it and (b) justify it!

Let’s start with some general principles. Firstly, think in terms of the whole system rather than just the ‘computer’ box. By this I mean think of the monitor and printer (and even your ‘software’ packages) as ‘upgradable’ parts of your overall system. My first ‘message’ to you is that a good printer and a good monitor both make up a substantial proportion of the overall cost of your system so thinking about what you want is at least as important as thinking about the ‘computer’ box.

Let’s start with a general discussion of printers using it as an example of the ‘right’ way to think about upgrades.

Printers

My first printer was a 9-pin Epson FX 80 and (important to my discussion) it cost as much as the BBC B computer. I bought it before I ‘upgraded’ from cassette to a floppy disc drive. However, that printer saw me through an upgrade to a BBC Master computer (as did the disc drive) and I used it with the A440 Archimedes for a year or two before relegating it to a tractor feed label printer. There is no doubt in my mind that the FX 80, although one of the more expensive printers at the time, was better value for money than was my BBC B computer. This is not to say that the BBC B was not good value; it was good value. The FX 80 was even better value because it saw me through three computers, the BBC B, the Master and the A440.

My second printer was an Epson GQ 3500 bought over five years ago. It is a laser printer and produces better quality at 300 dpi than the 9-pin FX 80 ever could. It still exists but I’ve ‘lent’ it to my son for use with his 486 PC; I used it for quite a while with both my A400 and then with my A540. If I still had it I would be using it now and I would be using it with my RISC PC (the one I haven’t bought yet). Once again, that printer cost as much as an Archimedes computer but it saw use with two (the A440 and the A540) and is still going strong now with a third computer. Let me repeat (in the hope of convincing you) that buying a good printer is a ‘better’ investment than buying a good computer such as the Archimedes A540.

I am not yet convinced about the printer I’m currently using. It is of the Colour Ink Jet type. The model is the Integrex ColourJet Series 2 which has a resolution of 300 dpi like the laser printer (but doesn’t produce quite as good an image - but it’s pretty close). The Integrex is an HP 500C compatible. I bought it for two reasons. One is that I wanted to experiment with colour. The other is that I often print one or two labels at a time on an A4 sheet of 18 labels. With the laser printer I was using a page worth of toner for a couple of labels; with the Ink Jet I use only the ink needed to produce the label - so it works out to be a little more economical than the laser. Nevertheless I expect that the Integrex will see me through at least two upgrades to my ‘main’ computer hardware and, at much less than the cost of a computer, it is still a better investment than the A540 which (currently) outputs to it.

What I hope you will have gathered from the examples I have quoted for Printers (as part of an upgradable computer system) is that it is not just the cost of an item which is important but you also have to judge how far into the future it’s going to ‘last’. Whether a piece of hardware - or for that matter, software - is a ‘good’ investment must include a (difficult to estimate) ‘time’ element. I hope that this series of articles will help not only ‘Coltonites’ wondering about upgrading to Fireworkz but also ‘non-Coltonites’ wondering about - let’s say - Monitors!

Monitors

Now to monitors. The technical considerations of choosing a new monitor have been covered in earlier issues of Archive but I hope that you'll agree (when you've read it) that what I have to say complements those articles rather than reiterates the information therein.

Back to my personal history. I soon replaced the TV which I used with the BBC B as a monitor with a 'proper' monitor. It was one of the Microvitec series but I can't remember which one. At the time it cost about the same as the BBC B had cost me but it served me well with the Master I bought to replace the BBC B and is still working well as part of the 'system' which I passed on to a friend.

I bought my A440 with one of the Acorn cheaper 'standard' monitors but I soon bought a multiple scan rate monitor (often referred to as a 'multisync') to replace it. The multisync I bought is the Eizo 9070S 17" flexiscan which, although unused, was available at about half price because it was soon to be replaced with a later model! Nevertheless the Eizo cost me about the same as the computer hardware currently being sold by Acorn.

I am still using that Eizo now with my A540. In the main I use it in Mode 102. This is a 'special' mode provided in software by Atomwide as part of their !VIDCmodes and !VIDCplus utilities; I believe that it is available from NCS as a Shareware disc. Let me elucidate about Mode 102 since it is relevant to the specifications of current (and future) monitors. I make no apology for referring to PipeDream documents in my discussion because, even if you don't have PipeDream then, by thinking "!Edit", I'm sure that you'll get my point.

The Atomwide Mode 102 allows me to use PipeDream documents which are 136 system font characters wide without any of the document disappearing off screen. The 'depth' (or should it be the height) of the screen allows 50 (system font) lines of any PipeDream document to be displayed. This is almost twice as 'wide' and twice as 'deep' as a Mode 12 screen (the Mode 12 screen will display - in system font - a PipeDream document which is 72 characters wide and 26 lines deep). You will see that the 'area' of the desktop displayed in Mode 102 is about four times that of a Mode 12 screen.

I find this large desktop area the biggest single benefit which I have gained from using a multisync monitor. The 'old' standard 14" monitor might have been OK under the Arthur (single tasking) operating system but, once it became possible to put many windows on the screen and to have more than one application running and to have transfers of data from one (say !Draw) to another (say Impression), then a 'bigger' desk top area was not a luxury but a necessity.

Although the Eizo 9070S is no longer available I expect that I would be able to use it with my RISC PC (when I buy it). I don't expect to transfer the Eizo to the RISC PC because I shall probably buy a new monitor with that machine and keep the A540 and Eizo as my second machine.

Buying a Monitor

I recommend that you do not buy a ‘standard’ SVGA monitor but a multisync. This is because the SVGA standard won’t ‘last’ into the future as well as a ‘good multisync’ will. Generally, if you buy a good 17“ multisync monitor now then it should last you through at least two ‘computer’ machine upgrades (even if you change to a Windows PC machine where the SVGA standard is seriously obsolescent and where sales of multisync monitors are on the rise). I know that a 17” multisync costs more than a ‘standard’ monitor (or an SVGA monitor for that matter) but I do recommend it to you on the basis that it will be a good investment - indeed, if I had the choice of buying either a ‘good’ 17“ multisync or upgrading from, say, an A5000 to the RISC PC as an ‘investment’ in ‘future proofing’ then I’d buy the multisync!

If I were a ‘normal’ user with a ‘good’ multisync then I would register as an “Acorn Enthusiast”; that registration would entitle me to order a RISC PC ‘system’ without a monitor at a reduced price - I would use the Eizo with the RISC PC.

So what is a ‘good’ multisync? I’ve already told you what I think is the major advantage of using a multisync; it is that you have a larger desktop ‘area’. It is possible to create ‘large desktop area’ modes for use with a ‘standard’ 14“ monitor but, with such a monitor this larger ‘area’ will be of no use to you. This is not just because everything is smaller (after all you could get closer to the screen) but because the screen itself doesn’t contain enough dots per inch to ‘resolve’ the fine detail your ‘larger area’ mode has created.

What you might try with a ‘standard’ 14“ monitor is the Acorn Mode 35. It doesn’t really show you what I mean but it’s a step in the direction of enlarging the desktop ‘area’ (in !Edit) from 80 by 32 system font characters to 96 by 36 (about 20% increase in each direction). If you have the Computer Concepts !NewModes (supplied with Impression) then you can try their Mode 90 which gives a desktop ‘area’ of 160 by 64 system font characters. I find it unreadable when I try it on my A440 with a ‘standard’ 14” monitor because the dpi resolution of the monitor won’t cope with the fine detail created by the software.

What Size

If you are serious about CAD or DTP and really need a very large desktop ‘area’ then you might consider buying a 20“ monitor. At present the prices are, in my opinion, rather high for non professional use (but see my comment in a later paragraph). I don’t recommend 15” because the improvement is minimal. Much more affordable, and a good compromise between cost and ‘the best’ is a 17“ multisync. With a 17” monitor you will, like me, be able to use a desktop ‘area’ of about twice (in both directions) that of Mode 12. I would have liked just a fraction more so that I could fit two 72 character wide PipeDream documents side by side. I’ve been told by an ‘expert’ that Mode 102 is about as far as it is ‘safe’ to go with a 17“ monitor. The expert I consulted understands the fine detail of the technical articles recently published in Archive - so I believe him.

Line Scan Rates

Understanding what is a ‘good’ range of line scan rates is usually presented as a difficult problem and one difficult to resolve. Let me tell you why and then I’ll tell you my views. The old BBC B was designed to use a TV as a monitor so that the line scan rate was about 15 KHz (about 15000 lines per second). The modes used by the BBC B are available on the Archimedes. For technical and marketing reasons (Yes! It’s the IBM PC syndrome again!) nearly all the ‘better’ multisync monitors have a minimum line scan rate of about twice this, 30 KHz. The consequence is that you can’t actually use Mode 12 with a monitor having a 30 KHz+ line scan rate unless you ‘cheat’ and fool your system into believing that it has to scan twice as fast as it needs to. This is effected with software such as that which used to be provided by Atomwide as !VIDC but is now available from NCS on a Shareware disc.

Here is my view. If you buy a multisync then it is unlikely that you will want to use these 15 KHz modes except for running a few special (old) packages. I suggest that you get the !VIDC software for those few occasions when you might need a 15 KHz mode and forget all about including low scan rates in your specification. Think of ‘future proofing’. If you use ‘old’ software which needs these low modes (for applications other than document production) then think about upgrading the software!

Frame Refresh Rates

If you have RISC OS 3.1 then you will find that the modes included by Acorn run at 50 Hz (50 frames per second), 60 Hz, 64 Hz and 70 Hz. The Video Electronics Standards Association (VESA) have studied the phenomenon of ‘flicker’ (see last month’s Archive article in the RISC PC Column) and they recommend that monitors be constructed using phosphors which persist for a length of time which requires (and thus implies) a minimum frame refresh rate of 72 Hz. Because of this I would expect that 72 Hz will become a minimum standard for any future extension of Acorn’s modes. I have been told that the standard for digital television is to be 100 Hz so I would expect many more monitors having frame refresh rates of 100 Hz than there are at present to come on the market soon. In the Windows PC market refresh rates up to 100 Hz are being discussed regularly.

Yes! In spite of my proclaimed naivety I do know that video memory and video bandwidth come into the equation, but the thrust of my article is ‘future proofing’ so I say “Let’s assume that video memory and video bandwidth will increase - have we bought a monitor which will take advantage of these advances in video memory and bandwidth when they appear?”

Perhaps a more important consideration is that digital television technology will use computer video memory and monitor technology rather than the current analogue circuitry. It seems certain now that Acorn have an eye on this market with their MPEG second processor board and ‘new’ multi media offshoot. If so then new Acorn modes are likely to have a 100 Hz refresh rate. Having said all this I hope you’ll see why my recommendation to you is that you buy a 17“ monitor which will run at a 100 Hz refresh rate (and more) if you want it to be an investment for the future.

My recommendation

I have looked at the specifications of what is available at the moment in 17“ monitors even though I haven’t bought one yet. What I have discovered in my search is that the Idek Iiyama Visionmaster 17 is the only one I’ve found with a refresh rate of 100 Hz when running with the largest ‘desktop area’ currently usable on a 17”. Others (I don’t see them in the NCS catalogue) will run at 100 Hz but only with a reduced ‘area’. The implication of this 100 Hz at a ‘large desktop area’ is that there is a margin for even larger ‘desktop area’ modes at lower refresh rates if appropriate software (and internal hardware) is forthcoming from the likes of Acorn or Atomwide.

This Idek monitor has a dot pitch of 0.26 mm, which is about the smallest (best) available on other monitors - because of this I would expect that the resolution of the large ‘desktop area’ would be good (ie not ‘grainy’) to look at. It is by no means the most expensive of monitors - in fact it is cheaper than many. NCS are selling it at about £694 inclusive. You may be able to get one at somewhere between £550 and £650 if you shop around but remember that part of the price charged by NCS is built in to provide you with service if you have a ‘bad experience’. One of the things I tell my students at College is that I would never buy insurance from a company that sells it so so cheaply that it can’t make a fair profit! You get one guess at why.

If you are buying a RISC PC from NCS then, for an extra £440, NCS will provide this Idek instead of the ‘standard’ Acorn 14“ AFK60. If you directly compare this Idek with the Acorn 17” AFK85 you will find that the dot pitch of the Idek is slightly smaller (good), that the scan rate range is larger at both ends (good - 23.5 KHz to 85 KHz) and that the refresh rate (nominally 50 Hz to 120 Hz) range is the same.

Finally, if you have an extra £1850 to spend (over and above the ‘standard RISC PC with 14“ monitor‘ price) when buying your RISC PC then you can consider the Idek MF-8621. This is the ’matching‘ 21“ model and is something to save up for! (There is also an MT-9121 model mentioned on page 6 of last month’s Archive which is about £250 cheaper. It has a slightly larger dot pitch and I don’t know what the scan rate range and frame refresh rates are but maybe the editor will mention here these parameters which I believe to be relevant.)

I know I ‘ought’ to buy the 21“ model because, in spite of the extra money, I’m sure it is a good investment that would see me through into using my RISC PC (and later ‘computer type’ hardware) as a terminal for the proposed multi media information super highway. I don’t think I can raise the cash but this must not deter me from recommending it to you if you feel that you want to buy the ‘best’ monitor and one that will last you through your next three (rather than two) ‘computer’ upgrades.

In conclusion

So I’ve made a start on my ‘new look’ column. I know that in my quest to help you develop a strategy for upgrading your system I’ve concentrated on monitors this month.

I do intend to get around to software soon. As my examples I shall choose Wordwise through PipeDream 2 to PipeDream 3, PipeDream 3 to PipeDream 4, PipeDream to Fireworkz and Impression (Junior or II) to Publisher (or Style). I shall discus how software purchases are ‘future proofed’. I hope that because I shall concentrate on these few packages as examples this won’t mislead you into believing that only users of those packages will benefit from reading the article.

If you have made any of those specific upgrades and want to tell me about it then my address is that of Abacus Training which you will find at the back of Archive. I’d also like to hear from anyone who has an ‘upgrade strategy’ all worked out in their minds even (and especially) if that doesn’t include any Colton Software product.

Remember, what I shall be looking at is document production in general. This range excludes games, programming and music (amongst other uses).

Please let me (and our editor) know whether you approve or disapprove of the ‘broader’ range which I propose for this column! Or should I revert to the more limited remit of the PipeLineZ column?

For my part I shall be interested to hear from you in more detail what you think ‘document production’ should cover and what it should exclude.

See you at the Acorn Show!