Document Production Column
by Gerald Fitton

Although the November 1994 issue of Archive has been out for only a few days already I have had much positive reaction to the changes in the nature of this 'Column'. The general reaction to the content of last month's article is that you'd like to hear more of my ideas and that you do want to develop a strategy for upgrading your hardware and software system. Whilst I shall concentrate on those components of a system which are related to document production, I'm sure that what I say this month will also be of relevance to those wishing to use their computer system for multi-media and those applications which use large sprite files.

In this article I shall consider 'back up' storage (such as hard and floppy discs) and help you to develop a strategy which I hope will be suitable for your present and future requirements.

What should be on a Hard Disc

Much has been written about the 'right' and 'wrong' way of using a hard disc. My view is that it is important to have all the 'Applications' which you use frequently in the root directory of your internal hard disc.

I've checked how much of my hard disc space is taken up by these 'Applications' and I find it to be be less than 15 Mb (of which about 5 Mb is in the Fonts directory). So you'll see that, even if you have a lot more applications than I have, and store all your 'Applications' on your hard disc then you might at most use 20 Mb.

Now let's reverse the argument. If you have an 'old' machine then the chances are that your hard disc is only 20 Mb or 40 Mb. My 'old' A440 (not to be confused with the much later A440/4 etc series). When I bought the A440 a 20 Mb hard disc was 'large'. One day it failed suddenly and catastrophically – so I replaced it with a 40 Mb hard disc. If your hard disc is 40 Mb or less then I recommend to you that you use it almost exclusively for 'Applications' and not for what I shall call 'Data' (see below).
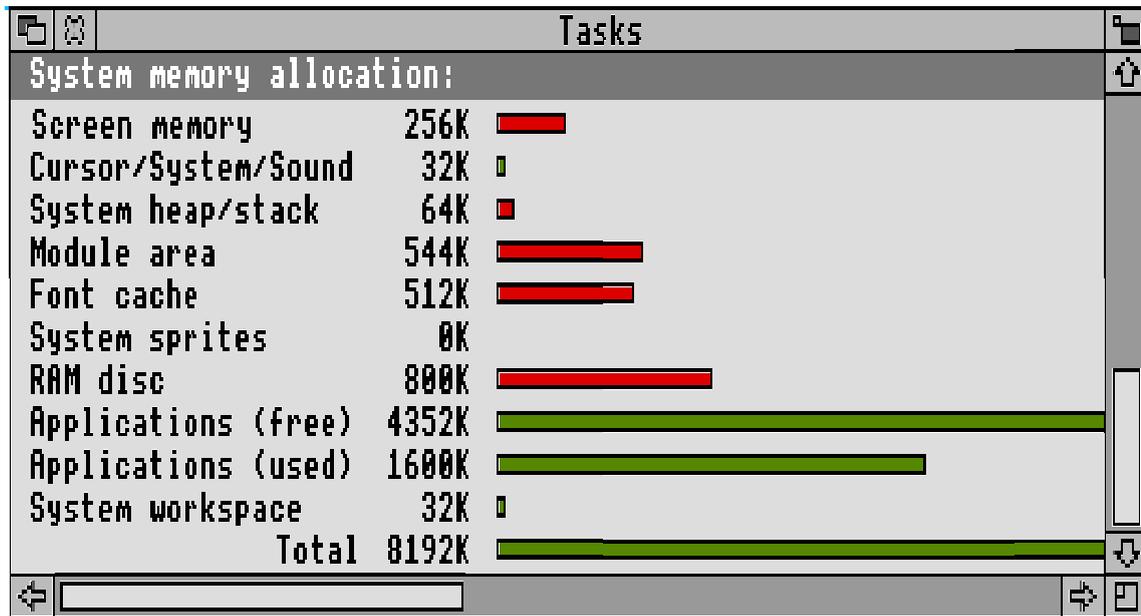
I shall return to the subject of 'Applications', where to put them and how to select 'useful Applications' when I discuss software in more detail in another article.

Wasted Random Access Memory (RAM)

I have read that it is a 'bad thing' to let RISC OS 'see' all your 'Applications' by having them in the root directory of the hard disc. Usually the writer goes on to point out the fact that as 'Applications' are 'seen' their !Boot files are run. This leads to memory being 'used up' by sprites and system variables related to 'Applications' which you know you won't use during that session.

It is true. The !Boot file (usually) puts all the sprites relating to that 'Application' into the sprite pool. The !Boot files also create System variables which help 'Applications' to identify which files belong to them.

Although I shall discuss the factors which determine the 'optimum' size of RAM in another article I want to convince you that the amount of memory used is minimal and that you ought to afford it (and that if you think you can't afford it because you have a 1 Mb or 2 Mb machine then you need upgrade to 4 Mb or 8 Mb).

```
┌─┬─────────────────────────────────────── Tasks ──────────────────────────┬─┐
│ System memory allocation:                                               │⇧│
│ Screen memory          256K  ▬▬                                         │ │
│ Cursor/System/Sound     32K  ▪                                          │ │
│ System heap/stack       64K  ▪                                          │ │
│ Module area            544K  ▬▬▬▬                                       │ │
│ Font cache             512K  ▬▬▬▬                                       │ │
│ System sprites           0K                                             │ │
│ RAM disc               800K  ▬▬▬▬▬▬                                     │ │
│ Applications (free)   4352K  ▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬  │ │
│ Applications (used)   1600K  ▬▬▬▬▬▬▬▬▬▬▬▬▬                              │ │
│ System workspace        32K  ▪                                          │ │
│              Total    8192K  ▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬ │⇩│
│ ⇦ │                                                              │ ⇨ │ │
└─────────────────────────────────────────────────────────────────────────┘
```

Have a look at the sprite 'tasks' above and you will see that I have used less than 128 Kb of system workspace on sprites and System variables. By the way, the entry "System sprites 0K" does not mean that there are no sprites used by the system. Sprites belonging to 'Applications' are no longer stored in this area of RAM.

By running all the !Boot files I have set up my 'system' so that if I open a directory containing a file which can be run with one of my 'Applications' (for example an 'ImpDoc' file which runs in !Style) then that file will display the 'right' icon. Furthermore, if I double click on that file icon then the appropriate 'Application' (such as !Style) will load onto the icon bar and the file will load into the 'Application'. What I don't have to do is open a directory (on my hard disc – or worse, on a floppy) containing that 'Application'. I think that 128 Kb is a small price to pay for the convenience of the visibility of the file icons and the 'double click' to start.

Yet another reason for this strategy exists; Object Linking and Embedding (OLE) has arrived. You will find it as a feature of !Style and !Publisher for example. Using !Style (or !Publisher) if you hold down <Ctrl> and double click on an embedded drawfile (a picture created in !Draw but dragged into a ImpDoc document) then the 'Application' !Draw will be loaded to the icon bar and the drawfile loaded into the 'Application' ready for editing. When you have finished editing the drawfile you can Save it directly back to !Style. If !Style can't find the !Draw 'Application' when you <Ctrl> double click on the picture then you'll get an error message. As OLE becomes more common it will be increasingly important that the 'embedded object' can find its 'Application' when you <Ctrl> double click on it. This in itself is a good reason for installing all your commonly used 'Applications' in the root directory of your hard disc.

Backing up Packages

If your hard disc fails then you have a problem. Often you can reformat it and it will work again – at least for a while. If all you have on your hard disc is 'Applications' then, in theory at least, you can go back to the master discs which came with your 'Applications' and install them again. What you might lose is your personalised configuration settings, and, for packages such as PipeDream, Fireworkz and Publisher, you will lose your user dictionaries. Even if you have only 'Applications' on your hard disc it is well worth making a back up – not necessarily every time you add a few words to your user dictionary, but at least every couple of months!

Using the Hard Disc for Data

As a general rule I think that it is a 'bad thing' to use your main hard disc for data. By data I mean data which is unique to you. If you create a document such as a spreadsheet in PipeDream or a leaflet in Style then this data is unique to you. It's no good writing to either Colton Software or Computer Concepts and asking for a new copy of your latest masterpiece!

If your data consists of many relatively small files (such as letters) then I recommend that you use a series of floppy discs, each one named in a meaningful way such as BusLetters, VAT_93, TaxReturn, Club_01, Invoice_01, etc. When I expressed this opinion previously I received a most interesting letter from one of our members. He said "By all means use the floppies as working discs but use the hard disc as your back up". It's an interesting idea which has a lot of merit.

The 'Big Job'

In spite of what I have said I have to tell you that I use my hard disc for data. I have separate master floppy discs for every PipeLine (and ZLine) disc. When someone wants a back number I can simply make a copy of the floppy using Backup. Nevertheless, I also have a copy of every one of those masters in a 4PL (or ZL) directory on my hard disc. Currently the total contents of 4PL runs to about 15 Mb and grows each time I produce another PipeLine disc. The advantage to me is that (when I am creating a new disc for PipeLine) I can find any previous article much more quickly than if I had to keep loading floppies. The hard disc has faster access than floppies.

Speaking generally, if you have a task which requires fast access to selections from a lot of your data then it might be a good idea to load all the data you might want onto your hard disc before you start. Whether it's worth taking it off the hard disc at the end of the job depends on two things. The first is that you might want to use it again fairly soon. My articles for Archive is that sort of data so I leave the backup copy permanently on my hard disc. The second is that you might not have enough space on your hard disc for the next 'big job'. I suspect that publishers of magazines such as Archive might find themselves in that position. The temptation is to buy a bigger hard disc rather than remove the 'unwanted' files. I believe that this is the wrong strategy.

You might need your hard disc for such a 'big job' if your interest involves the use of many medium size files of say 100 Kb each. For example you might have many digitised pictures as sprites which you wish to merge or include within a DTP report. In such a case it is far more efficient to load all the pictures onto the hard disc before you start rather than inserting many floppies full of pictures.

The 'Big File'

Another form of 'big job' is a database which is too large to keep on one floppy. The membership list for a large Club (or User Group) might be in this category. At the moment I can get all the membership details of the User Groups which I run into one file which will fit onto one floppy – but the time is coming soon when that won't be possible. What can be done about the data file except keep it on the hard disc?

Let me do a little gazing into the near future. It is my opinion that many people who have an interest in document production or databases will find themselves using larger and larger files. If you have an interest in 'multi-media' then soon you too will have 'big files'.

My view is that it won't be long before a significant proportion of you won't be able to store your 'masterpiece' or database on a single floppy disc. Yes! I know that floppy discs are getting larger and that 800 Kb discs are being replaced by 1.6 Mb discs – but 1.6 Mb might still not be enough. One of the 'rules' beloved by futurists (but I think that this one is OK) is that when you 'double' something more often than not there is no noticeable change in 'useability'. I'm a great believer in the 'tenfold rule' which, in one form states that, if you're going to make a major change then go for a tenfold increase (or reduction). I think that doubling the size of floppy discs will give you only temporary relief – and the timescale for doubling floppy disc capacity from 1.6 Mb to 3.2 Mb is further away than you think!

Hard Discs - Tape Streamers - etc

So, what can you do about permanent storage for such large documents? In the following discussion I am going to assume that you are going to generate many such 'big files'.

I guess that your first thought will be "I'll buy a larger hard disc". I know many who have taken that route – and later bought an even larger one – and then a larger one still! Then you wonder what you can discard from the biggest hard disc you can afford. Let me return to bigger and bigger and then bigger again hard discs in another article – accept that I don't think it's the 'best' solution for the 'big file' problem.

Another answer, not a very satisfactory one in my view, is to back up the large document onto a set of many floppy discs. There are ways of 'breaking up' a large document into many small ones and there are ways of backing up a large file without fragmenting it but spreading it over several floppy discs. From my correspondence it would seem that this 'solution' has a certain attraction and a significant number of followers.

Another way of storing 'big files' is to buy a tape streamer. A tape streamer is rather like a 'souped up' cassette tape recorder which will store a copy of your hard disc, or parts of it, on special cassette tape. Tape streamers have been the conventional commercial solution.

For the home user I don't like the idea because it tends to be slow and, even more important in my view, generally it isn't flexible enough to allow you to back up your 'big file' easily in such a way that you can replace it with another 'big file' on your hard disc without shutting down the machine between 'big file' loadings.

Interchangeable Hard Discs

This is the 'solution' which I recommend to those of you who have a 'big file' problem whether the 'big file' is a huge database, large document production or the result of an interest in multi-media. It is also the solution I recommend for the 'big job'. I shall adopt it for my Abacus Training applications as soon as finances allow. My immediate problem is: do I get a new monitor or a RISC PC before I get the removable drive? I've got a vested interest in finding a 'good' solution – so I'd like to know what you'd do!

A couple of Archives ago there was a superb article about SyQuest drives. What follows is meant to complement rather than repeat the information contained in that article.

My confidence in a 'technology' always increases when I see it in a non specialist shop such as my local general office equipment supplier. Our local shop has started selling removable cartridges for SyQuest drives, albeit at a price rather higher than most Archimedes specialists. That is comforting.

The earliest SyQuest drives were 5.25" 44 Mb. Later versions have higher capacity. There are two series: one series uses 5.25" discs and the other series uses 3.5" discs. Although the 5.25" 88 Mb drive will read 5.25" 44 Mb discs, naturally it will not read 3.5" discs of any capacity. Because I believe that the 'future' of the SyQuest drives will be 3.5" rather than 5.25" I am inclined towards the smaller disc format. The largest capacity drive available at the moment is the 3.5" 270 Mb drive. It costs about £550 for the drive; spare 270 Mb discs cost about £80 each. Although I have no 'big job' or 'large file' application at the moment which use anything near 270 Mb I have always found that a modified version of Parkinson's Law applies to disc capacity (and to RAM – and to monitor size – and, well anything). I'm sure that if I get a drive of smaller capacity (saving, say, £100 now) then I'll live to regret it because eventually I will want to use my computer for an application which needs much more disc capacity than I have!

An alternative to the SyQuest system is the magneto-optical (floptical) system. This system is highly popular in the PC world. Suitable magneto-optical drives are made by Fujitsu, Sony, Hewlett Packard, Panasonic and even IBM. These are all well known names so I feel 'good' about the reliability of the technology. The drive prices are a little higher than the corresponding SyQuest drives. Suitable discs are manufactured by 3M, Sony and Verbatim, all well known names, so I feel confident that supplies will be available into the future. Disc prices vary from £40 to £150 and they have storage capacities of 128 Mb to 1.3 Gb (1300 Mb). Discounts for quantity vary but I have seen the 128 Mb discs on offer from a supplier I trust at less than £300 for 10 discs. Drives are more expensive but discs are cheaper.

SyQuest or Magneto-Optical?

I have secondhand reports which suggest that the SyQuest removable disc system is about three times faster than the magneto-optical (floptical) system. However, there is a more serious 'snag'. So far as the Archimedes is concerned the SyQuest system is much more 'available' than the magneto-optical system. This means more technical support and dependable sources for spares, repairs and replacements.

For these two reasons I am strongly inclined towards the SyQuest system and, on evidence I've had from many other users, I recommend it to you. Nevertheless I'd like to hear what you suggest – so if you've any ideas then please write to me and you can bet that I'll be interested!

When compared with 800 Kb or 1.6 Mb floppy discs both the SyQuest and the magneto-optical technology gives much more than the 'tenfold' increase needed to make a noticeable difference which I mentioned earlier.

SCSI or IDE

Of course you could buy two removable drives – but how rich are you? Nevertheless, maybe you ought to consider leaving your options open about having two drives one day. If that is the strategy you adopt then you may find that the SCSI choice is 'better' than the IDE because it is more 'expandable'. Even though the SCSI-1 system is a little more expensive than the IDE system I would go for the SCSI anyway because I want to be able to take advantage of the higher speed SCSI-2 when it becomes available. Those who've been following me will realise by now that, as a general rule, I'm not looking for the 'cheapest now' system but one which will give me cheaper, better (and a wider choice of) upgrades in the future.

Finally, I prefer the feel of SCSI's 'future proofing' to that of IDE. Since I can't rationalise what is no more than a feeling perhaps I'm just prejudiced towards SCSI – but then, I trust my instinct in matters of this kind because it rarely lets me down!

If, one day, you decide to dispense with your Archimedes and buy, say, a PC (or clone), or if Acorn replace the RISC PC with something even more wonderful, then I believe it most likely that a SCSI-2 interface will be available for your new 'computer box' and that you'll be able to plug your expensive removable drive into it. Furthermore if you're careful with your choice of 'Applications' (more of which in another article) then you'll be able to use the data from your removable discs through the SCSI-2 interface of your new 'box'.

An alternative scenario for the future is that you buy a second removable drive for your second 'computer box' (keeping the old machine); no trailing leads or network interfaces – just take the removable disc from one machine to the other.

A word of warning about SCSI. Even before I read last month's excellent article in Archive about SCSI interfaces by David Holden I knew that if I were to add a SCSI SyQuest external 270 Mb, 3.5" removable drive to my A540 system then I would have to buy it from a supplier who 'understands' exactly what needs to be done to configure it to my A540 machine and who makes sure that I get all the necessary software to support it.

Last month I told you that you had one guess as to why you shouldn't buy insurance from a company that doesn't make a fair profit – I've already had a large number of correct guesses, but also a couple of wrong ones! The answer is that you want them to make enough profit to be able to afford to pay you (without too much quibbling) when you make your claim. In the same way, although NCS is not the cheapest (nor anything like the most expensive) I would regard paying the extra asked by NCS as a sort of insurance. I want them to be there when I ask for help and for them not to be fretting about my using up their time and "seriously eroding their profit margins". (No! I won't say which company I'm quoting – but it happened.)

Using Removable Hard Discs

I suggest to you that you do not use removable hard discs as an alternative to a conventional hard disc for 'Applications' but use it as a 'large' floppy for data storage. You can use it as data storage for the 'big job' and for data storage of 'big files' (as defined above). Of course you can also use one removable disc as a back up for many, maybe all, of the floppies you've created up to now. You can also use a removable disc to back up your conventional hard disc – I recommend this to you.

There is no doubt that SyQuest removable hard discs are fast. As near as makes no difference they're as fast as a conventional hard disc and, from what I've been told by those who have them, they are noticeably (but not ten times) faster than floppies. The SCSI-2 interface will be even faster.

A 'hidden' advantage of the removable hard disc is that if it develops too many faults to continue using it then you'll only lose only the 'cheap', £80 disc and not the expensive, £550 drive. Compare this with losing a conventional hard drive. By the way, you can 'map out' the odd fault that might occur; I'm referring to the day when the disc seems to be developing too many faults far too often.

If you have a removable drive then I suggest that only 'Applications' are stored on the conventional hard disc and that the removable discs are used for data. Why? There are many reasons but I'll give you just one. You will want to copy from one removable disc to another. You can do this via your RAM if you've got enough – 'optimising' the size of your RAM is a story I will leave for another day. The method which you are more likely to use is to copy a directory or two at a time from the source removable disc to the conventional hard disc and then from the hard disc to the destination removable disc. Probably you will then delete the directory containing the transferred data from your hard disc to make room for the next transfer operation.

Summary

If you have a small (less than 40 Mb) hard disc then use it only for 'Applications' together with a set of floppies for your data. Your system is unsuitable for the 'big job' or the 'big file'. If you have a larger hard disc (say 100 Mb or more) then you can use it as a back up for some of your (held on floppy) data files. You can also use it for the 'big job'.

However, your system is unsuitable for use with 'big files' (files too large to fit on one floppy). If you run into the 'big file' problem then don't bother buying a larger conventional hard disc (200 Mb or even 500 Mb); that will be a temporary solution which you'll live to regret. Go for a SyQuest removable drive instead.

Removable hard drives are more expensive than conventional hard drives but, once you've paid for the drive, they have advantages over conventional hard drives. The main advantage is that the removable discs can be treated as large floppies. In turn this means that you can probably 'get away with' a smaller conventional hard drive than you would otherwise think you need. You might consider a system having a 200 Mb conventional hard disc (instead of a 400 Mb hard disc) together with a 270 Mb removable drive.

If you're about to buy a RISC PC then don't wait for the 'biggest' machine to arrive (what's the delivery like now?); think positively about buying one of the 'smaller' models with a 200 Mb hard disc and putting the money you'll save towards a SyQuest removable drive. I'm sure if you ask NSC nicely they'll fit one for you and make sure that all the supporting software works like a well oiled clock!

If you use your 200 Mb conventional hard drive in the way I have suggested (ie for 'Applications' only) then you should have plenty of room on it for copying from one removable disc to another.

In Conclusion

More than usual I would like feedback from you on this subject. Please drop me a line and let me know those views and let me (and others) have the advantage of your knowledge and experience even if it's a 'negative' experience.on