

Gerald's Column *by Gerald Fitton*

Thanks for your many emails and fewer letters. Thanks also to those who have sent me a self addressed sticky label and return postage with their letters. Again my thanks to those who have included an example illustrating their comments or difficulties as an email attachment or on floppy disc. My address is that of Abacus Training which you will find in the Fact File at the back of Archive.

The PipeDream Self Help Group

In the May 2000 Archive, Volume 13 No 8, I referred to a List similar to the Ovation Pro and the Archive-on-Line Lists. The PipeDream List to which I refer is owned and run by Richard Torrens. I said that would be most interested in seeing how the List evolves if only because I'm certain that similar Lists will be set up for other packages.

Originally I thought that it would be run as a self help group with the more experienced users of PipeDream solving the problems and giving hints and tips to less expert users. Sadly the List has not developed in that way. Richard has guided it in a different direction and my view is that it has degenerated into something to which I can not give my support and of which I do not approve.

I do not wish to expand on these remarks any further for I am sure that those of you who are members of this List will understand why I have withdrawn my support. Those of you who are not members don't need to know.

If you want to join the List then send an email to <PipeDream@4qd.co.uk> with the subject line Subscribe. You will automatically appear on the list. To remove your name from the List write Unsubscribe as your subject line.

The Killer Spreadsheet

Last month I wrote: "I have noticed that it has become a popular pastime to say that there is no 'Killer Spreadsheet' package available for RISC OS machines. I don't think that is true . . ." My main point was that, in the RISC OS environment, multi sheet applications are easier to use. I have received a wealth of mail on this subject; to my surprise every one who wrote to me without exception has praised either Lotus or Excel to the detriment of those spreadsheets available for RISC OS!

The principal complaints are that RISC OS spreadsheets use much more disc space for the same application, they load (from disc) and recalculate (within memory) more slowly and linking a set of interdependent files is more difficult and error prone.

I must mention the names of two correspondents who have put their case most lucidly. They are Tim Powys-Lybbe and Roy K Gillard. I would quote them in full here but I believe that at least one of them will find space elsewhere in this issue of Archive. I am sure that they have come to their conclusions through personal experience rather than anecdotal evidence of dubious origin so they have spurred me to find out why we disagree.

I have found that if I set up an application (a linked set of spreadsheets) in Excel and then emulate the Excel solution in, say, PipeDream or Schema, the RISC OS solution is often convoluted, large and unwieldy. On the other hand, if I do as I have in the past, which was to set up the application as a RISC OS spreadsheet and then try to emulate the RISC OS structure using Excel, again the result is convoluted, large and unwieldy!

My conclusion is that my correspondents have a good point but that there is more to it than either I (last month) or they have realised. It seems possible to me that those who prefer Lotus or Excel are more familiar with the way that they work and are able to set up an economical or even elegant solution to their problems whereas those who are more familiar with the RISC OS spreadsheets (like me) also produce elegant but different solutions.

So, provisionally at least, my comment is, "The best spreadsheet is the one with which you are most familiar!" I would like to hear more from you!

APR and IRR

A couple of months ago in the June 2000 Archive, Volume 13 No 9, under the heading "The Iterative Method" I wrote:

"There is no explicit formula for calculating the interest rate of a mortgage or annuity when you know all the other variables. The only way of finding the answer is to use an iterative method in which you make a guess and then see if it was the right one."

John Stewart reminded me by email of an article which he wrote for ZLine back in 1995 in which he addresses this problem. For those who don't know, ZLine is a User Group which we run for users of the Colton Software Fireworkz package. John's article has been on our GoldLine Compact Disc since we started that User Group but he has sent me an updated version which I have included on this month's Archive monthly disc. His article includes a pair of example files in Fireworkz format.

As a by-the-way, if you don't have Fireworkz then I can send you a demo version which will allow you to Load and read these files. I can send it as an email attachment or on a 1.6 Mb floppy disc. If you do not live in the UK then I will supply the floppy disc.

In that article John wrote:

"There is no formula which will give the interest as a function of the advance (the initial amount for the mortgage or annuity) and the payments so it is all done by trial and error, in fact without computer power most APRs could not be calculated.

"However help is at hand with Fireworkz.

"The APR is a function of the Fireworkz IRR (internal rate of return) function:

$$\text{APR} = (((1+\text{IRR})^n)-1)*100 \quad \text{where } n \text{ is the number of annual payments.}"$$

He reminded me that the APR is an explicit function of the Internal Rate of Return (IRR) so there is no need for us as users to write a special custom function! John is correct, we don't have to write an iterative custom function for finding the APR because the (iterative) function IRR built into PipeDream and Fireworkz will do the trick.

Or will it? Read on.

FPEmulator Version 4.09

Spreadsheets do sums in Floating Point Arithmetic. I remember writing an article for Archive about Floating Point arithmetic. My reference is CG9804 (which means the column I wrote for the April 1998 issue of Archive). I have placed it on my website so that you can do some 'revision' if you wish! I remember that Colin Singleton, in his excellent Puzzle Corner took up my challenge to determine the number of rational numbers which can be stored in floating point format on a RISC machine—but I think Colin and I agreed that he was the only one to get the correct answer.

Windows machines do sums quickly because they have a dedicated piece of hardware designed to execute arithmetic. I believe that there was and maybe there still is an Acorn Podule which was designed to intercept the floating point arithmetic calls and execute them at high speed. However, most Acorn machines emulate such a Floating Point Accelerator (FPA) using a module called the Floating Point Emulator (FPE). When the FPE (rather than the hardware FPA) is in use, spreadsheets pass their sums to the FPE module which then uses the main processor (such as the StrongArm processor) to do the Floating Point Arithmetic sums.

So you are not left in doubt:

- (a) On an Acorn machine Floating Point hardware (the FPA) would be faster than the FPE.
- (b) Floating Point hardware is used on Windows machines so they are fast.

Incidentally many screen drawing operations use floating point arithmetic so it is not only sums but also the speed of drawing to the screen which is affected by the speed with which floating point arithmetic can be executed.

You can find out which version of the Floating Point Emulator (FPE) you have as follows: Tap <F12> so that an asterisk (the * character) appears in the command line at the bottom of the screen. At the * type in H. FPE. (don't forget both full stops). The Floating Point Emulator (FPE) fitted on my machine is: FPEmulator 4.06 (14 Mar 1996) (1.07Z).

Whilst researching for the 1998 article I discovered that an early version of the FPE (it was either version 2.7 or 2.8) had greater precision than a later version (which I think was version 4.03).

On the Archive monthly disc you will find version 4.09 of the FPE. This is the version supplied with RISC OS 4. To install it just double click on the module [FPEmulator]. Then try *H. FPE. again and it should read: FPEmulator 4.09 (25 Mar 1998) (1.07). Here are two comments I've received about the newer version:

“It speeds up calculations by the fact the module had a pile of redundant code removed.”

“The older FPE had greater precision than this version.” “This was down to 2 factors—one a big bug in the old FPE (it meant that everything was calculated down to 128 d.p. and then assigned to a long double instead of a standard double) and the second was the IEEE changed the rules for FPEmulators.”

In my 1998 article I explained Single Precision, Double Precision, Packed Decimal and a format called Double Extended Precision. The IEEE standard is Double Precision and the 'old' FPE was able to calculate to a higher precision than this namely Double Extended Precision. All the sums were done in this mode (for the 'expert' this is 65 bits for the mantissa and 15 bits for the exponent) and then the answers were rounded to the requested precision at the end of the calculation. I suspect that this precision, available in the older FPE is unavailable in the newer FPE. Right now I don't have the time to check this.

A Problem with FPE 4.09

Amongst the files on the Archive monthly disc you will find an article jointly authored by Eugène R Dahmen and myself which describes conditions under which the Fireworkz IRR function fails when used with the new FPE (supplied as part of RISC OS 4). This article is taken from a ZLine User Group disc and also appears on the GoldLine CD. The main purpose of the article is to describe the IRR function using worked examples. It is used to assess the viability of a financial project. However, a secondary purpose of the article is to show, with an example, how the newer FPE fails when the older version was OK. The directory containing the article contains a Fireworkz custom function called [c_irrerd] written by Eugène which overcomes the problem introduced by the new FPE.

In my opinion this custom function is an improvement on the irr(guess,range) built into Fireworkz. It does not require an initial 'guess' but, of course, it still uses iteration to arrive at the IRR.

So, a combination of John Stewart's explicit function for APR and Eugène's custom function for the IRR should see everyone right for calculations of the APR!

Although written for Fireworkz I am sure that similar problems will arise when the 'new' FPE is used with any RISC OS spreadsheet with an IRR function.

Finally

Once again this month, rather than attempt to include everything in my Archive article, I have placed the detail (files) in subdirectories called APR01, APR03, FPE and IRR on the Archive monthly disc. I have also sent Paul my original copy of GC9804/zip which contains the article describing the operation of the FPE. These files also appear on the Archive and our own web sites. This month my files, without exception, are all taken from back numbers of our ZLine discs which now appear as articles appear on the GoldLine CD.

If you want these files and you do not have access to the Internet and you do not have the GoldLine or Archive disc then you can send me a floppy disc and I will return it with copies of all the files.

I would like your comments on whether leaving detail out of my Archive article meets your approval or not.