A CURSORY GLANCE

During mid-June I visited the Commodore plant and had an enjoyable and interesting afternoon. As you might guess, the 2040 disk system was discussed during my visit. Commodore is aware that they need to make the 2040 easier to use. In the near future, this will be done with the "wedge" program that I mentioned last month. I have been able to use the "wedge" for a while now, and find that it does make life with the 2040 much more pleasant.

Although the wedge helps a lot, but does not represent the ultimate answer. The version that I have tested does not know the difference betweeen command mode and data input via a GET statement. As you might guess, this can lead to exciting results when you type a "/" as part of input data! (The wedge sees the character, and tries to go off and load a file). I expect that they will be able to correct that problem before the wedge is released. In the long run, I think that Commodore will develop a more sophisticated user interface with the 2040 disk system.

As far as the reliability of the 2040 is concerned, the jury is still out. I now have a 2040 that works very well! However, I also personally know of several disk systems that have been returned to the factory for adjustments or repair. I think that two things are involved with the reliability issue. First, a disk system is more complex to make than a computer is, especially a smart disk like the 2040. The production people and the Quality Assurance folks at Commodore are probably doing everything that they can to alleviate the problems as they become known. But it takes time to work everything out, and it takes experience.

As with many new products, the disk also has some design glitches. It is quite normal for design changes to take place as field experience with a product is accumulated. It is not always simple to decide how to resolve some of these problems. Take the heat situation with the 2040. (Every 2040 I have seen runs very warm.) There are folks at Commodore that think I have made a big issue out of something that isn't a demonstrated problem. I'll admit, it is hard to "prove" that the temperature that the 2040 runs at causes any of the problems we have seen. But somehow I feel nervous when I take diskettes out of drive one and they are very, very warm to the touch.) However, it isn't easy for the engineers to decide how to get the unit to run cooler. The obvious answer of installing a fan can produce problems that might be worse than the heat! Dust is a real problem with floppy media. A fan that doesn't circulate filtered air may cause problems by moving the dust around, and getting a bunch of junk on the media that wouldn't have gotten there otherwise. Also, the fan will increase the cost of the unit, as well as give you another electro-mechanical component to fail. So, they are also looking at "passive" (i.e. non-fan) solutions, such as better venting and decreasing the amount of heat that is generated.

I came away with a strong impression is that Commodore has a number of very bright, talented technical people. (Chuck Peddle is the best known, and he deserves a great deal of credit for having the vision, way before most others, that a single board computer could be packaged as an appliance.) But there are many other technical folks at Commodore, both hardware and software who also deserve a lot of praise.

CURSOR 11 HAS THESE PROGRAMS: (Programs that end with "!" use CB2 sound)

COVER	A fireworks display. By Glen Fisher.
DEMON!	Can you capture the Demon? (Has great sound effects). By Ken Morley.
HI CALC	A high precision calculator. By Glen Fisher.
WIPEOUT	Roll the dice and try to eliminate the 12 numbers. By Sheila Dolgowich.
PEG	A clever pegboard game. By Julia Hallford.
STATES	Learn the states and capitals of the United States. By Art Carpet.

MORE ABOUT THE PROGRAMS

DEMON!... A delightful piece of entertainment where a little demon pops up at random, and your task is to catch the beast. This game uses joysticks for input, if you have them, otherwise you can use the numeric pad. Hint to non-joystick users of DEMON!: you can improve your performance by using both hands. Try putting two fingers of your right hand on the [8] and [6] keys, and two fingers of the left hand on [4] and [2]. Also, note that by holding the key down, you continue going the direction that you are pointed.

HI CALC... This is a high-precision four-function calculator. On an 8k Pet with the old ROMs, it can do arithmetic using at least 120 significant digits, while on a new Pet with 16k it will work on about 684 digits! The exact number of digits carried depend both on what roms you have and how much memory. This is due to the array subscripting bug with the old roms. This means that regardless of how much memory you have on an old rom Pet, the most precision you can expect from HI CALC is about 381 digits, while with the new roms, the only limitation is how much memory you have, although we limit it to 684 digits. The methods used are the same ones as for paper and pencil calculations, modified somewhat to make them suitable for use on the Pet. For details, see Donald Knuth's _Art of Computer Programming, Volume 2: Seminumerical Algorithms_, pages 229-245. There are added complications in HI CALC due to the need of handling fractions (mostly trying to keep track of the decimal point). The program actually does all of its work in base 1000. This is because less memory is used by storing the numbers that way, and also because it makes it easy to correctly place commas.

The important variables in HI CALC are:

A%	The accumulator where results go.
E%	The entry where typed numbers are kept.
AS,ES	The sign of A% and E%.
AI,EI	The number of "thousits" to the left of the decimal point. (I for integer).
AF,EF	The number of "thousits" to the right of the decimal point. (F for fraction).
AL,EL	The number of significant "thousits" in A% and E%. (L for length). PRThe precision, in "thousits". Equals number of decimal digits divided by three.
PL	The number of places kept after the decimal point, also in thousits.

Numbers are kept in A% and E% with the rightmost "thousit" in A%(1) and E%(1), and the leftmost in A%(L) and E%(L). The combination of AI and AF keeps track of the decimal position in A%, and likewise EI and EF perform the same function for the E% array.

Whenever a number is created (or typed) that has too many significant digits, HI CALC will print the message "ROUNDING!". The answer you get back will still be displayed as the correct magnitude, but some of the less significant digits will be zeros. When HI CALC starts up, it is set to carry 15 or fewer decimal places on a divide operation. This protects you from waiting for 684 3's when you divide 1 by 3. You can change this limit by typing a decimal point when HI CALC asks for an operation. You'll then be asked "What precision?", and you response will be used when dividing. If the number of places to be kept is larger than the precision, the program will calculate as many as it can store, and then round the result. Note that due to the fact that numbers are stored in base thousand that HI CALC will only use a number of decimal places that is a multiple of three.

How, you ask, did we go about checking the results? We did two things: we tried a lot of problems that a hand calculator could handle as a way of showing that the algorithms worked, at least with small numbers. We also tried some very large problems on another computer that has a different high-precision calculator, and found that we checked out exactly!

WIPEOUT... A fun dice game that takes some thinking, as well as a fair amount of luck. You roll two dice, and then remove as many of the 12 numbers as you can. When you roll doubles, you get an extra roll, which comes in handy when you are unable to remove any numbers on a given roll of the dice.

PEG... A classic game where you try to interchange two sets of pegs on a board. It can be done, so if you tire of trying, give zero as your move, then ask the Pet to solve the problem.

STATES... If you've always wanted to learn all of the capitals of the U.S., here is a wonderful educational excercise for you.