

# Whither hobby computing?

David Stonier-Gibson

**The world is changing rapidly, not least of all in the realm of computing. Computing today is vastly different to what it was when Melb PC was established 37 years ago, with terms like The Cloud, The Edge, AI, Machine Learning and Quantum Computing, not to mention tablets, smartphones and home assistants. Far from being mysterious machines in air conditioned fortresses, computers are now embedded in almost every gadget, appliance or tool we use every day.**

When I started my engineering studies in Perth in 1967, we had a first semester subject "Slide rule 101". In second semester we got "Computer programming 102", and I started to discover the joys of Fortran IV, punched cards, fan-fold paper, a 5 day turnaround cycle resulting in "102 syntax errors detected - 10K core used", all using a room sized computer nestled behind an uninviting glass wall and tended by stern faced acolytes in white dust coats.

By the mid-70s I had developed a sophisticated industrial instrument, using a microprocessor (16 bit, clocked at 2MHz) and programmed with a floating package I wrote myself, for Mount Newman Mining. I still have a clipping of a write-up of it by a young Alan Kohler, describing the wonder of "a computer half the size of a matchbox".

# Mid-air device to measure Newman ore

by Alan Kohler

Two years ago the Mt Newman Mining iron ore company asked a Perth electronic company if it would be possible to measure the flowrate of ore in mid-air, using nucleonics.

What the company claims is the first nucleonic flow rate system in the world is now being installed at Mt Newman — due largely to the backing of the Pilbara iron miner and the invention of a tiny computer in America.

Development of the system cost Mt Newman \$62,000, but it will apparently result in an output increase of around two per cent, with consequent savings running into millions of dollars.

Rights to the invention have now reverted back to Pretron Electronics — the company which worked on the system — through a nominal sum transaction, and negotiations are now in progress for sales to other industries such as cement, grains and a wide variety of mining companies.

The standard system, which is programmed according to the application costs about \$7,000, with options taking the cost to \$12,000.

Essentially the system consists of two density gauges on each side of a free falling, constant profile curtain of material.

A stream of nuclear particles passing through the material constantly measures its density, which is then transmitted to a central processing unit.

Until recently this was manually computed with the width of the falling material to give the flow rate in terms of weight.

The information will now be fed into a micro-processor, a computer about half the size of a matchbox, which has been previously programmed for the particular application.

The source for the density sensors is caesium 137, which has a life of about five years.

It would have been possible to increase the life of the unit to 33 years, but according to Pretron, workers would have exposed themselves to harmful radiation while cleaning the ore bins.

Pretron says that because of the nature of the system, patents were not available, although world design rights have been taken out. The company also has the rights to supply replacement caesium 137.

The main advantage of the system is that stoppages due to clogged crushers and shutes is reduced to a minimum so that the flowrate can be increased closer to the critical level than with manual operation.

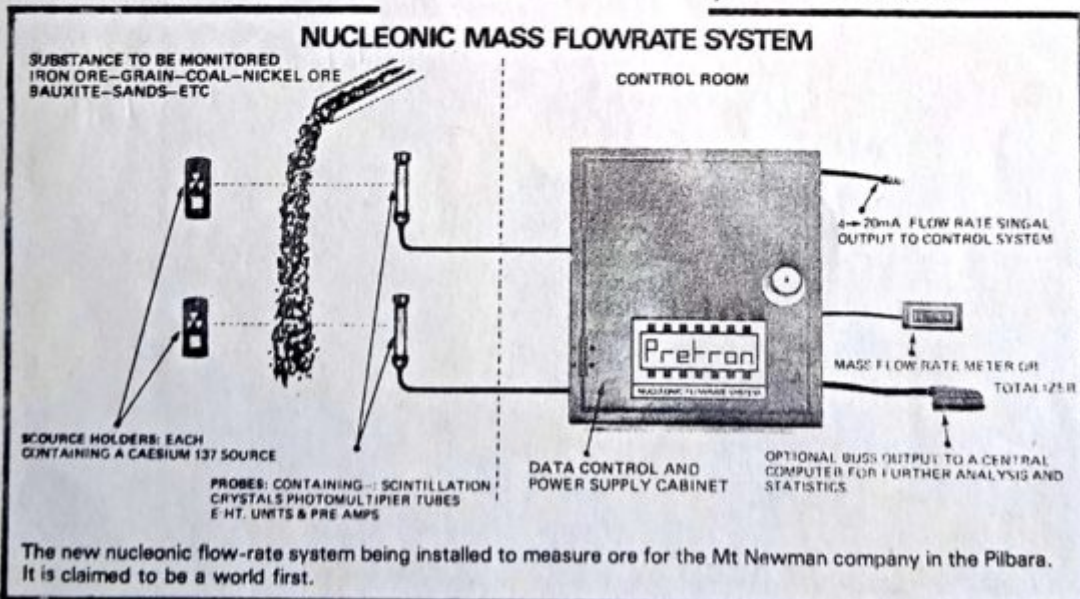
It is also suggested that disruptions to production in the Pilbara mines through industrial unrest has increased the mining company's desire for automation.

A sister development to the flowrate system is a nucleonic level switch.

This employs a low activity cobalt 60 or caesium 137 gamma source in specially protected containers outside the walls of an ore bin.

If there is no material in the tank the ray will be detected on the other side and the switch operated to either indicate or control the level of material.

Gamma rays, as distinct from conventional photo-electric cells are needed to penetrate the walls of the bin. Any instrument installed inside the bin would soon be destroyed.



That was before the days of word processors and spreadsheets. Around 1978 I was working, in my spare time, on a primitive word processor program, and I independently conceived the idea of a spreadsheet. I lacked the resources (initiative?) to follow through on the spreadsheet, and hence missed out on becoming a billionaire! Maybe?

Also in 1978 I bought myself a TRS80, an early consumer grade personal computer, and hence had one on one access to a computer at home as well as at work. The following year Apple got VisiCalc, the first spread sheet program, and sales of their personal computers rocketed on Wall Street.

Those were heady days for me, with Byte magazine, programming in BASIC as well as Z80 and 8085 assembler, and designing embedded microprocessor applications. I even got the opportunity to design my very own masked programmed chip for radio signalling. That had to be right first time, as the minimum order quantity was 5,000 chips!

## **The day the world changed**

On August 12, 1981 IBM announced their PC, and small desktop *personal* computers became respectable; nobody was ever fired for buying IBM! Three years later our club was started by a group of tech geeks who came together around their shared passion for the IBM PC. They were so - dare I say emotionally - beholden to the IBM PC that their logo echoed the IBM logo. It was indeed a club for its time.

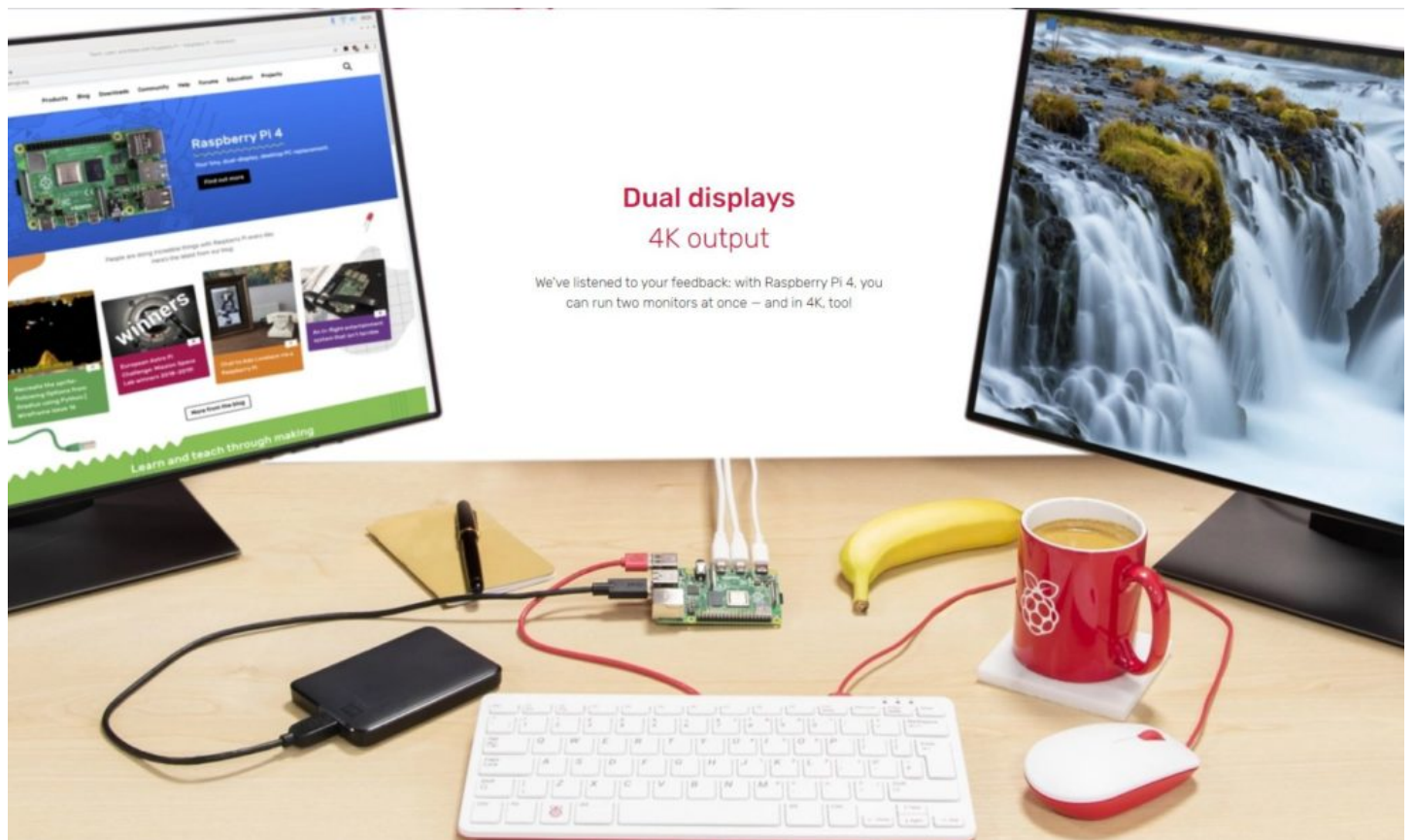
Much has changed since then. The trajectory of the desktop personal computer has been, in many ways, linear and evolutionary, rather than revolutionary. While the power and capacities of the desktop have increased exponentially: Speed 20,000 fold, memory 250,000 fold, storage 1,000,000 fold, a desktop computer today would be recognisable if you could take it back to 1984.

What a 1984 Melb PC member would not be able to wrap her head around is the Internet, smartphones, smart TVs, tablet computers, home assistants, handfults of computer chips embedded in every car and in virtually every home appliance, and wrist watch telephones. Dick Tracy was pure fiction back then. Likewise with so many of the things we now take for granted and which present day tech geeks love to play with: Home automation, 3D printers, microcomputer controlled (CNC) machining, digital photography. Not to mention the electronics hobby transforming into something centred on \$10 boards with more power than an original IBM PC.

*The future, 1930s style*

## **So where is it all headed?**

In my own field of industrial and machine controls, I am seeing not only the available processing power ballooning, I am also seeing a seismic change in the underlying programming methodologies. The idea that a machine controller had to be deterministically programmed for every conceivable circumstance is being replaced by neural networks, artificial intelligence, and non-deterministic machine learning, some in the Cloud, some at the Edge. Much of my professional expertise is being rendered obsolete. I am having trouble dragging my skills into the 2020s, and I must acknowledge being somewhat out of touch with the needs and interests of younger tech geeks. Conceivably the air conditioner of the future will learn how to make the optimum settings for its owner's lifestyle and desires, having left the factory with only a "basic education", and learn the rest on the job. (Fun fact: that's already happening!  
<https://support.google.com/googlenest/answer/9247510?hl=en>).



## Dual displays 4K output

We've listened to your feedback: with Raspberry Pi 4, you can run two monitors at once – and in 4K, too!

In the hobby spaces, the modern day tech geek is using tiny products that for \$10 provide built-in WiFi and Bluetooth, megabytes of memory and roughly 200x the speed of an original IBM PC. For \$5 he can get something more modest, but still sufficient to control a smart robot car made on his 3D printer. And for under \$100 he can buy a computer board capable of running a full operating system and driving two large displays.

What this means to me is that in the hobby space, just as in the wider world, computing has become a component embedded in other products, other interests, other hobbies.

The tech geeks of 1984 were focused on the desktop. Today's tech geeks are much more about embedding computing power in their other hobby products. What will tomorrow's tech geeks be seeking?

**Footnote:** *I applied to the Guardian for permission to use their 2011 obituary of Daniel McCracken, author of the Fortran textbook I had, and of many other language books. The Guardian wanted £200 for the rights. Links are free ...*

*<https://www.theguardian.com/technology/2011/aug/29/daniel-mccracken-obituary>*

*It's an interesting read, he was quite a guy.*

I simply couldn't  
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