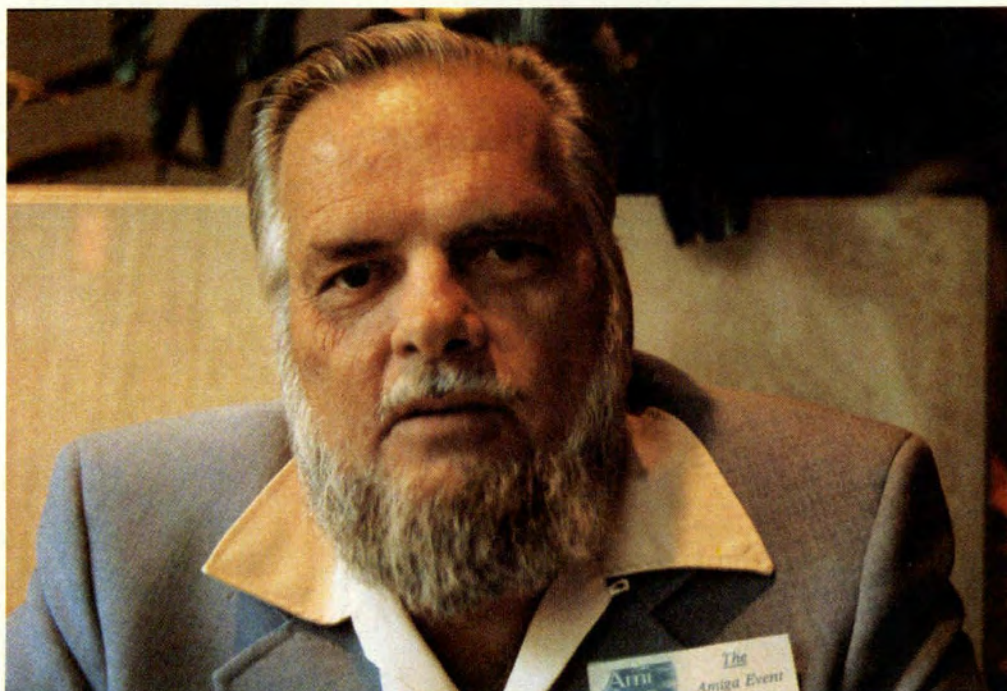


JAY MINER

'The father of the Amiga'



'The father of the Amiga' – the man most credited with its initial development gives A.U.I. an exclusive interview in which he tells how the computer came into being, says some very tough things about how it nearly never happened, and predicts what may come next.

I completed six months of Electronics Technician School in the Coast Guard, and then I spent three years on Coast Guard in the North Atlantic Weather Patrol repairing radars, radios and also the Captain's Hi-fi. That's how my interest in electronics got started.

After the service I studied engineering. I graduated in 1958, with a major in the Design of Generators and Servo Motors.

The first thing, however, that I was asked to do after graduation was to design a Computer Control Console with a Video Display, I

had to teach myself transistor circuit design and logic design out of the few books which were then available. This was an advantage however since it was easy in those days to learn enough out of one book to become the company expert.

In 1964, I went to work for General Micro Electronics, the first spin off in Fairchild devoted exclusively to MOS chips. Again it was easy to become an expert in this field, because the field was so new. We designed sixty-four of their chip register chips and the world's first MOS Calculator with twenty-three custom chips.

In 1974 after ten years of calculator, watch and computer chip design at a lot of different chip companies, Atari was just starting up and needed a chip designer. My friend Harold Lee was already there and he introduced me to Nolan Bushnell (*The founder of Atari*) Harold had done the chip for the first video game and Nolan Bushnell asked me to do a chip for the video game twenty six hundred system. You probably know how successful the twenty six hundred or the Video Computer system as it became called, so in 1977 they asked me to design the new Atari computer the 400 – 800 model. I directed the architecture

and the chip designing of this new machine and this too was a huge success.

The year was 1979 and Atari was rolling in money. However, they made a decision to write off all of the development costs in that first year production. This allowed them to show just enough profit that year to not quite trigger the bonus payment they promised to the engineers and programmers. The chief programmer on the projects name was Larry Caplin and a half a dozen of his team went off to start Activision.

This was the beginning of the end for the old Atari however, I wanted to do an advanced sixty-eight thousand machine at that time to compete with Apple but Atari decided that they did not need another computer. They decided not to pay the bonus they promised me and the engineers. So I quit, as did nearly all of the engineers and programmers. Atari then started to produce a bunch of junk cartridges, thinking that the public would buy anything I guess, I blame them in large part for the crash in the video game business that happened a few years later. I spent the next three years in a chip company called Zimast doing special purpose computer chips for heart pacemakers.

It was in 1982 that the programmer I mentioned earlier, Larry Caplin, called me up and said he was unhappy with Activision and did I know anybody with money who could help him start a company. Most people don't know but it was actually Larry Caplin who started AMIGA although it was not called AMIGA then.

'I was Vice-President'

I introduced Larry to my boss at Zimast, Bert Braddock, because he knew people with money and how to make a business plan. He leased an office in Santa Clara and found a chief executive offer, a vice president of marketing from Tonka Toys; Dave Morse.

Larry was going to design the games and I was going to design the chips and Zimast was going to build chips and all of us would prosper.

Well, things weren't going fast enough for Larry Caplin, so he bailed out, leaving the offices, a business plan, and financing. They had the money and a chief executive officer, but no engineer or programmer; the financial backers still wanted a video game company, so Dave Morse asked me to take Larry Caplin's place. This meant leaving Zimast. Dave

Morse was President and I was Vice President.

I had wanted for years to build a super personal computer based around the Motorola sixty-eight thousand micro processor. Atari had turned me down and here was my big chance, as long as it could be sold in a stripped down, low-cost version for video games Dave Morse and the financial backers were happy. As long as it was unlimited in its expandability as a high level home personal computer, I was happy. My goal was to design a low cost computer that could do good flying aeroplane simulations. My friend at Singer Link, Al Pound, had shown me the real million dollar simulators and I was hooked. I had to have a low cost version of that to practice on at home.

I read about blitters in one of the computer magazines and this seemed the ideal low cost way to improve animation such as flight simulators. Also, since good sound was important to both games and flight simulators we put in four independent VMA sound channels. Dave Morse hired some marketeers and manufacturers to pursue the video games business and joystick, joy board and game cartridges, while I started hiring a technical team to design the chips. This meant that the early AMIGA was really divided into two parts, one part devoted to the video game business such as joystick and joy boards, that was one half of the company, the other half of the company was in the backroom where I was in charge doing the chip design for this new computer.

I drew several sketches for the outside of the computer showing a large IBM style box with lots of card slots and a large IBM keyboard. Dave Morse had his own ideas about what a computer should look like and he felt that the card slots were too expensive for the machine he wanted to sell.

'go after IBM'

It was my biggest regret that we did not go after IBM right from the start, I know that sounds weird. But really IBM was very vulnerable just then in the PC market, they had no colour or sound and could only address 640k memory. We had a much better machine and a much better processor.

Dave Morse was insisting however, probably because of the investors, that we make as low cost a game type machine as possible; even though the only computers that had done well at that time were ones with card slots, such as the Apple and IBM. This was probably a good decision in retrospect, since Commodore was not at all interested in a high level machine and most likely would not have purchased AMIGA otherwise. So there we were de-

signing this super graphic computer with four blitter channels, eight sprites and four sound channels and the bottom just fell out of the video game market. This killed the joystick half of the company, and the cartridge market and that half of AMIGA started losing money fast.

The computer was still buyable as a personal computer and the work continued, but with severe financial restrictions. It seemed like we owed money to every supplier in town. I had to mortgage practically everything I owned personally to help meet the company payroll. Steve Jobs of Apple came around several times to look us over but he never actually made an offer to help us. He felt we had too much hardware, even though it was all integrated in three chips. Atari wanted to use our chips for their computers and they loaned us some money while they were negotiating the licensing agreement. They got real tough however just about the time that Tramiel was buying Atari.

Commodore came along then and bought AMIGA and saved us. Commodore was very good for AMIGA in the beginning. They made many improvements in the chips. Commodore made a lot of improvements in the things that we wanted but we did not have the resources to accomplish. The AMIGA originally only had three hundred and twenty colours across the screen, even in the six forty mode. They helped us put in full colour in the six forty mode. They also improved the colour by moving the NTSC converter off the chip. They paid off our creditors including my loans to the company and they got us a beautiful facility in Los Gatos and most surprising in 1984, sent the entire company including wives and sweethearts out to New York for a grand AMIGA launching party at the Rockefeller Centre here in New York City and what a party that was, tuxedos, champagne... all just to launch a computer. They really did it top notch. For me the most honourable thing about launching a new computer like this – and this was my third – is seeing what the software experts do with it years later.

The Hold and Modify feature of the Amiga was left over from the time the NTSC television conversion was on the chips. I almost took the HAM off the chips since it wasn't very useful with RGB colour. Well, look what Digiview has done with HAM. Another feature that really tickles me is the design of developers tool by Thomas Rokkiki, such as the one called Blitlab. This is a mouse visual control panel for the blitter. The blitter and line draw control registers are all shown there on the TV screen as well as a memory map

that shows you exactly what the various blitter commands do. It even tells you when you try to set an illegal memory move with the blitter. Things like that are just great!

What happened to Amiga, the company?

Well, it's a very sad story. You all know that CBM got into real financial trouble after they took over the Amiga. The sales of the 64 slumped, they had lots of Plus/4's and other stuff left over from the Tramiel era and the sales of the Amiga didn't zoom up as fast as they had hoped, though it sold as many as the Macintosh did in its first period. There weren't enough sales to cover its expenses. The Bank insisted that Commodore cut its expenses. So it cut heavily into the engineering facility in Westchester and also at the Amiga facility in Los Gatos. A 70% or so cut in engineering in Westchester still left 50 or so people in engineering but similar cuts at Amiga left only ten. People started giving notice and quitting but Commodore stuck to its policy of no raises and no replacements. In spite of very limited manpower, we managed to finish the 1.2 software release; and design a revised set of custom chips for the next generation of Amiga computers.

Amiga did all these things not Commodore

Then Commodore laid off more people in Los Gatos and closed Los Gatos. Let's face reality, Los Gatos was a very expensive place to live. We had to pay 25 to 50% more to get good people. And our rent per square foot was twice what Commodore paid in Westchester. Commodore didn't like paying gobs of money to support Amiga when their German and Westchester design teams could design better boxes faster and cheaper. Those teams promised to have the 500 and the 2000 ready by September – that's September 1986. Both of those machines used the chips and software that Amiga designed. But they were still more than a year late. Commodore refused to cost reduce the 1000 line. Because in my opinion, they didn't want a low cost 1000 to compete with Westchester's keyboard-attached 500. They cancelled the original Amiga 2000 being completed in Los Gatos in June of 1986. Because it only had two IBM card slots instead of three and the Amiga slots were not shaped enough like IBM cards. Commodore were convinced that their 500 and German-made 2000 would be ready by September '86. So why advertise the 1000 when there wouldn't be any around soon? So an entire year was lost while there was no advertising and no PR for the Amiga, no push to sell 1000s. But

IBM and Apple used that year to good advantage. They both have colour and sound and are even close to getting multitasking. I can't tell you how angry it makes me feel to see how the Amiga was handled. The advertisements they did have were absolutely awful. Old men changing into babies and kids competing in race cars. It was ghastly. And then a full year with no ads at all. They lost dealers and worst of all they lost public awareness. I am happy to say that things are changing now and things seem to be shaping up.

Now we have the 500 and the 2000.

What comes next?

Everyone agrees that the next step is more resolution, more computing power, more graphics engines and more memory. More resolution means up to ten twenty four across the screen. More computing power means bigger engines, probably from Motorola. And more memory is obvious and there is going to be better and better software.

'Video RAM'

Commodore now has a high resolution chip set of Amiga chips that I worked on when we were with Amiga in Los Gatos. These chips use video ram and can produce a very high resolution ten twenty four display along with the present Amiga display simultaneously. They increase the display address range to two megabytes. These chips are completed and tested and only require a computer and memory to hold them together. I'd like everyone to know that Amiga in Los Gatos designed these chips! These improved Amiga chips can use a new type of ram called video ram. This new type of ram – video ram – is a giant step in computer improvement because it frees up to the bottleneck into memory caused by competition between the computer itself and the memory fetchers required for the high resolution display. Imagine having an additional gigantic parallel output port thousands of bit wide, just for video. You wouldn't have to access it very often to dump a lot of memory data to a video picture.

The way it works is the video data for the high resolution display is dumped from memory into a large parallel to serial shift register right on the video ram chips. This outputs hundreds of picture bits – pixels – in one memory cycle, leaving 99% of the memory bandwidth for the computer. This is critically important for very high resolution multitplane colour displays.

Video ram can also be used for other things than video. It can provide a very fast path to hardware parallel processors; such as blitter and all kinds of I/O such as audio, hard disk and networking

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