STEVEN WOZNIAK

by Manish Srivastava

Steve Wozniak, born 1950.

Founder of Apple Computers and engineer invented one of the first computers Apple II. An industry pioneer who has been active in making computer a household word.

Education:

Bachelor's of Science Computer Science, University of California Berkley,1982.

Bachelor's of Engineering Electrical Engineering, University of California Berkley,1982.

Professional Experience:

Hewlett-Packard , Engineer,.1973-1976.

Apple computers, Co-founder and vice-president of Research and development,.1976- 1985.

Cl9, President, 1985-1987.

UNUSON, President, Present.

Honors and Awards:

1985: National Medal of Technology , President of the United States.

Known as the Wizard of Woz, Steve Wozniak along with Steve Jobs founded Apple Computers Inc. and started a computer revolution that has yet to slow down. Wozniak and Jobs introduced the Apple II which was one of the first personal computers originally aimed at medium to large size businesses. It was responsible for the species of small powerful computers that inhabit almost every part of our daily life.

As a child Steve Wozniak was enthralled with mathematics and computers. He would often become so engrossed in mathematical ponderings that his mother would have to physically shake him back to reality . This love of mathematics drove Wozniak's ambition , as a child, to want to become an engineer (Slater). In the mid 1970's Wozniak decided to drop out of the University of California at Berkeley, where he was majoring in engineering, and start working for Hewlett-Packard. During this time, he started working with John Draper who was working on the "blue box" ,an illegal pocket-size telephone attachment that would allow the user to make free long-distance calls (Halliday, 205). Draper recalls that "Woz's first call was to the pope. He wanted to make a confession." Draper and Wozniak joined other phreakers, one who endeavors to beat the telephone system for purposes of obtaining free telephone services or eavesdropping on the conversations of others (more so the former purpose), who were reshaping circuit boards into the guts of the first personal computers. John Draper's celebrated electronic scouting expeditions inspired these do-it-yourself technology junkies, eager to pull computing power out of it's climate-controlled fortresses and put it into the hands of the people (Daly). During his time at HP Woz met a summer employee by the name of Steve Jobs and soon Jobs was helping Woz sell "blue boxes" (Halliday,205). After the "blue box" industry had run it's course Wozniak became associated with the Homebrew computing club and started work on the Apple I.

Wozniak, while still at HP, became in his spare time the resident genius of a group of young computer zealots in Palo Alto California calling itself the Home-brew Computer Club. Wozniak like most of the club's members, was content with the joy of electronics creation. In 1975, Jobs ,who had dropped out of Reed College in 1972 and then taken a spiritual journey of sorts, began attending meetings of the computer club. Jobs admitted that he was "nowhere near as good an engineer as Woz" but Jobs had his eye on marketability, and he persuaded Wozniak to work with him
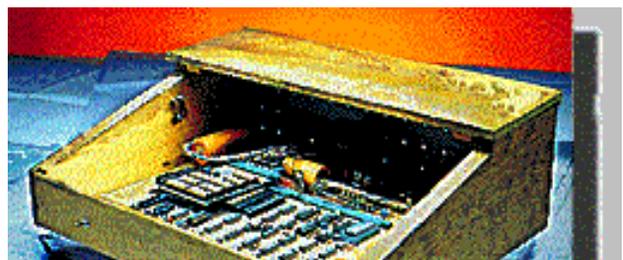
toward that goal. Wozniak and Jobs designed ,what would be the Apple I, in Jobs' bedroom, and they built the prototype in Jobs' garage. Jobs' was able to convince a local electronic retailer to order twenty-five Apple Is. In order to raise the capital needed to make these machines Jobs and Wozniak had to sell their most valuable possessions, Jobs' Volkswagen microbus and Wozniak's HP scientific calculator, enabling them to raise $1,300. With that base capitial and credit begged from local electronics suppliers they set up their first product line. Wozniak then quit Hewlett-Packard and became vice-president in charge of research and development of this new company called Apple Computers (Halliday, 205-206). The origin of Apple's name has been disputed. Some say that it is an allusion to the Beatle's record company and others to a summer that Jobs spent picking apples in Oregon. Their company logo was an apple with a bite missing from it referencing the computer term "byte" which is a sequence of binary digits operated on as a unit by a computer. One year after Apple was established it introduced it's first product the Apple I. The Apple I sold at $666 and was the first single-circuit board computer with on board Read only Memory or ROM , which told the machine how to load other programs from an external source, and a built-in video interface. This model sold mainly to computer hobbyists and the 600 they sold generated $774,000 (Halliday, 206). Improving on the Apple Is without departing from it's simplicity, Wozniak brought out the Apple II or what is now known as the Volkswagen of computers.
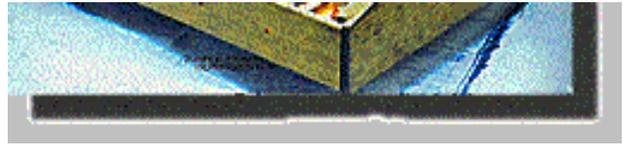
Wozniak said that a lot of reasons that made the Apple II standout where due to a game,Breakout, which he had designed in hardware form for Atari. He had wanted to program Breakout in software. Since Wozniak had written the Basic interpreter , a program that translates the instruction to machine language, he was easily able to. When he got the first stage of Breakout working he had a ball bouncing around on the screen he then decided to add sound so he added speakers. From there he needed paddles so he invented a minimum- chip paddle circuit. Wozniak and Randy Wigginton made a very simple disk operating system that would only load files from fixed locations off the disk in response to one-letter commands. Their rudimentary control program would not be flexible enough for efficient and simple use of the disk drive. Designing a disk operating system , DOS, was a lot of effort because on one side is the RAM memory in the Apple II, waiting patiently for a useful program to be loaded and executed and on the other side of an electronic bridge (interface card and connecting cable) are the floppy disk and disk drive hardware itself. The control program that Woz wrote could be compared to a narrow rope bridgecrossing a chasm; it works, but you can't carry much with you, and it is easy to lose data. Woz's "rope bridge "was a foundation, but after much work Apple came out with DOS 3.1 which completed the ground work (Wyehrich). The Apple II had built in circuitry allowing it to interface directly to a color video monitor or a television set through add-ons. With all this technology built into the Apple II the only thing left to do was to introduce it and see what the world thought.

The Apple II first appeared at the West Coast Computer Faire and in the end the color, the slots, the way in which the memory could be expanded from 4K to 48K bytes, the control of the keyboard and hookup to the cassette recorder, and the BASIC that was stored in the ROM chip, in effect the motherboard, was Wozniak's contribution (Weyhrich). In order to promote the use of Apple II Jobs challenged programmers to come up with applications for their fledgling machine. This generated programs ranging from Games to VisiCalc , a budget analyzer. In three years the Apple II raked in earnings of $139,000,000, not to mention that it was the best selling computer for five years straight, and Apple had a growth rate of 700 percent. When Apple went public in 1980 stock prices went from $22 to $29 in the first day bringing the market value of Apple to $1.2 billion. However, the Apple II Plus and Apple III didn't enjoy the same popularity that the Apple II did and due to design flaws the Apple III had to be recalled in 1981. During this time IBM ,with it's new PC , gained a large share of the office trade that Apple lost [Halliday, 206]. After the Apple III failure Apple reorganized and tried to remedy the Apple III failure.

After the Apple III calamity the senior staff of Apple was revamped in order to try from a new start. Then president at the time Michael Scott fired close to forty people he was then replaced by Mike Markkula. Jobs then took over the chairmanship left vacant by Markkula[Halliday, 205-206]. Steve Wozniak was involved with several projects at Apple during this time of reorganization. He had helped write some math routines for a spreadsheet product that Apple had planned to release in competition with VisiCalc. Steve Jobs had managed to convince Wozniak to participate with his new Macintosh project. In early February Wozniak's private plane crashed and he was injured with a concussion that temporarily made it impossible to form new memories. He couldn't recall that he had an accident; he did not remember playing games with his computer in the hospital, he did not remember who visited him earlier in the day. When he finally did recover from the concussion he decided it was time to take a sabbatical from Apple(Weyhrich). During this time off from Apple Wozniak needed, in some ways, to get back to his roots and so he began doing things he had wanted to do for many years.

Wozniak had gone through some very difficult times and he was now looking to come topeace with what had happened. Wozniak married and returned to college at Berkeley under the name "Rocky Clark" (a combination of his dog's name and his wife's maiden name). He decided he wanted to finally graduate and get his degree in electrical engineering and computer science. He formed a corporation called "UNUSON" (which stood for "Unite Us In Song") a company

promoting "a new kind of unity" to produce educational computer materials, wanting to make computers easier for students to use. He also decided to sponsor two rock music events called the "US Festival". Held on Labor Day weekend in 1982 and 1983 these music and technology extravaganzas were invigorating for Wozniak. Even though he lost a considerable amount of money on both occasions, though nowhere near drying up the value of his Apple Computer stock, he decided that he was ready to return to work (Weyhrich). According to News week (September 20, 1982) Wozniak wanted to go back to Apple as a regular engineer and fix a lot of motivational problems in Apple. So in June of1983, Wozniak entered the buildingon the Apple campus where the Apple II division was housed and asked for something to do (Weyhrich).During Wozniak's leave Apple had kept on growing and had introduced many other products.

In 1982 Apple sales went up 74 percent from 1981 and in January of 1983 they announced the Apple IIe and Lisa , the first ultra sophisticated new generation of personal computers aimed at executives and employees. Lisa incorporated many features that now set the standard on minicomputers today such as a 32 bit processor, ultra- sharp video display and a mouse that allowed users to produce graphics that did not need complex keyboard entry but the price of Lisa , around $10,000, was it's downfall. However, it's scaled down cousin the Macintosh did survive and has flourished since it's introduction (Halliday, 206-207). In 1985 Jobs and Wozniak received the National Technology Medal from PresidentReagan at the White House ironically Wozniak decided that it was time to leave Apple and soon there after Steve Jobs also left. Wozniak felt that his efforts where better suited in a more philanthropic mode and has done much in the public sector.

Wozniak has all but disappeared from public view now he decide to set up shop in a storefront office in Los Gatos California , about 15 miles south of Apple's headquarters in Cupertino. Wozniak left Apple almost a personal net worth of some $45 million, only to be besieged with requests for money. He recalls, "People wanted money to start companies, they'd send me screenplays for movies they wanted me to produce, and there were requests from all kinds of worthy causes." Wozniak says he has donated about $7 million to charities. After shutting the doors on CL-9 Inc., standing for Cloud Nine a company he started in 1985 to make wireless remote control devices for TVs and home appliances, after it shipped its first major product, CORE, which was a hand-size electronic device that allowed consumers to operate all their home entertainment gear remotely. Wozniak did volunteer work in Silicon Valley kindergartens, teaching local Hispanic children. It seems fitting that Wozniak, who designed the Apple personal computers most used by school children also wanted to become a teacher(Pitta). Wozniak , along with other computer industry pioneers, also founded the Electronic Frontier Foundation advocated the extension of the first amendment to electronic media and was a legal defense fund for Hackers (PC week). When asked to comment on Apple Wozniak says "...Apple is not the company I had hoped it would be. I always thought that a major player in the personal computer business, with its label on the products, would be composed of top engineers and multiple labs full of scientists developing new devices out of physics and chemistry. I only worked for HP and Apple. HP had lots of such labs. " but in the end Woz says " I had two goals in life, to be an engineer and to teach fifth grade. For several years, I've been teaching computers tonot only teachers but also to fifth through eighth graders." so it seems that Wozniak has fulfilled all his goals (Winer).

Steve Wozniak helped launch an industry that has come to touch the lives of almost everybody in some way. His inventions have laid the framework for others to come and make computer a day to day word, his Apple II set the standard for the industry. Wozniak was the typical computer "nerd" an electronic tinkered, computer gamer as well as a math genius. If it wasn't for Woz we would not have the information age as we have it now.

Quotation: If Apple were the Beatles, Steve Jobs would have been Paul McCartney, the commercializer and pop icon. Steve Wozniak would have been a cross between John Lennon and Ringo Starr - a combination poet and teddy bear.

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