Chapter 6 Microsoft in the 1970's

6.1 ... Gates/Allen Early Years

William Henry Gates was born on the 28th. of October 1955 in Seattle, Washington. He was the only son and the second of three children by William and Mary Gates. The father was a prominent Seattle lawyer and the mother was active in community organizations such as the United Way.

Bill's parents enrolled him in Seattle's exclusive Lakeside School in 1967. This was a progressive private all male school with a disciplined approach to education. During the 1967/68 school year, the teaching staff recommended acquisition of computer facilities to expose the students to the technology. The school could not afford to purchase a computer. However the Lakeside Mothers Club agreed to finance the use of a time sharing service. In 1968 the school obtained an ASR-33 Teletype terminal and used a local access line to dial into a General Electric Mark II time sharing system. In his 1968/69 school year at the age of thirteen, Bill Gates started programming.

Another student interested in programming was Paul G. Allen, who was born in 1953. From their mutual enthusiasm for programming computers a friendship developed which continued through high-school and university. It is this association that eventually led to their founding of Microsoft.
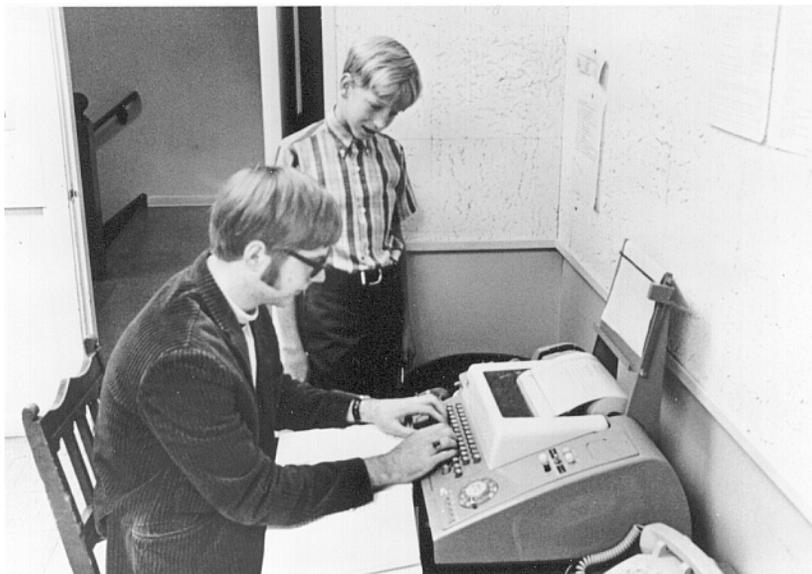
Figure 6.1: Paul Allen and Bill Gates (standing) at the
Lakeside School computer room teletype terminal, c1968.
     Photograph is courtesy of Microsoft Corporation.

        The students' enthusiasm for programming quickly
strained the schools' time sharing budget. Fortunately
the parent of another student had become one of the
founders of Computer Center Corporation (CCC). This
corporation had installed a Digital Equipment
Corporation PDP-10 computer to offer time sharing
service in the Seattle area. The corporation had a
shakedown agreement, whereby DEC did not require payment
for the computer until the equipment and software
operated to the customers' satisfaction. The company
suggested to the school that the students help test the
computer system for bugs. In return they would receive
free computer time. This became an intensive period of
programming and acquisition of computer technology
knowledge for both Bill Gates and Paul Allen. Not only
did they de-bug the DEC PDP-10 system, but they invaded
the intricacies of the computer accounting files to
access the passwords. This resulted in a temporary

disciplinary period of exclusion from the system. However after a short period of assisting the company programmers, Computer Center Corporation encountered financial difficulties and went into receivership in March 1970.

The next source of computer access and time was the University of Washington where Paul Allen's father was the associate director of the libraries. The university had a Xerox Data Systems (XDS) Sigma V time sharing computer and a Control Data Corporation (CDC) Cyber 6400 computer. Gates and Allen used both computers for a period of time.

Lakeside now managed to obtain on loan a DEC PDP-8/L computer. Gates obtained the source code for a version of BASIC from DECUS, a DEC user's group. He then started working on his own first version of a BASIC interpreter. However before he had completed the software, Lakeside returned the DEC PDP-8/L. Lakeside then received a Data General Nova computer. However the school returned the computer before Gates could adapt his BASIC interpreter to the new machine architecture.

Then in the fall of 1970, Lakeside arranged with Information Sciences, Inc., (ISI), a time sharing company in Portland, Oregon for use of their DEC PDP-10. By this time Gates, Allen and two other friends Richard Weiland and Kent Evans from Lakeside had formed an organization called the Lakeside Programmers Group. The group managed to obtain a contract from ISI to develop a payroll program in COBOL. Once again this contract provided computer time in exchange for the work required to develop the payroll software. It also provided experience in software development and documentation of a commercial program.

During 1970/71 a Lakeside teacher and former Boeing engineer had the task assigned of creating a program for class scheduling. Unfortunately a flying accident killed the teacher. Gates and his friend Kent Evans worked to refine and complete the program written in FORTRAN. However another tragic accident killed Evans in a mountaineering class. Paul Allen had enrolled at the Washington State University in the fall of 1971. He was now finishing his first year in computer science

when Gates enlisted his help to complete the software. They completed the program during the summer of 1972, by which time Gates credit for use of the ISI computer ran out.

During 1971 Gates and Allen contracted to do an analysis program and input data for car traffic counting boxes. These activities resulted in the creation of Gates and Allen's first company called Traf-O-Data. In the fall of 1972 Allen convinced Gates that they could use the Intel 8008 microprocessor in a machine to facilitate the analysis of the traffic tapes. They obtained the services of Paul Gilbert who was an electrical engineering student at the University of Washington to construct this specialized microcomputer. Allen then started developing a simulator program on the university computer that would emulate the Intel 8008 microprocessor.

Gates started sending applications for enrollment to different universities at the end of 1972. Then Gates and Allen got offers from TRW to work on the development of PDP-10 system software. TRW was developing a real-time operating and dispatch system for the Bonneville Power Administration in Vancouver, Washington. TRW was in desperate need of experienced DEC PDP-10 programmers. They both accepted jobs. Allen left university and Gates got permission to finish his final high-school year in an internship with TRW. Access to the DEC PDP-10 allowed Allen to complete his Intel 8008 simulator program. This also allowed Gates to complete the programming for the Traf-O-Data project.

In the fall of 1973 Allen returned to University and Gates entered Harvard University. During his first year, Gates met and became a friend of Steven (Steve) A. Ballmer, who would later become the president of Microsoft. Not completely happy with university life, both Allen and Gates considered taking a year off and applied for jobs at different companies. They were both offered jobs at Honeywell in Massachusetts. Allen accepted a position and moved to Boston. Gates declined the job offer. Paul Allen and Bill Gates would now meet on weekends and some weekday evenings to discuss computers, Traf-O-Data and other possible projects.

In the summer of 1974, Gates obtained a job to computerize a class enrollment project at the University of Washington. Then in the fall of 1974, Gates returned to Harvard

Gates and Allen had looked at developing a BASIC interpreter for the Intel 8008 microprocessor, and concluded it was not powerful enough. Then in April 1974, Intel released the 8080 microprocessor. After reviewing the new microprocessor capabilities, they determined they could develop an effective interpreter for it. Gates and Allen contacted computer manufacturers to determine their interest in a BASIC interpreter for the 8080 microprocessor. However, they were not successful, but this would change with the announcement of the Altair 8800.

6.2 ... Altair/BASIC

In mid-December of 1974, the January 1975 issue of *Popular Electronics* was on the newsstands. It had an exclusive feature article entitled "Altair 8800 -- The most powerful minicomputer project ever presented -- can be built for under $400." The authors of the article were H. Edward Roberts and William Yates of MITS Inc. [301]. Paul Allen read the article and realized this was the opportunity they needed. The Altair 8800 computer used the new Intel 8080 microprocessor that he and Gates had wanted to develop a BASIC interpreter for and now they had a potential market for the software.

Their previous experiences with the Traf-O-Data machine, Allen's simulation program and a modified DEC BASIC interpreter that Gates had written were going to be significant factors. Gates and Allen decided to develop a BASIC interpreter for the Altair 8800 computer. The interpreter with some modification would also be capable of running on other microcomputers using the Intel 8080 microprocessor. The Altair 8800 computer did not have any software. The operator used switches on the front panel to enter instruction codes and data. This process was long, tedious and prone to error.

Gates contacted MITS and advised Roberts that they had a BASIC interpreter. The timing was right. Roberts was just as anxious to have a BASIC interpreter as Gates and Allen were to develop and sell one. In the initial contacts between Roberts and Gates/Allen there were two problems. The first problem was that Gates and Allen had not developed the BASIC interpreter for the Intel 8080 yet. The second problem was that Roberts did not have memory boards at that time capable of storing the BASIC interpreter software. Gates agreed to Roberts suggestion of going to MITS Inc., in a month to demonstrate the program on the Altair.

The next four weeks were intensive. Allen started converting the Intel 8008 simulator software to emulate the Intel 8080 microprocessor. He also adapted assembler and debugger programs for the Intel 8080. Gates started working on the specifications for the BASIC interpreter. To a certain extent some programming languages develop based on earlier experience with similar languages. Gate's BASIC interpreter evolved from DEC's BASIC-Plus. The 4K memory limitation limited the number of features. This memory limitation had to accommodate not just the interpreter but also the user program data.

When the interpreter specification was complete, Gates started writing the assembler instructions for the program. Gates and Allen used the DEC PDP-10 computer at Harvard to create all the programs. Program development consumed any time left after Gates Harvard classes and Allen's job at Honeywell. Gates and Allen also obtained, the assistance of Harvard student Monte Davidoff, to develop the mathematical routines for the interpreter. The interpreter had now grown to require 6K instead of the 4K of memory initially targeted.

Paul Allen demonstrated the BASIC interpreter at MITS Inc., in Albuquerque, New Mexico in late February. The program had not run previously on either an Altair 8800 microcomputer or the Intel 8080 microprocessor. However it was a success. Allen's simulator and Gates interpreter had functioned without a problem. This was an incredible achievement.

Roberts wanted to market the BASIC program as quickly as possible. Allen negotiated some additional

time for Gates to refine the final version for release. Paul Allen left Honeywell and joined MITS Inc., to develop software for the Altair 8800 in March. Shortly after joining MITS, Allen became the Director of Software. In April, the headline "Altair BASIC Up and Running" was on the first issue of the Altair users *Computer Notes* newsletter.

MITS began a promotion campaign featuring a mobile van to demonstrate the Altair computer system in April 1975. It traveled all over the country and included a demonstration of a preliminary Version 1.1 of Gates and Allen's BASIC interpreter program. During its stop in California a member of the Homebrew Computer Club appropriated a copy of the paper tape with the BASIC interpreter encoded on it. The club members reproduced the tape and distributed copies to other members.

Gates and Allen signed a contract with MITS in July, just prior to the founding of Micro-Soft. The wording of this contract would be crucial in later developments. It required Gates and Allen to provide BASIC interpreter programs on an exclusive license basis to MITS Inc. MITS agreed to promote and commercialize the program to other companies on a "best efforts" basis. This allowed MITS to sell copies of the BASIC interpreter and pay Gates and Allen a royalty on each sale. Gates and Allen still retained ownership of the software. The agreement specified three versions of the software with varying memory requirements of 4K, 8K and 12K bytes. The compensation to Gates and Allen varied depending on the version. Another arrangement prevailed if the software was sub-licensed to other companies. They also specified that a secrecy agreement be signed by all MITS customers who purchased the software. Gates had concerns about piracy of the software.

Version 2.0 of both the 4K and 8K BASIC interpreter programs had started shipping in July 1975. The software received strong favorable responses in the market. Gates secured the services of Monte Davidoff from Harvard and Chris Larson from Lakeside School to assist in the software development during the Summer.

6.3 ... The Albuquerque Years

In August 1975 Bill Gates and Paul Allen founded a partnership called Micro-Soft in Albuquerque, New Mexico. The company name was an abbreviation of Microcomputer-Software. The company deleted the hyphen in 1976 and capitalized the "S" to form MicroSoft for a period of time. The partnership agreement gave Gates a sixty percent interest and Allen the remaining forty percent. Gates felt he had made a larger contribution.

Gates now started working on refinements for version 3 and an Extended BASIC requiring 12K bytes of memory. However Gates had also received requests to develop a disk version of their program. Gates was having to spend additional time to satisfy these demands and a desire to expand the company.

In the September 1975 issue of the Altair *Computer Notes* newsletter, the editor David Bunnell wrote an article condemning the piracy of the BASIC interpreter. The October issue included an additional article on piracy by Ed Roberts of MITS. Then the February 1976 issue of the newsletter included an open letter by Gates to the hobbyists complaining of the piracy. The subject also received discussion at the first World Altair Computer Convention in March. Then Bill Gates prepared a final letter and appeal that appeared in the April issue of the newsletter with his comments from the March convention. This was the beginning of the major concern by all producers of software for the personal computer market.

In September 1975, Gates enlisted the help of Richard Weiland from the Lakeside Programmers Group. Weiland developed a BASIC interpreter for the new Altair 680B computer that used a Motorola M6800 microprocessor. Allen rewrote the 8080 simulator for the Motorola microprocessor and Weiland had the interpreter completed by January 1976.

Allen and Gates licensed the 6800 BASIC interpreter to MITS for a flat fee. This assured Microsoft of a definite revenue and MITS could charge for the program or provide it free with the hardware.

Copying concerns with the 6800 BASIC interpreter had become a non-issue.

In early 1976, MITS was shipping approximately 1,000 computers a month. However Microsoft was only getting a royalty for its software, at a rate of less than 200 copies per month. Illegal copies were affecting Microsoft revenue.

In February 1976, while still at Harvard, Gates started writing the software for a version of BASIC suitable for a system utilizing disk drive technology. Gates had the software created and operating within a period of two to three weeks. It became known as DISK BASIC.

In April 1976, the company hired its first permanent employee, Marc McDonald. He began work on what became known as Stand-alone Disk BASIC for the National Cash Register (NCR) company. Richard Weiland became the second employee in May with the position of general manager. In mid summer Gates started developing APL (A Programming Language) software. Then Microsoft hired Steve Wood in August, who started working on the development of FORTRAN software. Work also started on the Focal language. DEC initially developed Focal to control scientific instruments. However sales of Microsoft Focal were a failure, that resulted in it being discontinued. Microsoft now started to obtain corporate customers for its BASIC interpreters. Then it opened its first office in Albuquerque in 1976.

Microsoft also started working on a 6502 BASIC interpreter for the MOS Technology microprocessor. Marc McDonald adapted the 6800 simulator to the 6502 and Richard Weiland developed the 6502 BASIC interpreter. The interpreter included a built-in editor for making program changes. The Apple II and other computers used the 6502 microprocessor. In October 1976 Commodore bought MOS Technology and selected the Microsoft 6502 BASIC interpreter for its new PET computer. Commodore placed the BASIC program in ROM that resulted in every Pet computer having Microsoft BASIC.

Microsoft, also offered its simulator, debugger and assembly development software called Develop-80, Develop-68 and Develop-65 for sale without success.

General Electric purchased the Microsoft 8080 BASIC interpreter in late 1976. Then in November 1976 Paul Allen left MITS and joined Microsoft full time. Revenue for the company's first year was over $100,000.

In December 1976, Pertec Computer Corporation signed a letter of intent to purchase MITS Inc. Microsoft had a number of potential customers for sub licensing through MITS during early 1977. However MITS was not promoting the business or using its "best efforts" as agreed to in the licensing agreement with Microsoft. Microsoft advised MITS in April that it was terminating its license agreement with them. In May MITS filed a restraining order that prohibited Microsoft from marketing 8080 BASIC and requested settlement of the contract by arbitration. Then MITS finalized the sale of their company to Pertec in late May. In late 1977 the arbitrator decided in favor of Microsoft. Although Pertec could still sell the BASIC interpreters, they no longer had an exclusive license. Microsoft could now market their products independent of Pertec and also retain the full sales revenue.

Gates left Harvard in January 1977 and was now full time at Microsoft. Then in February, Gates and Allen formalized their partnership agreement. Gates would have a sixty-four percent share and Allen thirty-six percent.

Microsoft had decided to expand its software market from BASIC interpreters to other programming languages such as COBOL, FORTRAN and Pascal. The company also decided to write the software for use with the Digital Research CP/M operating system. The first language to be released was a FORTRAN-80 compiler with a price of $500 in July 1977.

Apple Computer purchased a license for the 6502 BASIC interpreter in August. Previously Apple had used Integer BASIC written by Stephen Wozniak. Apple released the interpreter with modifications by Randy Wigginton of Apple as Applesoft BASIC. Microsoft had also started development of a new version of BASIC for Texas Instruments (TI) that had to be in compliance with a new ANSI BASIC standard. Paul Allen once again created a

simulator for the TI TMS9900 microprocessor and Gates hired Bob Greenberg to develop the BASIC software.

Another important contract from NCR required development of a disk version of BASIC for their 8200 terminal. The company assigned Marc McDonald to the project who developed a new disk formatting concept that used a File Allocation Table (FAT). The FAT controlled the sequence of data stored on a disk and improved the performance of disk operations. The company used the concept of a file allocation table in Microsoft Stand-alone Disk BASIC. Also in a Microsoft operating system project called MIDAS and later in QDOS by Tim Paterson of Seattle Computer Products.

Microsoft appointed Steve Wood as general manager to replace Richard Weiland who had left the company in September 1977. With the arbitrator's settlement of the MITS/Microsoft dispute in September, Microsoft now closed a number of contracts that had been pending with other companies. Microsoft was starting to dominate the BASIC language market by the end of 1977. The new major manufacturers of microcomputers such as Apple Computer and Commodore had licensed BASIC interpreters from Microsoft. A large contract was with Radio Shack. Microsoft hired Bob O'Rear in 1977 who then started adapting Microsoft BASIC to the Radio Shack TRS-80. The interpreter would be an alternative to the limited one developed internally by Radio Shack.

By early 1978 the market place had changed. The MITS Altair computer had lost its dominant role. Microsoft's relationship and revenue from Pertec were no longer significant. Microsoft required additional space and started to question Albuquerque as a location for expansion. In March 1978 Microsoft decided to relocate from Albuquerque to Bellevue, a city just east of Seattle in the state of Washington. The move was to take place around the end of the year.

A number of chip makers such as Intel and National Semiconductor were now purchasing Microsoft products. Richard Weiland had returned to Microsoft in January. He worked on the development of COBOL that Microsoft announced as COBOL-80 for the CP/M operating system at a price of $750 in April 1978. The Heath Company also

purchased Microsoft BASIC and FORTRAN software in 1978. Then the Heath Company software developer, Gordon Letwin joined Microsoft in late 1978.

In mid 1978 Vern Raburn of GRT (Great Records and Tapes) convinced Gates to supply software to the company for distribution to the retail market. Microsoft released versions of BASIC interpreters for the Processor Technology Sol and Southwest Technical Products computers. Microsoft also released the enhanced Level II BASIC that had been under development for the Radio Shack TRS-80 computer.

In June 1978, Gates negotiated an agreement with Japanese entrepreneur Kazuhiko (Kay) Nishi and his ASCII Corporation. Nishi would be the exclusive agent for Microsoft products in East Asia and receive a lucrative 30 percent commission on all sales. This resulted in the establishment of Microsoft's first international sales office in November, ASCII Microsoft.

Microsoft started developing a simulator program and a BASIC interpreter for the new Intel 8086 microprocessor in 1978. Microsoft hired Jim Lane to develop the simulator software. Bob O'Rear also worked on the simulator software and the 8086 BASIC for the new microprocessor. With Motorola announcing the 68000 and Zilog the Z-8000, 16-bit microprocessors were going to be the future technology

Prior to the move from Albuquerque in December 1978, Gates and Allen had a staff of twelve employees. Microsoft had also finished its first million-dollar sales year.

Figure 6.2: Albuquerque staff prior to move in 1978. Top row, left to right: Steve Wood, Bob Wallace, Jim Lane. Middle row, left to right: Bob O'Rear, Bob Greenberg, Marc McDonald, Gordon Letwin. Bottom row, left to right: Bill Gates, Andrea Lewis, Marla Wood, Paul Allen.

Photograph is courtesy of Microsoft Corporation.

6.4 ... Relocation to Seattle

Microsoft relocated from Albuquerque to new office facilities in Bellevue, Washington in January 1979. The company also obtained its own DEC 2020 minicomputer system.

Microsoft had close to 100 OEM customers for BASIC, FORTRAN-80 and COBOL-80 in March 1979. They also had hired Steve Smith as director of marketing. Work had started on the development of a BASIC compiler and a Pascal programming language.

In the Far East, agent Kay Nishi was generating additional lucrative revenue for Microsoft. Two large Japanese companies, NEC (Nippon Electric Company) and

the Ricoh Company signed contracts for Microsoft software.

Vern Raburn of GRT was out of a job due to financial difficulties at the company in 1979. In June he joined Microsoft as president of a new group called the Consumer Products Division. This division would be responsible for selling products directly to the retail market. Also released in 1979 were software products such as TRS-80 Level III BASIC, Typing Tutor and a game adapted by Gordon Letwin for microcomputers called Adventure.

Raburn was also responsible for promoting an interest in developing other software products for the Apple II computers. Apple II computer sales, and more important to Microsoft, software sales for the Apple II, were increasing significantly. This resulted in the concept by Paul Allen to create an interface card for the Apple computer that would allow the CP/M versions of FORTRAN and COBOL to operate on the machine. Microsoft hired Tim Paterson of Seattle Computer Products as a consultant to develop the Apple II card. Microsoft also hired Neil Konzen, an Apple computer programming enthusiast to develop the software. The function of the card evolved from an interface for Microsoft FORTRAN-80 and COBOL-80, to a general interface for the Digital Research CP/M operating system. The card used a Z-80 microprocessor and Microsoft named it the Z-80 SoftCard. Microsoft had to pay Gary Kildall of Digital Research $50,000 for a license to use the CP/M operating system. Subsequently Microsoft hired Don Burtis to improve the card design.

Microsoft completed the 8086 BASIC interpreter developed by Bob O'Rear and introduced it in June 1979. Tim Paterson of Seattle Computer Products had completed a card system for the S-100 bus using the new Intel 8086 microprocessor in May. Paterson had designed the card system and Microsoft tested the new BASIC interpreter using a Cromemco computer. Then Microsoft demonstrated the new BASIC interpreter for the 8086 at the June 1979 National Computer Conference in New York City.

In August 1979 Gates visited EDS (Electronic Data Systems) in Dallas. EDS was a computer service company

for mainframes owned by H. Ross Perot. As a result of these discussions, EDS made an offer to purchase Microsoft. However Microsoft rejected the offer due to financial differences.

Microsoft released in 1979, a Macro Assembler language for the Intel 8080 and Zilog Z-80 microprocessors in August, a BASIC Compiler with a price of $395 and the Edit-80 text editor with a price of $120.

Microsoft's revenue had reached $2.4 million with a staff of 28 employees by the end of its 1979 fiscal year. The revenue and number of employees had doubled approximately, during the past year.

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