Micro Instrumentation and Telemetry Systems

Micro Instrumentation and Telemetry Systems (MITS) was an American electronics company founded in Albuquerque , New Mexico that began manufacturing electronic calculators in 1971 and personal computers in 1975 . Ed Roberts and Forrest Mims founded MITS in December 1969 to produce miniaturized telemetry modules for model rockets such as a roll rate sensor . In 1971 , Roberts redirected the company into the electronic calculator market and the MITS 816 desktop calculator kit was featured on the November 1971 cover of Popular Electronics . The calculators were very successful and sales topped one million dollars in 1973 . A brutal calculator price war left the company deeply in debt by 1974 .

Roberts then developed the first commercially successful home computer , the Altair 8800 which was featured on the January 1975 cover of Popular Electronics . Hobbyists flooded MITS with orders for the $ 397 computer kit . Paul Allen and Bill Gates saw the magazine and began writing software for the Altair computer called the Altair BASIC . They moved to Albuquerque to work for MITS and in July 1975 started Microsoft - originally named " Micro @-@ Soft " by Paul Allen as recounted in this 1995 Fortune magazine article . MITS 's annual sales had reached $ 6 million by 1977 when they were acquired by Pertec Computer . The operations were soon merged into the larger company and the MITS brand disappeared . Roberts retired to Georgia where he studied medicine and became a small town medical doctor .

Origin

Founders

Henry Edward Roberts studied Electrical Engineering at the University of Miami before enlisting in the U.S. Air Force in 1962 . He soon became an electronics instructor at the Cryptographic Equipment Maintenance School at Lackland Air Force Base in San Antonio , Texas . To augment his meager enlisted man 's pay , Roberts worked on several off @-@ duty projects and even set up a one @-@ man company , Reliance Engineering . The most notable job was to create the electronics that animated the Christmas characters in the window display of Joske 's department store in San Antonio . In 1965 , he was selected for an Air Force program to complete his college degree , and became a commissioned officer . Roberts earned an Electrical Engineering degree from Oklahoma State University in 1968 and was assigned to the Weapons Laboratory at Kirtland AFB in Albuquerque , New Mexico .

Forrest Mims was interested in science and electronics as a youth and even built an analog computer while in high school . Mims graduated from Texas A & M University in 1966 (major in government with minors in English and history) then became a commissioned officer in the U.S. Air Force . While serving in Vietnam as an intelligence officer , Mims continued his model rocket hobby . At Texas A & M , Mims developed an infrared obstacle @-@ sensing device and he experimented with it at the Saigon School for Blind Boys and Girls . Launching model rockets in an area accustomed to rocket attacks and working with blind children resulted in a story in the military newspaper , Stars and Stripes . This caught the attention of an Air Force Colonel , who arranged for Mims to be assigned to the Weapons Laboratory at Kirtland AFB even though Mims lacked an engineering degree .

Roberts and Mims were both assigned to the Lab 's Laser Group in 1968 . Roberts had reactivated Reliance Engineering and built an infrared intrusion alarm for his uncle 's fish farm in Florida . Later , Roberts and Stan Cagle , a civilian worker who also went to Oklahoma State , started building a power supply they hoped to sell . Mims became an advisor to the Albuquerque Model Rocket Club and met the publisher of Model Rocketry magazine in July 1969 . Mims told him about a transistorized tracking light that he had used on night launches of rockets in Vietnam . This led to an article in the September 1969 issue of Model Rocketry ; " Transistorized Tracking Light for Night Launched Model Rockets " by Captain Forrest Mims . Mims became a regular contributor to Model

Rocketry .

= = = Model rocket kits = = =

Manned space flight and the race to the moon in the 1960s made model rocketry a popular hobby . Roberts , Mims , Cagle and another Air Force officer from the Lab , Bob Zaller , decided they could design and sell electronics kits to model rocket hobbyists . Roberts wanted to call the new company Reliance Engineering , Mims wanted to form an acronym similar to the Massachusetts Institute of Technology 's MIT . Cagle came up with Micro Instrumentation and Telemetry Systems , MITS . The December 1969 issue of Model Rocketry (circulation 15 @,@ 000) carried a press release that began :

Reliance Engineering in Albuquerque , New Mexico has announced the formation of a subsidiary company for the manufacture of miniaturized electronic and telemetry systems designed for model rockets . The company is called Micro Instrumentation and Telemetry Systems (MITS) . Reliance Engineering president Henry Roberts announced that " MITS is presently conducting an intensive research program involving high quality miniature telemetry systems . "

The first commercially available model rocket telemetry transmitter is among the first items to be offered by MITS . Accessory modules including a tone beacon , temperature sensor , and a roll rate sensor , as well as tracking lights , ground systems for data reduction , and light weight , water activated batteries will soon be available .

They designed and built the telemetry modules in their homes and garages but they were only able to sell a few hundred units . Mims had sold a feature article about the new solid @-@ state device , light @-@ emitting diodes , to Popular Electronics (circulation 400 @,@ 000) that May . With the hope of selling kits to the larger readership ; Roberts and Mims designed a device that would transmit voice over a beam of light , the Opticom . The editors accepted the project story and both articles were featured on the cover of the November 1970 issue . The payment for the articles was $ 400 but meeting Les Solomon , Popular Electronics technical editor , proved to be significant to both Mims and Roberts future success .

In August 1970 , Les Solomon , his wife and daughter were on vacation in the southwest and arranged to visit Mims , Roberts and their families . At that time , Dan Meyer and Don Lancaster were among the most prolific authors in Popular Electronics . Meyer had built a million dollar a year business that sold kits of parts to build the project that he and Lancaster wrote about . Mims and Roberts wanted to do the same and quizzed Solomon on the kit business . Solomon gave them some statistics but said there was no way of knowing how many kits an article would sell , maybe a hundred , maybe a thousand .

MITS had purchased components to build 200 Opticoms but only sold around 100 units . Roberts wanted to design a new electronic calculator kit but his partners wanted out . Bob Zaller had already left MITS and Forrest Mims was out of the Air Force and wanted to become a full @-@ time writer . Roberts bought his 3 partners out for $ 600 in cash and $ 350 in equipment . (Roberts ' four @-@ year commitment to the Air Force ended in mid @-@ 1972 .) Mims and Roberts remained friends and collaborated on books , magazines , instruction manuals .

= = Calculators = =

Ed Roberts ' interest in computers began in high school when he built a simple digital computer from relays . His first real experience with computers came while at Oklahoma State University where engineering students had free access to an IBM 1620 computer . Roberts ' office at Weapons Laboratory had the state of the art Hewlett @-@ Packard 9100A programmable calculator in 1968 . In July 1970 , a semiconductor company , Electronic Arrays , announced a set of six LSI ICs that would make a four @-@ function calculator . Roberts was determined to design a calculator kit .

To fund the new project , Roberts sold 15 % of MITS to fellow Air Force officer , Lieutenant William Yates . He also got an investment from another Weapons Laboratory officer , Major Ed Laughlin . Several other officers and scientist at the lab were interested in this state of the art calculator kit and

helped with the design . Forrest Mims wrote the assembly manual in return for a calculator kit .

The MITS 816 was known as a " four @-@ function " calculator ; it could add , subtract , multiply and divide . The display was only 8 @-@ digits but the calculations were done to 16 @-@ digits of accuracy . The custom molded case gave the kit a professional appearance ; the kit was $ 179 and an assembled unit was $ 275 . The MITS 816 was featured on the November 1971 cover of Popular Electronics . Thousands of calculator orders came in each month , in contrast to poor results for previous kits that MITS had offered .

The steady flow of calculator sales allowed MITS to run full page advertisements in Radio @-@ Electronics , Popular Electronics and Scientific American . In the June 1972 Radio @-@ Electronics , MITS announced a 14 digit calculator (Model 1440) with memory and square root function for $ 199 @.@ 95 kit and $ 249 @.@ 95 assembled . The original 816 kit was reduced from $ 179 to $ 149 @.@ 95 . Both calculators could be controlled by upcoming programming unit .

The monthly sales reached $ 100 @,@ 000 in March 1973 and MITS moved to larger building with 10 @,@ 000 square feet (930 square meters) of space . To meet the demand for assembled calculators , an automated wave solder machine was installed . In 1973 MITS was selling every calculator they could make , 110 employees worked in two shifts assembling calculators .

The functionality of calculator ICs increased at a rapid pace and Roberts was designing and producing new models . The MITS 7400 scientific and engineering calculator was introduced in December 1972 . It featured trigonometric functions , polar to rectangular conversion , two memories , and up to a seven @-@ level stack . A kit with a three @-@ level stack was $ 299 @.@ 95 and an assembled unit with a seven @-@ level stack was $ 419 @.@ 95 . The next month the Series 1200 four @-@ function pocket calculators were announced . The six @-@ digit model was $ 59 @.@ 95 and the twelve @-@ digit model was $ 99 @.@ 95 .

The Programmer accessory had been mentioned in the earliest advertisement but it was not featured until March 1974 . This was the same size as a desktop calculator and could hold 256 programming steps . (It could be expanded to 512 steps .) It was limited to emulating calculator key presses and simple sequence branching . The programming was done by entering hexadecimal key codes . The combination of the MITS 7440 calculator and the programmer was not nearly as sophisticated as the HP 9830 calculator but $ 400 for both kits was a fraction of the HP price .

= = = MITS calculators = = =

The feature and price information is from advertisements in Radio @-@ Electronics magazine (issue date shown) . The 816 price is from the original article in Popular Electronics .

= = = Price wars = = =

Bowmar Instrument Corporation introduced the " Bowmar Brain " , a four @-@ function pocket calculator , in September 1971 and the $ 179 calculator sold over 500 @,@ 000 copies in the first year . Bowmar then developed the " 901B " calculator that was priced at $ 120 . In September 1972 , Texas Instruments (TI) introduced the TI @-@ 2500 portable four @-@ function calculator that also sold for $ 120 . The 901B and the TI @-@ 2500 both used the TI TMS0100 family of " calculator @-@ on @-@ a @-@ chip " integrated circuit . TI was now directly competing with their IC customers . Other semiconductor companies such as National Semiconductor and Rockwell began selling calculators . Commodore Business Machines and other office equipment companies also got into the market . A frenzied price war started . By early 1974 , Ed Roberts found he could purchase a calculator in a retail store for less than his cost of materials . The larger companies could sell below cost to win market share . Bowmar lost $ 20 million in 1974 and filed for bankruptcy . Commodore acquired their IC supplier , MOS Technology . Texas Instruments won the price war but their calculator division lost $ 16 million in 1975 .

To compete in this market , Roberts needed more capital . He took MITS public in November 1973 with a stock offering of 500 @,@ 000 shares at $ 1 each . The 1973 oil crisis caused a stock market downturn and MITS was only able to sell 250 @,@ 000 shares . This allowed MITS to pay off the

existing debt , but did not allow for any expansion . Roberts had developed several test equipment products such as a Waveform Generator and a Digital Voltmeter so he attempted to appeal to kit builders again by featuring the test equipment and digital clocks in the advertisements , instead of calculators . MITS was losing money , and by July 1974 , the full page prominent ads were replaced with quarter @-@ page ads in the back of the magazine .

MITS was now $ 300 @,@ 000 in debt and Roberts was looking for a new hit product . He decided to return to the kit market with a low cost computer . The target customer would think that " some assembly required " was a desirable feature . Roberts had looked at the Intel 4004 for calculators and thought the Intel 8008 was limited and difficult to work with . Intel had just released the 8080 , their first microprocessor that could be a general purpose computer . The target price of this complete computer kit had to be under $ 400 . To meet this price , Roberts agreed to order 1000 microprocessors from Intel for $ 75 each . Roberts and his head engineer , Bill Yates , began designing the computer . The company was down to 20 employees and a bank loan for $ 60 @,@ 000 financed the design and initial production of the new computer .

= = Popular Electronics and Radio @-@ Electronics = =

In January 1972 , Popular Electronics changed its editorial focus in an attempt to attract more advertising revenues . Reviews of stereo equipment and citizens band radio were featured ; experimenter and constructions projects were gone . Dan Meyer , Don Lancaster , Forrest Mims , John Simonton and many other authors immediately started contributing to the competing Radio @-@ Electronics magazine . The June 1972 cover story was " Experimenting with a $ 32 Solid State Laser " by Forrest Mims . Another article in that issue was " Experiments with Op @-@ Amps " by B.R. Rogen ; this was a pseudonym of Popular Electronics technical editor , Les Solomon . Solomon wrote articles for Radio @-@ Electronics while working for Popular Electronics . Lou Garner , the longtime solid @-@ state editor , moved to Radio @-@ Electronics for a year . Several MITS kit projects were featured in Radio @-@ Electronics including the ITC 1800 Integrated Circuit Tester (May 1972) , the Model 1700 Function Generator (July 1973) , the Model 1440 Calculator (July 1973) and the 88 VLCT Computer Terminal (November 1974) .

Radio @-@ Electronics had a smaller circulation than Popular Electronics but led the way with innovative construction projects between 1972 and 1975 . John Simonton 's first modular electronic music synthesizer was featured on the cover of the May 1973 issue . It sold for a fraction of commercial synthesizers and his PAiA Electronics produced them for decades . Don Lancaster 's TV Typewriter in September 1973 and Jon Titus 's Mark @-@ 8 computer in July 1974 were the catalyst of the home computer revolution .

Art Salsberg became the editor of Popular Electronics in 1974 with a goal of reclaiming the lead in projects . He wanted to publish a computer project that was more functional and elegant than the Mark @-@ 8 . Les Solomon knew MITS was working on an Intel 8080 based computer project and thought Roberts could provide the project for the always popular January issue .

Ed Roberts and Bill Yates finished the first prototype in October 1974 and shipped it to Popular Electronics in New York via the Railway Express Agency . However , it never arrived due to a strike by the shipping company . Solomon already had a number of pictures of the machine and the article was based on them . Roberts got to work on building a replacement . The computer on the magazine cover is an empty box with just switches and LEDs on the front panel . The finished Altair computer had a completely different circuit board layout than the prototype shown in the magazine .

= = Altair computer = =

= = = Products = = =

The Altair 8800 was modeled after early 1970s minicomputers such as the Data General Nova . These machines contained a CPU board , memory boards , and I / O boards ; the data storage and

display terminal were external devices . The Teletype Model 33 ASR was a popular terminal because it provided printed output and data storage on punched paper tape . More advanced systems would have 8 @-@ inch floppy disks and a video terminal that would display 24 lines of 80 characters such as the ADM @-@ 3A . (No graphics were available and lower @-@ case letters were a $ 75 option .) Most of these computers had a front panel with toggle switches for entering data and lights for displaying it . These were normally used to boot the computer and to diagnose problems .

The Altair 8800 kit came with a front panel , a CPU board with the Intel 8080 microprocessor , 256 bytes of RAM , a 4 @-@ slot back @-@ plane and an 8 @-@ amp power supply for $ 439 . A 1k byte memory board was $ 176 and the 4k byte was $ 264 . The serial interface board was $ 124 and the parallel interface was $ 119 . There was a special price for an 8k byte system with BASIC for $ 995 . The Teletype Model 33 ASR was $ 1500 .

When the January 1975 issue of Popular Electronics reached readers in mid December 1974 , MITS was flooded with orders . They had to hire extra people just to answer the phones . In February , MITS received 1 @,@ 000 orders for the Altair 8800 . The quoted delivery time was 60 days but it was many more months before the machines were shipped . By August 1975 , they had shipped over 5 @,@ 000 computers .

The Altair 8800 computer was a break @-@ even sale for MITS . They needed to sell additional memory boards , I / O boards and other options to make a profit . The April 1975 issue of the MITS newsletter , Computer Notes , had a page @-@ long price list that offered over 15 optional boards . The delivery time given was 60 or 90 days , but many items were never produced and dropped from future price lists . Initially , Roberts decided to concentrate on production of the computers . Prompt delivery of optional boards did not occur until October 1975 .

The Intel 8080 did not have dedicated circuitry to support dynamic random @-@ access memory (DRAM) because in 1975 , this type of memory was still a new technology . MITS wanted to use DRAM because it consumed less power than static RAM . However , they had several design and component problems that led to a high failure rate with their 4K Dynamic RAM board . By July , new companies such as Processor Technology were selling 4K Static RAM boards with the promise of reliable operation . MITS released its own 4K Static RAM board in January 1976 .

The only floppy disk drives that were readily available in 1975 were IBM compatible 8 @-@ inch drives . MITS selected the Pertec FD400 disk drive which could store over 300 @,@ 000 bytes of data . The Altair disk controller occupied two boards and had over 60 ICs . The initial units were to be available in August , but were delayed until the end of 1975 . The production version of Extended Disk BASIC was released in April 1976 . The controller with one disk drive sold for $ 1 @,@ 480 (kit) and $ 1 @,@ 980 (assembled) .

= = = Marketing = = =

The first full page advertisements for the Altair computer appeared in the February issues of Popular Electronics and Radio @-@ Electronics magazines . Soon MITS was advertising in technical journals such as the IEEE Computer , and general interest magazines such as Scientific American . MITS was also the most prominent advertiser in the new hobbyist computer magazines such as Creative Computing and Byte .

David Bunnell joined MITS as a technical writer in the calculator heyday . In April 1975 he created a newsletter so the MITS staff could easily communicate with the customers . The newsletter , Computer Notes , was available to customers and other interested readers . It was a large format newsletter ; 11 @.@ 25 by 15 @.@ 5 inches (286 by 394 mm) , and each issue had 8 to 24 pages . In January 1977 , it switched to a smaller magazine format and the last issue was produced in January 1978 . Bunnell started Personal Computer magazine in October 1976 and went on to a successful career as a magazine publisher .

Computer Notes featured a wide variety of authors . Bill Gates and Paul Allen were regular contributors to the early issues . They wrote about Altair Basic and general software topics . Ed Roberts wrote a monthly " Letter from the President " column where he would answer customer

questions and even review competing products . MITS engineers , such as Tom Durston and Steve Pollini , would give technical descriptions of new products . Altair owners would contribute software and hardware suggestions and occasionally a complete article .

MITS purchased a camper van in April 1975 and outfitted it with an Altair system complete with floppy disk , a Teletype Model 33 and every accessory MITS produced . The " MITS @-@ MOBILE " was literally a showroom on wheels that would travel from city to city showcasing the MITS product line . They would hold seminars at hotel conference rooms that would draw crowds of over 200 people . The most notable seminar was at Rickey 's Hyatt House in Palo Alto , California in early June 1975 , where a member of the Homebrew Computer Club left with an unreleased copy of Altair BASIC . After retail computer stores were established in most cities , the " MITS @-@ MOBILE " was retired .

The first (and only) World Altair Computer Convention was held in Albuquerque , New Mexico in March 1976 . The convention , organized by David Bunnell , was an overwhelming success ; with 700 people from 46 states and seven countries attending . Many of the attendees would go on to become leaders of the personal computer revolution .

= = = Clones = = =

Owners of mainframe systems and minicomputers could purchase additional memory , interface boards and peripherals from third party suppliers ; so it was predictable that owners of the Altair 8800 computer would do the same . MITS 's delays in delivery of systems and accessories accelerated the formation of Altair compatible suppliers . The first ones started appearing in mid @-@ 1975 and by July 1976 complete computers systems were readily available . The technical manuals for the Altair 8800 provided electrical schematics of the 100 pin computer bus allowing others to design compatible boards . There was not a proper technical standard at the time and some " compatible " boards did not work with other " compatible " boards . Later , the industry developed the S @-@ 100 bus standard .

Bill Godbout Electronics in Oakland , CA was the parts supplier to many of the hobbyists and students from Berkeley . George Morrow approached Godbout with several Altair compatible designs that Godbout agreed to produce and sell . The October 1975 Byte magazine carried an advertisement headlining " Get your MITTS on a Godbout RAM kit . " The 4K byte Altair compatible board was $ 131 @.@ 07 .

Godbout also sold components to Processor Technology for their 4K Static RAM board and serial / parallel interface board . Lee Felsenstein designed an Altair compatible video board that provided 16 lines of 64 upper and lower case characters on a black and white television . This $ 160 board became very popular and led to the Processor Technology Sol @-@ 20 Computer in 1976 .

The IMSAI 8080 , the first " clone " of the Altair computer , was released in December 1975 . It corrected many shortcomings of the original Altair 8800 by providing a larger power supply , a 22 slot motherboard , and easier wiring of the front panel . Ed Roberts reviewed the IMSAI in his April 1976 column in Computer Notes , and agreed that the IMSAI was in some ways better than the original Altair . Roberts also pointed out that the new Altair 8800B was superior to the IMSAI 8080 and the upgraded Altair 8800A fixed the same issues that the IMSAI did .

Altair computers were only available from the 20 or so authorized Altair computer dealers , but the IMSAI 8080 , Processor Technology Sol and many other clones were sold by hundreds of newly opening computer stores .

The S @-@ 100 bus was used throughout the 1980s until it was overtaken by the IBM PC ISA bus . Seattle Computer Products (SCP) was a manufacturer of S @-@ 100 memory boards . The company 's engineer , Tim Paterson , designed an Intel 8086 CPU system on two S @-@ 100 boards in 1979 . Microsoft , then in nearby Bellevue , Washington , used the prototype machine to test their 8086 version of BASIC . Digital Research had promised to deliver an 8086 version of their CP / M operating system by December 1979 but missed that date . SCP needed a disk operating system to sell its 8086 products so Patterson wrote QDOS , a " Quick and Dirty Operating System " in three months . Microsoft would later purchase QDOS from SCP for $ 50 @,@ 000 and use it as

the basis for the IBM PC DOS .

= = = Altair BASIC = = =

In December 1974 Bill Gates was a student at Harvard University and Paul Allen worked for Honeywell in Boston . They saw the Altair 8800 computer in the January 1975 issue of Popular Electronics and knew it was powerful enough to support a BASIC interpreter . They wanted to be the first to offer BASIC for the Altair computer , and the software development tools they had previously created for their Intel 8008 microprocessor based Traf @-@ O @-@ Data computer would give them a head start . While their friend , Paul Gilbert , was building the computer , Allen wrote a program that ran on a DEC PDP @-@ 10 time @-@ sharing computer that simulated the 8008 system . He also modified DEC 's macro assembler to produce the machine code for the 8008 microprocessor . The Traf @-@ O @-@ Data software could be written and debugged before the computer hardware was complete .

Harvard had a DEC PDP @-@ 10 that was available for student use . They would use it to develop BASIC . While Allen modified their development software for the new 8080 microprocessor , Gates began writing 8080 assembly language by hand on yellow legal pads . They enlisted another Harvard student , Monte Davidoff , to write the math routines .

By early February the program coding switched from legal pads to the PDP @-@ 10 and a preliminary version was completed by March 1975 . Gates and Allen had been in contact with Roberts and MITS and the older looking Paul Allen would travel to Albuquerque in March . MITS needed more time to get a computer with 7k bytes of memory working , and they needed more time to get the software finished . When Allen arrived at MITS it took a day to get the software running ; Allen remembers this being caused by computer memory problems while Roberts remembers the delay was due to software problems .

The April 1975 issue of the Altair Newsletter , Computer Notes , had a banner headline " Altair BASIC - Up and Running " . The software was to begin shipping on June 23 , 1975 . The software price was $ 500 , but discounted to $ 75 with the purchase of an Altair computer with 8k bytes of memory and a serial I / O card .

On July 22 , 1975 MITS signed a contract for the Altair BASIC with Bill Gates and Paul Allen . They received $ 3000 at signing and a royalty for each copy of BASIC sold ; $ 30 for the 4K version , $ 35 for the 8K version and $ 60 for the expanded version . The contract had a cap of $ 180 @,@ 000 . MITS received an exclusive worldwide license to the program for 10 years . They also had exclusive rights to sub @-@ license the program to other companies and agreed to use its " best efforts " to license , promote and commercialize the program . MITS would supply the computer time necessary for development ; a PDP @-@ 10 owned by the Albuquerque school district . Paul Allen left his job at Honeywell and became the Vice President and Director of Software at MITS with a salary of $ 30 @,@ 000 per year . Bill Gates was still a student at Harvard and just a contractor with MITS . The October 1975 company newsletter gives his title as " Software Specialist " .

The price of Altair BASIC to customers who purchased additional memory and I / O boards from MITS was $ 75 . Users may have gone along with that if the memory board were reliable . Customers bought the computer from MITS , and working memory from companies like Processor Technology . Rather than pay $ 500 for BASIC , they would acquire bootleg copies of the software . Only about ten percent of the early customers actually purchased BASIC . With a royalty due of $ 30 per copy , Gates felt that the computer hobbyist were stealing money from him . In February 1976 Bill Gates , " General Partner , Micro @-@ Soft " , wrote an " Open Letter to Hobbyists " that was sent to every computer publication inferring that the hobbyists were thieves .

MITS had announced a new computer based on the Motorola 6800 microprocessor in November 1975 , the Altair 680 . The machines were supposed to ship in January 1976 , but hardware design problems delayed shipment until May . Paul Allen rewrote their 8080 simulator to support the 6800 microprocessor . Ric Weiland , a high school friend of Gates and Allen , converted the Altair BASIC 's 8080 assembly language to 6800 assembly language . To eliminate the per copy royalty loss issue , the 6800 BASIC was licensed to MITS on a non @-@ exclusive basis for a flat fee of $ 31

@,@ 200 . Weiland and Marc McDonald were impressed with the new MOS Technology 6502 microprocessor that was a derivative of the 6800 . They modified the 6800 development system to support the 6502 and " cranked out " a 6502 edition of BASIC . This version was later sold to Commodore and Apple .

The January 1976 issue of MITS 's newsletter , Computer Notes , carried an ad for 8080 BASIC . The last paragraph stated : " Licenses for source listing and rights to distribute the binaries are also available to OEM buyers . Write or call Mr. Paul Allen at the MITS plant in Albuquerque for more detailed information . " Microsoft found several corporate customers for BASIC and proceeds were evenly split with MITS . Pertec acquired MITS in December 1976 and refused to allow any more OEM deals , even though the agreement required MITS to uses their " best efforts " to license the software . The contract required MITS and Microsoft to use binding arbitration to settle disputes . In September 1977 , the arbitrator ruled in favor of Microsoft , MITS could continue to use BASIC on their machines but lost the exclusive license . Microsoft could license the software to anyone and keep all of the royalties .

There was no longer a business requirement to remain in Albuquerque so Microsoft wanted to relocate to a larger city that would be more attractive to new employees . The San Francisco bay area was considered but Allen and Gates decided to return home to Seattle . Microsoft moved to Bellevue , Washington in January 1979 .

= = Sale to Pertec = =

In 1976 , MITS had 230 employees and sales of $ 6 million . Roberts was tiring of his management responsibilities and was looking for a larger partner . MITS had always used Pertec Computer Corporation disk drives and on December 3 , 1976 , Pertec signed a letter of intent to acquire MITS for $ 6 million in stock . The deal was completed in May 1977 just before the National Computer Conference in Dallas , Texas . Roberts got $ 2 million and the other 500 MITS shareholders (including the Altair co @-@ designer , William Yates) split the rest .

Pertec was eager to increase sales to small businesses through the 26 Altair Computer stores across the United States . The marketing toward hobby / home user was curtailed . The November 1977 issue of the MITS newsletter , Computer Notes , was the last produced by the Albuquerque staff . There was one more issue produced by the Pertec staff in Chatsworth , California . The back cover of the leading home computer magazine , Byte , always carried a full page Altair advertisement . This ended with the September 1977 issue . Roberts and Yates stayed on and worked on special projects .

In August 1979 , Pertec agreed to sell a 45 % stake to North American Philips for $ 37 million . Before the deal was complete , Pertec agreed to be acquired by the West German computer company , Triumph @-@ Adler , for $ 120 million . In 1978 , Pertec had sales of $ 150 million and Triumph @-@ Adler had sales of $ 466 million .

The Altair products were merged into the Pertec line and the MITS facility was used to produce the PCC @-@ 2000 small @-@ business computer . The Albuquerque plant was closed in December 1980 and the production was moved to Pertec plants in Irvine , California .

By the end of 1977 Roberts left MITS and returned to Georgia to be a gentleman farmer . He studied medicine at Mercer University in Macon , Georgia and graduated with a M.D. in 1986 . Roberts practiced medicine in Cochran , Georgia , population 4500 , until his death in 2010 .