IEEE
Celebrates

The IEEE Region 5 Stepping Stone Award

for the

Datapoint 2200 Desktop Personal Computer
AS THE FIRST PERSONAL COMPUTER

The San Antonio Museum of
Sciences and Technology
102 Mabry Dr.
Port San Antonio
San Antonio, TX 782226

May 28th, 2022,
11:00 am – 12:30 pm
Reception to follow

Region 5 Stepping Stone Award
In Electrical Engineering and Computing

Saturday, May 28, 2022 at the
San Antonio Museum of Science and Technology
(SAMSAT)

Program of Events

Welcome
Dr. Zafar Taqvi, History of the Stepping Stone Award

City of San Antonio Welcome

Tech Port SA Welcome
Jim Perschbach, President

IEEE Lone Star Section (LSS) Welcome
Nils Smith, Chair

Development of the Datapoint 2200
David Monroe, SAMSAT CEO

Region 5, Introduction to the Presentation
Bob Becnel, Director

Presentation of the Plaque
IEEE: Bob Becnel, Zafar Taqvi, Nils Smith, IEEE Corporate
SAMSAT: David Monroe, David Gust, Austin Roche, Cliff Zintgraff

Reception and tours of the Museum

IEEE Region 5 Stepping Stone Award
in
Electrical Engineering and Computing
DATAPOINT 2200
DESKTOP PERSONAL COMPUTER 1969

This plaque recognizes the technological advances of the Datapoint 2200, the first desktop personal computer. The Datapoint 2200 was designed and produced by Datapoint Corporation, formerly Computer Terminal Corporation, starting in 1969. This design pioneered the computer architecture and instruction set that became the basis for the Intel 8008 and many other microprocessors.

May 2022 ◆ IEEE Region 5

The Datapoint 2200 was the first of a new breed of computers that were designed not for engineers to use, but for ordinary people. Prior to the 2200, the smallest computers were minicomputers that utilized awkward switch registers, register lamps and a bootstrap loader which loaded the operating system from paper tape or 9 track tape. These mini-computers were typically 19" relay rack-mounted, with external storage devices and displays, and did not feature office or personal applications.

United States Patent Office   Des. 224,415
Patented July 25, 1972

224,415
COMPUTER TERMINAL

Jon P. Ray and Austin O. Roche, San Antonio, Tex.,
and John R. Frassanito, Oyster Bay, N.Y., assignors
to Computer Terminal Corporation, San Antonio, Tex.

Filed Nov. 27, 1970, Ser. No. 26,176

Term of patent 14 years

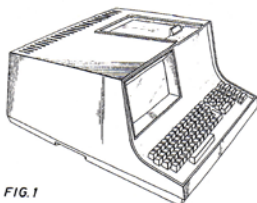U.S. Cl. D26—5   Int. Cl. D14—02

In order to achieve the goal of "a computer on a desk", the 2200 incorporated a number of innovations, many of which were adopted in later computers. These include tape cassette data storage, 8 bit words/registers, minimalist data set with register-register operations, "little-endian" number representation, serial bus and ALU architecture, external parallel bus for peripherals, N-key rollover keyboard and a switching power supply.
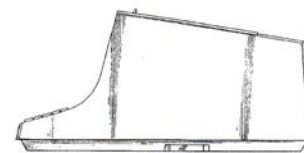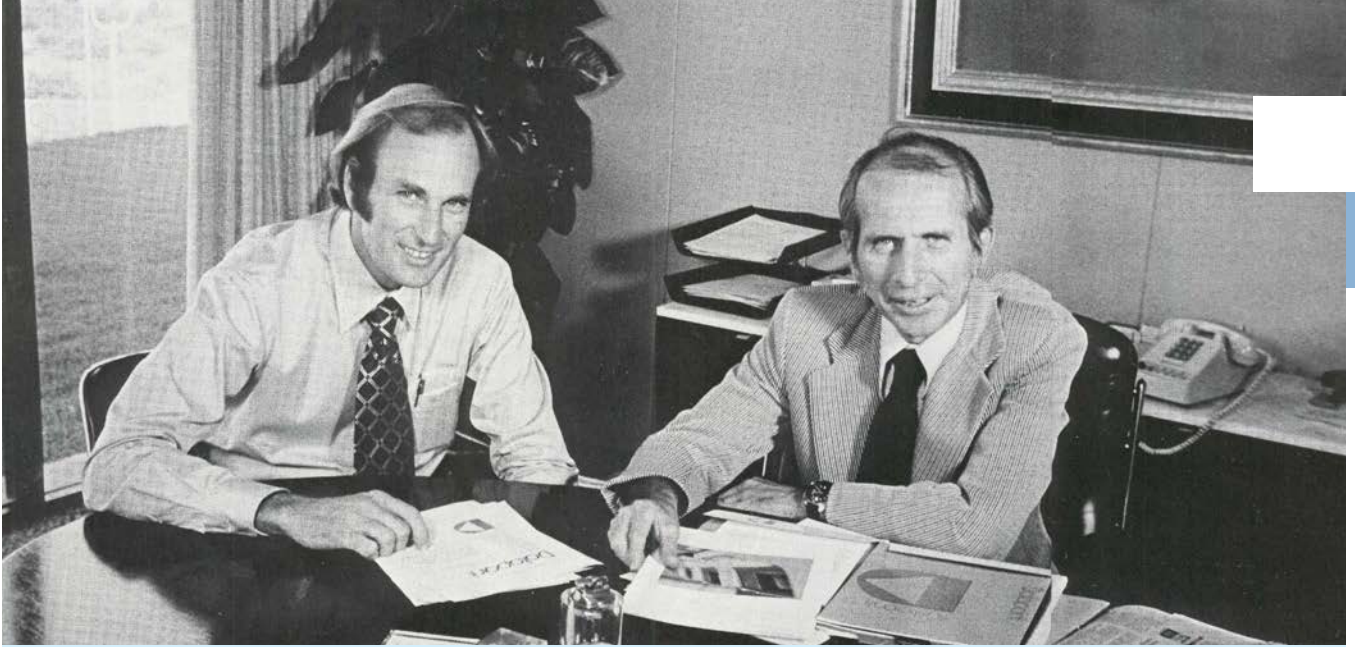

FIG. 1

FIG. 2

On July 6, 1968 Gus Roche and Phil Ray incorporated the Computer Terminal Corporation (CTC). Their business plan was to design and produce a "glass-Teletype" all-electronic computer terminal with a CRT display that would be compatible with the Teletype Corporation ASR-33 used as timeshare computer terminals. They named their terminal the Datapoint 3300 because they claimed that it was "100 times better" than its mechanical predecessor the ASR-33. The first Datapoint 3300's were shown at the 1969 Spring Joint Computer Conference in Boston. The 3300 terminals were very well received at the Conference and by September 1969 nearly 1500 units were on order.

Many Datapoint customers requested custom modifications which were difficult and time-consuming to do in the hardware implementation of the 3300. In order to meet these requests and to broaden the market, CTC decided to produce a programmable device. Over Thanksgiving in 1969, Harry Pyle and Victor Poor specified basic architecture and an instruction set of the new computer.
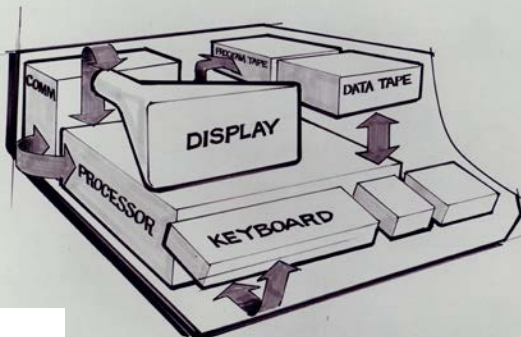
During the development of the 2200, CTC worked with Intel and Texas Instruments in an effort to implement the system on a single integrated circuit. Neither Intel nor TI were willing or able to produce a chip soon enough to meet the CTC production schedule and the 2200 was implemented with TTL logic chips.
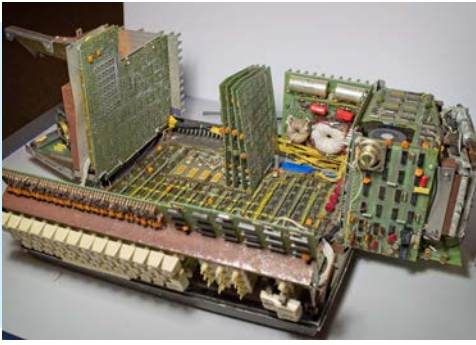
The Datapoint 2200 was rated at 180 watts, weighed 47 pounds and had nearly the same footprint as an IBM Selectric typewriter. It used two built-in cassette tape drives for program and data storage, each 130 KB capacity. The 2200 had 8192 bytes of internal memory, implemented with shift register integrated circuits and a bit-serial arithmetic logic unit. The processor was built with about 120 dual-in-line integrated circuits, primarily SN74XX series TTL logic chips from Texas Instruments. CTC provided a tape operating system called CTOS, a programming language called DATABUS and several computer games.
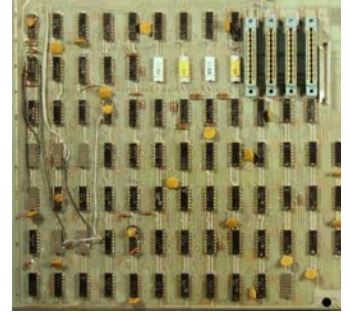
The 2200 was shown in April, 1970 at the 1970 Fall Joint Computer Conference in Houston. The first sale was to General Mills on May 25, 1970. Early users included Pillsbury who used it for payroll calculations and Levi Strauss for data entry applications. Others were used by order-entry firms and insurance companies. Due to this success, CTC proceeded with development of the 2200 Version II which was about 100 times faster than the original while maintaining compatibility to run all existing software that had been developed for the 2200. The 2200 became very popular and on December 9, 1972 the name of the company was changed to Datapoint Corporation, recognizing the fact they they were no longer a "computer terminal company".

Later both Texas Instruments, with the TMX 1795, and Intel completed the single chip implementations. The Intel chip was initially called the "SPD 1" (Semiconductor Processor Development 1), when delivered, was called the "1201" (12 for custom, 01 for the first custom Intel chip), and was later changed to "8008" when in volume production. The TI implementatioin was a chip set with memory, and the memory chip proved not to be reliable. These were the first production 8-bit microprocessor chips and both were based on the CTC architecture and implemented the instruction set of the Datapoint 2200, Version 1.

By May 2000, Datapoint Corporation ceased manufacturing computer systems but the legacy of the 2200 lives on in the architecture and instruction sets of many current personal computers and in the memory of many Datapoint alumni who meet annually at SAMSAT.

IEEE Region 5 Stepping Stone Award Program

The Region 5 Stepping Stone Award honors outstanding achievements that took place in the Southwestern United States and made a substantial impact in science, technology, engineering and mathematics. This program is executed by the Region 5 History Committee, Dr. Zafar Taqvi, Chair, T. Scott Atkinson, Member and Mr Hardy Pottinger, Member. Since its origin in 2017, this is the 4th award to be presented.

First SS Award:
Southwest Research Institute, For Management of the New Horizons Spacecraft program

Second SS Award:
NASA for development of the Analytic Ephemeris Generator (AEG) 1964

Third SS Award:
NASA for the new communicators design for the Apollo Space Program.

About IEEE

IEEE is the world's largest technical professional organization with over 400,000 members dedicated to advancing technology for the benefit of humanity. Through its highly cited publications, conferences, technology standards, and professional and education activities, IEEE is the trusted voice in a wide variety of areas ranging from aerospace systems, computers, and telecommunications to biomedical engineering, electric power and consumer electronics. Learn more at: ieee.org

About SAMSAT

SAMSAT, located at Tech Port San Antonio, is a world-class science center, an innovation incubator, and home to a major collection of technological artifacts including many one-of-a-kind items; a fascinating hub for today's dreamers in San Antonio and beyond. The collection of 10,000 items spans more than a century of technological innovations, from early telecommunications and computing machines to the breakthroughs that are the foundation of today's information era. Current preview displays focus on early communication devices, cybersecurity, the PC/Datapoint story, early Edison innovations, and innovations and collections that arose in San Antonio. More information at: **samsat.org**.

Speaker Biographies

Dr. Zafar Taqvi

Dr Zafar Taqvi, Ph.D.(EE)- Retired from space program after 41 years supporting Apollo, Apollo-Soyuz, Space Shuttle and International Space Station(ISS), ISS from requirements, specification, testing and selloffs for C&T subsystem. Associated with Galveston Bay section(GBS), he has actively served IEEE for 50 years IEEE chapters, section, Region 5, AESS Board of Governors as Assoc. V/P Member Development and Director International Operations, EMBS as the Ethics chair, and ComSoc North America Region (NAR) Board and DLT/ DS coordinator.

He is a Fellow of ISA, Associate Fellow of AIAA, and IEEE Life Senior Member, and a member of Tau Beta Pi, Sigma Xi, Eta Kappa Nu, Omicron Delta Kappa and Phi Kappa Phi honor societies. He has been honored many times by ISA, AIAA and IEEE at section, region and IEEE-USA levels.

Jim Perschbach, Port SA CEO

Jim Perschbach is president and CEO of Port San Antonio. He joined the Port in 2014 and leads a team that provides strategic support to grow advanced industries on the 1,900-acre technology innovation campus, including aerospace, cybersecurity, defense, manufacturing and global trade.

In addition to his work at the Port, Perschbach serves his community in other leadership roles. He is a past chair of both the San Antonio Chamber of Commerce's Aerospace Committee and Alamo Colleges' Scobee Education Center/Challenger Learning Center. Currently, he serves on the boards of the United Way of San Antonio and Bexar County and Our Lady of the Lake University.

In 2018 he was appointed Honorary Commander of the 502nd Airbase Wing/Joint Base San Antonio. He has also been named by the Business Journals as one of the country's top 100 executives to watch in 2019.

Bob Becnel, Director

Bob Becnel is an Associated Technical Fellow for the Boeing Company on Autonomous Systems in St. Louis with an expertise in command and control communications. Since joining Boeing in 2005, Becnel has supported or led projects in cellular technology, navigation and guidance and RF networking for military and homeland security customers. Previously, Becnel served as a Member of the Technical Staff at Lucent Technologies/Bell Labs, where he was engaged in the design of communication networks. Bob is married to Verla and they live in Imperial, MO (St. Louis). They have two daughters.

Mr. Nils Smith

Mr. Smith is the Vice President of the Defense & Intelligence Solutions Division at Southwest Research Institute. That division supports U.S. and friendly foreign governments, as well as commercial clients, developing communications signal intercept, direction finding, surveillance, tagging and tracking systems, avionics and support systems, and electronics integration and cyber technology.

He is the Chair of the IEEE Lone Star Section and Vice Chair of the IEEE-USA R&D Policy Committee. Mr. Smith is also an active member of the IEEE Technology and Engineering Management Society and the IEEE Aerospace and Electronics Systems Society. He is a registered Professional Engineer in Texas.

Mr. David Monroe

Mr. Monroe is the Founder and Chair of the San Antonio Museum of Science and Technology, SAMSAT, located at Tech Port San Antonio. David Monroe has over forty years of experience in the fields of commercial and government electronics. His achievements include the founding and managing of six technology companies and holding positions of Division Vice President and Corporate Vice President of Research and Development of a Fortune 500 computer company. Within these organizations, Mr. Monroe has had a broad spectrum of responsibilities including product line management, product architecture, engineering, engineering management, operations management, senior management and serving on board-of-directors and standards committees. He holds approximately 50 patents issued in the areas of communications, image and video transmission and other electronic systems, with additional applications pending.

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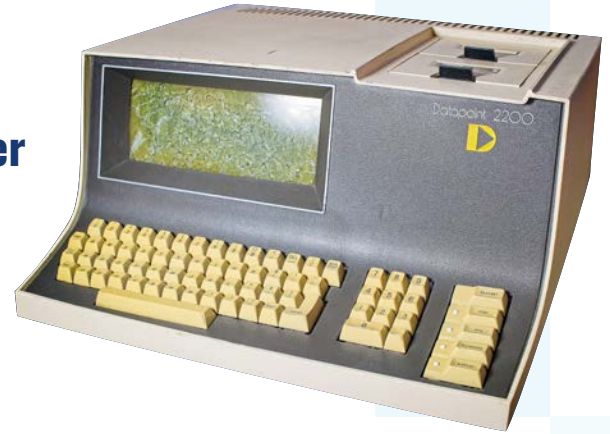
Sponsors & Acknowledgements

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IEEE Lone Star Young Professionals Affinity Group

San Antonio Museum of Science and Technology

Port San Antonio

Companies

Southwest Research Institute

Individuals

T. Scott Atkinson	**Joe & Patricia Jankowski**
Warren & Patricia Conner	**John Lyons**
Drew & Rosemary Crossett	**David Monroe**
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