

How It All Began

HEWLETT-PACKARD'S LOVELAND FACILITY

by KENNETH JESSEN

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FOREWORD

The thought that this document could become an important part of the Hewlett-Packard history in Loveland came to me several years before the recently announced separation of HP into a computing and imaging company and a measurement organization. With the advent of the separation, it now seems even more important to capture this period before the opportunity slips away.

I knew when I began this project that I needed not only an author with talent, but I needed someone with the passion of an early employee. I found that in Ken Jessen. When I first approached Ken with the idea following a meeting on another subject, I could tell I'd made the right decision. He began talking about the concept and his ideas as we walked down the hall. I knew I'd discovered a kindred spirit.

Ken and I have talked about the dangers of writing a history of this nature. Research is limited to the few existing artifacts we kept, primarily old *Hi-Points* magazines, faded photographs and interviews with retired employees. And when you set about to name names, it's impossible to recall or record all the players

involved. Be that as it may, this represents our attempt to record and relate the history of a unique place and time for hundreds of people we called HPites.

This book is dedicated to all those we described who made HP Loveland a brief and shining "Camelot." To those we've named and to those who were also players on the stage, but whose names are not recorded, you were all a part of it. And to Virginia DeBoer, my mother-in-law, without whose presence I would not have been a part of it.



Jim Willard
Site Public Relations Manager and
Hewlett-Packard employee 1967-1999

ACKNOWLEDGMENTS

The author would like to thank all of those who provided insight and ideas for this project. On the top of the list is Jim Willard who conceived of the idea for this project and provided a great deal of guidance. Others, who not only proofread the entire document but provided new information, include Bob Bump, Chuck Platz, Judi Hoefler, Laraine Frost, Linda Johnson, Arlen Amundson, Noel Pace, Al Sperry and Art Helgeson. Don Wick, Paul Febvre,

Jack Kirkpatrick and Bill Brunelli helped recall some of the early events and product development activity. Walt Skowron filled in the blanks where information about people and events was missing from written records. I also would like to thank my professional readers Mary Edelmaier, Sandy Perlic and Susan Hoskinson. The excellent book design and production was done by LaVonne Ewing.

INTRODUCTION

Hewlett-Packard has undergone many changes over the years. Up until the late 1960s, its entire product line consisted of instruments designed to make fundamental electrical measurements. The company's roots are based on the world's first practical, low-cost Wein Bridge oscillator, invented by Bill Hewlett. Hewlett-Packard rapidly expanded this product line through acquisitions and the development of new products by its own divisions.

The company entered the computational equipment field in the late 1960s in gradual steps with the introduction of a mainframe computer, a desktop electronic calculator and a pocket calculator. The final development and manufacture of the desktop calculator was done at the Loveland site. Printers and plotters were also developed by HP. Eventually, instrumentation played a minor role in overall sales.

In March 1999, Hewlett-Packard's management decided to split the \$47-billion company into two parts: an independent company, with its focus on test and measurement, and the Hewlett-Packard Company, with its focus on computation and imaging products.

Given HP's growth objective, this decision was made in response to the difficulty in managing HP's diverse product line.

Founded on the beliefs of Dave Packard and Bill Hewlett, the idea for new products was tied to technical contribution in the measurement field. Projects were cancelled if they would not offer new performance at a reasonable price. The idea of entering commodity markets, where price and brand name were the primary driving forces, is relatively new to HP's business philosophy.

In 1964, Bill Hewlett issued these objectives, "Twenty-five years ago, when Dave Packard and I began to design and manufacture electronic measuring instruments, we resolved on two prime objectives. One was to produce instruments that constituted true technical contributions. The second was to produce instruments that embodied quality at moderate cost."


Dr. Deming, considered the father of statistical process control, taught the Japanese the virtues of using quality components as a means of improving reliability. To achieve similar quality objectives,

turn, the managers could learn important details about their operation. Managers were asked to set objectives and to allow the workers to decide on the details. For many years, this same personal style of management was carried out at the Loveland facility.

This book covers the early history of Hewlett-Packard's Loveland facility and how it got started. It reflects an earlier attitude toward employees. It also shows how, during its first decade, the product mix at Loveland changed dramatically.

A great deal of the information came from the company's local employee-oriented magazine, *Hi-Points*, with additional information from interviews, newspaper articles and company records.

Jim Willard, Public Relations Manager, originated the idea for this project. As the Loveland facility approaches its 40th anniversary, he saw the need to pass this information on to future generations of employees.

A handwritten signature in cursive script, appearing to read "Kenneth Jessen", with a long horizontal line extending to the right.

Kenneth Jessen
Loveland, Colorado
1999

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Hewlett-Packard's Humble Beginnings

Dave Packard and Bill Hewlett met as undergraduates at Stanford University during the early 1930s. Dave Packard's father was a Pueblo, Colorado lawyer, while Bill Hewlett's father was a brain surgeon in San Francisco. After their graduation in 1934, the two men went their separate ways. Dave ended up at General Electric and worked in their vacuum tube research department. Bill went on for further studies at Stanford and wrote a thesis covering the use of a common incandescent lamp in a feedback loop to stabilize an oscillator.

Bill's idea opened the way for a low-cost, precision audio oscillator. Bill and Dave renewed their friendship and decided to use their accumulated wealth of \$538 to manufacture this oscillator. At the toss of a coin, the name Hewlett-Packard was selected for the new company. Since Bill Hewlett won the toss, his name came first and he became president. Dave Packard became

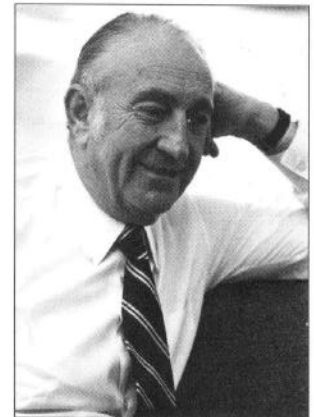
vice-president.

The way in which work on the oscillator began is best expressed by Dave Packard in his book, *The HP Way, How Bill Hewlett and I Built Our Company*.

"Now that Bill and I were back together, we started putting our

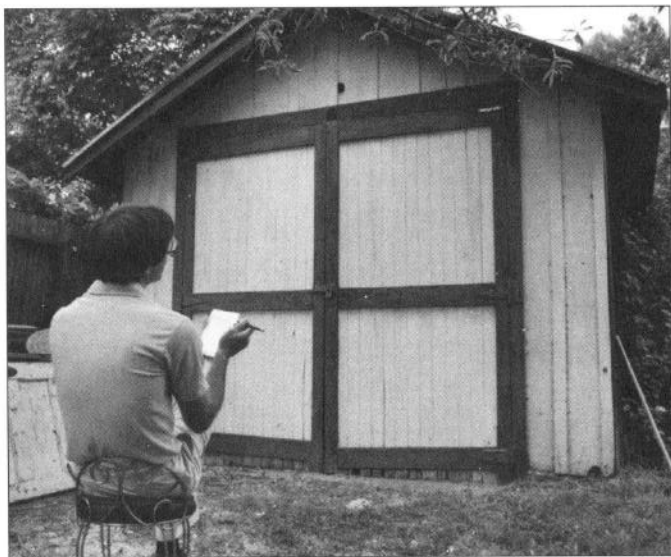
plans to work. Bill had found a two-story house on Addison Avenue in Palo Alto, and Lu and I rented the lower floor. Bill, who at the time was still a bachelor, lived in a little building out back. There was also a one-car garage, and that became our workshop." This garage has since been designated a California Historical Landmark and the birthplace of Silicon Valley.

The cabinets for their oscillator were



The founders of the Hewlett-Packard Company, Bill Hewlett (left) and Dave Packard (right), began their company in a single-car garage in Palo Alto, California. As of 1999, HP has grown to sales of \$47-billion a year.

purchased, but the front panels were hand-fabricated in the garage. They were sawed out of aluminum stock, then drilled with holes for the



This is the original workshop where Hewlett and Packard built their first instrument. It is now designated a California Historical Landmark and the birthplace of Silicon Valley. Gregg Piburn is shown "interviewing" the garage for a story he was writing.

switches, terminals and dial. They were spray-painted, then baked in Mrs. Packard's kitchen stove. The panels were then taken to Charlie Litton, a good friend of Bill and Dave and founder of his own company. Charlie engraved the designations on the

panels through the paint. Each dial was individually calibrated using a frequency standard. Pencil lines marked each major point on the dial prior to engraving.

Bill and Dave designated their product the 200A Audio Oscillator, and this kicked off a numbering scheme which was to last many decades. Later in the development of Hewlett-Packard, the 100 block was used for oscilloscopes,

the 300 block was reserved for analyzers and the 400 block was reserved for voltmeters.

Bill Hewlett took the original model of the audio oscillator to a technical conference in Portland, Oregon, in fall 1938. Among those who showed interest in the product was Bud Hawkins, the chief sound engineer from Walt Disney Studios. Hawkins was working on a new and innovative film called *Fantasia* and had planned to spend \$400 each for audio oscillators from General Radio. The movie was important since it pioneered the use of high fidelity stereophonic sound. When he found out that Bill's oscillator cost less than \$100, he ordered eight units. Enough modifications were made to call it a 200B. Each unit was sold to Disney for \$71.50.

Others took note of these fundamental products and their contribution in price and performance. Norman Neely, a Southern California manufacturer's representative, took over representing Hewlett-Packard within his sales region on a simple handshake. He encouraged Bill and Dave to think big and expand to an entire line of audio products. At the end of its first full year in business, 1939, Hewlett-Packard's sales were \$5,369 with a profit of \$1,563. The

company has made a profit every year since.

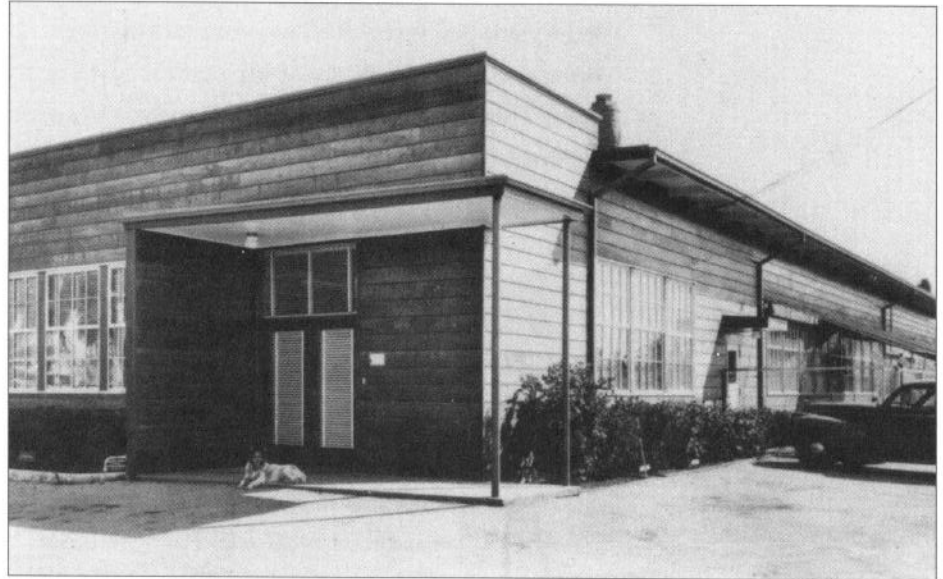
In 1940, the company moved from the garage to a rented building next to Tinker Bell's Fix-it Shop at the corner of Page Mill Road and El Camino Real in Palo Alto. Sales now totaled \$34,000, and the company had three employees. Significant, however, was the fact that it also had grown to eight products.

With the start of World War II, the demand for electronic equipment skyrocketed. To meet increased production, Bill and Dave constructed the Redwood Building in 1942-1943 just off of El Camino Real in Palo Alto. A Quonset hut was added behind the Redwood Building. Bill went off to war in the Signal Corps as a major, and Dave stayed home to mind the store.

Hewlett and Packard developed a corporate culture to convey the feeling of a close-knit family to its employees. It also provided top working conditions and hired excellent people. The company was able to take advantage of the rapid post-war growth in the infant electronic industry.

The company was incorporated in 1947, and construction began on a new building in 1948 adjacent to its Redwood Building. This was Plant No. 1, and in 1951, a twin of the first building

was constructed called Plant No. 2. The company now had more than 40,000 square feet of space, and sales for 1951 totalled \$5.5 million. Hewlett-Packard had 215 employees.



In 1954, Hewlett-Packard celebrated its fifteenth anniversary with the opening of its new administration building next to Plant No. 2. There was an open house for the public and a celebration for all 700 employees. The first service award pins were given with four fifteen-year pins. One of these pins naturally went to

The Redwood Building, located near El Camino Real and Page Mill Road, was the first building constructed by Hewlett-Packard. It was completed in 1942.

Dave Packard and another to Bill Hewlett. The remaining pins went to their first two employees.

As sales exceeded \$1 million a month, the company reached a point where it was difficult to maintain the same feeling of being a family. This led to smaller, integrated manufacturing units operating autonomously of the central corporate core. This was the beginning of Hewlett-Packard's decentralized approach to design and manufacturing.



The Model 200A was the world's first low-cost, practical, R-C tuned audio oscillator with its output level controlled by a feedback loop consisting of a simple incandescent light bulb.

The company needed more space, and a forty-four acre tract of land was leased in the Stanford Industrial Park up on the hill along Page Mill Road overlooking Palo Alto. In 1957, the company opened its first building in the Stanford Industrial Park. As other

buildings were added, the ground-level courtyard became enclosed. Eventually, a basement-like cavity was dug out of the ground called the "Mole Hole" where the stock rooms were located.

The latest manufacturing techniques and systems were used including conveyor-style assembly lines. The new Stanford Industrial Park facility was well lit with a combination of both



Bill Hewlett is shown at Loveland with the successor to the Model 200A, the 200CD Audio Oscillator. This product was produced for many years and wasn't discontinued until high output transistors became commercially available.

artificial and natural light coming from its saw-tooth roof structure. The new buildings were also air-conditioned.

Land became scarce in Palo Alto, and the company began having difficulty finding qualified people. By the late 1950s, it was clear that expansion outside the Bay Area was necessary.

It is important to note that Hewlett-Packard began as a single company, but soon acquired other companies to expand its growing product

line. The F. L. Moseley Company of Pasadena, California, made x-y pen plotters and was the first acquisition in 1958. Boonton Radio Corporation of Boonton, New Jersey, made inductance measurement equipment and was acquired by Hewlett-Packard. Boonton's line of products grew to include a signal generator, a power amplifier,

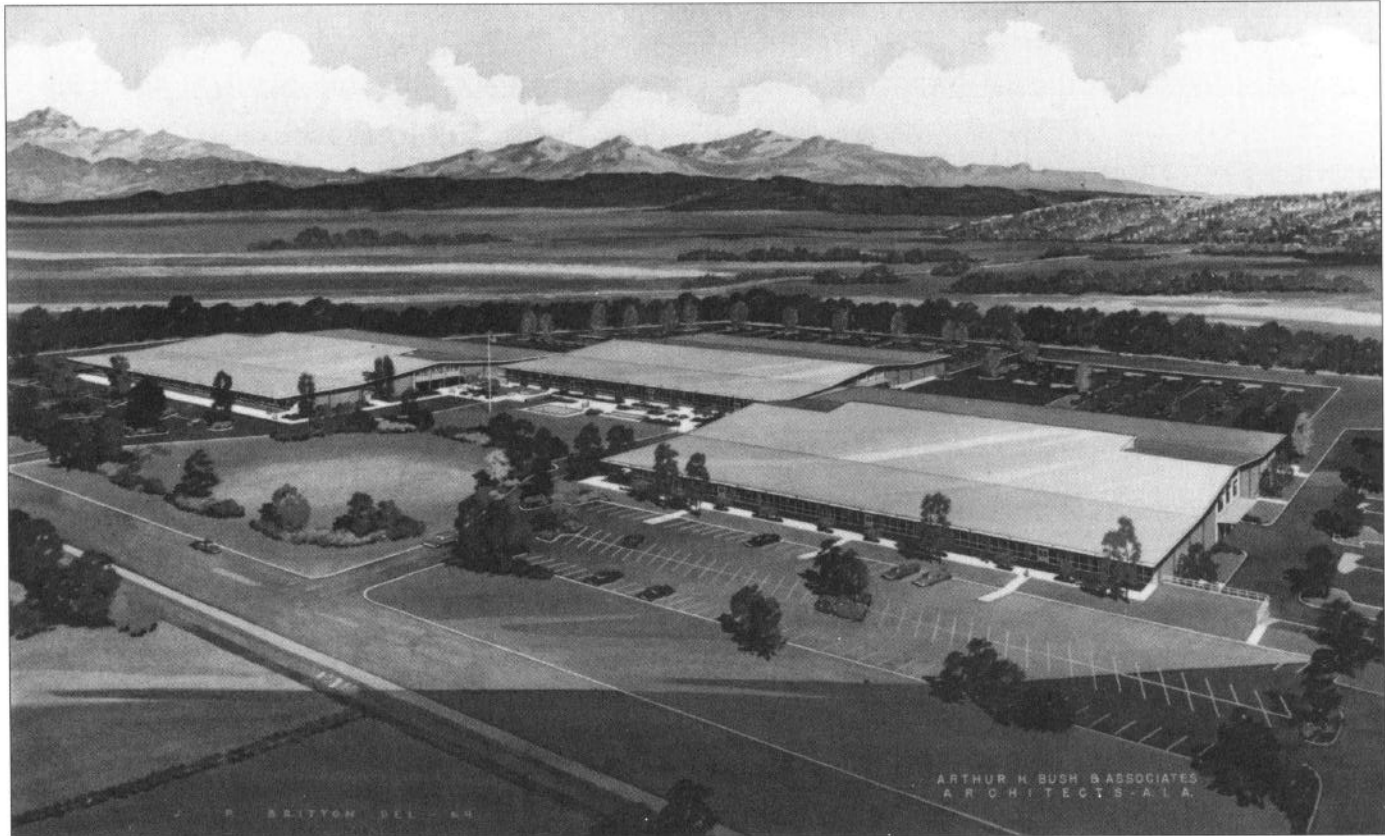


Both Bill Hewlett and Dave Packard had a high regard for their employees. Exercising "management by wandering around," Dave Packard is shaking hands with a wire and assembly person at the Loveland plant. The product in the foreground is the 204C, the first transistorized audio oscillator.

an attenuator and an RF millivoltmeter.

Sanborn Company of Waltham, Massachusetts was purchased in 1961 and manufactured strip chart recorders, EKG and other medical equipment. Also during the 1960s, Harrison Labs of Berkeley Heights, New Jersey, added power supplies to Hewlett-Packard's product line, while F & M Scientific Corporation of Avondale, Pennsylvania, added analytical instrumentation.

Hewlett-Packard also developed two subsidiaries during its early years. The Palo Alto Engineering Company was formed to make transformers and branched out into photochoppers and other components essential to precision instruments. Dymec, HP's second subsidiary, was a systems integration operation. It also designed and manufactured its own line of products including an AC/DC/Ohms converter, an integrating digital voltmeter and a digital recorder. Its logo was an inverted HP logo so that it read "dy."



An architectural drawing shows how HP's buildings at the Thompson Industrial Park were to look. This was published well before Building A was completed.

Hewlett-Packard's Loveland Facility

The story of Hewlett-Packard's Loveland plant begins with Loveland First National Bank President Paul Rice and an appliance dealer named Bob Hipps. They organized the Loveland Development Fund. Money raised by the fund was used to acquire a portion of the Schwartz farm on the southwest side of Loveland for a potential industrial site. Some of the money came from dimes and quarters collected by Loveland children and matched by the bank. The town had stagnated, and this prompted business leaders to try to attract a major corporation.

Since Dave Packard was born in Colorado, it was only logical that when the company decided to expand outside the Bay Area, that it would look first in Dave's home state. Stan Selby was picked to go to the Boulder area since there was a major university and close proximity to an airport.

Paul Rice heard of HP's interest in Colorado,

but he had never heard of the company. Consequently, he made a telephone call to see if it was reputable. Stan Selby was invited to tour Loveland, and later, Stan invited a contingent from Loveland to fly out to corporate headquarters to make a sales pitch. On that critical trip was Paul Rice, Bob Hipps and a representative from the Colorado governor's office. Their sincere presentation moved Bill and Dave, and Loveland was picked over Boulder.

Activity at Loveland began in 1960 at a time when HP's sales totaled \$76 million and worldwide employment stood at 3,500. Getting qualified people was the first order of business, and Hewlett-Packard opened a training center in a leased building on Lincoln Avenue in downtown Loveland. The door to the building read "-hp- training center." This building was used from January to July, 1960.

Many of the candidates for wire and assembly



Stan Selby was Loveland's first Division Manager. He brought the "HP Way" to the facility and introduced name badges. Selby eliminated time clocks, had weekly coffee talks and used "management by walking around" to stay in contact with the employees. He was also active in local civic affairs.



In January 1962, this was the Interim Plant. Later it became the Components Building. HP started its Christmas lights program on the large blue spruce tree on the right.

jobs came from farm families. To direct this program, Don Cullen transferred from Palo Alto on February 29, 1960. He was soon joined by Mary Burkett. Mary hardly knew what to make of the town of Loveland. She pulled up to the only traffic light in town and sat there through two light changes while a farmer stood in the middle of the intersection chatting with the driver of a pickup truck. She loved this slower pace of life.

After interviews, seventy local residents were in training during the month of May. Those who

demonstrated the necessary aptitudes were offered jobs.

In March, Don Carlson and Bob Moomaw joined HP as test engineers. Joe Barr moved his family to Loveland to start an accounting department, and “Big” John Hansen started working with Mary and Don at the training center.

Groundbreaking for the first Hewlett-Packard plant in Loveland took place on February 15, 1960, at a site located at Third Street South and Lincoln Avenue. At the ceremony were Frank Rorie, Purchasing Manager; Marvin King, Construction Manager; and Loveland First National Bank President Paul Rice. Bob Hipps, the Mayor of Loveland, and Mick Deuth, of the

Loveland Chamber of Commerce, were also on hand.



“Big” John Hansen was among the very first HP employees at the Loveland site and began working with Mary Burkett at the HP training center on Lincoln Avenue. John, known for his size, good humor and fishing stories, left the Loveland facility for another position at HP’s Corvallis plant.

The structure contained 12,800 square feet and was completed June 1, 1960. It was referred to as the Interim Plant, and it later became the Components Building. It is no longer owned by Hewlett-Packard and is now occupied by Lucas Control Systems.

The leased building on Lincoln Avenue was vacated at this time. Mayor Bob Hipps opened a General Electric appliance store, and today, the store is Art of the Rockies Gallery owned by Thomas Kinkade.

The Division Manager selected to manage the new facility was the energetic Stan Selby. His influence was responsible for getting the organization off to a good start. A strong disciple of Bill and Dave's management style, Stan brought the "HP Way" to Loveland. Individual contribution was encouraged through management by objectives rather than by directives.

The first open house was held on September 18, 1960, and the *Loveland Reporter-Herald* ran twelve pages about Hewlett-Packard. Mayor Bob Hipps cut the ribbon, and Dave Packard made a few remarks about his company's arrival in Loveland. The event was broadcast live on KLOV, Loveland's local commercial radio station. At least

3,000 people attended and toured the new Interim Plant. Production began on July 5, 1960, with a staff of twenty-eight employees.

At this time, Don Cullen announced that this was only the beginning. The construction of



three large buildings at the new industrial park on the southwest side of Loveland was to begin soon.

Other pioneers who were present during the start of production included Don Carlson, the first employee hired at the Loveland site, and Bob Moomaw. Both worked as test engineers. Bob Smith moved from Palo Alto to work in assembly, while Bob Hardin became a fabrication supervisor.

Training classes were held in this building at 440 Lincoln Avenue in 1960. After changing hands a number of times, it is now the home of Art of the Rockies Gallery.

Don Cullen was the very first Hewlett-Packard employee to be relocated to Loveland to setup the manufacturing operation by finding qualified people from the Loveland area. He arrived on February 29, 1960, and became the site's Manufacturing Manager.



Paul Baird eventually became Loveland Site Quality Manager. He was friendly and usually wore a bow tie. In 1965, Paul received a shrunken head and was named "Chief Headsizer" for his college recruiting efforts. He designed the 410C Multi-Function Voltmeter and worked on the design of the 3440A Digital Voltmeter.



who transferred from Palo Alto. Jack Kirkpatrick was the new Production and Inventory Control Manager. Rounding out the pioneer employees

Summertime employees included J. Robert Hipps, a senior at Yale; Gary Cherry, a student at Colorado State University; and Larry Carlson, also a student at Colorado State University. Mary Burkett was appointed Women's Supervisor. Jack Anderson graduated from Colorado State University and became a production engineer in training. In charge of manufacturing engineering was Edna MacLean, a Hewlett-Packard employee

was Jack Hargen, who had been with Hewlett-Packard since 1956 and became a standards technician.

The week after production began, four new employees were added. These included Doris King, Valora Peterson, Janet Whicker and Barbara Wolf.

The first products built at Loveland were power supplies including the 711A, 712B, 715A and 721A. In addition, two vacuum tube voltmeters were transferred from Palo Alto, the 403A and 410B. Designed in Palo Alto, the first pilot run of the new 722A Power Supply was completed, and marked the beginning of Loveland's own product line.

Modern by standards of the time were "Lazy Susans" that allowed access to all wire lengths and hardware necessary for assembly of that particular product. At times, one might think this was a Hewlett-Packard invention. It was improved upon many times and lasted for decades as the core piece of a wire and assembly workstation. The large wheels used on these Lazy Susans had pie-shaped trays for the parts. The wheel was positioned immediately below the production work surface.

The Research and Development Lab had its

own pioneers. Marco Negrete and Don Wick were first to move from Palo Alto in March, 1961, to start the lab. They were joined by Bill Barton who had been working for the Glenn Martin Company in Littleton. Bill Smith also transferred from Palo Alto. Chuck Platz was hired next right out of Colorado State University. Other Palo Alto transplants were Gale Hamelwright, Noel Pace and Dick Moore. John Boatwright came from the East Coast, while Bob Watson joined Hewlett-Packard from the University of Utah's Upper Air Research.

Among the first visitors to Loveland to check on how things were going were Bill McCullough and Don Schulz. Both would eventually move to Loveland and become key to the division's success. Bill McCullough visited the plant to help Don Carlson get the instruments turned on and calibrated, while Don Schulz wanted to see the new 722A in production. Don Schulz later became Research and Development Manager, then Division Manager. Bill McCullough would later manage the Civil Engineering Division, then the Components Operation. Both are retired today and live in the Loveland area.

Other leased structures at the time included the Quonset hut, now occupied by Handy Glass.



It was a memorable experience during the summer to sit in this un-air-conditioned structure. It was cooled by a lawn sprinkler on its roof. The Quonset hut housed Research and Development and the transformer winding

Lazy Susans were used extensively in the Interim Plant on the production lines. They were later moved to Building A.



The men and women of the Research and Development Lab in 1961 are standing outside of their temporary home, the Quonset hut on Lincoln Avenue. The Quonset hut housed transformer winding and the R & D Laboratory during the first year of operation in Loveland. The structure was cooled in the summer by a lawn sprinkler placed on the roof.

production line. The company was informal and wives who wished to go shopping would drop their children off for their husbands to watch. Fortunately for those working late, a liquor store was located across the street. Also leased was the

Armory Building across the street from the Components Building. It was used as a warehouse, for training classes and for shows.

During the fall of 1961, construction was under way on Building A located up on the hill in the new industrial park. Marvin King was in charge of the project. The building was designed to withstand winds of up to 100 miles per hour, and this specification would be tested to the limit during the following decades. The building was fully air-conditioned.

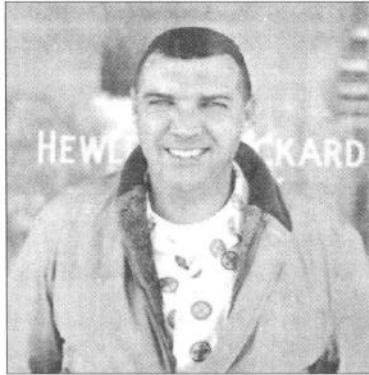
Because employees were anxious to move to the new facility, a great deal of information was published about Building A. One article stated

that, "... we will never again be crowded!"

However, Don Cullen, Manufacturing Manager, accurately predicted that Building A would soon be full and that employees would look forward to yet another building. This was, by the way, the largest single structure in the entire company.



Marvin King was in charge of all new construction during the early years at Loveland.



Every square inch was allocated prior to occupancy. Research and Development was given the mezzanine with Production on the ground floor. Also included were Purchasing, Personnel, Order Processing, Inventory Control and Shipping. It also housed shearing, sawing, punching and folding. Building A included painting, bright-dip, screening, welding, engraving, degreasing, and printed circuit board fabrication. The machine shop and tool and die shop were housed in Building A. Electronic maintenance and environmental test were in the building as well as the assembly line where the meter movements were made. All of the products were manufactured in Building A using three assembly lines. Fabrication of some of the components

remained in the Interim Plant, then renamed the Components Building. Transformer fabrication moved from the Quonset hut into the Components Building. The move into Building A began in mid-July 1962 and was not complete until the end of August.

The old State Armory building on Lincoln Avenue was leased by Hewlett Packard during its early years in Loveland. Instrument shows, training classes and Current Capers dances were once held here.



On Saturday, October 13, 1962, Colorado Governor Steve McNichols officially opened the new building. The dedication ceremonies were broadcast live on KLOV. Both Denver newspapers were on hand along with two of the television

stations, Channel 7 and Channel 9.

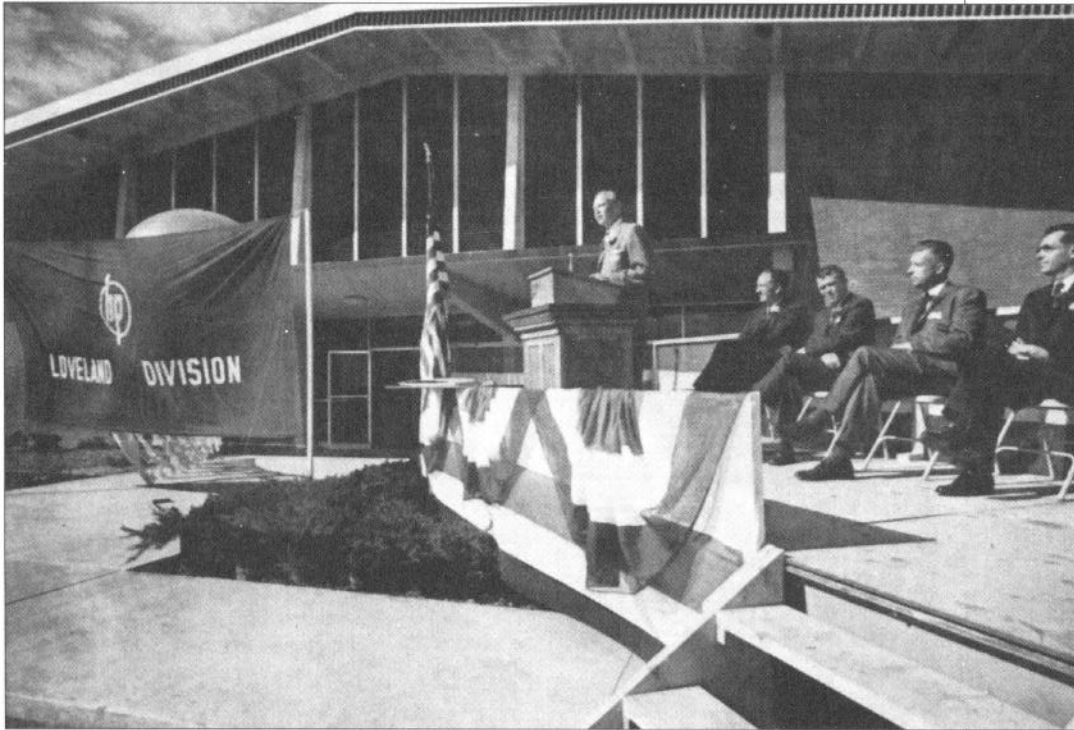
The Colorado Governor pressed a Zenith TV remote control, which used a tuning fork. The sound was supposed to trigger a wire to explode. When this failed, the wire was cut with a pair of

pliers. This allowed a tethered ten-foot helium-filled balloon to lift a banner revealing a sign with the word "Welcome." The front door was opened by a remote controlled motor. Dave Packard and Bill Hewlett joined in the celebration along with Loveland General Manager Stan Selby. Vice presidents Ed Porter and Ralph Lee also attended. The presidents of several Hewlett-Packard subsidiaries, including Francis Moseley of the F. L. Moseley Company and Alfred Lonnbery of the Sanborn Company, attended. The Loveland High School Band performed followed by a brief speech by Governor McNichols.

Emphasis was placed by Bill and Dave on the partnership between Hewlett-

Packard and the Loveland community.

Behind the scenes was design engineer Don



October 13, 1962, was a big day for the Loveland facility. It marked the grand opening of Building A, the first of a series of structures at the new site on S. W. 14th Street. Building A was the largest single structure in the company at the time. Bill and Dave were on hand as well as Colorado Governor Steve McNichols and Division Manager Stan Selby.

Wick. He was in charge of the complex release mechanism. Prior to the ceremony, the ten-foot balloon he was filling with helium exploded. He needed ten pounds of upward pull to raise the curtain. Fortunately, a war surplus balloon had been purchased the day before as a backup. As Don was filling it, the helium ran out. Don hoped it would be enough to raise the curtain. Everything else went smoothly.

Immediately after the grand opening, the public was invited to tour the new plant. A lot of work went into putting together displays, and an expert on each area was on hand to answer questions. An estimated 9,000 people visited the new facility that day.

The Interim Plant was doubled in size in 1962, and in 1963, a 2,400 square-foot chemical storage building was completed west of Building A. It became the vehicle maintenance building later in its life.



An exploding wire released a helium-filled balloon, that lifted a banner revealing a sign with the word "Welcome." This occurred on October 13, 1962, at the grand opening of Building A.



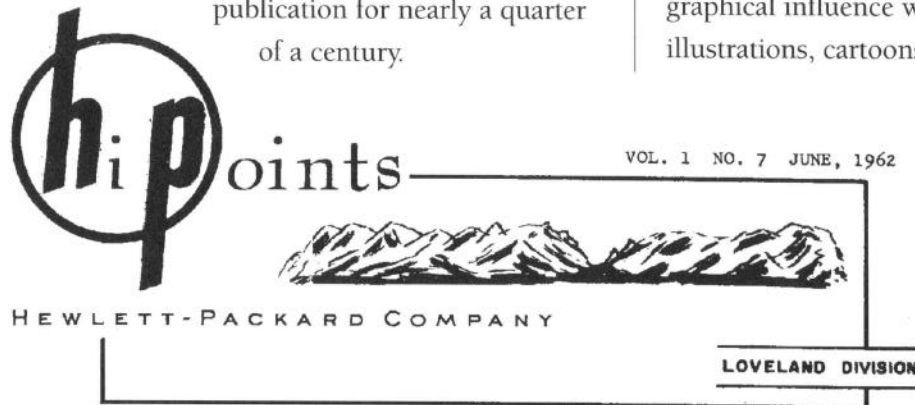
Don Wick was one of the two original design engineers to come to Loveland to set up the Research and Development Lab. Don is shown here donating a photograph of Brainard Lake for use in one of the conference rooms. Ironically, a room by this name was not set up, and this photograph now hangs in Don's home. He became Customer Service Manager, then QA Manager for the Civil Engineering Division. After CED closed, Don moved to Colorado Springs to assume the job as QA Manager for the Logic Systems Division. He is now retired.

The main entrance to Building A as it looked after landscaping. It was opened in October, 1962. On horseback, left to right, are Joe Barr, Marco Negrete, Don Cullen and Stan Selby.



Hi-Points ... the Voice of HP Loveland

H*i-Points* made its first appearance in December 1961, and for many years, was the voice of HP employees and management. It served as the primary communication vehicle for the plant and reflected Bill and Dave's values by treating all employees as part of a family. The first issue did not have a name, and its readers were asked for suggestions. In the very next issue, *Hi-Points* was born and remained a monthly publication for nearly a quarter of a century.



The *Hi-Points* cover design used during the early 1960s.

Initially, *Hi-Points* was a simple saddle-stitched booklet set in a typewriter font. In January 1966, *Hi-Points* moved from its small booklet size to a full 8.5" x 11" magazine printed on coated stock. Ultimately, *Hi-Points* became a formal, upscale magazine with four-color covers and some color on interior pages.

The editor and guiding light of *Hi-Points* during its early years was Kay Therp. Jerry Farm's graphical influence was felt with his excellent illustrations, cartoons and paintings.

Stan Selby, Loveland Division Manager, set the stage for *Hi-Points* by saying that it would provide, "...coverage to items of general interest to those in the Loveland Division... The items to be covered are personal



Kay Therp was *Hi-Points'* first editor. The publication lasted nearly a quarter of a century.

announcements, items of personal recognition, sports activities and a column introducing newcomers to the Hewlett-Packard gang.”



Jerry Farm was the lead illustrator for the Publications Department for many years. He is standing to the right with Alan Howe seated.

Stan Selby also outlined the objectives of the Loveland Division, the first major Hewlett-Packard initiated operation outside the Palo Alto area. A primary objective was to become relatively independent and to engineer and manufacture all the instruments assigned to the Loveland Division. With all of the time-to-market emphasis during the 1990s, it is interesting to note that Stan also listed as the last objective, “...to reduce the

time needed to develop an instrument to an absolute minimum.”

A constant feature of *Hi-Points* was a section called “Did You Know...?” that covered the lives of the Loveland employees. It was later replaced by a similar feature called, “Would You Believe?” Each department within the plant had its own

contributor. Content included items like who had a baby or where an employee went on a vacation. It even covered details like the time Bertha Wickum stayed at home during her vacation to remove the wax from her kitchen floor.

At Palo Alto, Hewlett-Packard had a tradition of serving cake and coffee once a month as a way of celebrating employee birthdays. This tradition was transferred to Loveland, and *Hi-Points* listed the individuals with birthdays that month. When a significant event, such as an engagement or marriage, happened in the life of an employee, it was covered in “A Bouquet To...”



Here is a typical Jerry Farm cartoon used in *Hi-Points*. Jerry's influence on the publication covered many years. This cartoon illustrated a story about Walt Skowron (center) and how he could not catch any fish. His companions, Frank Culver (left) and Chuck Platz (right), had no difficulty.



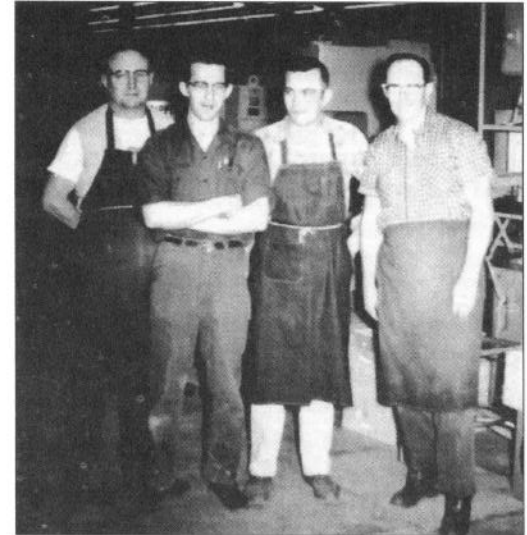
This Jerry Farm cartoon was drawn for one of the annual picnics to show that a barbershop quartet would be performing.

In the first issue of *Hi-Points*, the names of all twenty-two new employees were listed. The section was called “Welcome to HP...” This format continued until June 1965, when *Hi-Points* began to include not only the names, but also photographs of all the new faces, even if it required several pages. This feature continued until the very last issue.

Service awards were a big item in *Hi-Points* since company loyalty was a key issue to Bill and Dave. In January, 1962, Loveland employee Bert Jackson received his twenty-year pin and his photograph appeared in an article by Joe Barr. Bert began his career in Palo Alto as a spray painter and was eventually promoted to a tool engineer for the Microwave Division. He then

moved to Loveland and became the only employee with twenty years at Hewlett-Packard.

Marvin King got his ten-year service award. He was responsible for the construction of the Interim Plant. King began his Hewlett-Packard career in Palo Alto and was the Plant Engineer for work finishing and outfitting the Stanford Park Building 1. In addition, a five-year pin was given to Jack Kirkpatrick, Production and Inventory Control Manager. Jack, by the way, still lives in Loveland. Marco Negrete also got his five-year pin. He was the division's Lab Manager and guided much of the early product development. Finance and Personnel Manager Joe Barr also got his five-year pin. Another to receive a five-year pin was long-time Loveland employee Bob Hardin. He became Loveland's Printed Circuit Board Fabrication Manager. For many years, recipients of service awards also received a personally signed letter from Bill Hewlett.



In February 1962, these are all of the people at the Loveland site who had a birthday that month. Pictured are Harold Moser, Mick Moore, Chuck Fenwick and Dale Scoles. This became a *Hi-Points* tradition.

In the May 1963 issue of *Hi-Points* a new series of articles began by Kent Simcoe, a design engineer. He called it "Shazam's Corner," where detailed examples were given of the operation of various electrical circuits. The first article described resistance, voltage and current from a conceptual point of view. A quiz was given at the end of the article with the answers in the next issue of *Hi-Points*. The series continued for many years, and the examples grew more complex.

Walt Skowron joined *Hi-Points* as its Associate Editor to help Kay Therp in the ever-increasing workload of putting out a quality magazine. *Hi-Points* began to add articles with broader content, yet the publication retained its entirely local flavor. There was a little less of the



This Jerry Farm cartoon was used to show the faces of some of those attending the Hobo Dance.



SHAZAM'S CORNER

By KENT SIMCOE

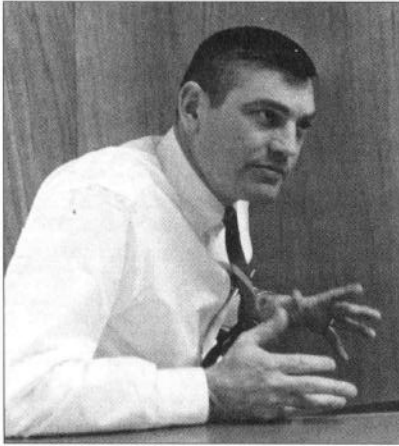
In 1963, design engineer Kent Simcoe started a feature called "Shazam's Corner" where detailed examples were given of the operation of various electrical circuits.

"Did You Know" material specific to individuals within a department. The publication, however, remained primarily focused on the issues at the Loveland Instrument Division.

Hi-Points included practical knowledge in the day-to-day operation of the plant. For example, in June 1963, Lou Moore explained how to fill out a labor voucher. It was on a punched card so that the information could be easily keyed in and machine read. Today, labor vouchers are in a different format, but essentially the same in content.

In December 1963, after acting as *Hi-Points* editor since its first issue, Kay Therp turned the job over to Personnel Manager Dan Mirich, with Walt Skowron as Associate Editor. *Hi-Points* had three reporters initially, and by 1963, the staff

totaled twenty-two. This included the editor, associate editor, consultant, photographer and reporters. Dan Mirich was well liked for his enthusiasm and energy. In May 1969, he was promoted and moved on to the Data Products Group in California.



Dan Mirich, Loveland's Personnel Manager, took over as editor of *Hi-Points* in December 1963.

On the cover of the June 1964 issue, the Field & Stream Division logo was used for the first time. The idea of Jerry Farm and Bob Hall, it depicted a cartoon character on skis with a fishing pole. The field engineers, always looking toward divisions with a specific identity, reacted favorably and freely referred to Loveland as the Field and Stream Division for years to come.

Humor in *Hi-Points* provided new meaning to book titles including:

- ◆ *Ah! Wilderness* - the recreation area
- ◆ *The Longest Day* - Friday!
- ◆ *For Whom the Bell Tolls* - a tardy employee
- ◆ *Gone with the Wind* - HP paychecks
- ◆ *You Can't Take It With You* - withholding tax
- ◆ *The Asphalt Jungle* - HP's parking lot



Based on the ideas of Jerry Farm and Bob Hall, a new logo was born in June 1964. It was featured on every *Hi-Points* cover for many years. The Loveland Division became known as the Field & Stream Division.

Hi-Points covered news that was primarily on the happy side, such as the time Dale Busby carried Ruth Turner through the snow across the Components Building's parking lot to her car. Dale was called "Sir" after the incident. However, the *Hi-Points* editor also provided a memorial to Hewlett-Packard employees who passed away. Such was the case for Ed Moore's wife who worked in Production Control beginning in 1962. A poem by Leona Parkinson was presented at the bottom of the page in that issue.

Hi-Points began to cover the activities and outside interests of HP employees with feature stories. One of the earliest stories appeared in November 1966 and was contributed by Nancy Sorensen, a Marketing Department secretary.

She began with, "Turn the engine off. Listen. At first it's so quiet, it's like stepping into a vacuum. Then your hearing adjusts and you hear - wind over the rocks, the cry of a faraway bird, subtle sounds." It was about the joy of using a four-wheel drive vehicle to reach remote Colorado locations far from civilization. Nancy's article included the four-wheel adventures of a number of employees. One story covered John Smethurst's long trip over eleven passes in a 1958 Dodge Power Wagon. In addition, mention was given to Jim Bauer's 1947 Willys and Bill Marr's four-wheel drive pickup.



Nancy Sorensen was one of the many employees to contribute articles to *Hi-Points*. One story covered the joys of exploring Colorado's back roads with a four-wheel drive vehicle.

Sports Coverage

A topic in every issue of *Hi-Points* was sports. This subject would occupy three and even four pages in some issues. The first sports photograph published in *Hi-Points* was of the HP Basketball Club. It began with an article by Bob Watson who stated, "Consistent with Hewlett-Packard's policy of contribution to the morale and good will of the community, the HP Basketball Club had consistently promoted the good feelings and gratitude of the majority of the City League Clubs by graciously accepting the short end of the tally stick."

Translated, this meant they lost most of their games during their first season. These men were Bill Marr, Gale Hamelwright, Joe Barr, Larry Carlson, Ivan Engelhardt, John Hansen, Dick Kekar, Bob Watson, Dick Moore, Bob Hardin, Dan Mirich and the club manager, Skip Beatty. All of these employees were to remain with Hewlett-Packard for many years.

By February, photographs of Hewlett-Packard's bowling team entry into the City Tournament appeared. Early members included



The "HP Rejects," a men's 5F basketball team, won the City Championship for two successive years during the 1960s. Pete Smith (center) was selected by his teammates as the most valuable player.

Phyllis Kekar, Peg Eoriatte, Shirley Buchanan and Eleanor DeNeui for Team #1 and Freda Bevard, Carol Shade, Karen Schuman, Evelyn Ritter and Jackie Laes on Team #2. In all, Hewlett-Packard had three women's teams and three men's teams. During the summer of 1963, Hewlett-Packard set up its own 5-F Softball League. At the end of the season, the Module No. 1 team emerged undefeated, and its members were Les Lotz,

Skip Beatty, John Hansen, Mel Baldock, Al Vigil, Marv Welburn, Oscar Barstad, John Woods, Sherrill West, Dan Felker, Glen Christenson and Wally Austin.

Noel Pace, Bill Barton, Frank Culver, Marco Negrete and Bob Moomaw were listed in *Hi-Points* as having gone skiing at Loveland Basin in March 1962. These early activities led to the formation of the HP Ski Club. The group typically skied at Hidden Valley above Estes Park (abandoned a number of years ago) and Arapaho Basin.

In 1962, the HP Sportsman's Club was founded. Its emphasis was on outdoor activities, such as fishing and hunting. The first mention of this type of activity was by Walt Skowron about a fishing trip to Lake John. Hewlett-Packard also had an archery group with Bill Marr as its president.

By 1964, Hewlett-Packard employees had branched out into even more sporting events, including ping-pong. (Ping-pong, by the way, was sort of a "company sport" at the Palo Alto facility with a number of tables set up in the courtyard.) Horseshoes and volleyball were added as well as tennis. In autumn 1964, The HP Golf League was organized with thirty-four regular players.

Arlen Amundson was rapidly becoming one of Hewlett-Packard's best athletes. He was noted for pumping seventeen points on the floor when Hewlett-Packard dropped their opponent by 42-30 in men's basketball. As for Arlen's hitting ability at softball, he was an outfielder's worst nightmare. Many of the old baseball diamonds were simply not deep enough to field his towering homeruns. In men's 5-F basketball, Pete Smith was selected by his teammates as their most valuable player. The "HP Rejects," as they were called, won the city championship for two successive seasons.

Current Capers

It is not known exactly when this organization was founded, but items sponsored by Current Capers began in February 1962. Activities included bingo, hobo party, swimming party and Halloween party. Kay Therp and Bob Moomaw, founders of Current Capers, first headed up the organization. Current Capers continues today as an integral part of Hewlett-Packard's social activities and sponsors many events.

Current Capers began holding a Sweetheart Dance in February of each year. In 1964, it was held at the Westgate Skating Rink. John Mahorney and Sheila Davis reigned over the evening as King and Queen of Hearts. John received a set of cuff links and Sheila received a gold necklace. Current Capers provided Fritos, potato chips, pretzels and dip. The bartenders were kept busy all evening, according to *Hi-Points*.

Parties

In the spring of 1962, the first company party was held by the Research and Development Lab. It was based on the beatnik theme, dress and lifestyle and was hosted by Marco Negrete and Frank Culver. It drew a crowd of thirty-five in a basement "uniquely decorated...with beatnik furnishing." The Twist was the preferred dance.



Virginia DeBoer earned the title of "legs" at the Research and Development Lab's beatnik party held in the spring of 1962.



The Hewlett-Packard Choral Group gave its first performance at the 1963 Christmas party.

Virginia DeBoer, secretary to Engineering Manager Marco Negrete, wore shorts and earned the title of “legs” DeBoer. Virginia, by the way, was known for her charm and patience and was credited with leaving visitors to the facility with a favorable impression of Hewlett-Packard. Bob Moomaw, product designer, fashioned a goatee out of steel wool and attached it to his chin. Chuck Platz and his wife were voted the “cutest couple” dressed in sweaters and berets.

Another party for HP employees was dubbed

a bingo ball with green and white decorations. The reason given for the decorations was that they were left over from a Saint Patty’s dance. Bill Marr was the “twisting bartender.” The band played Western Swing and about 300 attended.

A HP 650A Signal Generator was used to test the hearing of employees in the plant to determine who could hear the highest pitched sound. In this contest, Phillip Knoelk won the competition at 17,000 cycles per second. A dog outdid all of the Homo Sapiens, however, at 24,700 cycles per second.

On February 16, 1963, a Sweetheart Dance was held at the Loveland Elks Lodge to the music of the Tune-Twisters. At the same time, the HP Choral Group was formed and gave its first performance at the HP Christmas party.

On September 14, 1963, Hewlett-Packard held a talent show. Gerry Reid and Walt Horst were among the winners. The office area presented their version of Guys and Dolls, and Components did their own rendition of Camp Granada.

Later that fall, Current Capers held a Halloween Dance at the Elks Lodge ballroom in Loveland. “The atmosphere was one of merriment as devils, witches and robots danced as though

they would turn into human beings at the stroke of 12 o'clock," wrote a reporter for *Hi-Points*. Mr. and Mrs. Robert Cramer won the couple's best costume award as matching robots. Dick Kekar won the individual male costume as a devil with a red cap and tail, and his wife, Phyllis, won for the best female as a witch.

The Halloween Masquerade became a regular Current Capers event on the Saturday before Halloween. Bob Shuffler, a long-time Hewlett-Packard employee, hosted the first one in 1966. Prizes were given for those with the best costumes. This tradition eventually spread to the lunch-hour Halloween Walk.

Christmas Gift Distribution

The Loveland Division began distribution of gifts at Christmas to the children of its employees in 1961. Gifts were distributed to the homes of the children living within Loveland. Parents of children outside the city limits were asked to bring their child to the Elks Lodge or the Community Center to receive their gifts. This grew to one thousand deliveries and was discontinued when it became impractical. Besides, children of non-HP families became distressed when Santa passed by their homes.

For the first Christmas celebrated by HP employees in Loveland, the blue spruce tree in front of the Interim Plant was decorated with Christmas lights by Jack Hargen and John Hansen. This was the beginning of another



Liliane Grover told *Hi-Points* readers what it was like to celebrate Christmas in her native France.



Sten Andersson and his wife, Josiane, covered Christmas traditions in Sweden for Hi-Points.

tradition carried on to this day, colorful lights around the plant during the winter holiday.

For 1965, a teenage dance party was held for children between the ages of twelve and eighteen. The recommended dress code was skirts and sweaters for the girls and sport coats and slacks for the boys. The tradition of a Christmas teenage dance was carried on for many years to come.

In 1967, *Hi-Points* featured how Christmas was celebrated by others from

around the world. Liliane Grover worked in the shipping area and provided a glimpse of what this holiday was like in her native France. She included a recipe for Choux a la Creme Chantilly. The Loveland Marketing Department's Peter Kertesz gave readers a look at Christmas in Hungary. Test Technician Sten Andersson covered Jul (Christmas) in Sweden.

Outstanding Employees

Hi-Points was used regularly as a vehicle to give outstanding employees recognition. In many cases, it was some type of improvement leading to better efficiency on the production line. Kay Therp and Walt Horst, for example, were recognized for the construction of a semi-automatic allen loader. It was used to start allen screws in couplers and gear units used for variable capacitor tuners.

Most of the improvements, however, centered on modifications to the Lazy Susan. In 1966, the triple-decker "Lazy Susan" was introduced. Designed by Sherrill West and Virgil Bennett, it integrated pie-shaped compartments on a large wheel located immediately below the work surface. Work areas were reduced in size, and at the same time, efficiency increased.

The people at the Loveland Division became heavily involved in community affairs. In 1963, Jack Kirkpatrick was appointed General Chairman for the 1963 United Fund Drive and



Al Davis was appointed to the Loveland Memorial Hospital Advisory Board and was among many employees involved in community affairs.

Al Davis was appointed to the Loveland Memorial Hospital Advisory Board. Bill Murphree started the Toastmasters Club in Loveland in December 1962.

Perfect attendance records were presented in 1964 to Andy Benke and Otto Ackerman. Both men started in

1962 and had the longest perfect records.

Walt Skowron and Les Lotz were recognized for being elected to the Cosmopolitan Club as vice president and treasurer, respectively. Stan Selby and Walt started the Cosmopolitan Club, which continues today as a service organization designed to aid in the spiritual and mental development of business and professional people.

Howard Degabain won \$25 worth of Lego Toys for suggesting the name for the industrial park where Hewlett-Packard's plant is located.

The name, Big Thompson Industrial Park, was incorporated into a sign at the entrance to the park. Lego Toys were produced in the plant below Hewlett-Packard, now the Teledyne-Water Pik plant.

The contributions of John Woods to the Boy Scouts of America were recognized. In 1965, Woods received their Arrowhead Award.

General Manager Ray Demere presented Don Niewold, Machine Shop Supervisor, with a membership in the Wise Owl Club of America. It is an organization of industrial workers and students who cheated blindness by wearing safety eye protection. Niewold was involved in an incident that took place in May 1965 at his Warner-Swasey turret lathe. A tool broke and struck his goggles with a terrific impact.

Don Carlson was recognized for his manuscript titled "Common Sense Design of a Transistor Amplifier," which was published in *Electronics World*. Don was the first employee hired at the Loveland site, and at that time, supervised Electronic Maintenance. Don Cullen presented Carlson



Bill Murphree started the Toastmasters Club in Loveland in December 1962.

with a check for \$300. This was the first recognition by *Hi-Points* of a technical article published in a major magazine by a Loveland employee.

Another contributor to the community was Ivan Englehardt. In 1965, he was elected to the R2J School Board and was congratulated by General Manager Ray Demere.

On a frigid day dressed in their bathing suits, Ray King, Marco Negrete, Frank Rorie, Johnny Holmes, Walt Skowron and Dick Jablonski helped the SPLASH (Swimming Pool

Money for the swimming pool at Loveland High School was raised, in part, by Hewlett-Packard employees who formed the SPLASH committee. Pictured above are Ray King, Marco Negrete, Dick Jablonski (squatting), Frank Rorie and Johnny Holmes.



Loveland Achiever Safety and Health) committee raise money. From this effort, the swimming pool at Loveland High School was constructed and has been enjoyed for many years.

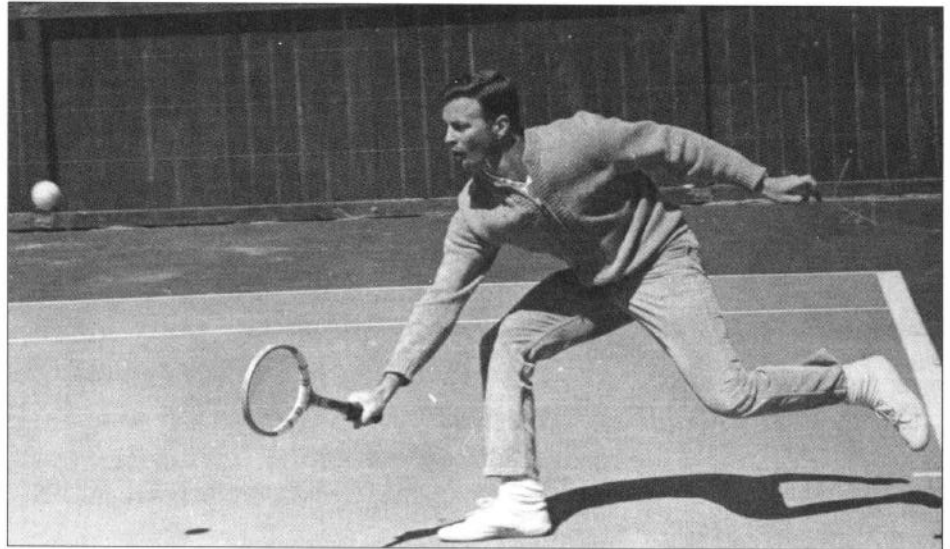


Although the name, Big Thompson Industrial Park, does not seem to apply today, it was selected for the Loveland site including the land all the way down to Railroad Avenue. The name was suggested by Howard Degabain (on the left) who won \$25 worth of Lego Toys presented by Loveland Division Manager Ray Demere. These toys were once manufactured in the plant just below the HP campus.

The Loveland-Colorado Springs Olympics

The birth of the Colorado Springs-Loveland Olympics, put together by Don Cullen of Loveland and Hal Edmondson of Colorado Springs, took place on May 16, 1964. This was the very first meeting of the athletic gladiators and was held at the Loveland site. Events included ping-pong, horseshoes, volleyball, tennis, bowling and softball. Archery, golf and handball were added later. When the dust had settled, Loveland was vanquished and the trophy went south to Colorado Springs. The large trophy was designed for a life span of ten years, and then it was awarded permanently to the division receiving the most wins.

The loss prompted a grudge match in September. This time, Loveland had learned a lesson and was better prepared. It wanted to return the trophy “to its rightful home.” Loveland did win by the narrow margin of 69¾ to 66¼.



During the competition, the Loveland women remained undefeated in ping-pong, while the men lost their matches for the second time. Al Dargis, known for his expertise on the links, tied in his golf match, while Joe Barr won 2 to 0. Loveland was thoroughly trampled in tennis with Roy Melin the only winner.

Larry Carlson fights hard to win a point at the 1967 Olympics between the Loveland Division and the Colorado Springs Division.



Bob Foster, in his shorts and garters, ran onto the lawn south of Building B to light the 1967 Olympic flame.

In May 1965, the third contest was held with Loveland topping Colorado Springs by a combined score of 102 to 46. The Loveland women dominated bowling, while the scores were tied in women's ping-pong. The men went down to their third defeat in this sport. Thanks in part to Howard Degabain, Loveland shutout Colorado Springs by 4 to 0 in horseshoes. The most improved team was women's softball. The Loveland women forfeited their first contest, lost 8 to 15 in their second meet and came out winners in this 1965 meet.

Loveland adopted the Indian as their symbol, while Colorado Springs' symbol was the tiger. At the end of the June 1966 competition, the tiger was hung in effigy in Building A. The final score was Loveland 133 and Colorado Springs 49. Men's ping-pong came through this



In this 1967 photograph, Carol Smotherman is shown next to a giant Indian representing the Loveland Olympic team. Colorado Springs selected the tiger.

time winning 14 to 2. Skip Beatty headed up “Beatty’s Bombers” in handball, defeating Colorado Springs. For the second time, Loveland had a strong horseshoe team. Little was said about the meet in September since Loveland lost.

Nearly all of the June 1967 issue of *Hi-Points* was devoted to the Olympics. This special edition contained 38 photographs of the pep rally and of the competition itself. On the day of the rally, many employees came dressed as Indians. Bob Foster, in his shorts and garters, ran onto the

lawn south of Building B to light the Olympic flame in front of a large crowd gathered to cheer for the Loveland teams. A stuffed tiger was hung in effigy during the rally. Loveland was victorious.



After the competition and a win by Loveland, the Colorado Springs tiger was hung in effigy.



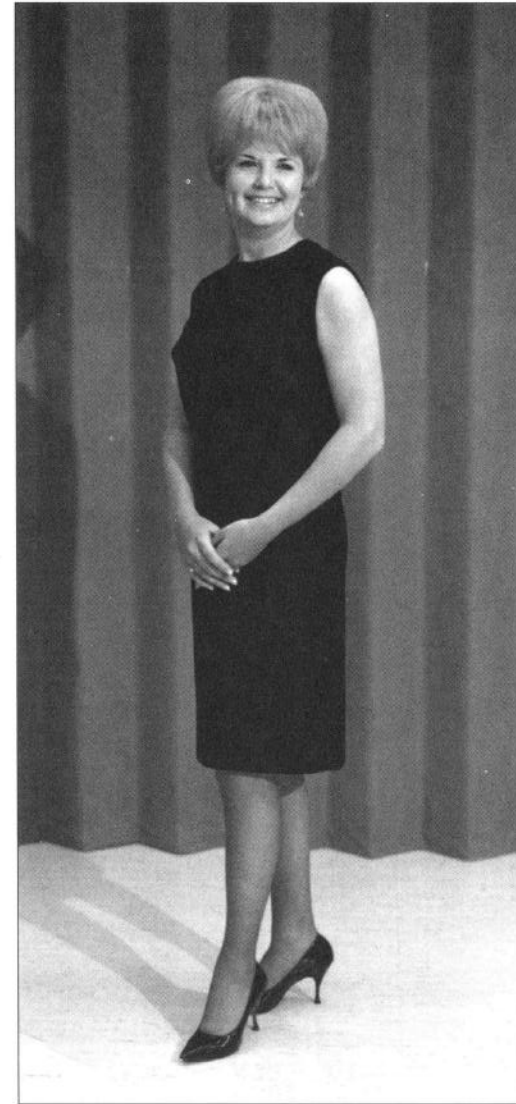
In 1967, a rally was held prior to the Olympics, and many employees came dressed as Indians or soldiers. Left to right is Tom McKelvey, Art Helgeson and Howard Johnson.

Of note, Loveland shut out Colorado Springs 4 to 0 in archery. In golf, Loveland won 18 to 10, and in bowling, Loveland won 47½ to 12½. Loveland's only significant loss was a combined score of 0 to 36 in men and women's softball. No competition was held in September, and the Olympics became an annual event.



Kay Therp and a few others came to the 1967 rally dressed in barrels. Exactly what this had to do with the Olympics is unclear.

The 1967 Olympics not only had a rally, but it had a beauty contest to pick "Miss Loveland Olympics." The winner was Carol Denny.



On May 25, 1968, Colorado Springs could not capitalize on its home field advantage and lost again to the Loveland Indians. Prior to the competition, Loveland golfers practiced on Loveland's own putting green located south of the volleyball court outside of Building B.

The most spectacular win was in men's handball. The Loveland team won all eight singles matches and all four doubles matches. Indians, however, are supposed to be good at archery. Loveland won by the narrow margin of 1032 to 1024. At the end of the first inning, things looked bad for the Loveland women's softball team. They trailed 0 to 8. They came from behind, however, and won the game 12 to 11.

The Olympics continued for eleven years, with Loveland winning eight out of the eleven contests. As for the traveling trophy, it is now located in Human Resources.

Here is a summary of the Colorado Springs-Loveland Olympics:

<u>Winner</u>	<u>Date of the Event</u>
Colorado Springs	May 1964
Loveland	September 1964
Loveland	May 1965
Loveland	June 1965
Loveland	June 1966
Colorado Springs	September 1966
Loveland	May 1967
Loveland	May 1968
Colorado Springs	July 1973
Loveland	July 1974
Loveland	July 1975



The HP Radio Show



One obscure piece of HP Loveland history was that the company had its own radio show. It was narrated by Division Manager Stan Selby, shown on the left, and was called *The Hewlett-Packard Hour*. The program received an award (shown above) for the best public service program for the year 1961-1962.

Hewlett-Packard produced its own radio show in 1962. It was narrated by Division Manager Stan Selby and broadcast on local radio station KLOV. Called *The Hewlett-Packard Hour*, the Colorado Broadcasters Association gave it an award for the best public service program for the year 1961-1962.

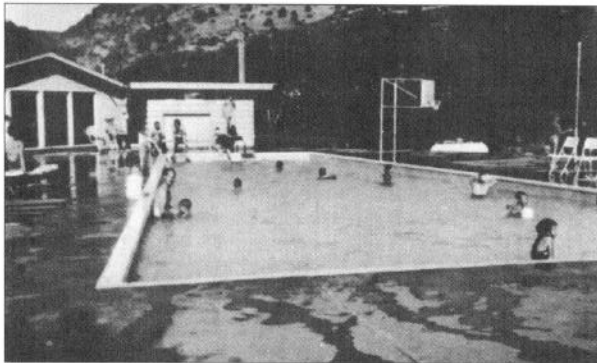
The purpose of *The Hewlett-Packard Hour*, broadcast every Wednesday and Sunday, was to communicate to the Loveland community what HP was all about. At the time, the company was sensitive about the community's attitude. The program also tried to make its employees feel

at home. Program elements of *The Hewlett-Packard Hour* included music, public service presentations and messages about the company. The music ranged from light classical to pops concert music. Integrated into the show were a little HP history and policies, HP products and their use, and discussions with employees about working at HP. Public service features included forums on local problems, live dramatic presentations from local high schools and discussions on national issues.

Company Picnics

The Loveland facility had grown to thirty-six employees by the fall of 1960. On September 17, the first company picnic was held at the Sylvan Dale Guest Ranch, located at the mouth of the Big Thompson Canyon. This was the beginning of a long tradition still carried on today.

As was their style, Bill Hewlett and Dave Packard, along with vice presidents Ed Porter and Ralph Lee, helped prepare and serve the food. Today, it is rare indeed for the founders and



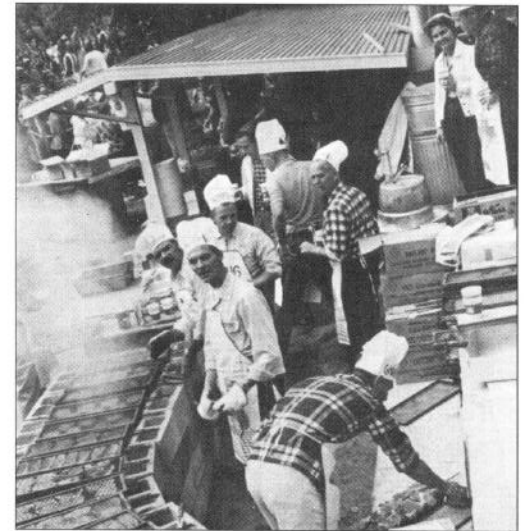
The first picnic for the Loveland Division was held in September 17, 1960 at the Sylvan Dale Guest Ranch on U.S. 34.

top officers of any major U.S. corporation to take the time to get to know their employees on a personal level. Bill and Dave were exceptional people and viewed their employees as a valuable asset.

Steaks were purchased locally and corn was picked fresh that morning. Presumably, the sauce put on the meat was a secret formula sent by code direct from Palo Alto headquarters.

This was also the beginning of some tall tales. These included how John Hansen tossed back any trout less than four pounds and how Marvin King had to shoo the pheasants out of his backyard in the morning so he could let his cats out.

During the 1962 picnic, 766 steaks and 370 hamburgers were served and more than a dozen



HP managers cooking and serving food at the August 1962 annual picnic. At this picnic, 766 steaks and 370 hamburgers were served.



Frank Rorie and Dan Mirich accidentally dumped out the salad dressing thinking it was dishwasher prompting this cartoon by Jerry Farm.

kegs of beer were consumed. Games for the children included a penny hunt in a sand pile and pony rides. There were many other games and booths to occupy their attention as well. During the day, 350 prizes were given away to children at the booths. Virginia Scholz and Jerry Simon dressed as clowns. This became a tradition at future HP picnics. The reporter, Walt Skowron, noted that thirty cases of soda pop were stolen, and he doubted that it was done by a HP employee. Frank Rorie and Dan Mirich accidentally dumped out the salad dressing thinking it was dishwasher. Artist Jerry Farm was quick to respond with a cartoon of this incident.

A new recreation area was opened by Hewlett-Packard twenty-one miles west of Loveland with its entrance off U.S. 34. It was located on a 240-acre tract of land in a small, wooded valley above the canyon.

A contest to name the new recreation area was announced, and the

distinguished judges included Dave Packard, Bill Hewlett, and the editorial board of *Hi-Points*. The name "Highland Park" was selected for the new recreational area. The winning name was submitted jointly by Virgil Jensen and Eva Miller. On Saturday, August 10, 1963, the new recreational area was christened.

The theme for the first picnic held at this site was the Gay Nineties, and everyone attending was encouraged to dress like their parents. Activities were similar to the previous picnic and included a penny hunt for the children as well as other games. Also featured was a Little League



Dave Packard (left) and Bill Hewlett (right) serving food to HP employees at the annual picnic held in August 1962.



Dave Packard (center) serving food at the 1963 annual picnic.

softball game. This was the fourth annual picnic held for Loveland employees, and 900 adults and about the same number of children attended.

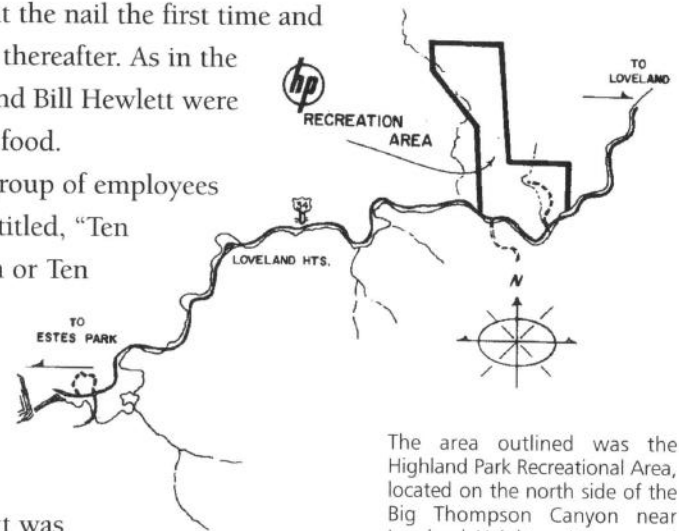
For the children, a treasure map was published in *Hi-Points* called the *Legend of the Treasure of Two Stumps Ridge*. A fictionalized account was given of a stagecoach robbery by "Slippery Stan" (Selby) and his ace gun hand "Dangerous D. C. Doc" (Cullen). A posse was formed by Bill "The Mauler" (Marr).

As an illustration of how times have changed, the longest line for adult games was at the shooting gallery. Contestants would fire a cork gun at one of many cigarette packages

sitting on a railing. If the required number of packages were knocked down, he or she would win a package of cigarettes.

A ride on the whirlybird seemed to be the biggest attraction for the children. There was also panning for gold featured as well as horseshoes and volleyball. Possibly, the most unusual event was pounding the nail. To win, one had to drive a nail through a board with a maximum of three blows. Lou Moore admitted that it took him all three blows just to hit the nail the first time and a multitude of blows thereafter. As in the past, Dave Packard and Bill Hewlett were on hand to serve the food.

After dinner, a group of employees put on a melodrama titled, "Ten Nights in a Bar Room or Ten Bar Rooms in One Night." Of note was Walt Skowron's performance as Joe Morgan, the alcoholic. Jack Clagett was the announcer, and toward the end of the performance, Jack was supposed to get a multitude of pies in the face delivered by



The area outlined was the Highland Park Recreational Area, located on the north side of the Big Thompson Canyon near Loveland Heights. It was used from 1963 until the company purchased Hermit Park in 1966.



Dave Packard (above photo) and Bill Hewlett (right photo) serve food at the 1964 annual Loveland Division picnic. It was an uncomfortable job, but one the founders thought important to employee morale.



members of the cast. Walt, however, was the recipient.

The picnic concluded with dancing. During the course of the picnic, 1,360 steaks were served to the adults along with 500 hamburgers to the children. Also of note were the 176 gallons of beer consumed and 40 gallons of coffee. There were 2,880 prizes given away.

At the 1964 picnic, Bill Hewlett and Dave Packard again flew out from Palo Alto to serve the food to their employees. There was a penny

hunt for the youngsters and a barrel bucking contest for the adults. The greased pig contest had an extra bit of excitement when some of the pigs escaped through a hole in the fence and ran around the recreation area. Piggy banks were awarded for the best in this competition. Other livestock competition included calf roping minus the horse. Winners of the dance competition were Dick and Phyllis Kekar for the waltz and Ben and Helen Wagner for

their polka. During the picnic, 350 8-oz. club steaks and 1,240 12-oz. New York cut steaks were served. Among the prizes given away were 600 packs of cigarettes.

At this time, Personnel Manager Dan Mirich announced that Highland Park would open for use by employees and their families. More campsites were added on the Two Stumps Ridge, bringing the total to eight. A typical campsite included a tent, bunk beds to sleep four, picnic table and food locker. Summer usage exceeded ninety percent.

In 1965, Current Capers held a spring picnic for HP employees and their families at Highland



This was the penny hunt for the smaller children at the 1963 annual Loveland Division picnic. This was a regular feature of picnics for years to come.

Park. At the time, Al Vigil was president.

The sixth annual plant-wide picnic was held in the summer. The theme was Carnival Day. The highlight was Jack Lieberman dressed as a clown to entertain the children. He played this role at picnics for several years. During this summer, a picnic for single employees was held, and it attracted seventy-four unattached HP employees.

In December 1966, it was announced that Hewlett-Packard had purchased a new recreation area. Over 1,000 acres, it was named Hermit Park and remains in use today. It is located along Colorado Highway 66, a little over a mile from Estes Park. Construction began that winter on barbecue pits, installation of picnic tables, comfort stations and a shelter house. Electricity was brought in. Mr. and Mrs. Larry Freyer were



Jack Lieberman is dressed as a clown to entertain the youngsters at the 1965 annual picnic. He continued to delight children for several years to come with his outfit. Jack eventually became Loveland Instrument Division Marketing Manager, then Santa Clara Division Manager.

the first caretakers to live on the site.

By the summer of 1967, a new road had been constructed to Hermit Park. Denver architects were hired to develop a master plan for the development of the area. Work progressed at a rapid pace so that the area would be ready for



Bill Beierwaltes organized the 1967 singles picnic. Geoff Chance is the first man on the rope and Bill is the second.

the August 26 annual picnic. This also included the construction of three year-round log cabins.

In July, a singles picnic was organized by Bill Beierwaltes. This was the third year for this event



Geoff Chance entertains at the 1967 singles picnic.

and 130 attended. Beierwaltes would manage the marketing activities for the 970A “Probe Voltmeter” and would eventually leave HP. He first founded Colorado Time Systems. Then using his success, he founded Colorado Memory Systems, a company Hewlett-Packard would later purchase.

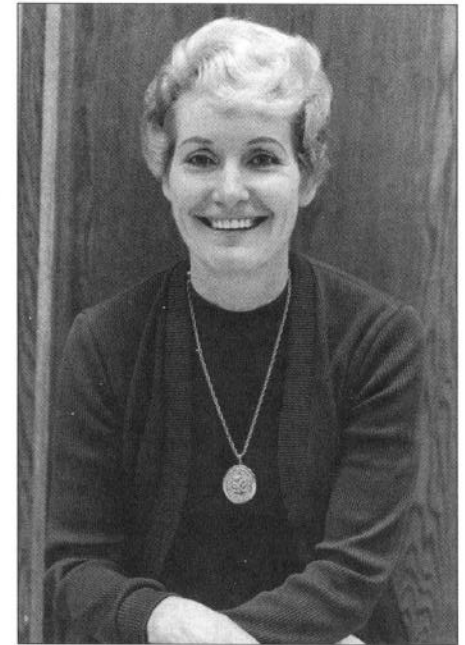
The theme for the first site-wide picnic held at Hermit Park was “Hobo Days.” It was a great success, but there was the notable absence of Bill and Dave serving food to their employees. The company had simply grown too big for them to attend all of the summer events held at each division.

Housemothers

During the 1960s, men and women were not treated equally within the company. In some respects, women were provided more help with their corporate working environment. The person who started the movement toward a little extra assistance was possibly Mary Burkett (Swietzer). She supervised over 150 wire and assembly women. She also taught men how to handle pliers and how to solder. She commented about women vs. men in wire and assembly work, "We have women doing all the assembly work because it's too tedious for men. They don't seem to have the patience that women do." She also told how men's fingers were usually too clumsy to cope with the tiny components. Burkett was the undisputed dean of women and was responsible for counseling, interviewing, screening and general welfare of female employees. She began her HP career in Palo Alto. Her past qualifications included work as a

switchboard operator, but at the time, HP only had an opening in the production area. After two years, she was promoted to an instructor. Mary Burkett was one of the first HP employees to move from Palo Alto to Loveland.

The difference between men and women in the workplace was further emphasized when HP created the position of "housemother." Its official title was Administrative Director of Women. The first to hold this position was Barbara Schleiger. She started work in wire and assembly in 1963 and was promoted to housemother in 1965. It wasn't long before two more women joined her, which brought the total to three housemothers for nearly 500 women.



Mary Burkett (Swietzer) was one of Loveland's pioneers and became the undisputed dean of women responsible for counseling, interviewing, screening and general welfare of female employees. She later transferred to HP's division in South Queensferry, Scotland. She returned to Loveland after a two-year stay.

Barbara Schleiger was still employed at HP when she passed away in June 1969.

The housemother spent a great deal of time getting to know the women employees on a first name basis. She was a counselor and handled both big and little problems. The basic approach was to hear out a female employee with a problem, and rather than offer specific solutions,

help the woman solve her own problems. Private meetings, both on-site and off-site, went with the job. In an interview, Barbara concluded, "The fine art of housemothering pays off in better morale, higher quality of workmanship and a lower turnover of employees."

As equality spread throughout Hewlett-Packard and the company began to hire both men and women for wire and assembly positions, the housemother position no longer made sense and was dropped.

Letha Minch is shown bending over a car engine helping a female employee get it started. This was one of the many duties of a housemother at the Loveland Division.



The Mighty Univac

The Univac 60 was the most modern piece of computation equipment available at the time. It was designed to read from 90-column punched cards. The computer consisted of a card sensing and punching unit and a computing unit. Program instructions were hard-wired on removable patch panels. In other words, to change the way the computer processed its cards, panels had to be swapped with ones that were wired for a new task. Data could be read into the computer at the speed of 125 cards per minute or 11.25 Kbits per minute. The maximum number of program steps the Univac 60 could handle was twenty! The computer was used for payroll and daily labor vouchers.

In 1963, the Univac 1004 replaced the old machine. This was another punch card processor and card punch machine only faster than its predecessor. It could read 300 to 400 cards per minute and print an equal number of lines per

minute. It could also punch 200 cards per minute. A patch panel was still used to control the internal logic. The 1004 had 961 magnetic cores for its program memory. Al Dargis invited employees to stop by and see this “ultra modern” machine in operation.

In February 1968, Loveland abandoned the Univac 1004 for an IBM 360. The punched cards remained, but the format changed. Instead of 90 columns with round holes, the IBM cards had 80 columns with rectangular holes. Instead of the board-wired logic, the IBM machine was programmable.

Eventually, Hewlett-Packard would enter the computer market with the 2114A, developed in Palo Alto. Univac, as a line of computers, would fade into history.

Today, even the most modest hand-held calculator packs more computational power than both of these primitive machines combined.

Special Handling

Hi-Points continued to cover individual departments. One of the more interesting areas was Special Handling composed of Jack Anderson, Harry Yelek, Leona Bernhardt and Al Nordell. Many customers wanted a customized product. Many of the specials involved small changes, such as connectors, while others involved the product's function and specifications. The range of modifications went from paint color and identification plates to major mechanical and electrical redesigns. Some of the specials became repeat items and were sold to a variety of customers. The volume on some specials prompted their release to production. The trick was to document a special so that if it were ordered again, an exact duplicate could be built. Specials grew to become ten percent of the division's output.



Special Handling was organized quite early in the division's history to modify standard products to fit specific customer needs. Left to right are Jack Anderson, Al Nordell, Leona Bernhardt and Harry Yelek.

HP Scholarship Fund

The HP Scholarship Fund was established in 1951, and the money came from what was left over from Christmas gift distribution for presents given to Bill and Dave. Additional funding came from the company, and a trust was formalized for continuation of the program. The purpose of the program was to offer modest financial assistance to worthy young people on the threshold of a college career. In 1962, the children of six Hewlett-Packard Palo Alto families received scholarships. It was at this time that management felt that a similar program could be started at Loveland. At the time, Loveland had over 200 employees. The scholarships amounted to \$500 with 75% of the funding from the company and the remainder from employee contributions. Janet DeBoer, daughter of Virginia DeBoer, received the first Hewlett-Packard scholarship in 1963. By 1964, Loveland employees contributed a little over

\$1,000 dollars so that two scholarships could be awarded. These went to Karen Kauffman and Gerald Taylor.

The format of the program has remained the same over the years. The children of HP employees who will enter college are asked to fill out an application and write a brief paper on their career objectives. Financial need, scholastic achievement and participation in activities enter into the selection process. An interview of the candidates by a scholarship committee is the final step in the process.

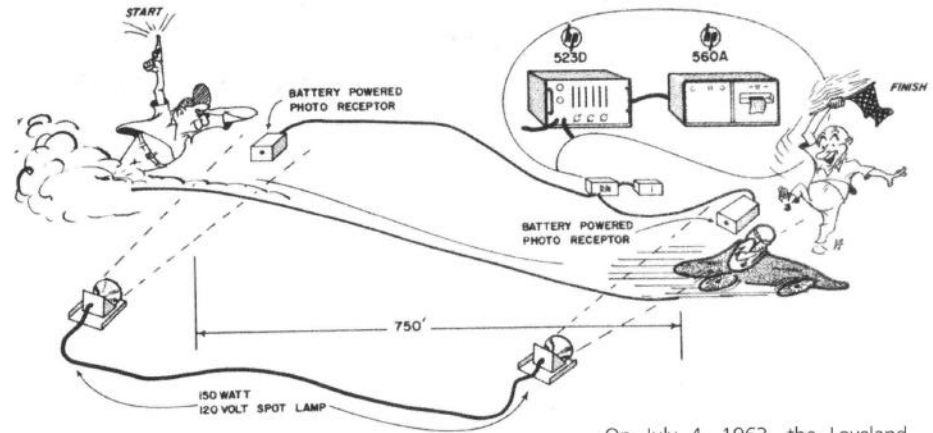


Janet DeBoer, daughter of Virginia DeBoer, received the first Hewlett-Packard scholarship awarded at the Loveland site in 1963. It was presented to her by Don Cullen. Janet graduated second out of her class of 180 students and was a member of many organizations including the National Honor Society.

Soapbox Derby

On July 4, 1963, Hewlett-Packard was involved as a sponsor of Loveland's first Soapbox Derby. It was held on 14th Street on the hill coming down from the plant. This was a two-lane road and traffic had to be routed around the area. HP supplied the timing lights, one set at the starting line and the other set at the finish line. Out of the seventeen contestants, the winning speed was 23 miles per hour over the 750-foot course. Jim Colwell and Roger Minear operated the equipment for the race.

A LOVELAND FIRST! SOAPBOX DERBY, 1963



On July 4, 1963, the Loveland Division sponsored its first Soapbox Derby run down 14th Street below the main plant. The timing lights were supplied by HP.

Junior Achievement

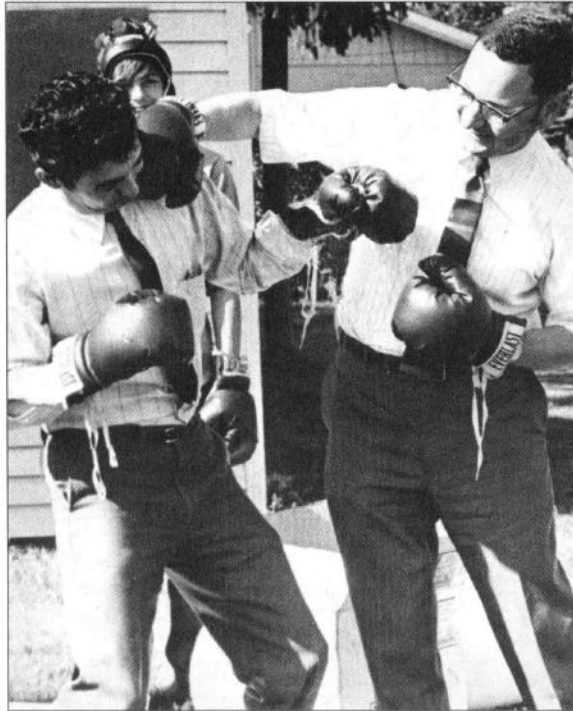
During this time, some Hewlett-Packard employees became involved with Junior Achievement. HAPCO was the name given to the fictitious Junior Achievement company sponsored by HP. Students from Loveland High School met to decide on the type of company they wanted to form and the products they wanted to build and sell. In an effort to emulate a real company, money was raised through the sale of stock. The next step was the purchase of material followed by the production of the product. HAPCO met at the main plant.

For this first HP sponsored JA company, the students selected a wood and ceramic ashtray along with a brass and ceramic trivet. The teenagers learned about the various aspects of running a company including product design, manufacturing and marketing. Early HP volunteers included Jack Clagett, Bill Murphree, George Ligotke, Russ Becker and Don Niewold.



Students participate in an activity during a Hewlett-Packard sponsored Junior Achievement company. Employee participation was encouraged by management as a means of helping the Loveland community.

Marco Negrete, on the right, is shown delivering a fake punch to a member of the Madison Center Boxing Club. Their objective was to train young men to form a Golden Gloves team. At the time, there were fifteen charter members between the ages of fourteen and twenty-five. HP contributed over \$200 in new training equipment.



In 1969, JA was expanded to a summer program to allow teenagers to earn income while learning about the contributions they could make to American industry. CSU and HP Loveland provided the advisors. Jack Clagett was the program manager with Bill Marr and John Hansen HP advisors.

HP Hams

Occasionally, the switchboard operator received a call asking for the Hewlett Packing Company. Apparently, there was such a company in the area. However, when the HP Loveland Amateur Radio Club was founded, the site did have some “hams.” By 1967, the club had around forty members, and twenty-five held FCC amateur radio operator and station licenses. The main objectives of the club were to help other would-be hams pass their FCC examination and to pool their technical knowledge. At the time, Bob Lamb was president, Bart Roffee was vice-president, Don Reab was the secretary/treasurer and Clyde Glass their activity manager.

The following year, the club toured the FAA Longmont Air Traffic Control Center. The tour was technical in nature and included the microwave terminal.

First Chess Tournament

In the spring of 1964, *Hi-Points* covered HP Loveland's first chess tournament. Bob Bump was its organizer, and a ladder was published. Larry Carlson, Ron Grob, Gale Hamelwright, Bob Bump and Don Niewold worked their way into top contention. In June 1964, Bob Bump came out on top by defeating Ron Grob. Chess tournaments like this continued for years to come.



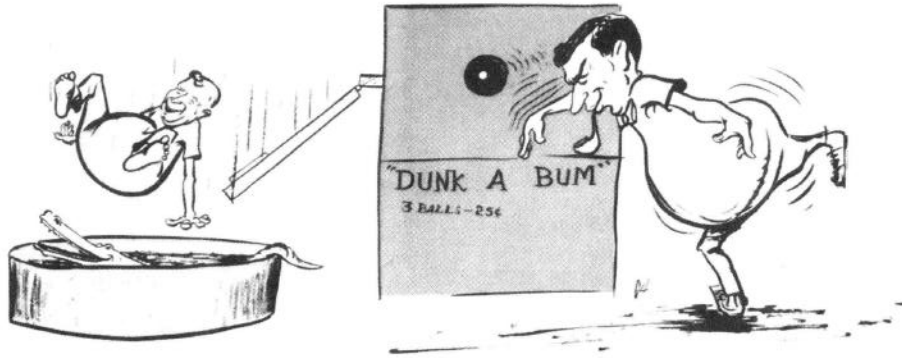
Concentration over the next move in a chess match between Gale Hamelwright and Bob Bump.

Bob Bump is a Colorado native and married his wife, Jean, in 1963. He graduated with a bachelor's degree from the California Institute of Technology, and then he went on for his master's degree from Colorado State University. As of 1999, he still works at the Loveland site as an engineer and is involved in noontime, high-energy bicycle rides. His design work dates back to the 208A Oscillator and the 465A Amplifier. Bob was involved with the early HP sponsorship of the SoapBox Derby. This may have stemmed from his interest in motor sports. He has also constructed and flown model rockets and aluminum boomerangs.



Design Engineer Bob Bump organized the first chess tournament at the Loveland site. He also won!

Skowron Dunks Stan Selby, His Boss



A cartoon by Jerry Farm depicts Walt Skowron dunking his boss, Stan Selby.

At the 1964 Larimer County Fair held at the Fair Grounds in Loveland, Stan Selby donated “himself” as a target to help raise money for the Loveland Olympic Club. This organization offered physical education to the youth of Loveland during the summer. Stan sat in his swimming outfit on a small seat over a large tub filled with three feet of water. By purchasing a baseball, the contestant could throw the ball at a

target. If it were hit, a release mechanism under the seat would cause the seat to fold away. The person on the seat would be sent rear end first into the water.

Walt Skowron and his family were strolling along the midway at the fair when they saw the hapless Division Manager, Stan Selby, perched on the platform just waiting for destiny to strike. Walt asked his wife for an advance on his allowance so he might throw the ball at the target area. With luck, he could dunk his boss. He ordered a dozen balls and fired away. He hit the target twice and twice, Stan Selby was dunked. Walt’s son admired his father’s aim, concentration and athletic ability and asked if he could try for a prize. Walt answered confidentially, “No, son, no prize, just satisfaction.”

A major change occurred in March 1965 with the departure of Stan Selby from the position of Division Manager of the Loveland



Ray Demere succeeded Stan Selby as Loveland Division Manager. Ray graduated from Yale University and was HP's Corporate Customer Service Manager before coming to Loveland.

Division and the arrival of his replacement, Ray Demere. Stan Selby was liked by practically everyone in the plant for his energy and dedication to the company and for getting the division started. He moved to a similar position at the Colorado Springs Division.

Stan Selby was born in Boulder, attended Colorado University and Denver University, and graduated with a degree in physics in 1947. He served his country in the U.S. Navy during World War II and was stationed overseas as a radio technician. Later, Stan moved to office manager at the Commander Service Forces center at Pearl Harbor. He joined HP as an assembler, draftsman, Engineer Production Coordinator and Plant Manager in Palo Alto before moving to Loveland.

During his five-year tenure as Division

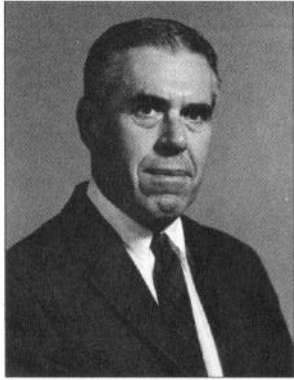
Manager at Loveland, Stan believed in involvement in community affairs and served as president of the Loveland Chamber of Commerce in 1962. He also was a member of the Planning Commission, Board of Adjustments and the Rotary. Among other activities, Stan was the chairman of the South Platte Valley Economic Development Committee, and was on Colorado Governor John Love's Economic Development Council.

Stan was responsible for the early leadership in getting the Loveland Division started and for setting the pace for the future. The division grew from just a handful of employees to over 700. He is credited with starting the HP name badge tradition when he had difficulty remembering all of the employees' names. On Fridays, he climbed up a stepladder and gave a coffee talk to keep everyone informed. When there were simply too many employees to gather around the ladder, *The Word* replaced this form of weekly communication.

A surprise party was thrown for Stan Selby at the HP picnic area on April 10, 1965. Hamburgers, pop and beer were served. On Stan's staff at the time were Tom Kelley, Marketing Manager; Roy Melin, Components Manager; John Lark, Meter



Marco Negrete started as the Engineering Manager of Research and Development at Loveland and by 1970, became the General Manager over all of the divisions at the Loveland site.



Tom Kelley was the Loveland Instrument Division's first Marketing Manager. After the introduction of the 9100A Calculator, Tom went with the calculator product line. He was instrumental in successfully marketing an entire series of products at the Loveland site and was also involved in forming the Fort Collins Division.

Manufacturing Manager; Marco Negrete, Engineering Manager; Joe Barr, Accounting Manager; Dan Mirich, Personnel Manager and Don Cullen, Manufacturing Manager. Al Vigil, president of Current Capers, presented Stan with a brand new RCA color television.

Ray Demere, born in Savannah, Georgia, succeeded Stan. He graduated from Yale University with a BS degree in Industrial Administration and Engineering. His previous position prior to com-

ing to Loveland was Corporate Customer Service manager in Palo Alto. He joined HP in 1946 and held a number of executive positions. Prior to his job in customer service, he was General Manager for Hewlett-Packard GmbH in Boeblingen, West Germany. He was instrumental in setting up the company's manufacturing operation in Europe.

Getting There is Half the Fun

One of the most unusual means HP employees had of getting to a seminar occurred on April 3, 1965. They boarded a Denver & Rio Grande lounge car and headed to Winter Park by rail. The group was from manufacturing, and they were on their way to attend an accounting seminar. The weekend prior to the seminar, however, was set aside for skiing at Winter Park. In all, thirty-six came from all of HP's manufacturing facilities and subsidiaries. Don Wick, a railroad

enthusiast, provided a history lesson during the trip as the train moved through the numerous tunnels above Boulder Creek on the approach to the Moffat Tunnel. After passing through the six-mile tunnel, the group arrived at Winter Park. Many of the attendees had not skied before and took lessons at Idlewild. The more seasoned skiers went to Winter Park for the day.

The Neely Demonstration Bus

The Neely Sales Region demonstration bus also visited the Loveland facility in 1965. It was loaded with HP's latest equipment from all divisions and subsidiaries. It was a way of bringing HP products to customer sites and to the public. Local field engineers would join the bus at their customer's site and show how the various products worked. A single driver stayed with the bus throughout the entire tour through eleven states. The bus cost \$65,000, and \$100,000 worth of equipment was added. A 30 kW generator supplied power. On this particular bus, sixteen Loveland instruments were included in the displays.

Hewlett-Packard has used other means of letting customers in relatively remote areas try its line of instruments. A ship toured the port cities of Latin America in 1965. In 1967, another ship was sent to Ecuador, Peru, Chile, Argentina, Uruguay and Brazil. In 1969, a DC-6B lifted off

the runway at the Oakland International Airport for a 100-day tour of 46 cities. The aircraft was owned and operated by HP and contained the latest in HP measurement and computational equipment. It was able to reach thousands of potential customers who otherwise would not have been able to see the company's full spectrum of products.

Loveland Site Library

In 1963, a lending library was set up by Virginia DeBoer behind her desk. It included the latest technical books and featured a policy of no fines. This was the predecessor to the creation of a formal on-site library. At the time, Hewlett-Packard had but one technical library, and it was located at Corporate Headquarters in Palo Alto.



Virginia DeBoer, executive secretary for Marco Negrete, started the first technical library behind her desk.

Early Recruiting Activities

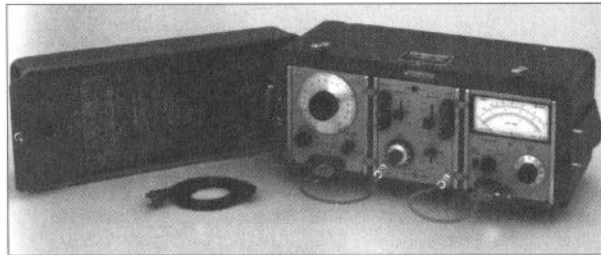
As early as January 1962, Loveland had recruiting activities at various colleges. An unusual article was published in *Hi-Points* covering HP's recruiting efforts for 1965 at college campuses throughout the United States. Don Wick, "The Witchdoctor," was shown jabbing a pin into the belly of his voodoo doll and wouldn't reveal his recruiting secrets. Dick Moore was dubbed "Chief Headhunter," and Paul Baird was named "Chief Headsizer" for his efforts in college

recruiting. All three men received awards personally from Dave Packard for their efforts during a celebration in Berthoud's Wayside Inn. As an added touch, Paul Baird got a shrunken head and Dick Moore got his own HP 175A Oscilloscope. Don Wick received a quiver of arrows. During this year, fifty-six engineering students were invited to spend a day at the Loveland Division, and offers were made to thirty-five.

HP Products Developed at Loveland

During the earliest months of operations at Loveland, products were transferred from Palo Alto. A small Research and Development lab was set up in the Quonset hut located on Lincoln Avenue, now home of Handy Glass.

The earliest design done at the Loveland facility was by Don Wick. He took the 350A Attenuator, with handmade, wire-wound resistors, and produced the 350B. The "B" version used precision metal film resistors. This

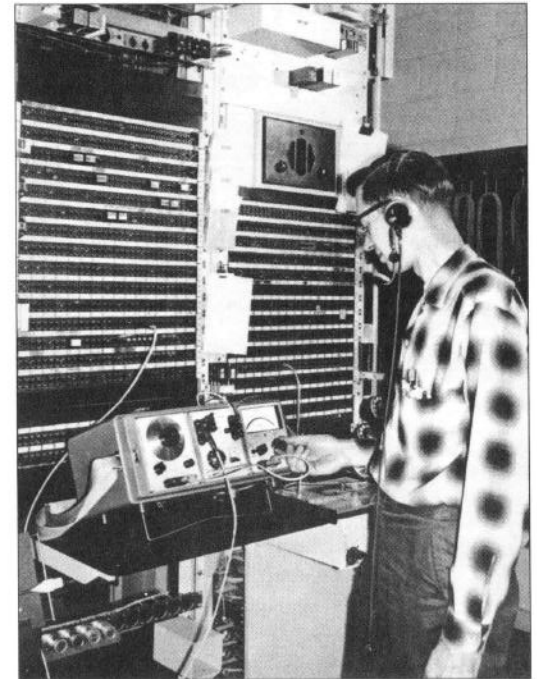


The 3550A Portable Telephone Test Set is the third product with some design content done at the Loveland site. It was made up of existing products including the 204B Oscillator, the 403A AC Voltmeter and a custom design patch panel. It was designed for telephone line testing.

product was shown at the 1962 IEEE show by Frank Culver. The second project at Loveland was the 403B AC Voltmeter, designed by Noel Pace, Marco Negrete and Bob Moomaw.

The third design was the 3550A Telephone Test Set, which included the 353A Patch Panel designed by Don Wick. It also utilized the 403B AC Voltmeter and the 204A Oscillator in a combining case designed by Gale Hamelwright.

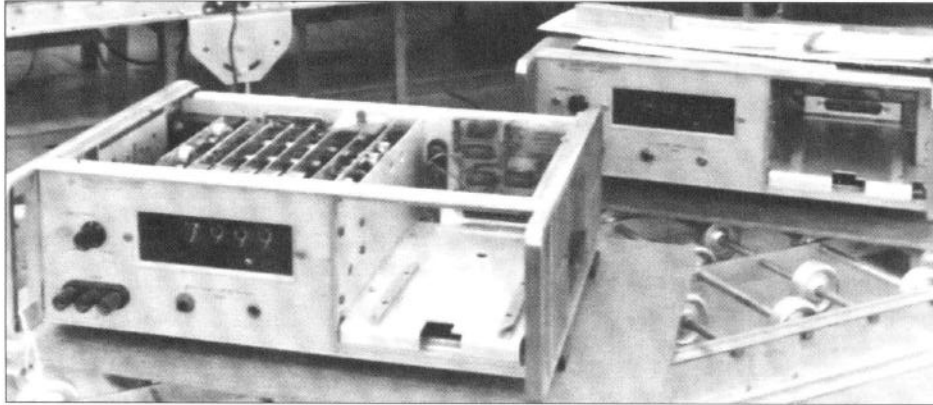
By February 1962, the Loveland Division had added a line of amplifiers. During 1963, the 403B Transistorized Voltmeter came along with the 350C and 350D attenuators. In addition, the lab designed the 208A Test Oscillator. Other



At the Loveland central office, the new 3550A Portable Test Set is put to work. It could supply a variable frequency audio tone from its oscillator and could make measurements using its voltmeter.

products at the time included the 3400A RMS Voltmeter.

One of the most successful instruments ever produced at the Loveland site was the 3440A Digital Voltmeter, introduced in 1963. Although



Over 10,000 of the durable 3440A Digital Voltmeter were produced by the Loveland Division over the years. New plug-ins were designed to keep the product up-to-date and to expand its measurement capability.

the design was started in 1961 in Palo Alto, it was transferred to Loveland after its first pilot run. Tor Larsen, Don Barkley, Chuck Near and Dave Cochran worked on the product under Group Leader Don Schulz. The product initially came out with two simple plug-ins for basic dc measurements. Other plug-ins, including the 3443A High Gain/Auto Range unit and the 3444A Multimeter, were developed the following year to expand the instrument's measurement

capability. In 1968, the 10,000th 3440A was manufactured and shipped. By this time, there were six plug-ins covering a broad range of measurement capability.

The HP 3440A Digital Voltmeter's durability came into play when a flat tire caught on fire on a semi-trailer in New Mexico. The driver was unable to put out the fire, and by the time help arrived, the trailer was half consumed by flames. Among the contents was a HP 3440, which had been subjected to intense heat, smoke and water. The carton had been burned away and one of the plug-ins was melted. When power was applied back at the Loveland Division, the 3440A remained in calibration.

A successor to the Palo Alto-designed 460A Amplifier, the 461A Amplifier, was introduced in 1963. The 410C Electronic Voltmeter was also added to the product line.

A new line of products designed for the standards lab and for precision measurements began with the 740A DC Standard/Differential Voltmeter. This product was followed in September 1964, by the 741A AC-DC Differential Voltmeter/DC Standard. The 741A was first shown at the WESCON show in California and

was selected as one of the outstanding new instruments developed during this time. Bill Smith was the project leader with Bob Moomaw the product designer along with electronic engineers Rex James, Fred Hanson and Jerry Harmon.

This product combined six functions in a single, compact solid-state instrument. It was a DC Standard, a DC differential and normal voltmeter with 0.03% accuracy, a digitally selectable DC source up to 1000 Vdc, and an AC differential and normal voltmeter. It provided a combination of functions not found in any other instrument on the market at the time.

In May, 1965, the first production run of 3460A Digital Voltmeter took place. Art Helgeson, Neil Miller and Ray King showed the units for the *Hi-Points* photographer. In December 1965, the 3406A Broadband Sampling Voltmeter was introduced on the cover of *Electronic Design*.

The new 410C Voltmeter was introduced at the 1963 IEEE show in New York City. Also introduced was the 241A Pushbutton Oscillator.

Another interesting product from the 1960s was an electro-anesthesia unit, the Model 100A. It produced signals that interfered with those

generated by pain response. The unit was sold to veterinary schools and clinics for use on animals during surgery. It allowed an operation to be performed without drug-induced side effects. The Russians had extended its use to humans.

The product began as part of a separate company called EMI with Marco Negrete and Bill Barton among its investors. Money to finance the company also came from an area farmer. The unit

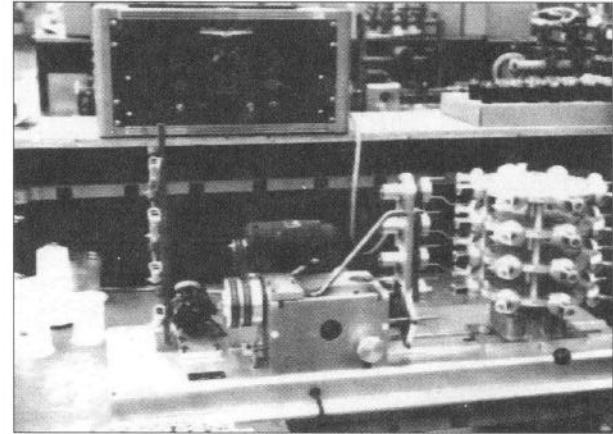
Jokes are told today about smoke testing the first instrument to come off of the assembly line. Here is a photograph of turning on the very first 740A DC Standard/Differential Voltmeter. To the left is Don Gill, then Larry Carlson with Bob Watson seated looking at the instrument. Holding the cone of a fire extinguisher near the product is Bill Marr, and in the background is Dan Merrell.



was expensive to sell, and the company ran out of money. As the story goes, Marco pitched the merits of electro-anesthesia to Bill Hewlett, and HP purchased EMI in 1964. Based on a transistorized version of the HP 200CD Audio Oscillator, the product was modified to produce a controlled output current at a fixed frequency. Paul Febvre was the design engineer, and with the purchase of EMI, he became a Hewlett-Packard employee. Dr. Calvin Turbis continued research in this field as a consultant and sold units to various university veterinary medicine departments. Pat Welch handled market development within HP.

The original Model 100A was replaced by a more sophisticated version with variable frequency. A filter was sold as an accessory so EKG measurements could be made while the electro-anesthesia was in operation. In addition, a device was constructed to control output level. The product was not profitable, and it would have taken about ten years to obtain FDA approval. It was discontinued around 1966.

Design engineer Paul Febvre also experimented with an electro-ejaculation unit for bulls. Another product, also in the experimental stage, used electrodes to force dogs to urinate.



This is a relay coil-winding machine, part of another precision product manufactured at the Loveland site. The coils were used to create a reed relay for use in a variety of HP products.

Experimentation was being conducted on rat blood at the time, and the Humane Society thought it cruel to decapitate rats while they were conscious. This led Paul to design a miniature headset containing electrodes to fit a rat so the animal could be put to sleep prior to decapitation. What reaction the Humane Society had to the change is lost to history!

A prototype of a hybrid analog-digital computer, dubbed the “synchro-retro-flash,” was designed at Loveland. This was the brainchild of Fred Wenninger, who wrote his doctoral dissertation on non-linear equations using an analog

computer. Fred was put in charge of the project and his team was composed of Geoff Chance, Fred McNeal, Roger Williams, Wayne Covington, Bob Tinner and Ron Tuttle. After the expenditure of a great deal of effort, the project was cancelled while still in the investigation stage. The cost was too high and the reliability too low. Digital computers were just entering the market as well. The prototype, in its beautifully designed cabinet with all of its dials, sat in a closet in A Mezzanine for several years.

One of the more obscure products built during the early years was a modified version of the 428A DC Current Meter. It could test the quality of the magnetic ink used on bank checks among other applications.

The very first use of modular cabinets within Hewlett-Packard was in 1962 on the 457A AC/DC Converter, designed by Noel Pace. It was used with the 405A Digital Voltmeter. *Hi-Points* covered a visit by Carl Clement, Industrial Design Manager from Palo Alto, sent to introduce the program. Used for many years, the modular cabinets had die-cast aluminum side frames that could be used for any number of electronic instruments. The system allowed the product to

be used in either a rack mount configuration or on the bench.

In keeping with an expanding product line in the standards market, Loveland introduced the 735A DC Transfer Standard. It was a small box with an important role. Customers could have it calibrated by the National Bureau of Standards, then use it to keep instruments within their facility in calibration. To further improve stability, the E02-735A was a set of four of these units tied together. The average drift rate was on the order of 0.00001% per day for its 1.018500 Vdc output.

The 3480A/B Digital Voltmeter and its associated plug-ins were introduced in 1970. Its primary contribution was improved accuracy and resolution over the 3440A. It also used a thermopile, built by HP's Integrated Circuits facility, to produce accurate true rms ac measurements by converting RF energy to heat.

One of the most significant products ever designed and manufactured by Hewlett-Packard was introduced in March 1968. This was the 9100A Desktop Computing Calculator, the forerunner to the personal computer or PC. The 9100A was the first, totally self-contained programmable unit of its kind which could fit on

One of the most significant products ever designed and manufactured by Hewlett-Packard was the 9100A Desktop Computing Calculator, the forerunner to the personal computer.

a desk. It included a display with three registers and a magnetic card reader. An optional printer, which fit neatly on the top of the 9100A, was offered separately. The 9100A used a ten-layer, PC board ROM for its algorithms, including log and trig functions. Its volatile core memory used small ferrite rings through which were woven copper wires. The initial price of \$4900 was rather steep, and it was later lowered to \$4,400. The 9100A was about the size and weight of an IBM typewriter. This product represented a significant departure for the Loveland Division's



existing line of measurement equipment.

The 9100A's performance seems insignificant today with limited internal memory that stored only 196 program steps. It was truly innovative for its time, however. The 9100A spawned an entire line of desktop calculators developed by the Calculator Products Division at Loveland under the direction of Tom Kelley. The Fort Collins Division was formed to carry on this product line.

Development of the 9100A started in 1965 in Palo Alto when a physicist named McMillian approached HP with a small calculator he invented. Tom Osborne, another inventor, also approached HP with his own home-built calculator. The best features of the two products were combined, and Osborne was hired as a consultant to continue the development work in HP Labs. The original size of the product was reduced by the invention of the PC board ROM by Chuck Near. Once the product's design was found feasible, it was transferred to the Loveland Division. Chuck Near came along with the product.

Responding to the wish of Arthur C. Clarke, author of *2001: A Space Odyssey*, he was presented a 9100A in April, 1970. The unit was given to



Barney Oliver (left) and Bill Hewlett (center) present a 9100A to Arthur C. Clarke (seated). Clarke, a science fiction author, is best known for his book, *2001: A Space Odyssey*.

Clarke by Barney Oliver, Director of HP Labs.

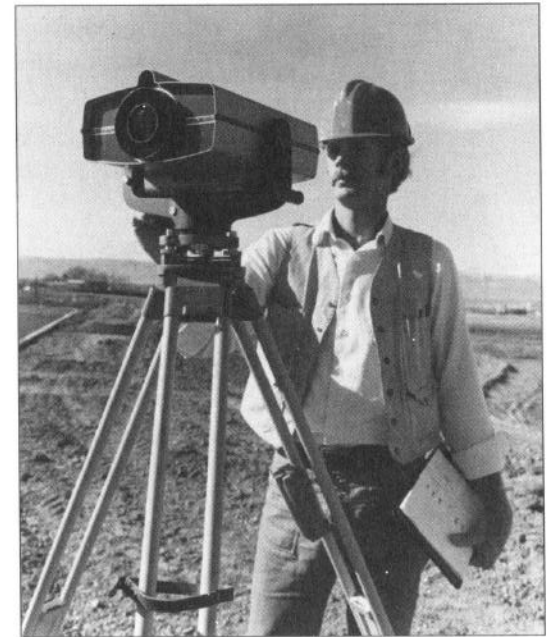
Another innovative product was the 3800A Distance Meter, directed at the civil engineering market. This product was introduced in April 1970. The technology was based on a modulated beam of coherent light sent out as far as two miles to a corner reflector. The phase relationship between the returning beam and the reference beam in the product allowed distance to be calculated. This was the beginning of the Civil Engineering Division headed by Bill McCullough.

One of the earliest applications was not in

surveying, but rather to measure the movement of a glacier located on Mt. Baker in the Cascades. Dave Daniels-Lee, a graduate of the University of Washington in Seattle, was sent out to set up the 3800A. In the process, he carried the unit three and one-half miles up the mountain to an observation point. Reflectors were placed on the glacier, and its daily movement was measured. Dave was part of Alfred Gort's development team.

The Civil Engineering Division's business was tied to new housing starts and the surveyors who used the product. The division only had high-end products and did not survive a downturn in the housing market. In addition, less expensive distance meters entered the market.

Hewlett-Packard entered the civil engineering market in 1970 with a line of distance measuring instruments. This is the 3805A Distance Meter, the second instrument in the product line. It had a lower price than the 3800A Distance Meter and was designed for shorter-range measurements. The Civil Engineering Division did not last, however, and closed its doors in 1982.



Significant Products Reflected in *Inventions of Opportunity*

It is difficult to measure which products developed at the Loveland site were the most significant, however, here is a list from *Inventions of Opportunity*, published by Hewlett-Packard in 1983:

3406A Broadband Sampling Voltmeter
(ac measurements to 1 GHz) — closely associated with this product were John Boatwright, Ron Tuttle, Fred Wenninger, Jr. and Roger Williams.

9100A Calculator
(first self-contained, programmable desk top calculator) — closely associated with this product were Richard Monnier, Tom Osborne, David Cochran and Chuck Near.

HP-IB (IEEE 488)
(bi-directional bus which could be daisy-chained for programming instruments from a computer) — this idea was

developed by patentholders Gerald Nelson and David Ricci.

3820A Electronic Total Station
(fully-integrated distance and angle measurement device for the survey market) — closely associated with this product were Alfred Gort, Gerald Wasinger, Dave Daniels-Lee, Sanford Baran, Craig Cooley, Billy Miracle, Dave Sims, Charles Moore, Walt Auyer, Jim Epstein, Ron Kerschner, Tom Christen, Hal Chase and Arnold Joslin.



This is the 9820A, one of many in a line of desktop calculators to follow the 9100A.



The design team for the 3406A Broadband Sampling Voltmeter (left to right): Roger Williams, Fred Wenninger, Ron Tuttle and John Boatwright.

Remembering Products Manufactured at Loveland

As reflected in the *Hewlett-Packard Journal*, 1960 to 1966

3550A Telephone Test Set

The 3550A combined the 204B Oscillator, the 403B AC Voltmeter, and the 353A Patch Panel. The patch panel allowed telephone customers to perform transmission line testing using the oscillator as a source and the voltmeter as a detector. An impedance matching transformer made measurements on 135 Ohm, 600 Ohm and 900 Ohm balanced lines possible. The instruments were equipped with rechargeable batteries for portable field operation. The units were combined into a portable carrying case designed by Gale Hamelwright. The voltmeter was designed by Noel Pace and Chuck Platz. Don Wick designed the patch panel.

204B Oscillator and 403B AC Voltmeter

HP's second transistorized audio oscillator was capacitor tuned instead of resistor tuned. It lacked a high power output, however, but met the needs for small signal applications. It could operate either from line voltage or from a battery. Its predecessor, the 204A, was designed at HP Labs in Palo Alto, then it was transferred to Loveland. David Cochran was the design

engineer on this product.

Similar to the 204B, the 403B was an improved version of the 403A. This design was done by Noel Pace.

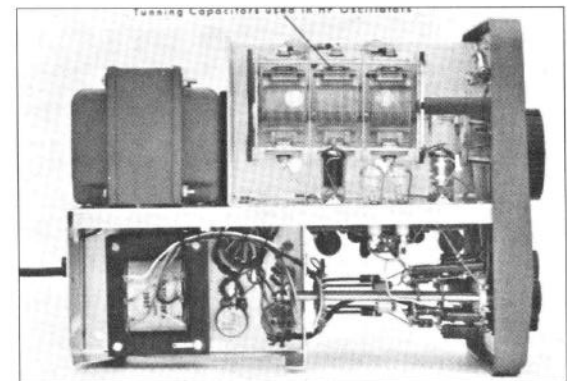
410C Multi-Function Voltmeter

This was a general-purpose voltmeter. The product contributed high dc stability using chopper stabilization. This eliminated the need for a dc zero calibration control found on competing products. Functions included ac and dc voltage, resistances and dc current. A detachable probe (containing a vacuum tube) extended its frequency range to 700 MHz. Paul Baird was the design engineer.

241A Push-Button Oscillator

The 241A was designed in Palo Alto, then transferred to Loveland for production. This 1963 product was driven by demand from the telephone industry for a discrete tone generator. It covered a frequency range from 100 Hz to 10 kHz and could operate from an external 48 V telephone battery. Robert Colpitts is credited with the design.

This is the side view of one of the 200-series audio oscillators showing the air variable tuning capacitor. The manufacture of this type of component was transferred to Loveland.



3440A Digital Voltmeter

This long-lived product contributed both accuracy and speed to voltage measurements. Plug-ins allowed the same mainframe to be configured for a variety of measurements. Initially, however,



Hazel Benesh winding resistors at the Components Building for the 3440A Digital Voltmeter, one of several products to use this type of component.

only dc voltage plug-ins were available, but as time passed, ac voltage and other functions were added. Over 10,000 were produced. David Cochran and Charles Near were credited with the design. Paul Baird and Peter Kertesz designed several of the plug-ins; Don Schulz was the project manager.

467A Power Amplifier

In 1965, this wide-band amplifier was introduced as a continuation of a series of amplifiers designed as companions for HP instruments. With its 10 W output capability, the 467A could expand the power range of an oscillator. The design was done in Palo Alto at HP Labs under Dr. Paul Stoft. Robert Strehlow was the design leader. After the design was completed, it was transferred to Loveland.

651A Test Oscillator

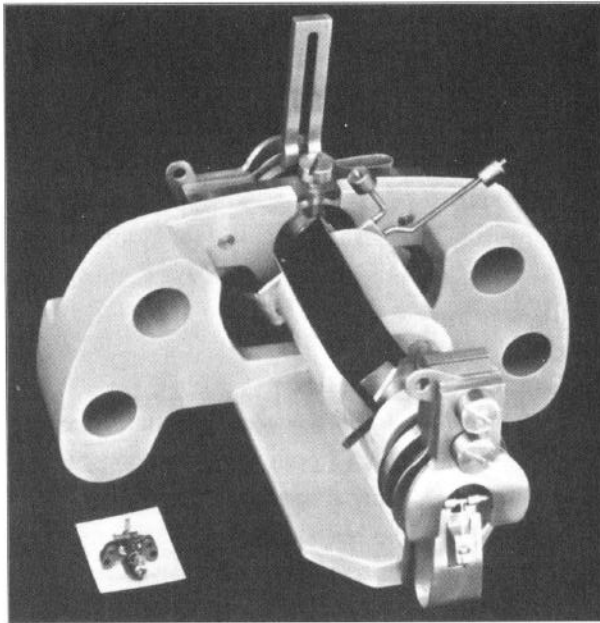
Myles Judd worked on this product along with project leader Noel Pace. In addition, Kay Danielson did the product design. Other engineers included Don Pauley and Jim Colwell. This product was a solid-state version of the older vacuum tube 650A Test Oscillator and had a frequency range of 10 Hz to 10 MHz. One of its features were its dual outputs, one for 600 Ohms and the other for 50 Ohms. The attenuator used in this product offered improved accuracy. The 651A led to a line of other generators including the 652A and 653A.

3400A RMS Voltmeter

Another that enjoyed a long life was this analog ac voltmeter. Using a matched pair of vacuum thermocouples, it contributed the ability to measure high crest factor ac signals with high accuracy. An ac current converter box with a clip-on probe were offered as accessories. Designed by Gregory Justice in Palo Alto, the product was transferred to Loveland for production.

3460A Digital Voltmeter

With 0.005% accuracy using an integrating-potentiometric technique, this voltmeter was HP's entry into precision voltage measurements. It was far more accurate than the 405A, HP's first digital voltmeter. To provide immunity to common mode



This taut band meter assembly is the key to accuracy in an analog voltmeter. After assembly, each individual meter movement was calibrated and its scale created using a photographic process.

noise, the product was fully guarded. Ed Holland at HP Labs in Palo Alto first proposed the integrating-potentiometric technique. Bill McCullough was the design engineer. The product was transferred to Loveland and placed in the digital equipment section under Don Schulz. Others on this project included Bill Kay, Ed Heinsen, Harold Briggs, Jerry Blanz and John Becker.

414A Autovoltmeter

During the transition period between analog voltmeters and digital voltmeters, this unusual product was introduced. The 414A was an analog voltmeter that could automatically range. No prior knowledge of the input signal level was required. The product could also handle either positive or negative voltage inputs. Don Schulz and Jim Kistlen worked on this product.

740A DC Standard/Differential Voltmeter

This was HP's entry into the standards/calibration market. The dc calibrator function was aimed at the need for greater precision in calibrating digital voltmeters. The 740A had an internal dc transfer standard, a high-resolution voltage divider and a sensitive null detector. Bob Watson was the primary design engineer and worked with a team of engineers including Chuck Platz, John Boatwright, Don Wick, Gale Hamelwright, Larry Linn, Dan Merrell and Ray King.

741A AC/DC Differential Voltmeter/DC Standard

This product was the second entry into the standards/calibration market and combined a number of distinct functions. Its big contribution was improved accuracy for ac measurements. The product also included a precision dc transfer

standard. Bill Smith was the primary design engineer with Bob Moomaw, Jerry Harmon, Rex James, Fred Hanson, Gale Hamelwright also contributing.

3300A Function Generator

A new concept in function generators, the 3300A provided flexibility by using plug-ins to allow the product to handle a variety of functions. Its basic range was from 0.01 Hz to 100 kHz for sine, square and triangular wave-shapes. One of the first plug-ins, the 3302A, allowed pulse-width modulation and phase lock to other signals. Bob Dudley was the primary design engineer with Jim Crooks and Virgil Leenerts also contributing to the design effort.

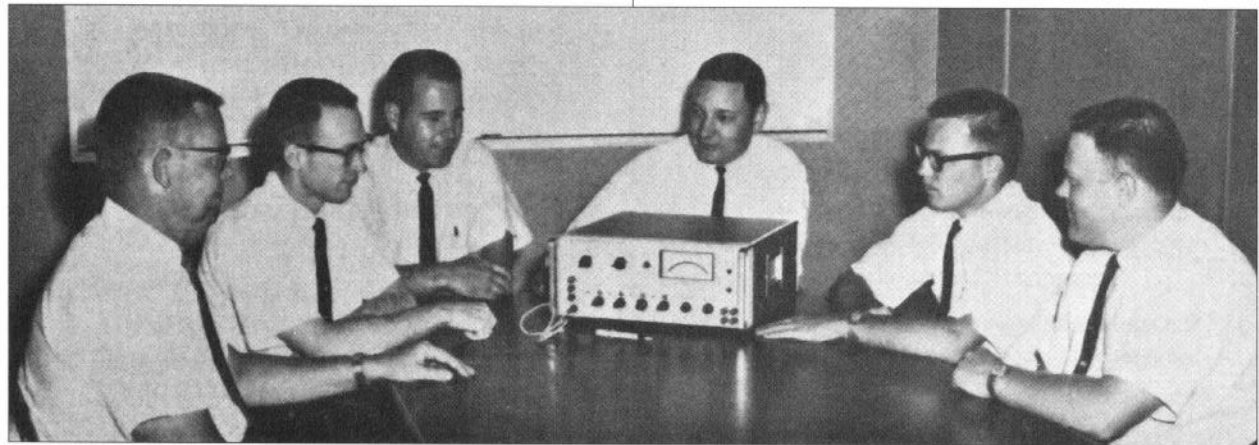
462A Amplifier

This was a fast rise time pulse amplifier for general instrument applications. Its bandwidth went up to 150 MHz. A companion product was the 461A Wide Band Amplifier with virtually flat response over its entire bandwidth. Alfred Gort was the design engineer along with John Boatwright. Mechanical design was done by Darrell Coble.

735A DC Transfer Standard

This small, portable box could output any four dc voltage levels with 2 ppm stability over eight hours. Its stability allowed it to transfer the Standard Volt as maintained by the National Bureau of Standards. The product was aimed at eliminating cumbersome chemical-based standard

The 741A AC-DC Differential Voltmeter/DC Standard design team included Bob Moomaw on the left, Project Leader Bill Smith, then Fred Hanson and behind the instrument, R & D Lab Manager Marco Negrete. To the right are Rex James and Jerry Harmon.



cells. Bob Watson was the electrical design leader with Larry Linn doing the product design.

331A, 332A, 333A and 334A Distortion Analyzers

These products simplified total harmonic measurements. The fundamental of the signal to be measured was rejected by an active notch filter, and the remaining signal components were measured as a percent of the total signal. The 333A and 334A had automatic nulling where the operator needed only to get close to the fundamental. The product would then automatically seek the optimum null point. The 331A was the basic unit with a frequency range from 5 Hz to 600 kHz. The 332A was designed for radio frequency work with a broadband detector capable of measurements up to 65 MHz. The 333A was like the 331A only it incorporated automatic nulling, and the 334A included automatic nulling along with the broadband detector. Dick Moore was the group leader and the design engineers included Terry Tuttle and Larry Whatley.

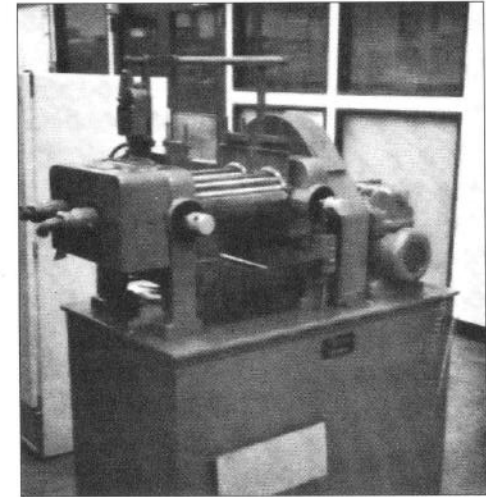
419A DC Null Voltmeter

With its 18 measurement ranges, this product could measure down to 3 μV dc and was used in conjunction with precision voltage dividers and bridge circuits. It was aimed at the standards market and made its contribution through lower

drift and lower noise. Chuck Platz was the design leader, Bob Watson was the group leader and Larry Linn was the product designer.

11100 Standard Resistor

This product superseded the Rosa Resistor as a transfer standard. It was adjustable and could be set within 1 ppm of its nominal value. The product was made in 100 Ohm, 1 kOhm, 10 kOhm and 100 kOhm values. Construction included precision resistance wire wound on a thin polyester shell so that no strain was placed on the wire with changes in temperature. Paul Hubbs, at the HP Corporate Standards Laboratory in Palo Alto, worked on the design. Henry Hetzel, at the Loveland site, also worked on the product's development.



Silicon rubber molded parts were yet another aspect of HP's vertical integration designed to provide all kinds of fabricated parts for the company. The parts made with this machine were relay bobbins.

427A Multi-Function Meter

This battery-powered meter included a variety of functions and many ranges. It could measure both ac and dc voltages as well as resistance. It had a 10 MOhm input impedance. Jim Colwell and Noel Pace were the design engineers.

3406A Broadband Sampling Voltmeter

This was a departure in ac measurement techniques. Instead of using a diode bridge or thermopile, it sampled the input waveform. This gave it a bandwidth of 1 GHz. The product included an active probe attached to the end of a probe cable. Within the probe was a small PC board that held the sampling circuit. John Boatwright, Ron Tuttle, Fred Wenninger Jr. and Roger Williams worked on its design.

465A Amplifier

Design for use as a preamplifier to increase instrument sensitivity, the 465A was the first HP product to use a low noise FET front end. The product had a voltage gain of 20 dB or 40 dB over a frequency range from 100 Hz. to 50 kHz. It replaced the cumbersome 450A vacuum tube amplifier. Bob Bump was the primary electrical design engineer under the direction of Noel Pace. Kay Danielson did the product design.

3420A/B Differential Voltmeter/Ratio Meter

Using a precision six-digit divider and null meter, this meter had 0.2 ppm resolution and very high accuracy. Its voltage range was from 1 μ V to 1100 volts. Larry Carlson and Larry Loop were the principal electrical design engineers under group leader Bob Watson. Russell Meston helped with the design of the precision resistors.



When the 9825A came along, a display was put together with the very first 9100A prototype, "Old Blue."

Hewlett-Packard's Sales Organization

During the early 1960s, Hewlett-Packard was in the process of building its own sales organization. As of 1963, however, independent sales companies still made up the majority of the sales force. Locally, Lahana & Company handled HP sales. In California, Neely Enterprises, located in North Hollywood, was HP's representative. Crossley Associates sold HP equipment in the Chicago area, and so it went with regional representatives. The majority of these sales organizations were purchased by HP, and their names have faded into corporate history. One exception was the California based sales force founded by Norm Neely. This area was known as the Neely Sales Region for many years.

In the January 1963 Sales Seminar in Palo Alto, the audio-video product line built at Loveland was introduced to the sales representatives by the Loveland Division. Up until this time, these products were represented by a marketing group in Palo Alto. Loveland had come into its

own as a freestanding division.

The sales seminar was quite technical and designed to train the field engineers on the details of how to use Hewlett-Packard products effectively in solving measurement problems. From this, the sales force was able to answer a variety of customer questions. HP had always emphasized that it did not use salesmen, but rather degreed sales engineers. This set the company apart from its competitors.

Specific Loveland products covered at this time were the 3550A Telephone Test Set, the 353A Attenuator and a new RMS voltmeter, the 3400A. The 3440A Digital Voltmeter, with its plug-ins, was also introduced. All of these products would live on for many years.



At the opening of Building B, many displays were set up to illustrate the process of designing and manufacturing HP's line of products at the Loveland site. The Marketing Department's Ed White is showing his young son some of the technology involved.

Component Manufacturing

Once a manufacturing manager bragged that sand could be poured into a hole in the roof of the Loveland Division and precision electronic instruments would come out the door. What this referred to was vertical integration, where HP did practically every operation to create its own products. Today, much of the product content is purchased on the outside from vendors. During its early years, HP manufactured its own meters, transformers, wire-wound resistors and even its own injection molded plastic parts. Other operations, such as sheet metal, metal-finishing and screening, allowed HP to control quality.

The Component Section was organized in January 1962 with thirteen employees and grew to ninety-four by the beginning of 1964. Until digital readouts were available, the key to HP's vacuum tube voltmeters was its precision analog taut band meters. Just in the second half of 1963,

the production of meters increased four fold. At the time, seven instruments used the meters.

Originally, HP purchased its meters from Siemens, but as business grew, the vendor could not keep up. John Lark was sent to Siemens and another company, Halske, in Germany to learn how HP could transfer the technology to the United States. Using his knowledge, Lark set up a meter department in 1961 in Palo Alto. The operation, and Lark, were subsequently moved to Loveland. HP built taut band meters under a license agreement. Manufacturing in Loveland started in the Quonset hut on Lincoln Avenue and moved to the Interim Plant (Components Building) in September 1962. It grew from the manufacture of one type of meter to eighty-five distinct meter types. In 1968, John took an assignment in Japan, but several years later, he returned to Loveland.

The heart of the taut band meter assembly,

consisting of numerous small parts, was the platinum band attached to the coil assembly. One end of the band is soldered to the spring of the torsion head. The meter's fine pointer was attached to the coil. In the field of a large permanent magnet, the coil would move in proportion to current applied. This precision assembly was manufactured in a clean room environment. The clear plastic case was also manufactured at Loveland.

Many subtle elements made the HP meter better than commercially available products. For example, small gram weights were placed onto a formed wire at the lower end of the pointer to counterbalance the needle. The weight had to be adjusted so that meter readings were duplicated within 0.3%. The taut band, made of a platinum alloy, was so delicate that it could not be touched during assembly. The linearity error, common to all meters of this type, was removed using a meter calibrator. With a photocell, the calibrator followed the pointer as precise amounts of current were applied. Each meter scale was custom printed for that specific meter movement. A mirror backing, located behind the scale, eliminated parallax error when making a reading.

Early employees in the meter assembly area included Hal White, Jill Molzahn, Lenore Hersh, Ernie Riberdy, Ed Pennington, Otto Ackerman, John Lark, Esther Feuerstein, Peggy Schlosser and Linda Michaels.

In early 1964, the Loveland Division branched into the manufacture of air-variable capacitors. HP purchased Oak Manufacturing Company's business, including the necessary equipment. It gave Research and Development flexibility in their designs. Those that worked on bringing the Oak equipment into the plant and refurbishing it included Don Carlson, Ed Pennington, Fred Wullschleger and Ivan Engelhardt.

The Precision Resistor Department began production in April 1963 and that year manufactured 8,500 resistors. By the end of 1966, production had climbed to 100,000 resistors a year. The resistors were used for precision dividers within a variety of products. These resistors were of a type not commercially available at the time. They were the key to many of the division's products, including vacuum tube voltmeters, solid-state digital voltmeters, precision AC and DC standards and even one of the oscillators.

The process of winding a precision resistor began with insulated-coated wire. For higher value resistors, the wire diameter was smaller than a human hair. The wire itself cost \$2,000 a pound. The wire was wound around a bobbin and to create the desired resistance, as many as 60,000 turns of wire were required. After winding, the bobbin was dipped into varnish. After the leads were attached, the product was sent to a temperature-controlled room where precision measurements were made on the value. Once the resistor had undergone tests and its value was stable, encapsulation followed. Each resistor was individually numbered and aged. The aging process involved heating and cooling each resistor to stabilize its value. Accuracies of 0.001% were achieved.

Aside from components themselves, HP had an extensive plastic molding operation, which began operation in September 1962. At the time, there was one employee. After the Components Building was opened, molding machines were transferred from Palo Alto. Loveland manufactured a little over half of the plastic knobs used throughout the corporation. Also included were binding posts, insulators, meter parts, transformer cases, lamp boards and switch brackets. After the introduction of desktop calculators, a two-color injection molding process was added for key caps.

Buildings B and C

An announcement was made that HP would construct its second building at the Thompson Valley Industrial Park. This would become Building B, and it enclosed 123,000 square feet. Started in the fall of 1965, it was completed in May 1966. The new space was initially used for warehousing, office and production. It had four conference rooms and added an 11,200 square-foot cafeteria.

In September 16, 1966, an open house was held for HP employees and their families as well as the public to see the new Building B. Approximately 4,500 toured the facility. A hostess greeted visitors at each door, and a map of Building B was posted for directions. Large yellow arrows on the floor showed visitors the way through the many different departments. Each department had a display and an employee was on hand to explain that particular operation. Of note was a half-size Pacific International Express truck and trailer displayed in the shipping area.

Coincident with the open house was the HP

Board of Directors meeting. This was a great honor for the Loveland facility since usually such meetings were reserved for Corporate Headquarters. Celebrities in the electronic industry such as Dave Packard, Bill Hewlett, Francis Moseley, Ed Van Bronkhorst, Ernest Arbuckle and Fred Terman were present. Arbuckle was the Dean of the Graduate School of Business at Stanford University. Dr. Frederick Terman was past Dean of the School of Engineering at Stanford and a consultant to Stanford's President. Ed Van Bronkhorst was a Vice President and the Treasurer of Hewlett-Packard.

During the summer of 1969, based on extremely rapid growth, construction was started on Building C. A slowdown in sales the following year prompted management to finish the structural portion and exterior, but not the interior. There wasn't any celebration when it was finished, and except for material storage, it sat empty for several years.

The Loveland Cafeteria

Up until 1966, there wasn't a cafeteria and employees ate in the break areas or at their desks. Many brought their own lunch. Stan Williams, owner of the Williams Wayside Inn in Berthoud, brought a hot food wagon into the plant each day. He sold lunches from the wagon as he pushed it up and down the main aisle. The smell of a hot roast beef sandwich was often irresistible. Finally, it was announced that HP would construct its second building at the Thompson Valley Industrial Park. This would become Building B and house the present cafeteria.

Stan made the transition to Food Service Manager and held this position for many years. Howard Hicks took over when Stan retired. It continued as a HP-run facility until the present vendor, Marriott, became the operator.

In May 1969, a cafeteria was opened in the Components Building. The menus at both cafeterias were kept identical. Meals were prepared at the main plant and transported in warming trays. At the time, almost 200 worked at the Components Building.

Organized for Growth

In May 1970, Marco Negrete announced that the Loveland site was organized for future growth, but in the process, the complexity of the management structure was revealed.

Marco was the General Manager for all of the various Loveland divisions with long-time employee, Bob Shuffler Sr., as his Administration Assistant. Don Cullen headed up the Loveland Manufacturing Division with Cliff DeLude as Manufacturing Engineering Manager. Al Davis was Plant Engineering and Maintenance Manager, and the Purchasing Manager was John Smethurst. The Fabrication Shops Manager was Rod Pederson, and the Printed Circuit Fabrication Manager was Walt Johnson. Roy Melin was Components and Materials Manager.

The Loveland Instrument Division was under Don Schulz with Pendell Pittman working as Marketing Manager. Pendell coined the phrase, “sell them critters,” a slogan that gained popularity with the field engineers. Joe Conrad was the Instrument Manufacturing Manager, and Dick Moore was the Instrument Engineering Manager in charge of Research and Development.

Ed Shideler was Integrated Circuits General Manager, and Quality Assurance came under Paul Baird. Paul was one of the few who came to work wearing a bow tie. Steve Ford was the Business Manager, and Bill Barton headed up Personnel.



Don Schulz was responsible for many of HP's early instrument designs and transferred from Palo Alto to Loveland. He became a lab section manager, then Research and Development Manager, and finally General Manager of the Loveland Instrument Division.

The Cutback

Loveland's first decade ended on a sour note. A cutback was imposed on the entire company, as the order rate simply could not keep pace with capacity. In addition, there was a sharp decline in the backlog and an enormous jump in finished goods inventory. Bill Hewlett made the announcement on July 1, 1970, that employees would work four days in one week, then five days the next week repeating the pattern. The day off was without pay. This

reduced expenses by ten percent and was the first time in its history that Hewlett-Packard had to use such measures. No employees were laid off and no severance packages were offered. HP retained its experienced people, and by the end of October, attrition had adjusted the workforce. The work schedule returned to normal.

Major Events from 1971 to 1985

1971

The 9810A Programmable Calculator (referred to as the Model 10) was introduced following the success of the 9100A. It had six-times the memory of comparably priced competitors and used plug-in cartridges to allow it to be tailored to specific programs.

Johnny Harrison's model train layout was featured in *Hi-Points*. Johnny began working for Hewlett-Packard in 1951 and held badge number 51.

1972

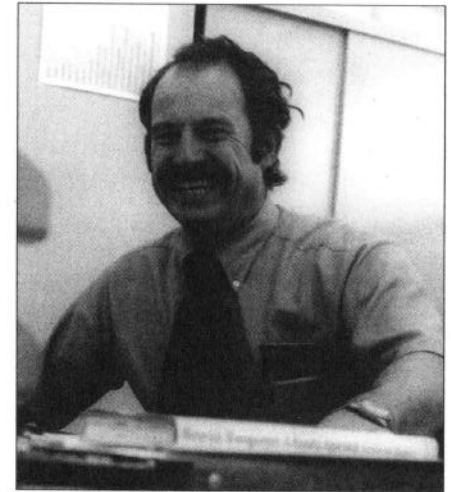
After sitting empty for several years, Building C was finally occupied in April. Calculator Marketing and Calculator Research and Development moved into the building. The 9820A was introduced to fill the gap between programmable calculators and computers. This was followed by the world's most powerful

desktop calculator, the 9830A and a companion printer, the 9866A.

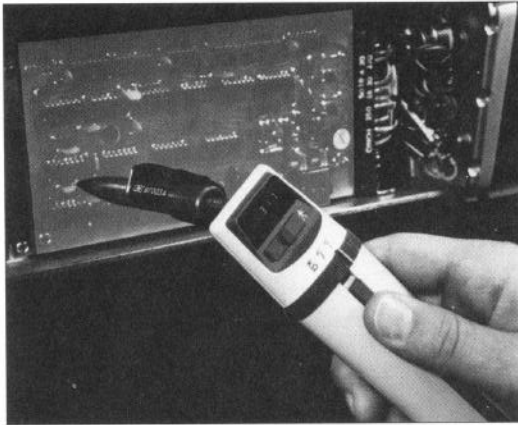
The last 205AG Audio Oscillator rolled off the line. It was introduced in 1950 and was popular among telecommunication customers. The 205AG was how HP got into the transformer business. A substantial backlog of incomplete product was piled in stacks waiting for transformers. When Dave Packard passed by and found out what delayed shipment of this product, he said that it looked like we should make our own transformers.

1973

Marco Negrete announced that the recession was over and the Loveland facility was back to normal. Plans called for the introduction of a dozen new products. This included the 3311A



Jack Kirkpatrick started with HP in 1957 and moved to Loveland in 1960 to take the position of Production and Inventory Control Manager. He held this position for ten years then transferred to HP's Singapore facility. He set up their production and inventory control system and returned to Loveland in 1973. Jack retired in 1988, and now he and his wife operate a successful property rental business along the east coast of Mexico's Yucatan Peninsula.



The 970A Multimeter was one of the most innovative products to come out of Loveland. A flexible band below the display allowed the user to easily switch between functions. A battery pack fit into the handle of the instrument. Price, relative to more conventional designs, and reliability ended the product after a few years.

Function Generator designed by a team consisting of Ed Pennington, Noel Pace and Harry Heflin. Jerry Estes handled the marketing, and Jim Bennett was in charge of Production test. Jeanette Moser was the line leader for this product.

The HEART order processing system was installed as well

as a material requirements planning system (MRP). This included the bill of material processor (BOMP).

Longtime Hewlett-Packard employee Jack Kirkpatrick transferred to HP's Singapore facility to set up their material system. Jack started with the company in 1956 and moved to Loveland in 1960.

For his decade of work managing food service at the Loveland site, Stan Williams received ten shares of HP stock. Since Stan was

not an employee, the stock was for the Hermett-Packing Company.

This was the year the 970A Digital Multimeter was introduced. This hand-held instrument was more commonly known as the "Probe Voltmeter" and was a radical departure from traditional bench instruments. It made the front cover of 92 magazines around the world. No other HP product had done this since nor received so much publicity.

Due to fear of a natural gas shortage, HP



The marketing team for the 970A Multimeter (Probe Voltmeter) consisted of Jerry Estes (left), Walt Skowron (center) and Bill Beierwaltes (right).

installed large propane tanks north of the Building A parking lot. The fence, which surrounded these tanks, can still be seen along the main east-west access road. HP also laid a natural gas pipeline and purchased a well. The well produced too much oil and not enough natural gas so the oil was traded to Public Service Company for gas.

1974

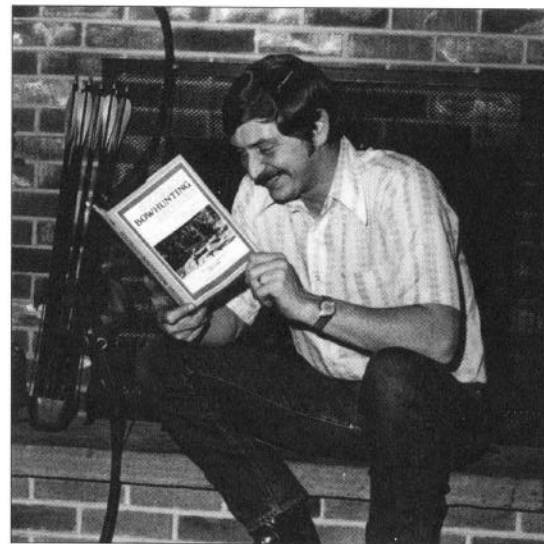
Energy conservation was the major topic for this year, and under the direction of Wayne Danielson, gas consumption was cut by 70% over the previous year. During the winter, the heat was turned off every Friday evening and not restored until early Monday morning. It was a cold place to work for those on the early shift every Monday, and some of the secretaries hid small electric heaters under their desks.

Using a built-in calculator, the new 3805A Distance Meter was introduced. It could automatically average a number of distance measurements to produce greater accuracy.

Among outstanding employees were Glenn Gibson. He was selected to serve on the R2-J School Board. Cliff DeLude was elected to the

Loveland City Council while George Ligothke was elected to the Loveland Hospital District Board. Bob Shuffler Sr. served on the Board of Directors for Foothills-Gateway and the Loveland Breakfast Optimist Club.

Receiving their twenty-year service awards were Hudson Grotzinger, Roy Melin and Al Sperry. (As of 1999, Hudson was still doing mechanical engineering work for Hewlett-Packard.) Lee Kline had his impressive book, *Colorado Bow Hunting Records of Big Game Animals* published, and Bill Brunelli talked to a *Hi-Points* reporter about his various card tricks. He is quite amazing, and even when he performs his tricks very slowly, the hand always proves quicker than the eye. Bill eventually became Personnel Manager and later in his career, he transferred to HP's Puerto Rico facility. Bill is retired and lives in Loveland.



Lee Kline had an impressive book published in 1974 titled *Colorado Bow Hunting Records of Big Game*.



Bill Brunelli was known for his good humor and extraordinary card tricks. He began as a technician, then moved to become a test leader, a line supervisor and a section manager. Eventually, he became the Personnel Manager for the site and was promoted to Group Personnel Manager. In 1994, Bill took the job of Personnel Manager at HP's Puerto Rico plant. Now retired, Bill lives in Loveland.

1975

David Ford transferred to Loveland from HP's South Queensferry Division to manage the LID Communications Marketing Group. David later resigned from HP to take the job of International Marketing Manager for Comlinear in Fort Collins. After retiring, David died of cancer.

Roy Melin, Components and Materials Manager, reviewed the need for Hewlett-Packard to be in this business. The Components Building housed the manufacture of transformers, ferrites, meters and molded parts.

The 3800A Distance Meter was used for the construction of the Olympic Stadium in Munich, Germany. The Civil Engineering Division introduced the 3810A Total Station at this time.

The new 9830A Programmable Calculator was used on ABC's "Password" game show to store words, and it was also used during the Pikes Peak Hill Climb.

1976

The 9815A and 9825A calculators were introduced. The 9825A would become the most successful calculator product ever manufactured



The HP 3476A Digital Multimeter was the company's first entry into the low-cost instrument market. Able to measure ac or dc Voltage, current and resistance, the product sold for \$225.

by Hewlett-Packard. It had the programming features of a minicomputer and used the HP-developed High-level Programming Language or HPL.

For just \$225, customers could own a Hewlett-Packard digital multimeter with the introduction of the 3476A. It was the first low-cost instrument produced at Loveland and reached a broad market.

Larry Potter, the Customer Service Manager, received a cream pie in the face delivered skillfully by Bill Parzybok. Potter lost a bet that his own department couldn't achieve 100% participation in the United Way Campaign. Little did he know

that some of his loyal employees paid for the contributions on behalf of others within his department to guarantee that he received the pie in the face.

1977

It was this year that the Fort Collins Division was founded under the direction of Division Manager Tom Kelley. Plans were released for the construction of a new campus located on Harmony Road just west of I-25.

Jackie Peake, a professional journalist, was hired under contract to take over as *Hi-Points* editor.

Although it certainly didn't enhance the looks of the Loveland campus, modular buildings were set up north of the main east-west access road as a training center for the DTS-70 Digital Board Test System. This was a product transferred to Loveland from the Automatic Measurement Division in California. Roger Youngberg was in charge of the program. These buildings were removed a number of years ago.

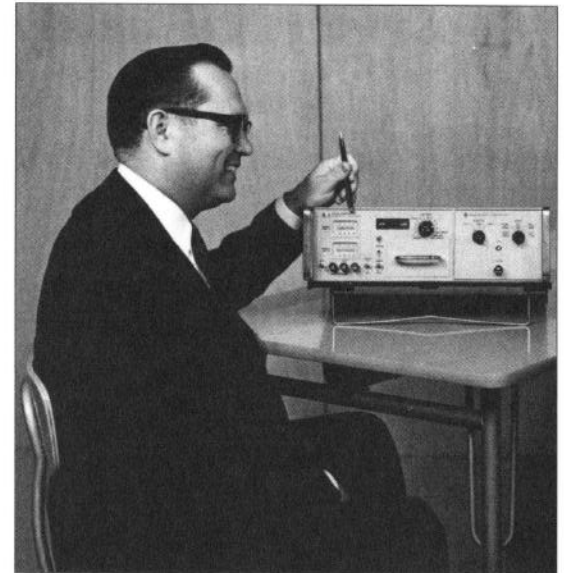
John Young became Hewlett-Packard's president as Bill and Dave began to step aside to let others manage their company.

1978

The Civil Engineering Division needed a way to calibrate distance meters over short distances and built a "railroad" along the top of the central wall in Building C. A remote controlled "train," running on an I-beam track, was used to accurately position a corner reflector. The contraption could stop within 0.0005 feet of a given position.

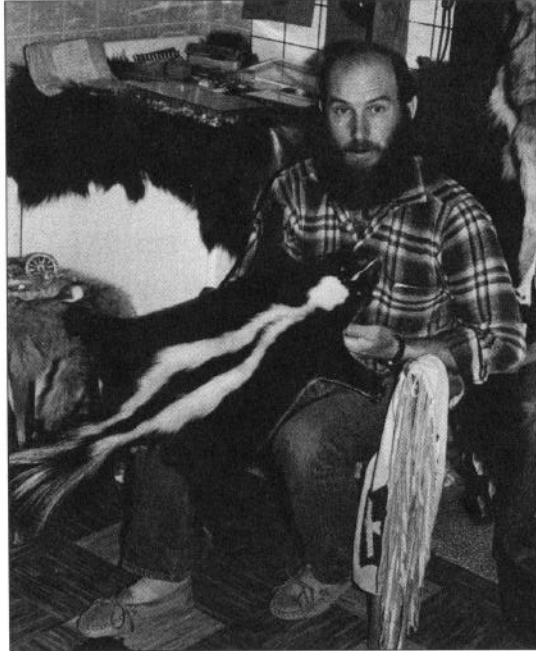
The Calculator Products Division changed its name to the Desktop Computer Division. The Loveland Instrument Division introduced the 339A Distortion Analyzer.

To free up valuable space for expansion at the main plant, LID shipping, finished goods and central shipping moved to leased warehouses on Madison Avenue near the Great Western Sugar Factory. These were known as the Ward Warehouses, and eventually stock was moved to this location. A truck was



Pendell Pittman, LID Marketing Manager, coined the term "sell them critters." This slogan rapidly gained favor among HP field engineers.

purchased to shuttle people and material between the two locations.



Dwayne Thompson made a brief appearance in the made-for-TV movie, *Centennial*. Dwayne is part of a local mountain man group and had all of the paraphernalia including a black powder rifle and buckskin clothes.

Chuck Kingsford-Smith Jr. made the 50th anniversary flight from Oakland, California, across the Pacific Ocean to Brisbane, Australia to commemorate his father's epic flight. In 1928, Sir Charles Kingsford-Smith, Sr. was the first to fly this Trans-Pacific route non-stop. Today, his aircraft sits in a special concrete shelter between the lanes of the divided highway near the Brisbane International Airport.

Dwayne Thompson, Paul Cackowski and Dick

Whitmore put on their mountain man costumes and played minor roles in *Centennial*, a made-for-TV movie based on James Mitchner's novel starring Richard Chamberlain.

1979

The Lake Stevens Division was formed, and Bill Kay was named Division Manager. Plans were made for the construction of a building at the site. The signal sources and analyzers were transferred from Loveland to this facility.

Robin Williams, a relatively unknown nightclub comedian at the time, starred in a Hewlett-Packard videotape series called "Behavior Styles." Williams went on to gain fame in the TV series "Mork and Mindy," and then began a successful career on the big screen in numerous movies.

1980

Building D opened in October, adding another 278,000 square feet to the facility at a cost of \$10 million. At Hermit Park, two more cabins were completed.

Bill McCullough was elected to the Loveland Chamber of Commerce, and Bob Shuffler Sr. received his 30-year service award.

Choice Care Health Services, Inc., an HMO offered to Hewlett-Packard employees, defaulted on its payments to healthcare providers. HP sued to prevent doctors from trying to collect their fees from HP employees.

1981

The number of employees at the site topped 3,000 and overall Hewlett-Packard employment stood at 59,641.

Construction began at the Lake Stevens site.

The General Manager of the Loveland Instrument Division, Bill Parzybok, delivered the first pitch at the new softball field located at the site north of Building D. Soon, Bill was named General Manager of the Electronic Measurement Group, and he then became a vice-president. His successor to the general manager's position for the Loveland site was Bill Tippett.

On "Monday Night Football" and on "Nightline," HP began running commercials for its products in an effort to get its name known before the public.

More than 3,000 acres of undeveloped land west of Carter Lake was purchased for a new recreation site. It was known as Chimney Hollow, but it was never developed.

1982

It came as a shock to many when the Civil Engineering Division closed its doors and its product line discontinued. The employees were

absorbed into the Loveland Instrument Division.

Work began on a new campus near Greeley, and an option to purchase land near Longmont was exercised.

1983

Hewlett-Packard entered the Rocky Mountain Corporate Cup Relays and during the meet held in Boulder, finished third. Larry Potter was named General Manager of the newly formed Manufacturing Test Division.



Bill Parzybok worked his way up from C.S.U. summer seed student to General Manager of the Electronic Measurement Group, and he was then named a vice-president. He later left HP to become Fluke's Chief Executive Officer.

1984

The only significant event this year was the reorganization of the product groups and the field marketing organization to better align HP with its customers.

1985

A M*A*S*H celebration was held to build enthusiasm for the newly formed Manufacturing Test Division in April 1985. Kim Mast, dressed in Army fatigues, played the role of a most believable "Radar."



The Manufacturing Test Division kicked off its M*A*S*H celebration on April 25 with the spectacular arrival on the south lawn by helicopter of its new general manager, Larry "Colonel"

Potter. Potter then got on an ATV. With an Army helmet and surgical gown blowing in the breeze, "Colonel" Potter rode down the lawn to Building B. Kim Mast, dressed in Army fatigues, played a most believable "Radar" while "Hot Lips" was played by Sherrie Vines. Terry Pierce played "Hawkeye."

It was time to celebrate the Loveland site's 25th year, and a booklet was issued covering its history. The theme of the celebration was "Hewlett-Packard and Loveland, Partners in Progress." After an internal celebration, an open house

was held for the public. At this time, the flowerbeds were developed and planted along the south side of the property facing S. W. 14th Street.

Unfortunately, the business level had fallen, and HP elected to close the plant over the Fourth of July weekend. It encouraged employees to take two days without pay during August, September and October. Employees working at the Components Building were moved to the main plant, and eventually, that building was sold.

APPENDIX:
EARLY HP EMPLOYEES ADD THEIR THOUGHTS

The Early Years at Loveland by Don Carlson

I first met Stan Selby in the hallway of a hotel in downtown Boulder. I had just stepped off the elevator on the third floor, looking for the room where Hewlett Packard was interviewing technicians for the new Loveland facility. Stan was one of those kind of guys that you feel like you have known all your life after having talked with him for only five minutes. To say that I was impressed with what I saw of HP in meeting with Stan is really an understatement. Stan probably was HP's best salesman of the company and its philosophy that ever existed.

That moment when I met Stan was on January 16, 1960, and the occasion was my chance to be interviewed for a job. I might have chickened out had I known that I would have to take a test before the interview. But as it turned out, this was the beginning of a long association and I probably thought I had better make the best of it. In any event, as I was to learn later, HP tested and interviewed seventy technicians from the Denver,

Loveland and Boulder area that day.

I guess I was pretty excited when I received confirmation to start work for HP Loveland on March 3, 1960. In the meantime, I had a lot of loose ends to pick up - things like having a farm sale and closing out my farming operations, buying a house in town and moving.

My first day at work I met Don Cullen. Don had been part of the interviewing team at Boulder but somehow we didn't meet that day. Don transferred from Palo Alto to be the Loveland Manufacturing Manager; it was his job to get things rolling at the new Loveland Division. I was soon to learn what a good HP PR man Don was as he met with the city fathers and the local community.

We started our Loveland operation in what has become known as the "Bob Hipps" building. Actually, the building had been vacated by the Nash Rambler garage before we moved in and was later occupied by the Bob Hipps company. In those first

days, Don Cullen was ably assisted by Janice Powers, his secretary and Mary Burkett (Sweitzer) who moved from Palo Alto to teach soldering and wiring classes. Bob Moomaw started to work at the Loveland division one week after I started. Both Bob and I were hired as test engineers. What a combination; an ex-banker and an ex-farmer. What we didn't have in common from our recent vocations was made up by our avid interest in electronics.

Probably one of Don and Mary's top priorities those first few weeks was interviewing applicants for the wiring and soldering classes. During the first few months, starting in April, Mary Burkett trained about 70 gals in the fine art of wiring and soldering. Bob Moomaw and I attended each wiring and soldering training session. Little did we realize that at a later time we would be teaching the same type of classes as the Loveland Division continued to grow.

Our third locally hired employee was Ivan Englehardt. Ivan was hired to be our facility maintenance man and jack-of-all-trades as it turned out. On the south side of our temporary quarters was an open area that we closed in and put up a temporary roof. This was Ivan's work area where he built 4 x 8 tables to be used in our production area when we moved into our permanent quarters. Ivan was a good-natured fellow; good thing too, because we

really gave him a bad time about the wobbly tables he constructed on the uneven paving out in the workshop.

On April 27, we had an open house for the City of Loveland. We had received a number of HP instruments by this time, and Bob Moomaw and I worked up some displays with 200CD oscillators and 130B oscilloscopes. About 300 people attended the open house and were apparently awed by this new technology in their midst.

While we were busy at our temporary quarters training wiring and assembly people, an interim building, which was later to become our Components Building, was being constructed. The steel framework was up and the pre-cast concrete slab walls were being elevated and bolted into place in the early part of May. This would give us a total of 12,800 square feet of space for our first manufacturing facility.

As has been the practice of HP over the years, only a few key people were asked to transfer to the new facility. Joe Barr, who would handle Accounting and Personnel, and Frank Rorie, the purchasing function moved to Loveland in May. Big John Hansen joined our group on May 9 as a mechanical assembler. John not only brought with him the years of experience in mechanical things but also a sense

of humor. John had the reputation of always stirring the pot, joking and creating hilarious moments that we all enjoyed.

Sometime in the May or June time frame, Jack Kirkpatrick, our Production Control Manager, and Kay Therp, our QA Manager, joined the Loveland group. Also about the same time George Bender, who was to be our electrician, came to town. George was one of the few moving from California who missed the golf course and the five o'clock happy hour, amenities that the little town of Loveland seemed to have in short supply. Of course, we did have Dinty's and the Hub - and north of town was Clancy's, but somehow they didn't seem the same.

While we were busy getting ready for production in our new building, Marvin King, our Plant Engineer, was working with architects for the construction of Building A on our present permanent site. These are some of the almost hidden activities in an operation that seem to go unnoticed. It was apparent that HP was here to stay.

Interesting enough, when HP first came to town not everyone was sure just what kind of a company HP was. Historically, Loveland's economy had been based on agriculture with the Kuner Epsom canning factory providing a few months of employment during about three months of the year. We also had the

Great Western Sugar Company that provided year round employment for some and temporary employment for a larger work force during the sugar beet harvest and processing campaign.

During the first couple of months of HP's existence in Loveland there were times when some of our city fathers questioned, did we do the right thing in inviting HP to Loveland? Is it a stable company? Is it here to stay? There was also the concern that HP would provide competition in the Loveland labor force with our \$1.25 starting wage. (The starting pay rate for women was slightly lower for the same job.)

June brought a lot of activity getting ready to start production in our new interim building. Truckloads of machinery, test equipment, component parts and all of the things we would need to start production was starting to arrive. Everyone was busy receiving and storing material in waiting for the day we would move into our new facility.

As has been typical of many of our moves into new buildings, everyone was chomping at the bit to get into the new building. Since the building was being built with union labor and HP was non-union, we had to be careful about getting started with our outfitting before they were done. We started before the union electricians had completed their work and

almost had a walkout. So we had to bide our time and wait.

Before we could move in, Don Cullen said we had to seal the concrete floor. Don thought we ought to sand the floor before sealing, so we rented big floor sanders (the kind you would sand oak floors with) and proceeded to sand. Before it was all done, we had raised such a fog of cement dust that we thought we would all die from silicosis.

By July 5, we were ready to start production. Our first instrument was the 721A power supply. This was a transistorized product that was designed in Palo Alto and transferred to Loveland. It had one printed circuit board, a transformer, a meter and two switches. One switch for two voltage ranges and a current switch to select various current ranges that were metered.

It's amazing when I think back of how quickly we assumed responsibility for all of the various manufacturing activities, which were required to produce an instrument. From our wiring and soldering training classes, we hired sixteen gals. (Please, no offense ladies, that's what Stan Selby affectionately called our women employees.) Some of the gals wired switches, some laced cables and some loaded PC boards. We even had a hand dip solder pot, and guess what? We used a fly sprayer to spray on the flux.

Shortly after we started production of the 721A Power Supply, Palo Alto transferred the 403A transistorized voltmeter. Our production line consisted of the familiar roller track that we have used for years. Unfortunately, the rollers didn't do us much good since we covered most of the line with plywood to be used as wiring and assembly work area.

Now that we had two instruments in production, we would build a run of 721A power supplies, test them, and run them through final QA and ship. Then we would set up on the same production line and build 403A voltmeters.

Bob Moomaw and I sat across the line from each other, both testing 721As, racing each other seeing who could put out the most in a day. However, when the 403As came down the line it was another matter. In a typical run of fifty units, only about sixteen of the units would turn on acting somewhat alive. Since we had to troubleshoot nearly every instrument, we wouldn't be done before we had another batch of 721As coming down the line. We then had to carry the remaining 403As over to a work area in the northeast corner of the building to finish troubleshooting.

HP Palo Alto was bursting at the seams in 1960 and was anxious to transfer products to Loveland to be manufactured. We soon received the

711A, 712B, 715A power supplies followed by the 410B voltmeter.

The first HP Loveland annual picnic was held on Saturday, September 17 at the Sylvandale Ranch at the entrance of the Big Thompson Canyon. Dave Packard, Ed Porter and Ralph Lee cooked and served the steaks while the rest of the Loveland gang prepared and served the rest of the fare. Selby, in recording this event in the October 1960 issue of Watts Current stated, "And the food - well the steaks melted in your mouth - after all they came from locally butchered corn-fed beef. The corn on the cob was so good and fresh that you didn't need butter and salt on it. Pete Lahana and his crew, HP's sales force from Englewood, came up from Denver in a bus to help celebrate the occasion and get acquainted with the new fledgling Loveland Division. To round out the day, there were horseback rides for the kids, sack races, egg throwing contests and a beer-drinking contest. After getting all of the husky beer drinkers lined up, they were given their beer in a baby bottle. Of course, the biggest sucker won.

The next day, on Sunday, we had our open house. The weather was perfect and so was the attendance - at least 3,000 Loveland people. The open house was preceded by a ribbon cutting ceremony. Bob Hipps, Mayor of Loveland, made a

few remarks, followed by Dave Packard, who thanked the people of Loveland for their cooperation in getting HP off to a good start. The local Reporter-Herald published a special 12-page section devoted entirely to HP.

Dave and Lu Packard, Bill and Flora Hewlett and the Ralph Lees were able to meet most of the people. The local merchants overwhelmed us with about 40 floral arrangements, so the plant was really dolled up.

Danny Lesher arrived in Loveland in August 1960. The plans were that we were going to fabricate all of our sheet metal parts, and Dan was our sheet metal man. In chatting with Dan, he said, "When I arrived in Loveland, none of the equipment had arrived yet. Palo Alto shipped us a 50-ton Dennison, a press brake, two kick punches a shear and some kind of mill. We received a 60-ton Bliss from the Bliss factory and found that the bolster plate didn't have any holes in it to bolt down any tooling. Rod Pederson, the Shop manager, and I took the bolster plate off the Bliss and borrowed a van from one of Loveland's furniture stores to haul it over to Sandoz's Machine Shop. We thought that old van was going to buckle under the load. When we got to Sandoz's, he had a track that extended out from the ceiling of his shop. It looked like we were going to

pull that down before we got it unloaded. But we got the holes drilled and then hauled it back to the plant.

Del Newton joined us in late September of 1960. Del was hired to be our painter. Since we didn't have any painting facilities yet, Del was assigned to work with Ivan Englehardt building more production tables or whatever was needed in our new operation.

Since we had vacated the Bob Hipps building, Ivan and Del were working in the shed out at the industrial site where we would be building our first permanent building. The industrial site was known as Cherry Hill. Actually, it was Hutchinson's cherry orchard where we were going to build and the farm home and buildings were still on the site. The home, and out-buildings were located on what is now the grassy knoll about 100 yards east of Building A. These buildings remained intact until we built Building B.

Del said, "originally we were only going to do touch up painting of parts that were shipped from Palo Alto. It turned out that the painted panels had runs and smears, and we had to do a lot of it over. We probably got our paint booth set up about the end of the year. It was a single water fall booth about 8 X 10 feet. We set it up on the west side of what is now the Components Building.

Del laughed about some of the things we lacked in equipment. He said, "I talked some of the gals out of their old nylon stockings to be used to strain paint. I used my own paint gun for the first year that I painted. We must have been really hard up.

In November of 1960, the 722A Power Supply was transferred out of the Palo Alto R&D Lab to Loveland. Bill McCullough was the group leader of the design team that designed the 722A, and Don Schulz was the R&D section manager. The 722A was the first pilot run unit to be built at Loveland.

The company scheduled me to fly to Palo Alto to do the environmental tests on the 722A. As I recall, the 722A passed environmental tests with flying colors and was put into production by the end of the year.

In keeping with HP's traditional social activities, Loveland's version of the Harmony Plotters was formed and named Current Capers. Their first social affair was a combination dance and card party held December 3 in the old Armory. Each couple brought a box 'midnight lunch' and these were auctioned off to help defray the expenses.

Thoughts about HP during my Early Years

by Arlen Amundson

I interviewed with HP in May 1960, while I was still in the Air Force at Lowry AFB in Denver. I received a letter from Don Cullen stating that there were delays in hiring, so I actually hired on at HP in 1964. Don had done the interviewing at Bob Hipps old place on Lincoln.

At that time, some of the line leaders, section managers, and other managers were Art Helgeson, Bill Marr, Dick Kekar, Virgil Bennett, Mel Baldock, Neal Miller, John Hansen, Ray King, Joe Conrad and Don Cullen. We had "housemothers," like Doris King, Betty Acock, Barb Hansjosen, Letha Minch and Mary Burkett, that managed many of the wire and assembly processes. We were separated into product lines called modules. Some built source and analyzers, others voltmeters, etc.

On the 3440A line, we built and tested as many as we could every day. Isabelle Schleiger, Lorrene Jones, and others did the assembly and wire. At times, Jim Bennett, John McMahan,

Bob Victor, Ken Becker, Spence Futrell, Rocky Pugh, and Robbie McCarthy all worked on this product and its accessories. Hal Medo and Virgil Shuetz checked these products at a QA station before they were sent to shipping. Don Carlson headed up a maintenance group. Al Vigil, Al Nordell and Leona Bernhardt all helped us with specials under the guidance of Harry Yelek.

Some of the other voltmeter products we built and tested were: 3460A & B, 3462A, 3461A, 3450A, 3490A, 34740 series, 3437A, 3455A, 3456A, and up to the 3458A. At one time, we had thirteen techs working on the 3450A. We were a one-shift operation back then. The 3450A was unique because of the new processes used in this product, such as flex cables, 12 layer mother boards, vertical nixie tubes and a Peltier device for keeping the reference voltage constant. Some of the engineers that were willing to help the techs during this time were Bill McCullough, Bill Kay, Jerry Harmon,

Ben Lizardi, Al Gookin, Jerry Blanz, Harold Briggs and many others. Since we didn't have board test boards were usually put in products one at a time, turned on and tested. Exploding backward capacitors kept us alert.

For recreation at lunch and breaks, there were many ping-pong tables set up in Building A. Competition was fierce at all tables. Art Helgeson, Dick Kekar, Ron Corbett, Glenn Gibson, Spence Futrell, Wilbur Saul and Bob Hardin always were tough match ups.

After work, there were the men and women's twilight bowling leagues at the Lucky Strike Lanes just across the street from HP. Jack Murata, Jerry Harmon, Harry Krause, Gib Weber, Marv Leamons, Jack Bray, Terry Thompson, Danny Leshner, Neal Miller, the Hankins twins, Ken and Keith, Jerry Redabugh, and many others made the competition challenging and fun. Marie Bakel, Letha Minch, Jeanette Moser, Joyce Horstman, Vera Buchanan, Natalie Johnson, June Starck, Vi Renshaw, Jerry Hoffman and others made the women's league fun. Many of them bowled in the Olympics between Loveland and Colorado Springs.

Softball was as big attraction then, as it is today. Most modules had their own team. We had a City League HP team also. One module team,

composed of Art Helgeson, Arlen Amundson, Jim Bennett, Bill Marr, Ken Becker, John Scohy, Walt Hert, John McMahan, Les Lotz, Bob Victor, Bill Brunelli, Al Vigil, Dick Palmer and Robbie McCarthy, were all on the team that won both the intramural league and the 5F City League championships. The coach of this team was Jack Murata. Games were played on fields in Sherri Mar, Sunny Side, Van Buren and a few sites next to our plant. Our module team used to practice in the parking lot of Building A during lunchtime.

One time we hauled Bill Marr to the hospital in the back end of a station wagon because he had broken his ankle sliding into third base at Sunny Side Park. Years later, Keith Weise broke an arm at Van Buren while running through playground equipment chasing a fly ball.

We had a City League competitive fast pitch team that included Rod Lampe, Jerry Harmon, Tim Graves, Ron Held, Ron Meyer, Dixon Freeman, John Woods, Arlen Amundson, Steve Eversole, Les Lotz, Larry Reifschneider, Sam Ramos, Harlan Starck, Bob Hardin, Glenn Gibson, Wilbur Saul, Bob Foster and others. We played in several State Tournaments and the Olympics with Colorado Springs. We had a traveling team that played games in Longmont, Loveland, Fort Collins and Francis E. Warren AFB

in Cheyenne, Wyoming. Some of the competition teams in the City League were A&W, Ready Mix, and teams from Windsor. Aluminum bats were just coming into use. Softball started out as separate men's and women's teams, but eventually became a co-ed sport at HP.

We made two softball fields east of the plant. A new field was finally built just north of Building D. It was named Fox Hill Park after the fox that roamed the land north of HP. It was dedicated by Bill Parzybok. A lot of hard work by Bob Gile, Kay and Robbie McCarthy helped get the park. Intramural softball remains a favorite pastime for a lot of HPites.

Intramural and City League basketball also attracted a lot of HP people. Ray King, John Hansen, Pete Smith, Dick Kekar, Dan Mirich and a host of others competed in the 5F league. Players, such as Rod Lampe, Bob Watson, Bob Olmstead, Dave Scoles, Dave Brown, Larry Lessman, Arlen Amundson, Ron Meyer, Arlan Massey, Ed Olander, Jerry Ward, Ed Pennington, Jim Colwell, Bob Rutz, Ben McGuire, Les Lotz, Glen Worstel, Jim Willard, Dick Kekar and others, were on the early HP teams. The competition included a team of mostly coaches from Loveland High School. Frank Javernick, Loren Wilcox, Gib Quadhammer, Terry McIntosh,

Dick Hewson, George Walbye and others were from the school district.

Olympic competition between Loveland and Colorado Springs grew and was supported by managers like Stan Selby and Don Cullen. Archery, bowling, softball, tennis, ping-pong, volleyball, basketball, swimming, golf and horseshoes were some of the events. Bowlers, like Jerry Harmon, Peck Walters, Jack Bray, Harry Krause, Jack Murata and Dixon Freeman, kept the competition tough. Horseshoe players, like Howard DeGabain, Virgil Shuetz, Marv Leamons, Danny Felker, Alan Fowler, and Don Reab, kept Loveland in the race. Many of the ping-pong players from the daily noontime competition also competed in the Olympics. John Hansen, Bill McCullough, Dennis Perry, Bob Watson, and Bob Olmstead proved more than worthy competition against the Springs volleyball team. Spence Futrell, Paul Baird, Bob Hardin, Jim Colwell, Ron Corbett and Wilbur Saul handled the ping-pong games. Al Dragis, Warren Porter, Carroll Pyle, Roy Melin and the rest of the golf team were tough. Glenn Gibson and Larry Carlson led the tennis effort. The Olympics had many women's teams competing in some of the same events also. Everyone had a good time, and a big picnic celebration followed the events.

Building A used to just have cement floors, then tile was added. Lunch was either a brown bag snack from home or a meal off Stan Williams' catering truck that drove in the west door of the building. Building B looked huge when it was empty and attached to the northeast corner of Building A. Building C came next and was the first to have a lower level. We used to watch the big caterpillars break up the shale when Building D was being constructed. The courtyard was carved out of shale. Cars were serviced in the shed west of Building A. Carpenter work was done by Johnny Harrison, while Glen Haber and Chuck Amen did a lot of welding for everyone.

Perfect attendance was noted by pictures printed in the Hi-Points magazine. Bill Hewlett's office sent out letters thanking people for their five and multiples of five-year awards. Starting pay for technicians in 1964 and 1965 was about \$2.50 an hour

and raises came out about every six months. A lot of technicians were hired in 1964 and 1965. Many came from Martin Marietta during the wind down of the Titan 2 missile program.

The half-day before Christmas was always a fun time. Just as it is today, except I think the coffee tasted different back then.

The thirty-five years that I have been here in Loveland have been priceless. Thousands of products have been shipped around the world from this plant. Many families have had the pleasure of having someone work here and many still are. It would be nice to hear a roll call of all the persons who have worked here in Loveland just to bring back memories. Wouldn't that be nice!!

Learning About “The HP Way” by Art Helgeson

During the winter of 1962, our family was living in Cheyenne, Wyoming. I was employed by General Dynamics as a technician to help activate the Atlas missile sites that surrounded Cheyenne at that time.

We often took drives to Loveland because it was so much more beautiful and friendly than Cheyenne. One day, while driving down Lincoln Avenue in Loveland, I happened to notice a Hewlett Packard sign on a building. I had used HP test instruments in the past and decided to stop in and see what HP was doing in Loveland. I found that HP was in the early stages of starting up a manufacturing operation. It was projected to have three large buildings and would hire 2,000 people in the next few years. We decided that HP would be a good place to be for future opportunities and set up a date for an interview.

I remember interviewing with Skip Beatty and then taking a basic electronics test. I also remember talking to personnel manager, Dan Mirich. Dan

made it very clear to me that if I were offered a tech. job at HP that the pay would be less than I was now making. He also stated that he never wanted to hear me complain about coming to HP and taking a pay cut.

Within a short time, I received an offer to be a production line tech. starting at \$2.40 an hour. At the time, I was making \$3.10 an hour in Cheyenne.

Taking a 22% cut in pay, plus going to work for a company I did not know much about, made the decision to accept a hard one. Also I had never worked on a production line and was not sure I would enjoy that. However, after the work for General Dynamics was done in Cheyenne, we would be transferred to Roswell, New Mexico, and we did not want to live there. We decided to accept HP's offer, and if HP did not work out I would find something else to do in Loveland. We were tired of moving around the country and even bought a home in Loveland before leaving Cheyenne.

HP wanted me to go to work on April 16, 1962.

If I terminated from General Dynamics of my own will I would not get paid for the vacation and sick leave I had accrued. If, on the other hand, General Dynamics terminated me I would get paid for the vacation and sick leave. So I went to my supervisor and asked if there was any way I could get laid off in the near future.

He said, "Is it worth a bottle of good scotch to you?"

I said, "It sure is."

The next day I had my termination papers and all of my checks. That evening I delivered the Scotch and said goodbye to my boss. I would now become the 221st employee at Loveland HP.

The first few days at HP I was trained by Bill Marr on how to test the 723A power supply. Bill was a good teacher, and after a few days I was on my own and enjoying the work.

Don Cullen was the manufacturing manager at the time, but I had not met him yet. I was getting ready to turn on another 723A when he came by and said "Do you know what you are doing?" I said "You bet I do." I promptly turned on the 723A, and it went up in a cloud of smoke. Don just laughed and went on his way. Boy was I embarrassed. A capacitor had been put in backwards, and as a result, it blew up when I turned the instrument on.

The General Dynamics Atlas project was totally funded by the U.S. Government on a cost plus basis and also had an open shop union. Coming from that environment to HP was a huge cultural change but a good one.

After six months at HP, I was asked to become a test supervisor. Now I had to learn about supervision, how to test all the instruments, and in addition, learn about "The HP Way".

Back in the early days, the first line supervisors were expected to spend 50% of their time doing direct labor so the supervisor duties were not that many.

We learned a lot about our products from HP engineers. They taught classes in the basement of the Old Armory building on Lincoln Street. The classes were in the evening, and both the engineers and technicians volunteered their own time. This was of great benefit to the technicians since most of them had no prior experience troubleshooting and testing HP instruments.

The more I learned about "The HP Way," the more I realized it was something that I believed in and was similar to my own values. I especially remember reading a speech that Packard had given in California in the early 1960s. He talked about having trust in people, and that he believed people wanted to do a good job. He also had a strong belief

that individuals should be treated with consideration, dignity, and respect. Over the years, I have found that trust is something a good supervisor or manager must earn by fair treatment of their people. Trust is hard to earn and easy to lose.

The fact that Bill Hewlett and Dave Packard actually came to our company picnics and served steaks was really impressive to me. The first picnic we attended was at Sylvan Dale in the summer of 1962. My wife, Audrey, and her friend, Norma had consumed a few cool beers as had most everyone else. When they came through the serving line, they gave two of the servers a hard time in a good-natured way. They later found out the two servers were Bill Hewlett and Dave Packard. Bill and Dave just laughed and thought nothing of it. Our new recreation area in the Big Thompson Canyon later opened, and Bill and Dave were there serving steaks and hamburgers at the annual HP picnic. Audrey and our children, Eric and Rene, were going through the serving line, and young children were supposed to be served hamburgers. But our two kids told Hewlett and Packard they wanted steaks. Bill asked Audrey, "Will they eat steaks?" She said "Yes," and so our kids got steak.

The HP board of directors meeting was at Loveland in 1966. During one of the meeting

breaks, Dave Packard wandered out to the production lines and sat down with some of the second shift techs and talked about cattle ranching.

Dave and Bill toured our production area in Building A shortly after we started producing the 3440A digital voltmeter. I was very much impressed by how much they knew about the 3440A, and they made our group feel good about producing a real winning product.

As time went on, I learned about managing by objective and "managing by walking around." Bill and Dave felt you really did not know what was going on unless you sometimes wandered through your area and talked to people one on one. This also helped to build trust between employees and management.

Part of "The HP Way" was to be able to enjoy the work you were doing. The people in my group worked hard but also often had a good laugh. The one event I will never forget is during a period of time when it seemed every month someone in my group was becoming pregnant. There was already the title of "Housemother" in production, but I soon became known as the "Housefather." One day I came to work and every one of the 40 women in my group was wearing a maternity dress and looked like they were eight months pregnant. What a shock that

was, but we all had a good laugh.

During my 30 years of working at HP, I became a firm believer in “The HP Way” and I hope it remains part of the HP culture as HP continues to grow.

The coming of desktop computers, e-mail, voice-mail, and the internet have been wonderful and necessary tools. But they have taken away much of the one on one contact between management and workers.

Today, I would imagine that managers and supervisors have difficulty finding time to “manage by walking around” as often as they used to. They have more people reporting to them and do many of the things the personnel department used to do.

I can't help but wonder what Bill and Dave would say and do to preserve “The HP Way” in today's environment if they were still in charge.

The Golden Years: A Workplace of Simple Virtues

by Walter A. Skowron

HP in 1961-71 was a model company of simple values thriving on rapid innovation from the integrated circuit era comprising the world of electronics. In 1961, a Soviet astronaut became the first human space traveler. This brought about a national sense of urgency that brought forth one of the greatest decades of innovative American science and technology. During this time, HP was well positioned to become a major contributor providing staggering achievements in test and measurement application technology. Those were the golden years when HP Loveland created many blueprints for success in playing a major part in fields as diverse as microelectronics embracing the latest technologies to marry instruments with computers. These were the golden years, the Old Testament days, its "HP Way" having produced accelerated growth and prosperity for everyone in the HP organization. HP's "managing by walking around" and "open door policies" undisputedly gave all employees the feeling

that HP's most precious asset was the people working for the company. There were beer busts, picnics, free coffee and donuts everyday, expensive Christmas presents for HP employee children, and individualized tender loving administrative support for all employees who needed assistance when medical, educational and financial assistance was required. All employees could borrow shop tools for home projects, and there was no security, fences or barriers preventing anyone from entering the HP facility to see friends and family. HP employees were paid the dues to participate in local service clubs and other organizations that would make HP people an integrated part of the community. It wasn't HP but changes in the actions and behavior of our society that forced the cancellations of these wonderful employee benefits.

The rapid growth in the high-tech world has changed things at HP Loveland. HP is now 60 years old and \$47 billion in size. It is no longer easy to

keep up with newer and flashier competitors. This is not only true for HP Loveland, but the stories are familiar everywhere. At one time, we were told that the computers would reduce our workloads giving us more time for fun and relaxation with our friends and families. Instead, we work longer hours to do better than the competitors selling the same product to the same customer with more features and benefits at a lower sales price. Accelerated reorganizations and changes take place at work. Some changes create happiness and good fortune. Some changes create depression and even hopelessness because of the mammoth changes that have taken place in the modes of work over the past 27 years and which will continue for many years to come. HP remains a great company. The Test & Measurement part of HP will soon become a separate independent company that nobody should count out! It is the making of a

new Technology Czar that has the people and “The HP Way” philosophy sure to make this new company the talk of the industry, similar to Lucent (formerly Bell Labs when it was AT&T).

My career with HP was magnificent, not because of the growth from \$400 million to \$47 billion that I have experienced over the last 37 years. It is because of the people I have worked with teaching me those simple virtues...where people are an organization's greatest asset. Perhaps those who read about HP-Loveland in the Golden Years from 1962-1972 will appreciate why “The HP Way” has played such an important role in our lives.

Early History in the Formation of HP Loveland R&D

by Noel Pace

In 1961, the R&D labs at HP in Palo Alto were organized into four product or market areas: Audio-Video; Microwave; Oscilloscopes; Frequency Counters.

Products from the Audio-Video lab were, on the whole, less complicated than the others, and the first products moved to Loveland for manufacturing were transferred from this area. In the beginning, Loveland was designated as a manufacturing expansion site, and R&D wasn't part of the early plans.

In 1962, a small R&D lab was formed at Loveland under the direction of Marco Negete. This lab was housed in the north end of the Quonset hut located at First and Lincoln. Products transferred from Palo Alto for manufacturing were the 721A and 722A power supplies, 204A Oscillator, 403A Voltmeter, 350A Attenuator and, I believe, the 405A Digital Voltmeter. Because of the selection of these instruments, the R&D Lab at Loveland eventually became the Audio-Video Product line.

John Cage was the HP Palo Alto Audio-Video manager and later was succeeded by Paul Stoft. The 403B was the first product designed at Loveland followed by the 353A Patch Panel. These products were packaged in a System I cabinet and combined with the 203A Oscillator to form the Telephone Test Set. The Telephone Test Set was targeted for the Bell system, but it sold more to the U.S. Army and the railroads. Prior to focusing on the Audio-Video product line, Loveland R&D had begun efforts to develop a series of power supplies. This effort was stopped when HP purchased the Harrison Power Supply Company, which later became the New Jersey Division. I believe Barney Oliver was a director of this company.

The next products were the 651A, 652A, 331A, 465A, 740A, 741A and so on.

THE AUTHOR

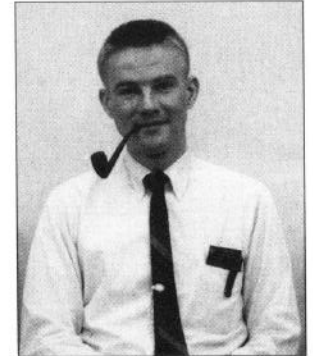
As the 5,618th employee hired by Hewlett-Packard, Kenneth Jessen worked for thirty-three years in a variety of engineering and management positions. In 1965 he began work in Product Training, located in Palo Alto. Most new hires were placed in this particular department to allow them to become familiar with the product line and to introduce them to customers. Ken's particular job was to assist in training HP customers on the use of microwave products.

The next move for Ken was to International Sales Support, sitting only fifty feet from Dave Packard's office in 3U. It was here that Ken learned that Bill and Dave were exceptional people. When the Loveland Division began its rapid growth, Ken was offered a position in Loveland's Sales Support group by Loveland's Marketing Manager, Tom Kelley. Over the years, Ken has held a variety of positions, including Advertising Manager, Service Engineer, Service Engineering and Technical Publications Manager, Physical Distribution Manager, Material Engineer, New Product Engineer, Application Center Fixture and Library Development Manager, Manufacturing

Engineer and Program Manager for several projects. Ken also holds one patent for HP.

As an author, Ken has written numerous articles and books. His technical articles written for Hewlett-Packard have appeared worldwide in almost all of the major magazines in the electronic industry, and have been translated into Chinese, Italian, French and German. Topics have ranged from how to monitor global pollution, how modern automobile braking systems work, the purging of silt in a harbor, the differences between Windows NT and Windows 98, to testing Formula One racecars. In addition to over 500 articles, Ken is the author of nine books on Colorado history, and presently has a column in the *Loveland Reporter-Herald* covering Colorado ghost towns. His latest writing project is a three-volume set of books titled *Ghost Towns, Colorado Style*.

Now retired from Hewlett-Packard, Ken continues to work part-time as a systems design engineer for TSO on a contract basis.



The author in 1969 while working in the Loveland Instrument Division Marketing Department.

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