

Tektronix



Building 50 at the company's headquarters

Type	Subsidiary of Fortive
Traded as	<ul style="list-style-type: none">• NYSE: FTV• S&P 500 Component
Industry	Electronic Equipment
Founded	1946 (Oregon , United States)
Headquarters	Beaverton, Oregon United States Tami Newcombe, President ^[citation needed]
Key people	Howard Vollum , Cofounder Melvin Jack Murdock , Cofounder
Products	Testing Equipment, Measurement Equipment
Revenue	US\$1,039.9 million (FY 2006) ^[citation needed]
Operating income	▲ US\$118.7 million (FY 2006)
Net income	▲ US\$92.4 million (FY 2006)
Number of employees	4,359 (2006)
Parent	Fortive
Website	www.tek.com

Tektronix, Inc., historically widely known as **Tek**, is an [American](#) company best known for manufacturing test and measurement devices such as [oscilloscopes](#), [logic analyzers](#), and video and mobile test protocol equipment.

Originally an independent company, it is now a subsidiary of [Fortive](#), a [spinoff](#) from [Danaher Corporation](#).

Several charities are, or were, associated with Tektronix, including the Tektronix Foundation and the [M.J. Murdock Charitable Trust](#) in [Vancouver, Washington](#).



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History

1946–1954



Versatility... Plus

The Tektronix Type 511 is a portable wide-band oscilloscope providing facilities formerly available only in very expensive, cumbersome instruments.

SWEEP CHARACTERISTICS
Continuously variable 1 second to 1 microsecond (10 cm. deflection).
Direct reading sweep speed dial.
Choice of triggered, recurrent or single sweeps at all speeds.
Triggers on sine waves to 10 mc. or pulses over 250 microseconds.
Any 20% of sweep may be expanded 5 times.
DC coupled RF amplifier for external sweep input.

VERTICAL DEFLECTION SYSTEM
Amplifier Bandwidth 10 mc., 1 stage, 8 mc., 3 stages.
Rise Time .24 microsec., 1 stage; .25 microsec., 3 stages.
Maximum Sensitivity 27 V/cm. (Peak to Peak).
Input Impedance Direct 1 meg., 40 db.; Probe 10 meg., 11 db.

MISCELLANEOUS
Calibrating voltage 0.1, 0.25, 0.100 volts, 40 cycles.
CRT 5C71A, 5C97A or 5C71A operating at 5 kv.
Direct connection to all plates from side panel.
Total weight 45 pounds, self contained.

Price \$795.00 f.o.b. Portland
Your inquiry will bring more detailed information and name of the nearest Field Engineering Representative.

Phone, EAst 4885
Cable, TEKTRONIX

712 S. E. Hawthorne Blvd.
Portland 14, Oregon

ELECTRONICS—September, 1946

Advertisement from an engineering magazine touting the features of the Tektronix 511. The model 511 set Tektronix as a future leader of oscilloscope products

The company traces its roots to the electronics revolution that immediately followed [World War II](#), and was first founded in December 1945, as Tekrad. However, the name was similar to that of a California company, Techrad, and so, in 1946, the four partners, [Howard Vollum](#), along with [Jack Murdock](#) and Miles Tippetery, who had both served in the [Coast Guard](#), and accountant Glenn McDowell, formed Tektronix, Inc., with each contributing an initial \$2,600 for equal shares. ^{[1][2]}

Howard Vollum had graduated in 1936 from [Reed College](#) with a degree in physics and a keen interest in oscilloscopes, then worked as a radio technician out of [Jack Murdock's](#) Murdock Radio and Appliance Company (M.J. Murdock Company) prior to the outbreak of war, during which he served in the [Signal Corps](#). Following the founding of Tektronix, Vollum invented the world's first triggered [oscilloscope](#) in 1946, a significant technological breakthrough. ^[3] This oscilloscope, refined and developed by Tektronix, was the model 511. The model 511 was a triggering with sweep oscilloscope. The first oscilloscope with a true time-base was the Tektronix Model 513. ^[4]

The leading oscilloscope manufacturer at the time was [DuMont Laboratories](#). DuMont pioneered the frequency-synch trigger and sweep. ^[5] [Allen DuMont](#) personally tried the 511 at an electronics show and was impressed, but when he saw the price of \$795, which was about twice as much as his equivalent model, he told Howard Vollum at the show that they would have a hard time selling many. ^[6]

Tektronix was incorporated in 1946 with its headquarters at SE Foster Road and SE 59th Avenue in [Portland, Oregon](#), ^[7] just six blocks from Murdock's first family home. ^[8] In 1947 there were 12

employees. Four years later, in 1951, Tektronix had 250 employees.^[7] Murdock and Vollum were known [humanitarians](#) and sought to operate their business as one might run a large and caring family.^[9] In 1978, Tektronix was named by authors Robert Levering and Milton Moskowitz, et al, as among *The 100 best companies to work for in America* in their book of the same name.^[10]

By 1950 the company began building a manufacturing facility in [Washington County, Oregon](#), at Barnes Road and the [Sunset Highway](#) and, by 1956, had expanded the facility to 80,000 square feet (7,000 m²).^[7] The company then moved its headquarters to this site, following an employee vote.^[7]

A detailed story of Howard Vollum and Jack Murdock along with the products that made Tektronix a leading maker of oscilloscopes can be found at the Museum of Vintage Tektronix Equipment.^[11]

1955–1969

In 1956, a large piece of property in nearby [Beaverton](#) became available, and the company's employee retirement trust purchased the land and leased it back to the company.^[7] Construction began in 1957 and on May 1, 1959 Tektronix moved into its new Beaverton headquarters campus,^[7] on a 313-acre (1.27 km²) site which came to be called the Tektronix Industrial Park.^[12]



Tektronix 321- Their First Battery Operated Transistor Oscilloscope. LEFT- Later Version
RIGHT- Earliest Version

In the late 1950s (1957–58), Tektronix set a new trend in oscilloscope applications that would continue into the 1980s. This was the introduction of the plug-in oscilloscope. Started with the 530 and 540 series oscilloscopes, the operator could switch in different horizontal sweep or vertical input plug-ins. This allowed the oscilloscope to be a flexible or adaptable test instrument. Later Tektronix would add in plug-ins to have the scope operate as a spectrum analyzer, waveform sampler, cable tester and transistor curve tracer. The 530 and 540 series also ushered in the delayed trigger, allowing to trigger between a sweep rather than at the beginning. This allows more stable triggering and better waveform reproduction.^[13]

In 1961, Tektronix sold its first (possibly the world's first practical) completely portable oscilloscope, the model 321. This oscilloscope could run on AC line (power mains) or on rechargeable batteries. It also brought the oscilloscope into the transistor age (only a Nuvistor

ceramic tube was used for the vertical amp input). A year and a half later the model 321A came out and that was all transistors.^[14]



The Model 564 First Mass Produced Analog Storage Oscilloscope

The 560 series introduced the rectangular CRT to oscilloscopes. In 1964 Tektronix made an oscilloscope breakthrough, the world's first mass-produced analog storage oscilloscope the model 564. [Hughes Aircraft Company](#) is credited with the first working storage oscilloscope (the model 104D) but it was made in very small numbers and is extremely rare today.^[15]

In 1966, Tektronix brought out a line of high frequency full function oscilloscopes called the 400 series. The oscilloscopes were packed with features for field work applications. These scopes were outstanding performers often preferred over their laboratory bench models. The first models were the 422, a 16 MHz bandwidth and the 453, a 50 MHz bandwidth model. The following year the 454, a 150 MHz portable.^[16] These models put Tektronix well ahead of their competitors for years. The US Military contracted with Tektronix for a model 453 "ruggedized" for field servicing. The 400 series models would continue to be popular choices in the 1970s and '80s. In addition the styling of the 400 series would be copied by Tektronix's competitors. 400 series oscilloscopes were still being used as of 2013.^[17]

1970–1985

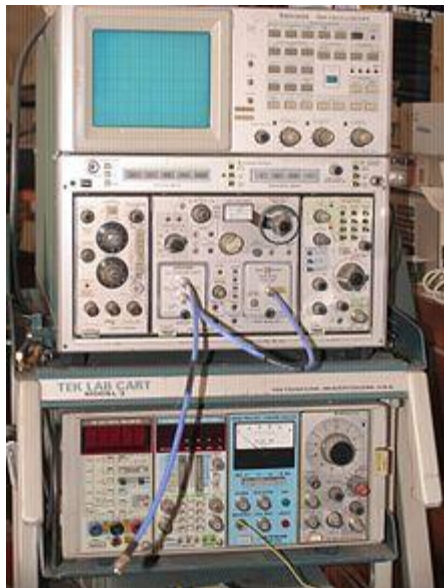


A Tektronix model 475A portable analog oscilloscope, a very typical instrument of the late 1970s.

The company's [IPO](#), when it publicly sold its first shares of [stock](#), was on September 11, 1963.^[citation needed] In 1974, the company acquired 256 acres (1.0 km²) in [Wilsonville, Oregon](#) where it built a facility for its imaging group.^[7] By 1976, the company employed nearly 10,000, and was the state's largest employer.^[7] Tektronix's 1956 expansion and, in 1962, [Electro Scientific Industries'](#) similar move to Washington County and expansion are credited with fostering the development of a large high-tech industry in Washington County, a number of firms which collectively are often referred to as the "[Silicon Forest](#)".^[12]

For many years, Tektronix was the major electronics manufacturer in [Oregon](#), and in 1981, its U.S. payroll peaked at over 24,000 employees. Tektronix also had operations in Europe, South America and Asia. European factories were located in [Saint Peter's, Guernsey](#) (then in the [European Free Trade Association](#)) until 1990,^[18] Hoddesdon (North London, UK) and [Heerenveen, Netherlands](#) (then in the [European Common Market](#)). Some oscilloscopes marketed in Europe and the UK were sold under the brand name Telequipment but many in the UK used the Tektronix brand name in the 1960s and 70s.

For many years, Tektronix operated in Japan as Sony-Tektronix, a 50-50 joint venture of [Sony Corporation](#) and Tektronix, Inc; this was due to Japanese trade restrictions at the time. Since then, Tektronix has bought out Sony's share and is now the sole owner of the Japanese operation.^[19] Under the Sony-Tektronix name, the 300 series oscilloscopes were light weight and totally portable. They replaced the model 321/321A oscilloscopes. Examples of the Sony/Tektronix models were 314, 323, 335 and 370.



Tektronix 7854 oscilloscope with other equipment

During the early 1970s, Tektronix made a major design change to their oscilloscopes. The 5000 and 7000 series oscilloscopes maintained the plug-in capabilities that originally started with the

530 and 540 series; however, the choice of plug-ins was even greater. These scopes used custom designed integrated circuits fabricated by Tektronix. The CRTs were all rectangular and were all fabricated by Tektronix. These oscilloscopes provided on screen controls setting. The 5000 series was the general purpose line while the 7000 series were capable of a wide variety of applications and could accept as many as 4 plug-ins. One model the 7104 (introduced 1978) was a true 1 GHz bandwidth oscilloscope.^[20]

Beginning with the firm's first cathode ray [oscilloscopes](#), Tektronix has enjoyed a leading position in the test and measurement market. Although its equipment was expensive, it had performance, quality, and stability. Most test equipment manufacturers built their oscilloscopes with off-the-shelf, generally available components. But Tektronix, in order to gain an extra measure of performance, used many custom-designed or specially-selected components. They even had their own factory for making ultra-bright and sharp CRT tubes. Later on, they built their own [integrated circuit](#) manufacturing facility in order to make custom ICs for their equipment.^[citation needed]

Tektronix instruments contributed significantly to the development of [computers](#), test, and [communications](#) equipment and to the advancement of [research and development](#) in the [high-technology electronics](#) industry generally.

Tektronix as time went on fabricated more and more of their electronic parts. This led to very specialized skills and talents which in time led to employees forming new businesses. Some former Tektronix employees left to create other successful "Silicon Forest" companies. [Spin-offs](#) include [Mentor Graphics](#), [Planar Systems](#), [Floating Point Systems](#), [Cascade Microtech](#), [Merix Corporation](#), Anthro Corporation and Northwest Instrument Systems (NWIS) - later renamed to MicroCase. Even some of the spin-offs have created spin-offs, such as [InFocus](#). As Tektronix fabricated more specialized parts, they spread out their product base to include logic analyzers, digital multimeters and signal generators. The TM500 and TM5000 rack mount series was born featuring custom designed test instruments chosen by the buyer.

During this period, Tektronix acquired what were sold as the 8000 and 8002 Microprocessor Development System (MDS), the 8000 being a software development system running editors and cross-compilers with twin floppy disk storage, while the 8002 could be fitted with [real-time emulators](#) for several processors including the [8080](#), [Z80](#) and [6502](#). These were later replaced by the 8540/8550/8560.^[21] The 8550 was a standalone development system capable of being fitted with real time emulation hardware for several different processors. The 8560 emerged just after [Bell Labs](#) were able to sell [UNIX](#) commercially, and ran a mildly modified version of [Version 7 UNIX](#), called TNIX, supporting 4 or 8 (depending on how many I/O processor cards were fitted) serial terminals, with a special High-Speed Input/Output, based on RS-422, to connect to a remote 8540. There was a hard drive of about 34MB, later increased, and a variable amount of RAM depending on the processor card fitted, which was either a DEC LSI11-23+ or a LSI11-73, which had a wider address bus as well as a higher clock speed. The final upgraded variant was the 8562. The 8540, of which several could be connected to the 8560, contained emulation hardware similar to that available for the 8550, including RAM cards, Trigger Trace Analyser, 1 or 2 processor emulator cards, each with external probe, etc. The 8540 had no software development capability, but worked with the 8560, or other systems such as a [VAX](#), which

would provide the software development environment. It was unique in its day, in that the serial terminal could be connected to the 8540, on the bench, or to the 8560, and would pass UNIX commands automatically to the 8560, which passed emulator commands back to the 8540 for execution, completely transparently. Thus a complete compile, link, load and emulate session could be run from a UNIX shell script, a facility probably not seen on any development system since. The 8540/8550/8560 supported many 8-bit and 16-bit microprocessor types, with a change of emulator cards and probes, and installation of assembler and possibly compiler software, and did not require any particular code to be linked in to the user's code to facilitate register tracing at breakpoints, a shortcoming of the only real alternative multi-manufacturer MDS of that era, by [HP](#). However, an impressive feature was that by including a special instruction sequence, typically a double NOP followed by a call to a specific address, the emulator would generate a "Service Call" to take whatever action the user required, and continue execution. This for example could allow UNIX to write variables to a log file as commanded by the running program on the emulated microprocessor.

It is not clear at present why Tektronix eventually withdrew from the MDS business, as their products were highly regarded.

1986–2006



Old logo

Tektronix faces big challenges to its business structure. In the 1980s, Tektronix found itself distracted with too many divisions in too many markets. This led to decreasing earnings in almost every quarter. A period of [layoffs](#), top management changes and sell-offs followed. In 1994, Tektronix spun off its [printed circuit board](#) manufacturing operation as a separate company, Merix Corp., headquartered in [Forest Grove, Oregon](#).^[22] Eventually, Tektronix was left with its original test and measurement equipment. Upon his promotion in 2000, the current CEO, Richard H. "Rick" Wills, carefully limited corporate spending in the face of the collapsing [high-tech bubble](#). This led the way for Tektronix to emerge as one of the largest companies in its product niche, with a [market capitalization](#) of \$3 billion as of April 2006. However, this failed to prevent it from becoming an acquisition target, and Tektronix was acquired by [Danaher Corporation](#) in 2007.

Major Product Changes—Digital Sampling Scopes. With the advancement in signal sampling techniques and digital processing, oscilloscope manufacturers found a new horizon in the market. The ability to sample the signal and digitize it for real time viewing or digitally store it for future use and maintain the integrity of the waveform. In addition a computer can be integrated with the scope to store many waveforms or instruct the scope to do further analysis. Color enhanced waveforms can be produced for ease in identification.

Tektronix was heavily involved with designing digital sampling oscilloscopes. In the mid-1980s, they quickly replaced their analog oscilloscopes. Their 400, 5000 and 7000 series oscilloscopes

were replaced with a new generation of digital oscilloscopes with storage capability, the 11000 and TDS series. The 11000 series were large rack mount laboratory models with large a flat CRT face and had touch screen, multiple color, and multiwaveform display capability. They were still plug-in units and could accept the older 7000 series 7- plug-ins and the new 11000 series 11A- plug-ins. The TDS series replaced the 300 and 400 series portable line. They had the same panel layout but with enhanced storage and measuring capabilities. During this period Tektronix would also expand its test equipment line to logic analyzers, signal generators etc.

By the mid 1990s the use of the CRT was dropped and Tektronix started using LCD panels for display. The 11000 series would be replaced by the MSO (Mixed Signal Oscilloscope) which featured a color active matrix LCD. The TDS continued but with LCD panels starting with the TDS-210. In the TDS models, the lower priced models replaced the last of the 2000 series analog scopes and featured monochrome display while the higher end models were color LCD models which were more like the older 400 series scopes in performance. Spinoffs of the TDS was the TBS storage scope series. Later Tektronix would replace the 200 mini oscilloscopes with the TH series hand held digital oscilloscopes. All TDS and spinoff series with LCD display are totally portable (light weight and can run AC or on batteries).

2007 to present

On November 21, 2007, Tektronix was acquired by [Danaher Corporation](#) for \$2.85 billion. Prior to the acquisition, Tektronix traded on the [New York Stock Exchange](#) under the symbol *TEK*, the nickname by which Tektronix is known to its employees, customers, and neighbors. On October 15, 2007, [Danaher Corporation](#) tendered an offer to acquire Tektronix for \$38 cash a share, which equated to a valuation of approximately \$2.8 billion.^[23] The deal closed five and a half weeks later, with 90 percent of TEK shares being sold in the tender offer.^[24] Also, as part of its acquisition by Danaher, the Communications Business division of Tektronix was spun off into a separate business entity under Danaher, Tektronix Communications.

The digital oscilloscope line that was introduced in the 1990s (MSO, TDS, TH series) are still being manufactured in some form.^[25]

On February 1, 2016, Tektronix introduced a new logo design, replacing a logo that had been in use since 1992, and indicated a shift in strategy to offer measurement products tailored for specific fields such as computing, communications and automotive.^[26] Danaher spun off several subsidiaries, including Tektronix, in 2016 to create Fortive.^[27]

Early oscilloscope models

For individual model history Tektronix and Tektronix Collectors has complete details. Just go click to the reference number next to the Tek Product Series. You will be directed to the latest link.

1. 7000 series oscilloscopes and plug-ins 1970-1985^[28]
2. 5000 series oscilloscopes and plug-ins 1970-1985^[29]
3. 2000 series portable oscilloscopes (1978-?)

4. 500 series oscilloscopes and plug-ins 1946-1970^[30]
5. 400 series portable oscilloscopes and spectrum analyzers 1966-1989^[31]
6. 300 series portable oscilloscopes 1952-1969?^[32]
7. 200 series portable oscilloscopes (1975-?)

'Non test' products

Some important non-test equipment Tektronix created and sold include:

- [Tektronix 4014 computer terminal](#)
- [Tektronix 405x](#) graphical microcomputers
- [Tektronix 408x](#) graphical minicomputers (original [DRADIS of Battlestar Galactica](#))
- [Tektronix FEM181](#) Finite Element Modeling software system
- [Tektronix 4115](#) color raster scan graphics or the TGRAPH emulator
- [Tektronix 6130 NS 32016](#) workstation series running UTek, a [4.2BSD](#) clone
- [Tektronix 4300 Motorola 68020](#) graphic workstation series running UTek, a [4.2BSD](#) clone
- [Tektronix XD88 Motorola 88000](#) graphic workstation running [Utek V](#), another Tektronix Unix based on Unix System V Release 3
- Flatbed [plotters](#) used with Tektronix computers
- TekXPress [X-terminals](#), later sold to [Network Computing Devices](#)
- [Phaser](#) -branded color [computer printers](#), including their pioneering [Solid Ink](#) models, sold to [Xerox](#) in 1999
- [Television studio](#) and [video production](#) equipment manufactured by onetime Tek subsidiary [Grass Valley Group](#), which was spun off as an independent company (and later bought by [Thomson SA](#)). The Grass Valley brand is now owned by [Belden](#).

Notable employees

The following notable individuals currently work for Tektronix, or have previously worked for Tektronix in some capacity. This list includes persons who are notable for reasons unrelated to their Tektronix careers.

- [Howard Vollum](#): founder, former President and chairman of the board, recipient of the [Legion of Merit](#) award for work on radar for England in WW II, noted philanthropist. (See [Howard Vollum Award](#))
- [Jean Auel](#): technical writer; author of Children of Earth novels
- [Kent Beck](#): engineer; [Extreme Programming](#) developer
- [Tom Bruggere](#): engineer; later founded [Mentor Graphics](#) in 1981; 1996 candidate for [United States Senate](#)
- James B. Castles: [General Counsel](#); one of three original Trustees of the [M.J. Murdock Charitable Trust](#)
- [Ward Cunningham](#): engineer; [Extreme Programming](#) developer, inventor of the [wiki](#)
- [Miller M. Duris](#): politician who served as mayor and county commissioner^[33]
- [Barrie Gilbert](#): popularized the *Gilbert cell*, a type of [electronic mixer](#)

- [Robert W. Lundeen](#): Director, CEO
- [Vivek Maddala](#): composer and musician
- [Steven McGeady](#): engineer; later [Intel](#) Vice-President and co-founder of [Intel Architecture Labs](#)
- [Merrill A. McPeak](#): Director; former US Air Force chief of staff
- [Keith Packard](#): engineer; [X Window System](#) developer
- [Randal L. Schwartz](#): [Perl](#) and computer security expert, author
- [Norm Winningstad](#): engineer; founder of [Floating Point Systems](#), author
- [Rebecca Wirfs-Brock](#): engineer; technical lead for first commercial [Smalltalk](#) implementation; author of books on [object-oriented programming](#)
- [Delbert Yocam](#): former President, [COO](#); former COO of [Apple Computer](#)
- Craig Ryan: Technical writer, author of non-fiction Sonic Wind and film of same title.
- William D. Walker: former President, COO; former President of [Electro Scientific Industries](#), former President of [Planar Systems](#), former chair of Tek Foundation, former board of [Oregon Graduate Center](#).

See also

- [Semiconductor curve tracer](#)
- [Waveform monitor](#) / [Vectorscope](#)
- [First Tech Credit Union](#), originally Tektronix Federal Credit Union
- [Tektronix Analog Oscilloscopes](#)
- [List of companies based in Oregon](#)
- [SyntheSys Research](#)