**~ 1970:**

* John Rex Warren had a knack for programming Litton tape drive based computers and slowly started to build up a small name for himself in writing software for these machines
* Bud was working as a detective and Bud’s sister was married to John Warren
* Litton Industries decided to drop support for their systems and John saw an opportunity

**1971:**

* Warrex Computers was created by Bud Smith and John Rex Warren using $4,400 (half Bud’s severance pay, half John’s money) in San Antonio, Texas
* Warrex Computers was incorporated with John, Bud and Bud’s sister as the co-founders
  + John was a notoriously sketchy person however, often using company funds to buy himself fancy toys, or spending time with one of his many girlfriends

**1972:**

* John meets with Terry Little, Henry Arnold and Bob Wohlander in San Antonio, who were ex-Litton employees
* Terry knew manufacturing, Henry and Bob knew engineering, John knew programming and Bud knew business and marketing
  + This combination of skills allowed Warrex to get off the ground
* At some point in the early 1970s, Warrex relocated to Dallas, Texas
* This team provided new software packages and tech. support to customers that had Litton computers

**The EE200:**

* One day Bud gets a call from a Bank who is a customer and they want a new computer
  + They’re sick of how difficult and unreliable the Litton is
  + They want Warrex’s programs and support on a new machine
  + Bud searches high and low and finally comes across [Eldorado Electrodata](http://www.bitsavers.org/pdf/eldoradoElectrodata/)
* The Eldorado Electrodata design featured three CPU cards on a passive backplane
  + This was called the [EE200](http://www.bitsavers.org/pdf/eldoradoElectrodata/ee200_Brochure_1972.pdf) and was the primary hardware used by Centurion for many years
  + The Warrex teams figures they can work with this hardware
* Warrex then became an official Eldorado Electrodata dealer
  + Warrex, [Fedder Data Centers](https://trademarks.justia.com/722/43/fedder-data-centers-72243234.html) and (we believe) Computer Development Inc. (CDI/IPC) all three became dealers for Eldorado
  + The three dealers had a contract that if Eldorado failed, they would receive perpetual rights to continue producing the technology (the EE200)
* Warrex sold EE200 systems with a Sykes drive and core memory
* Bud quits Warrex and then joins again after a month
  + John was continually stealing money from the company and Bud had had enough
  + John desperately need Bud, and Bud needed the money, so Bud rejoined
  + However, Bud made John sign a 5-page contract that forced him to be less shady
* After a few months of selling and maintaining EE200 based tape systems, Henry, Terry and Bob become partners
  + John = 30%, Bud = 30%, Henry = 13.3%, Terry = 13.3%, Bob = 13.3%
* John wrote powerful accounting and inventory software packages that ran on the EE200 tape based systems
* Eldorado goes bust and control of technology is handed over to Warrex, Fedder and CPI
  + Additionally, Eldorado had built a huge number of backplanes and CPU boards and this stock was redistributed among the dealers who gained control of the technology

**1973:**

* Bob Christensen (BC) and Steve Webking get hired sometime around early 1973 for engineering work
* At this point, the Control Data Corporation (CDC) 9427 Hawk drive is the wave of the future
  + The 9427 is the precursor to the 9427H used in our Centurion system
  + It features 10MB of storage, 5MB removable and 5MB fixed
  + The platters spin at near 3,000 RPM and seek times are lightning fast

**The First Warrex/Centurion Computer**

* John Warren started writing the random-access [Operating System](https://github.com/Nakazoto/CenturionComputer/wiki/Operating-System) (notably [JCL](https://github.com/Nakazoto/CenturionComputer/wiki/JCL-(Job-Control-Language)))
* Getting the EE200 based hardware to work with the Hawk drive proved difficult
  + The EE200 had some random-access issues and required redesigning a bit to work better with Hawk
  + DMA access was also necessary and so a fourth board was dedicated to that (unclear as to who was supplying the DMA boards at this time)
  + The CPU4 system was so named because it utilized four cards - three CPU cards and a DMA card
* Warrex built a fake case that looked fancy and got a beautiful model (Jan Gibson) to pose with it on the steps of the capital (this brochure specifically)
  + This photo and brochure was used as a bargaining tool to build a line of credit with CDC for Hawk Drives
* CDC gave Warrex a $200,000 line of credit
* Warrex started selling the first CPU4 systems
  + CPU: Modified EE200 CPU cards + DMA card
  + Memory: 4k core Fedder built 16k DRAM
  + Storage: 9427 Hawk and Sykes tape compatible
  + Communication: ???
  + Peripherals: ???

**1974:**

* In late 1973/early 1974 Warrex joined a trade show in El Paso, debuting the CPU4 system
  + Warrex was the only vendor using the Hawk
  + The lightning fast drive combined with John’s powerful applications meant that Warrex absolutely killed it at the show
  + They were taking orders for systems at the actual show
* Warrex was involved in some litigation [with IBM in 1974](https://github.com/Nakazoto/CenturionComputer/blob/main/Reference/Ads/Screen_Shot_2022-04-15_at_12.41.13_AM.png), unsure as to what
  + Bud was unfamiliar with this litigation
  + We believe it was potentially against John for non-payment of something
* Warrex starts selling Centurion computers all over the state of Texas
* Bud Smith is working very closely with CDC to continue receiving drives
  + At one point, Bud sold two systems, but only had one Hawk drive
  + They would install it for two weeks at one customer’s location, then say it had a problem, and carry it over to the other customer’s location for two weeks
  + They kept up this lie of Hawk “problems” to share the drive between two customers long enough to get a second drive
* As the company grew and demand for systems increased, they needed more space
  + They moved to their location on Arapaho

**1975:**

* Ken Romaine joins Centurion as 6th employee and first non-family employee
  + Ken worked with Centurion from August 1975 to March 1986
* Warrex was using the Hawk disk controller model “A” Disk Controller from Fedder Data Systems
  + The Fedder model “A” Hawk Disk Controller had design problems causing data to occasionally be written in the wrong disk sectors
  + This forced Warrex to design their first PCB’s the [DSK/AUT and DSK-II](https://github.com/Nakazoto/CenturionComputer/wiki/DSK-AUT-and-DSK-II-Boards) (p/n 1001 & pn 1002)
    - These would read the Sector Address “before” writing data into a sector, solving the problem
* Warrex designed its first memory PCB to replace the EE200 4KB core memory & Fetter’s 16KB memory cards.
  + The Warrex 32KB memory board (p/n 1003) was a 4-layer PCB using TI’s 22 pin 4K bit DRAM memory chip.
    - The 2nd engineering prototype 32K memory burned up damaging all DRAM chips because of a mod-wire error on the refresh timer circuit
* Warrex designed its first 4-Port MUX as well as Parallel Printer Interface

**1976:**

* Warrex built the wood cabinet tops and sides, as well as the CRT tables in their own dedicated woodworking shop
  + The shop caught fire and nearly bankrupted the company
    - Some CPU4 PCB artwork was on the drafting table at the time of the fire and was subsequently lost in the fire
  + As a result of the fire and loss of the artwork, Warrex designed replacement 4-layer PCBs for the CPU1, 2, 3 and DMA cards
  + Now Warrex had its own CPU1, 2, 3 and DMA cards now on 4-layer PCB’s not 2-layer PCBs
* John Rex Warren was driving through west Texas when a tire blew and he was killed in a car crash
  + John was driving a 1975 C3 Corvette at triple digits through west Texas heading from Odessa to Midland
    - John had an old girlfriend in Midland he wanted to visit
    - The police estimated at least 140 MPH
  + The Vette had Firestone tires and the Warren family got into legal battles with Firestone & GM
  + Ken Romaine was supposed to join John that night, but he had service calls in East TX that kept him to Midland / Odessa (whoa!)
* After John’s death, the company name changed from Warrex to Centurion
  + Centurion is the “Guardian of the People’s Data” (according to Bud)
  + Rumor is the employees liked the cop movie “The New Centurions”
* Around this time, Jerry Coolridge of Litton Industries left the company and took around 9 other Litton employees with him
  + Jerry approached Bud about working with Warrex/Centurion
  + This original group of 10 became the first Centurion dealers
  + Almost overnight, Centurion had a far reaching dealer network

**1977 ~ 1978:**

* Steve Jobs and Bill Gates approached Bud at the [West Coast Computer Faire](https://en.wikipedia.org/wiki/West_Coast_Computer_Faire) about implementing a GUI, however Bud declined
* The CPU5 was developed Steve Webking
  + The CPU5 featured a much more evolved ISA based on the AM2901 using microcode
  + It was constructed with two cards sandwiched together ([like the FFC](https://github.com/Nakazoto/CenturionComputer/wiki/FFC-Board))
* Jim McGee and Steve Pool were the OS Software engineers around this time

**1979:**

* The CPU6, developed by Steve WebKing, releases in the Centurion 6000
* Centurion Moves to JayEll Dr, from Sherman Dr. in Richardson.
* Centurion attends large minicomputer seminar in California
  + They did well with good software packages and strong hardware
  + EDS was in attendance and first heard of Centurion here
* Smart MUX cards development began
  + AM2901 based MUX cards that allowed up to 16(?) serial connections per card
  + The smart MUX cards unfortunately were too cost prohibitive and were never completed
* In response to the failed Smart MUX cards, David Williams developed an 8-port MUX card
  + Two [4 port MUX boards](https://github.com/Nakazoto/CenturionComputer/wiki/MUX-Board) were combined onto a single board
  + The programmable baud rate circuitry was stripped out to fit the 8 [UARTs](https://en.wikipedia.org/wiki/Universal_asynchronous_receiver-transmitter)
  + Port 3 and Port 7 had DIP switches to toggle the baud rate for printers
  + Ports 0, 1, 2, 4, 5, and 6 were all hardwired thru jumpers to 9600 baud
* 56 bit Fire-Code Checksum CMD Drive Controller Developed (7 or 8 board set) by Bobby Christenson and Tommy Atwood

**1980:**

* The chassis design changed to get UL certification
* Two board/Single Board [CMD drive controller](https://github.com/Nakazoto/CenturionComputer/wiki/CMD-Board) with simple CRC checksum developed by David Williams
* [Finch Floppy Controller card](https://github.com/Nakazoto/CenturionComputer/wiki/FFC-Board) designed by Tommy Atwood and David Williams
* Centurion Reel to Reel Tape Drive interface developed by David Williams
* Centurion gets a mention in the book “[The Soul of a New Machine](https://en.wikipedia.org/wiki/The_Soul_of_a_New_Machine)” by Tracy Kidder when they describe the big New York computer show
  + "*But I saw many other names, passing by. Among others, I saw Centronics, Nortronics, Key Tronic, Tektronix and also General Robotics. There were Northern Telecom and Infoton and Centurion, which had a fellow dressed as a Roman soldier standing by its booth.*" - Tracy Kidder
  + Centurion had hired an actor to dress like a Roman Centurion for the show booth
  + Eric L. recalls seeing the costume in someone's office at one time
* In November of 1980, Centurion was in Las Vegas for a convention and around 30 Centurion employees were staying at the MGM Grand Hotel
  + A refrigerated pastry display case on the first floor malfunctioned and caught fire
  + The fire quickly grew and the MGM fire became the deadliest disaster in Nevada history, killing 85 people
  + Bud was fortunately still awake and managed to get out with his wife, as did all the other Centurion employees

**The EDS Buyout Begins**

* In late 1980, Bud Smith goes to a venture capital conference in California
  + He gives a presentation to 350 venture capitalists
  + His presentation is good enough that several attending want to set up meetings with Bud
* Bud returns from the conference in California and the very next day there is a mystery man in his office
  + This mystery man tells Bud that he needs to meet with his client this afternoon, but only if he promises to cancel all his other appointments with the people from California
  + Bud laughs and tries to kick him out, but the mystery man is very important
  + He won’t tell Bud who his client his, but Bud starts to get the picture that the client is a very important person
* Later that afternoon, the important client strolls in
  + It’s none other than Ross Perot flanked by his #2 and #3 in charge
  + Perot wants to buy Centurion
  + Bud is reluctant and negotiations start
    - Bud’s primary focus is to protect his dealer network, which is now quite large
    - Perot claims he wants to just help Centurion grow without changing anything
* Negotiations lasted for approximately three months
  + During the negotiations, Bud dealt almost exclusively with Bill Gayden
  + They would meet multiple times per week at a high-scale French restaurant to hammer out the deal
  + Centurion was estimated by EDS to be valued at around 15 million USD

**1981 ~ 1982:**

* Early January 1981, the EDS buyout goes through and Centurion becomes a wholly owned subsidiary of EDS
  + Bud got a substantial pay increase (from around 100k to 500k per year)
  + Bud also had to sign a no-compete clause that he would not produce IT products for 4-years after leaving if he decides to leave EDS, this is important later
* During this time Centurion grew to be quite large, totaling around 300 direct employees
  + The dealer network also was a not insubstantial number of people
* The CPU6 was still going strong being further developed by Steve Webking
  + AM2901 based architecture with 56-bit microword
  + Clocked at 5 MHz
  + Still fully backwards compatible with EE200 ISA
  + Fully fleshed out CPU6 ISA features several interesting capabilities
* Centurion 8-inch Disk Drive Interface and Streamer tape interface developed by David Williams
* Centurion also started development of the MicroPlus
  + 4-Slot Backplane - David Williams
  + Membrane switch Front panel - David Williams
  + Dual Floppy or 8 inch Drive with Floppy or 8 Inch Drive with 8 Inch Streaming Tape Drive
  + 64k, 128K, or 256k Memory Board - Steve Webking
  + The MicroPlus was sold to CUDNA Credit Unions
* Centurion was also designing an Intel based PC for EDS that never made it to production
  + Engineering was told that EDS used it as leverage to get reduced pricing from IBM
* Somewhere in here Centurion did a port of [Unix](https://en.wikipedia.org/wiki/Unix) to the CPU6
  + However (as we recall) there wasn’t enough memory run any applications, all they could do was boot Unix
  + Steve once mentioned to Eric L. that EDS was able to get Unix to boot on a CPU6 but the performance was not good so they quietly dropped the project
* There was also an attempt to contract a [COBOL](https://en.wikipedia.org/wiki/COBOL) compiler to be written for the CPU6 that eventually was dropped
* [Diag Board](https://github.com/Nakazoto/CenturionComputer/wiki/Diagnostic-Board) for CPU5/6 designed and built (Hardware design by David Williams, software engineering by Terry Little, concept and specifications by Ken Romaine)

**Things Turn Sour:**

* One day in 1981, Bud pulls into the parking lot and there’s a beat up truck in his parking spot
  + He strolls in trying to find to kick out to get his spot back and Frank Furr is in his office
  + Frank has been appointed Chairmen of the Board for Centurion
  + Frank slowly usurps control of Centurion from Bud, changing things internally little by little
    - Forcing employees to wear specific uniforms
    - Preventing Bud from having direct input in day-to-day operations
* Bud feels Centurion is being pulled away from him
* Bud finally manages to talk directly with Perot and confronts him
  + The conversation goes how closed door conversations go
  + Perot ultimately declares he wants to be rid of the Centurion dealer network
    - Centurion dealers sell Centurion systems for approximately a 50% markup
    - That means its money EDS aint getting
    - It’s bad business and Perot wants the dealer network gone
* Bud and Perot fight about the dealers for a long time
  + Bud hangs in with Centurion through all of 1982, trying to save the dealers
    - But also trying to save the millions of dollars he will lose if he quits early

**1983 ~ 1984:**

* 8-Port Mux board developed by David Williams

**Betrayals and Bad Blood:**

* This is the start of a sequence of unfortunate events and decisions that led to Centurion's bankruptcy
* Bud and Ross met on a weekly basis and the meetings get worse and worse
* In the meantime, Frank Furr is undermining Bud and offloading dealers
  + Many dealers got screwed by EDS but still felt loyalty to Bud, this is important later
* Bud, distancing himself from EDS/Centurion creates a new company called ZTron
  + ZTron doesn’t have any products or anything to sell yet
  + Bud is envisioning the next system he can build and how to leverage the dealers screwed by EDS
* Finally, Bud quit in a fit of anger and that really pissed Ross Perot off
  + Bud says Perot looked at him and said “You leaving is like stabbing me in the heart with a dagger.”
  + That might be overdramatic, but Perot is a force to be reckoned with, and you don’t cross Perot
  + It is likely that Perot felt that Bud betrayed him after Perot invested so much in Centurion
* Bud now focuses full time on ZTron and developing the CPU7 computer
* Perot immediately sues Bud for violating the no-compete clause
  + Bud is sued for all sorts of stuff, including counterfeiting EDS technology
  + However, ZTron is only working with Centurion/EDS dealers to provide support which isn’t a violation
  + That means that ZTron is more like a vendor of EDS and therefore can’t be competing
  + Bud wins the suit
* Around this time, Jim McGee quits Centurion/EDS, but carries a disk pack filled with OS and Application source code
* Jim sells this pack to Bud at ZTron, who starts reverse engineering
  + The goal of reverse engineering was to fix problems that plagued the OS
  + For example, the OS was updated to use 512 byte sectors instead of 400 byte sectors
  + They also fixed buffering issues with the OS
  + On top of that, they used the source code to design the CPU7 to be fully backwards compatible with all previous operating systems and application packages
* ZTron is getting closer to a working system
* EDS, still unaware that source code is missing, is fed up with both Centurion and the remaining dealer network
  + Perot is ready to be done with Centurion altogether, and charges Jack (???) at EDS to facilitate a sale of Centurion assets to Bud
  + Bud obviously can’t afford it, so they strike an agreement to pay off the assets as Bud sells systems and gets money (a pay as you go type thing)
* Bud buys back Centurion and in less than six months ZTron/Centurion systems are being produced and sold
  + These feature the all new AM2903-based CPU7
  + CPU7 was a Multibus-1 based system
  + Multibus 1 allowed the use of third party developed cards including
    - SCSI-I disk controller from InterPhase
    - Buffered intelligent MUX card
  + Dual AMD 2903 based CPU
  + 4M of Memory
  + Of the shelf controllers and backplane
  + Switching Power supply

**Counterfeiting:**

* The first counterfeit system is seen in the Tulsa, OK office and reported to EDS management around 1984
* The first counterfeit circuit boards showed up in the EDS-Centurion repair depot
* Counterfeit PCBs came from the Ft. Worth dealer for a Dallas area customer system
* EDS starts looking into the counterfeiting problems
* As best as we can tell, this is how the counterfeit machines came to be (this may be hilariously incorrect or pinpoint perfect, we really have no way of knowing for sure)
  + Terry Hall had received permission from Frank Furr to build CPU4 PCBs separate of the main Centurion lineup for testing
  + Terry was good friends with George Weatherford, who produced the PCB blanks
  + Terry was also a good friend with Dub McCabe who was a dealer up in Oklahoma
  + It’s possible that Dub asked Terry for some boards under the table
  + Terry asked George to do him a solid and produce some extra boards for a little kickback
  + George gives the boards to Terry, Terry gives them to Dub
  + Dub then hand solders the boards up, throws them in a cheap, generic cabinet with a CDC acquired Hawk and sells directly to customers, eliminating EDS and Centurion headquarters altogether
* Either way, counterfeit systems were out there and once enough proof was found, Ross Perot and EDS rained down hellfire
  + Centurion had to remove all counterfeit cards and replace with genuine cards
  + All counterfeit cards were taken by EDS and presumed to have been destroyed

**1985:**

* Note: There is some heavy speculation here based on what I have heard from multiple people, what is written may be true, false or somewhere in-between
* I believe it was at this point a few things happened that really pissed Perot off
  + Bud left, betraying Perot and the work they had put into Centurion together
  + Bud defeated Perot in court regarding the no-compete clause
  + Bud bought back Centurion and in less than 6 months had a competing system on the market that was fully compatible
    - Which is ludicrously fast, too fast to be possible under normal conditions
    - Perot and EDS likely surmised that Bud somehow got ahold of proprietary information before Centurion was sold
  + The counterfeiting scandal happens at the same time
    - This is quite possibly totally coincidental timing with Bud leaving, but either way, it doesn’t look good
* Perot was pissed and wanting to burn Bud Smith and ZTron to the ground
  + War was waged with incessant legal battles over everything under the sun
  + EDS lawyers went to absolute town on Bud
  + As Bud tells it, this was intended to bleed Bud dry of time and money until ZTron went bust
* During this time, Centurion found a group of Doctors out of Tulsa that put up 1M$ to help get some machines going
  + This was also a tax thing, so the Doctors weren’t doing it out of the goodness of their heart

**1986:**

* EDS found a way to withdraw the 1M$ for missed payments on the Centurion sale
* This was the final nail in the coffin, and forced ZTron/Centurion into bankruptcy
  + ZTron had a whole line of computers and products planned, but in the end only sold around 100 CPU7 machines
* The now bankrupt ZTron/Centurion was sold to Buddy Cruze of Cruze Computers
  + Centurion Dealers Computer Corporation (CDCC) was formed as a subsidiary of Cruze Computer Systems
* Cruze Computers still exists today and currently holds the Centurion IP
* Cruze developed the CPU9
  + The CPU8 was never used as a “label” for marketing reasons
  + The CPU9 was simple a cleaning up and streamlining the microcode of the CPU7, and represented a 30 to 40 percent increase in speed over the CPU7
  + The CPU7 was designed by an engineering firm in Houston using tools that optimize completing the project expeditiously and not for product performance
  + The only real difference in the CPU6 and CPU7 electrically was the bus interface and how memory was accessed
* The OS saw major changes due to a change from 400 byte sectors to 512 byte sectors
* A reverse compiler for the CPU7 microcode was developed by David Williams

**1987:**

* Centurion Dealers Computer Corporation (CDCC) was moved to Knoxville Tn.

**1988:**

* CDCC was moved from Knoxville to the Industrial Park near Maryville Tn.
* Somewhere in here Dr. Jim Lemmee joined CDCC from the Indianapolis Dealership.

**1991:**

* CPU 10 was developed.
  + The CPU10 was a 16 bit bit-slice CPU
  + Simple instruction prefetching
  + Simple data caching.
  + Upward Compatible with the CPU7 and CPU8
  + Some Instruction set enhancement

**1992:**

* Centurion ported to the X86 environment including 8X287 integer emulation
* All drivers for new PC and Multibus interfaces implemented Jim Lemmee
* All operating system modules ported to X86 Jim Lemmee
* Integer operations w/wo 80287 implemented by David Williams
* All CPL, JCL, Supported applications (GL, AP, AR, etc) converted to X86 Jim Lemmee and David Williams
  + Configurations were:
    - Single PC as Single user
    - PC as multiple users, using 4 port smart multiplexers
    - Multiple users using a network of PCs
    - Multi-bus 1 using the 80286 w/wo the 80287
* The Centurion CPU6 hardware side of things was completely retired
* Many enhancements to CPL to give it more C functionality
* A version of this port is still in use today with two customers of Cruze Computers