History of the Atari ST

presented by Craig Maloney

Penguicon 2021

http://decafbad.net

What we’ll cover

- The video game crash of 1983
- Hi-Toro / Amiga and Atari
- Jack Tramiel’s departure from Commodore
- The purchase and creation of Atari Corp.
- The development of the Atari ST and GEM / TOS
- The various models of Atari ST
- Highlights from the software library
- Several community developments since Atari Corporation’s demise.

What we'll conveniently ignore

- Much of the software library of the Atari ST
- Atari's subsequent sale to JTS, Infogrammes, Hasbro, and whatever passes for Atari these days.
- Developments in the other Atari divisions.
- Most of Atari's 8-bit computers.
- The fact that have never owned any Atari ST hardware.

1983: The Video Game Crash

A war on all fronts

- Atari Video Game Consoles had cooled in sales
  - Computers were overtaking game-only systems
  - Game players wanted more complex games than the simple Atari games
- A glut of Atari cartridges of varying quality from third-party developers meant lots of discounted or unsold inventory for retailers, who stopped making large purchases on unproven games
- Atari's attempt at making a next-generation console out of the 5200 failed, as it was clearly an incompatible Atari 400 computer with analog joysticks
  - Atari corrected this mistake with the XEGS in 1987, 5 years too late.
- The IBM PC was eroding sales of all computers and games
  - If you want an idea of how much of a big deal the IBM PC was, your laptop or desktop computer still shares DNA with this machine.
- At its worst Atari was losing around $1 million dollars a day.

E.T. The Extra Terrestrial

- Warner Management thought great games were the result of great licenses, and no license was hotter than E.T.
- Warner paid $20-25 million for the home and arcade rights, and then told Atari to make the games happen.
- When asked by Steve Ross what he thought about making an E.T.-based video game, Atari CEO Ray Kassar replied, "I think it's a dumb idea. We've never really made an action game out of a movie.”
- Atari sold a credible 1.5 million units of a rushed, untested game (6 weeks to develop when the normal time was 6 months)
- That left an unsold inventory of 2.5 – 3 million units, which stores shipped back to Atari.
- There was no way for Atari to make back the money they spent on the rights for E.T., even if they had scored a critical hit and had created a gaming masterpiece.

Atari 8-bit Home Computers

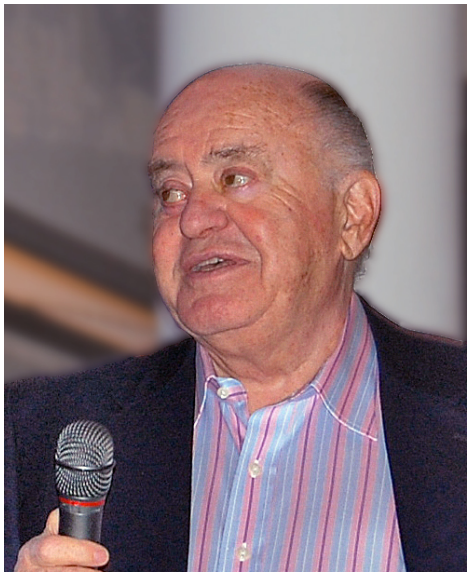
- Atari had an 8-bit computer line, but it was severely hampered by lack of documentation.
  - Atari / Warner believed that the less documentation out there, the more that folks would rely on Atari to provide software, which meant more sales of games and software.
  - Atari would sell you documentation and ROM listings, but it was uncommon and expensive.
- De Re Atari (Chris Crawford, Lane Winner, Jim Cox, Amy Chen, Jim Dunion, Kathleen Pitta, Bob Fraser, and Gus Makreas) was an attempt to get some better documentation about the machine from a semi-official source (Atari's APX, aka the Atari Program eXchange).
- Other documentation (Inside Atari DOS, Atari Basic Source Code, Mapping the Atari, and others) provided much needed third-party documentation.
- Compared with other machines from the era the Atari was undocumented, and required machine code and intensive knowledge of the machine to access most of its power.
- The Atari 1200XL was released in 1983 for $1,000. It was expensive compared with the available models and offered modest improvements over the already discounted 400/800 series machines. It was steeply discounted shortly after release.

The Commodore 64

- Released by Commodore in 1982.
- Jack Tramiel started a price war, selling the Commodore 64 for $595 (The Atari 1200XL was announced at $1,000).
- The Commodore 64 knocked Texas Instruments out of the home computer market and severely reduced the margins on computer sales for other manufacturers.
- The Commodore 64 dominated the market for 8-bit computers, and helped Commodore earn record profits with record sales.

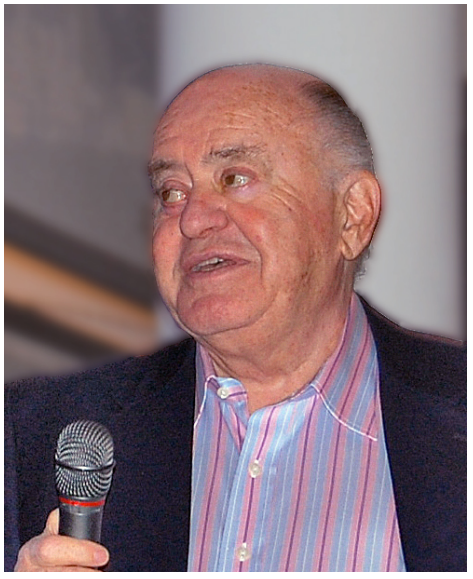
Jack Tramiel

- Born on December 13th, 1928
- Holocaust Survivor (Auchwitz)
  - Liberated in April 1945 by the 84th Infantry Division of the U.S. Army.
  - Joined The Army in 1947 and helped fix office equipment, including typewriters.
- In 1953, while working as a taxi driver he bought an office repair shop in The Bronx, securing a $25,000 loan from a US Army Entitlement. He named it Commodore Portable Typewriter.



Jack Tramiel

- Tramiel was deadly serious when it came to business. He moved a factory to Hong Kong because (at the time) they didn’t have many regulations.
- “Business is War”.



Irving Gould

- Commodore was originally formed in Canada and initially produced mechanical typewriters and calculators. In 1965, Jack Tramiel, Commodore's founder and CEO, decided to purchase the Canadian store chain Wilson's Stationers to provide a sales channel for their products. To fund the purchase they borrowed $3 million from Atlantic Acceptance Corporation at an 11% interest rate. On 14 June 1965, Atlantic bounced a $5 million check and was insolvent within days. This led to all their capital loans being called in, including Commodore's $3 million.[1]
- Looking for a way out of the problem, Irving Gould arranged the sale of Wilson's Stationers to a US company. To pay off the bridge loan, Gould purchased 17% of Commodore's stock in 1966 for $400,000.[2] Over the next decade, the company repeatedly had difficulties and repeatedly turned to Gould for funding.[1]
- Through the late 1960s and early 1970s, Japanese companies began introducing typewriters and calculators at price points Commodore could not match. Tramiel responded by moving into the newly emerging field of electronic calculators.[1] Irving had a Japanese girlfriend and kept up on changes in Japanese industry. In the mid-1970s, Irving told Jack Tramiel that the Japanese were starting to produce calculators using CMOS electronics that were going to "kick your butt".[3] Tramiel visited Japan to examine their systems, and found they would not sell their technology to the US.[4]
- The Japanese companies were able to undercut Commodore both in technology and by being vertically integrated. Texas Instruments, one of Commodore's suppliers, decided to follow this pattern and introduced complete calculators at prices below what they sold the parts to Commodore. Gould provided funding to keep Commodore going during the period where they were being forced out of the calculator business. Tramiel responded by buying MOS Technology to supply microprocessors and moving into the computer market.[5]
- (source: https://en.wikipedia.org/wiki/Irving_Gould)

An aside on history...

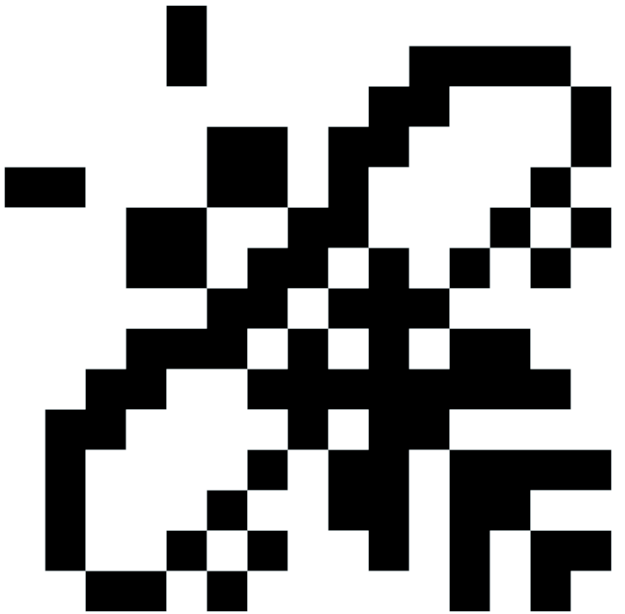
Jack Tramiel leaves Commodore

- In 1984 Jack Tramiel left Commodore.
- The reason (stated at the time) was that Irving Gould felt that Jack was taking over the company by putting his sons (Sam and Leonard) in key positions in the company.
- This is the reason that filtered through the press.

The reason Jack Tramiel left

- Leonard Tramiel stated that the reason Jack left was the Irving Gould wanted to recoup his investment in Commodore by using company assets as his own.
- Jack, being a frugal and shrewd businessman, thought this would put the company in jeopardy. They would need the cash to weather the oncoming storm if the bottom fell out of the computing industry.
- Jack gave Gould an ultimatum. He would not allow Gould to pull money from the company while he was CEO / President. “You can’t do that while I am president”. Gould said “goodbye”, and Jack left both CES and Commodore.
- Source: https://www.youtube.com/watch?v=uH7iMlVyXIw&t=965s

Time passes...



Jack buys Atari

- Jack forms Tramel Technology.
- On July 1984, Tramel Technology bought the Consumer Division of Atari Inc. from Warner Communications and renames themselves Atari Corporation.
- Reason for purchasing Atari: It was the number two most recognized trademark in the world.
- Atari experiences heavy layoffs. Atari goes from ~2,000 employees to ~200.

“Imperial Stormtroopers have entered the base!
Imperial Stormtroopers have … URK!”

– Announced over the Atari intercom system when Jack Tramiel arrived at Atari

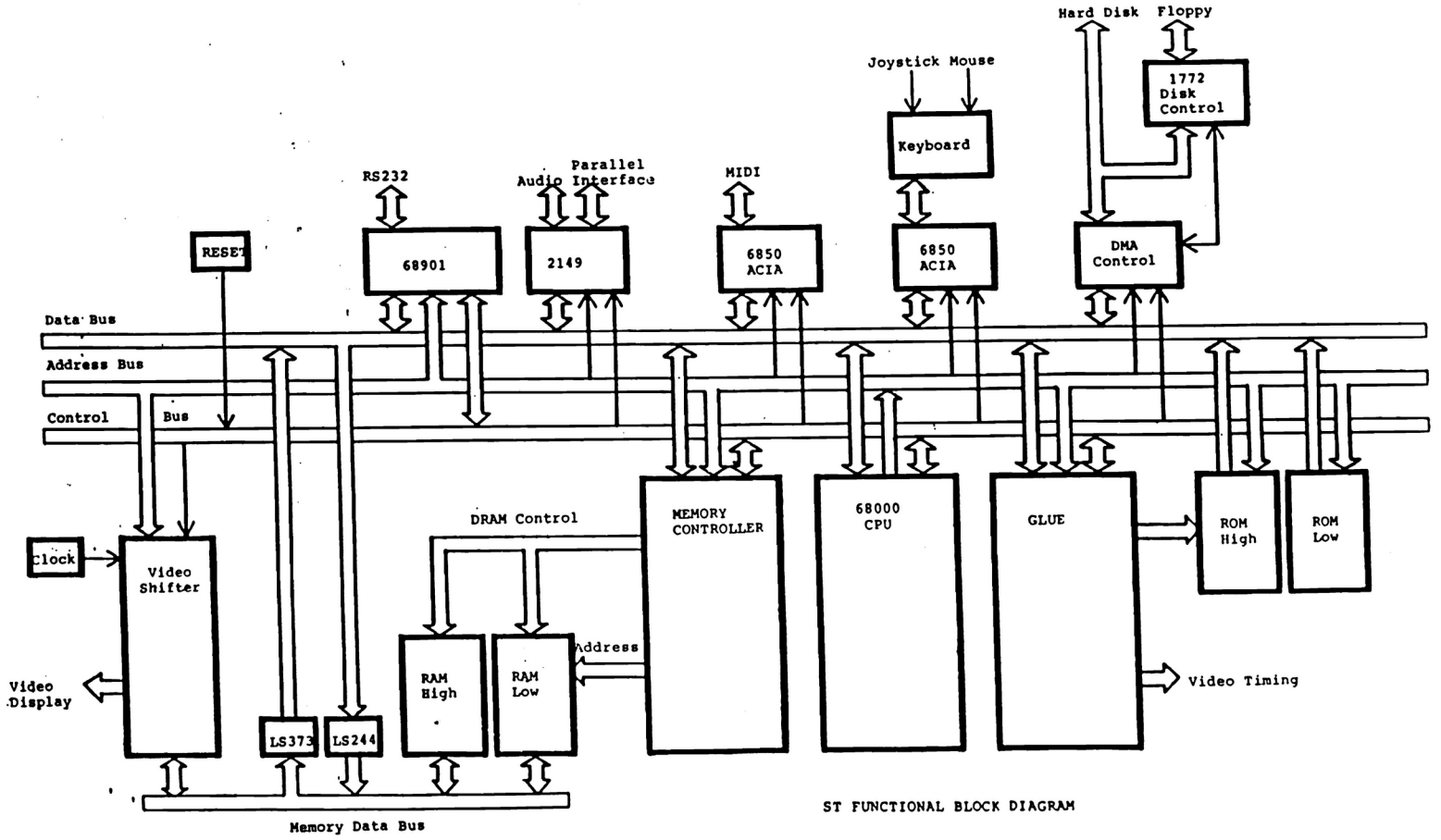
https://dadhacker-125488.ingress-alpha.easywp.com/the-atari-st-part-1/

Aside: The Atari Amiga?

- Hi-Toro was a company started by Jay Miner, Larry Kaplan, and several other ex-Atari folks (including Joe Decuir)
- Lined up $7 million in funding from a group of dentists.
- Created peripherals for the Atari 2600 while working on the Lorraine project (a 16 bit computer with custom chips_
- The video game crash meant that Hi-Toro (later named Amiga) was also having trouble. Needed cash in order to continue.
- Atari gave Hi-Toro a loan of $500,000 that needed to be paid back in one month or the Lorraine design would be forfeited to Atari.
- There’s an apocryphal tale of one of the designers getting a check from Commodore to give to Jack so Atari couldn’t exercise the forfeiture clause of the loan.
- The Lorraine later became the Commodore Amiga, and the main rival of the Atari ST.
- Tramiel countersued Amiga Corp. on August 13, 1984. He sought damages and an injunction to bar Amiga (and effectively Commodore) from producing anything with its technology.

Building the Atari ST Hardware

- Designed in 6 months (August 1984 to CES in January 1985).
- Shiraz Shivji lead a team of 6 engineers to design the Atari ST
  - Previously Shiraz worked on the Commodore 64.
- Only had a handful of custom chips for glue logic and video. Everything else was off-the-shelf parts.
- The original 520ST case design was created by Ira Velinsky
- Originally there was supposed to be a 130ST and 260ST with 128K and 256K, but only the 260ST was ever released in Europe as a low-cost option and was quickly supplanted by the 520ST.



ST FUNCTIONAL BLOCK DIAGRAM

Custom Chips

Custom chips:

- ST Shifter "Video shift register chip"
  - Enables bitmap graphics using 32 KB of contiguous memory for all resolutions. Screen address has to be a multiple of 256.
- ST GLU "Generalized Logic Unit"
  - Control logic for the system used to connect the ST's chips. Not part of the data path, but needed to bridge chips with each other.
- ST MMU "Memory Management Unit"
  - Provides signals needed for CPU/blitter/DMA and Shifter to access dynamic RAM. Even memory accesses are given to CPU/blitter/DMA while odd cycles are reserved for DRAM refresh or used by Shifter for displaying contents of the frame buffer.
- ST DMA "Direct Memory Access"
  - Used for floppy and hard drive data transfers. Can directly access main memory in the ST.

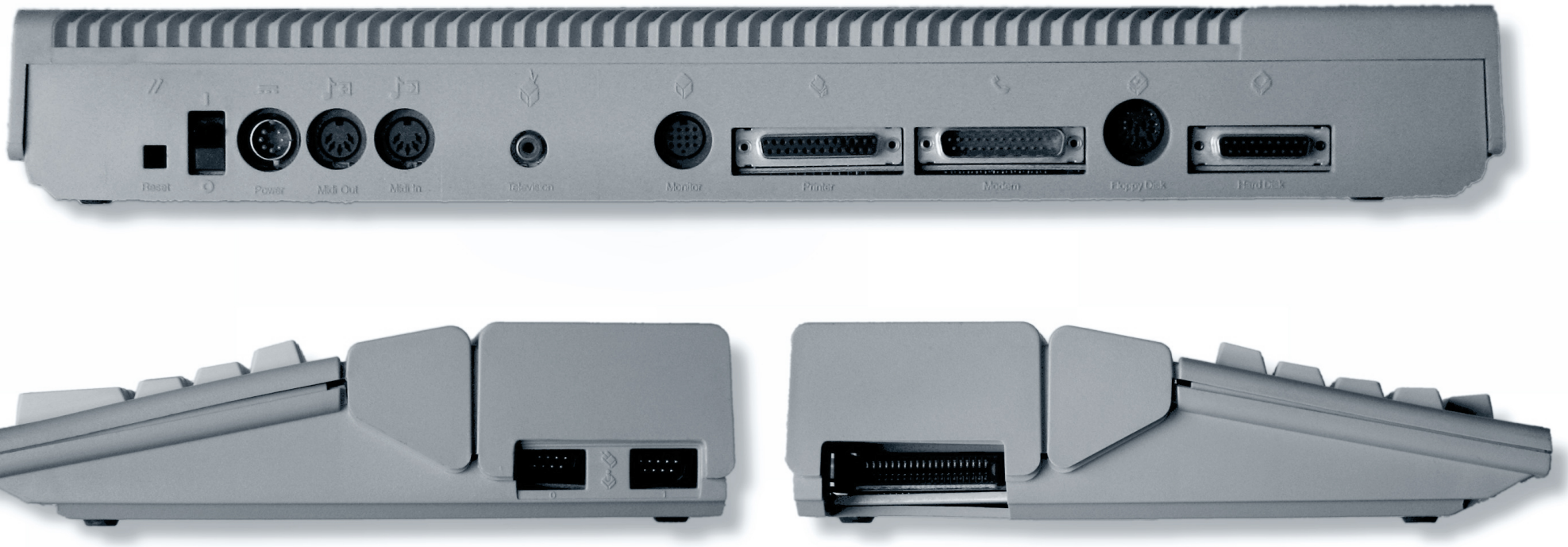
https://en.wikipedia.org/wiki/Atari_ST#Technical_specifications

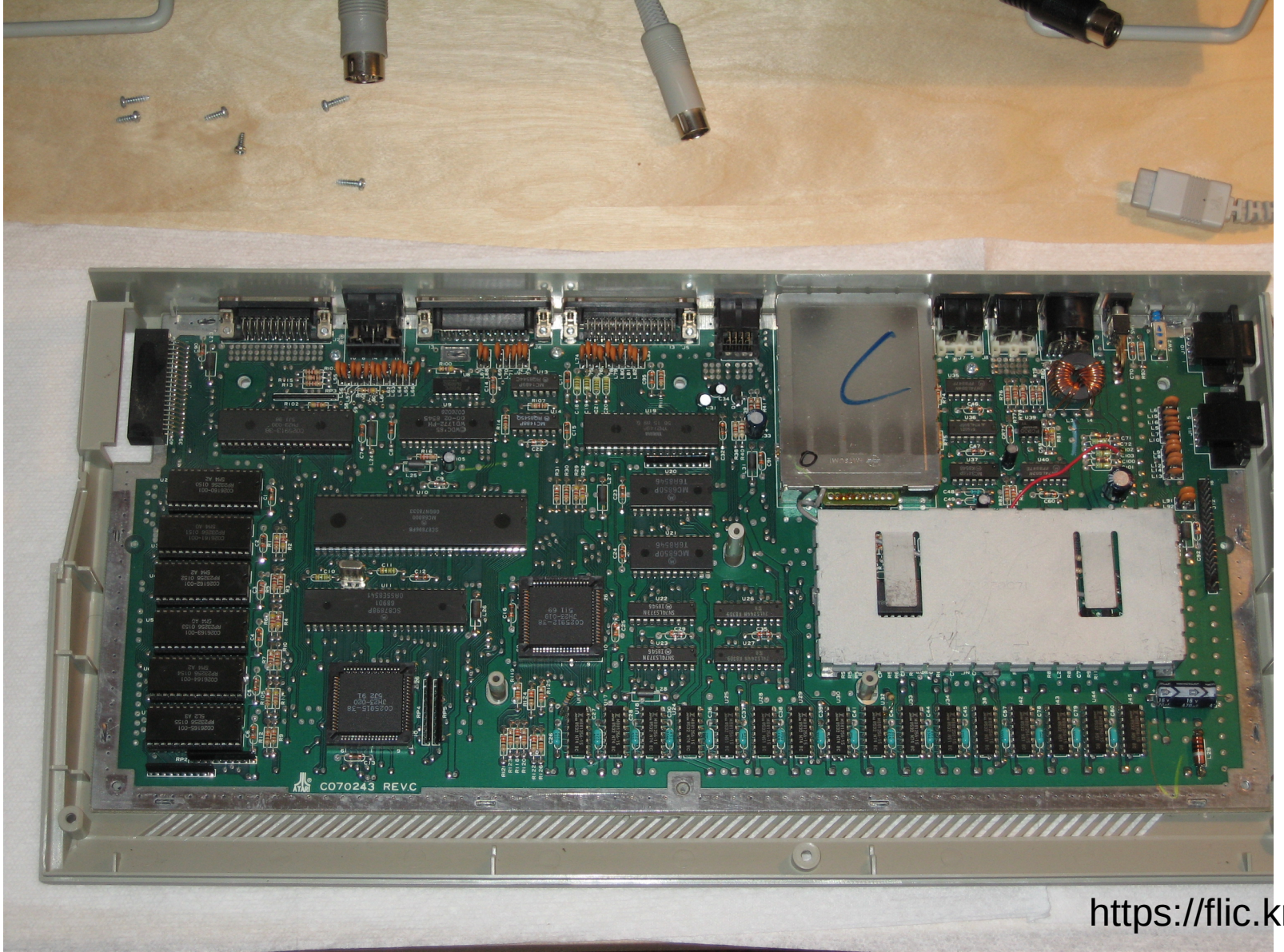
Support Chips

- Support chips:
  - MC6850P ACIA "Asynchronous Common Interface Adapter"
    - Enables the ST to directly communicate with MIDI devices and keyboard (two chips used). 31.250 kbit/s for MIDI, 7812.5 bit/s for keyboard.
  - MC68901 MFP "Multi Function Peripheral"
    - Used for interrupt generation/control, serial and misc. control input signals. Atari TT030 has two MFP chips.
  - WD-1772-PH "Western Digital Floppy Disk Controller"
    - Floppy controller chip.
  - YM2149F PSG "Programmable Sound Generator"
    - Provides three-voice sound synthesis, also used for floppy signalling, serial control output and printer parallel port.
  - HD6301V1 "Hitachi keyboard processor"
    - Used for keyboard scanning and mouse/joystick ports.

The Atari 520ST

- US$799.99 (monochrome) / US$999.99 (color)
  - 320x200 16 color, 640x200 4 color, and 640x400 (monochrome)
  - Palette of 512 colors
- 512K of on-board (non-expandable memory)
- Yamaha YM2149 3 voice chip (same as the MSX 2 and equivalent to the AY-3-8192 of the Sinclair Spectrum 128 and later models)
- MIDI ports standard, along with Joystick, ACSI, RS232 and Centronics ports
- Initially shipped with single-sided 3.5” floppy drives storing 360KB, later dual-sided floppies storing 720KB.
- Used a Motorola 68000 CPU (similar to the Macintosh and Amiga) at 8MHz
- Had TOS (The Operating System) installed in ROM on the machine (192K).


Reset
Power
Midi Out
Midi In
Television
Monitor
Printer
Modem
FloppyDisk
HardDisk



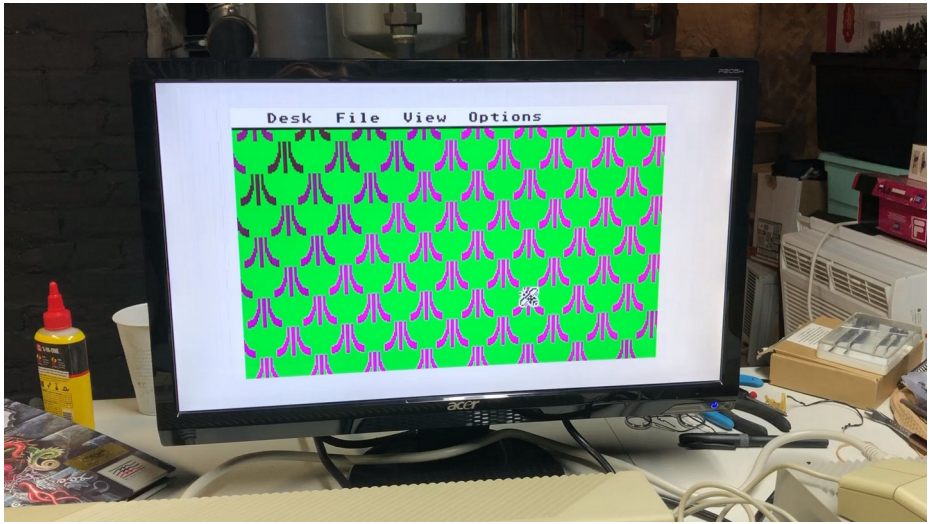
https://flic.kr/p/4C5yTu

TOS

- Designed “cooperatively” by Digital Research (DRI) and Atari.
- Based on the Crystal (later GEM) desktop environment.
- Digital Research was primarily Intel-based, so porting to the 68000 was a challenge.
- Atari signed a contract for CP/M-68K and GEM to be ported to the new machine. Only problem: the new machine didn’t exist.
  - There was an amazing crunch of porting on flaky wire-wrapped hardware
- Lots of friction between Atari and DRI folks. DRI underestimated the programmers of Atari, and Atari folks thought the DRI folks were arrogant and had bad code.
- Later decided to use the GEMDOS environment because CP/M-68K was too limiting.

TOS (cont.)

- In December the ROMs weren't ready for the finished machine. The RAM in the early 520ST machines was doubled and the OS was booted from floppy.
  - The ROM was called "Das Boot"
  - You can find a demo of this boot screen here: https://www.reddit.com/r/atarist/comments/eevixu/
  - The demo screen was a demonstration to the DRI engineers by the Atari engineers of what video game programmers were capable of.



TOS, the single-tasker

- TOS was capable of running one program and up to four “accessories” (a calculator, VT52 terminal emulator, and control panel were shipped with the machine).
- You couldn’t task-swap on early versions of TOS. You needed to exit the program in order to launch another program.
- This was later rectified in MagiC, and MiNT/MultiTOS, but that didn’t come until the late 1980s / 1990s.

The timeline

- July (1984): Tramiels buy Atari and consolidate the people that they don't lay off into a single building. The "ST" plan is bandied about, but nobody knows a whole lot.
- August: The ST hardware becomes clearer. We evaluate other OSes, etc.
- September: Work starts in Monterey, near the Digital Research campus.
- October: Work. We get (rented) houses in Monterey.
- November: More work. We barely see those houses.
- December: Much more work. The ST boots TOS for the first time.
- January (1985): CES (with STs running CP/M-68K). Decision made to move to new file system (GEMDOS).
- February: 16K boot ROMs written (a couple-week side effort).
- March: Even more work. Two weeks to crunch TOS to fit into 192K.
- April: ROMs actually work (do you know how long it takes to burn 192K of ROM, not to mention UV-erasing older chips?)
- May: ROM TOS 1.0 shipped. Phew!

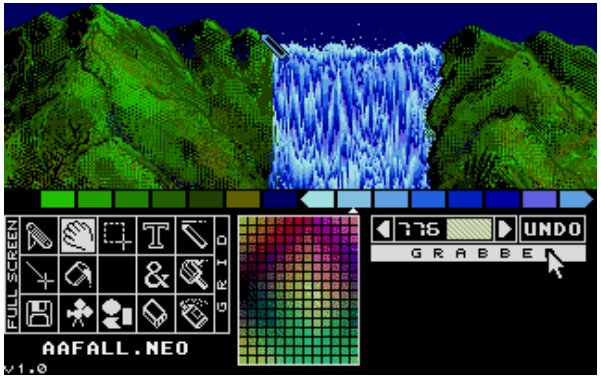
Source: https://dadhacker-125488.ingress-alpha.easywp.com/the-atari-st-part-2/

July, 1985

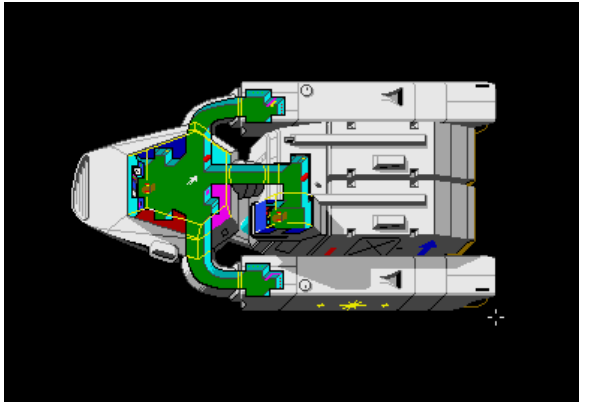
Atari 520ST released

- Included computer, power supply, and monitor (monochrome or color).
- Language Disk
  - NEOChrome
  - ST Basic
  - Logo
  - Desk accessories
    - control panel
    - printer/RS232 configuration
    - Calculator
    - VT-52 emulator
- Later editions had different or updated software
- Several “Discovery” packs included more software with the machine.

Notable Early Atari ST Software

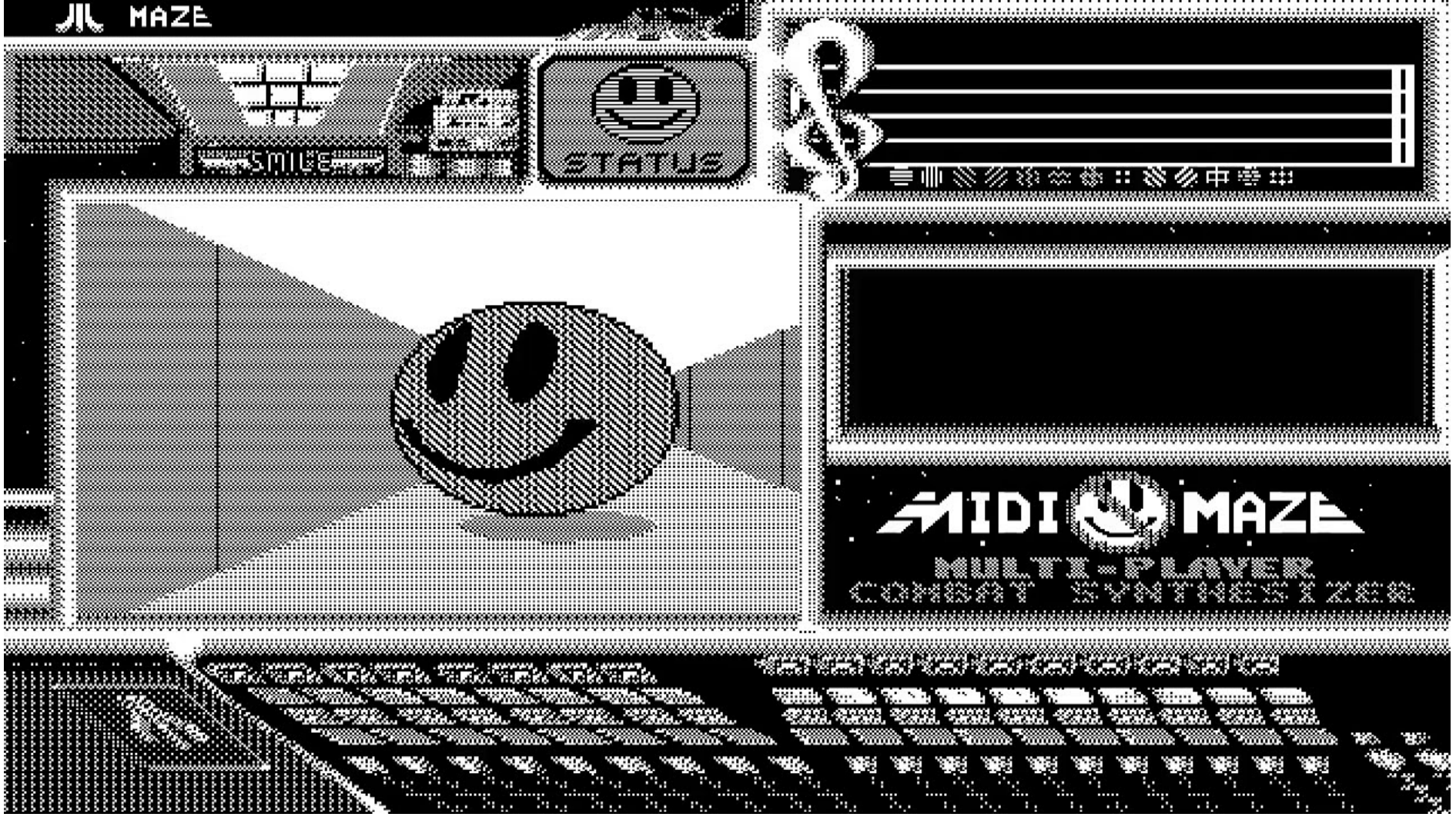


- NEOChrome (a paint program)
- ST Writer (a port of AtariWriter)
- Joust (a pixel-perfect port)
- Degas (another excellent paint program)
- MegaMax C (a credible C compiler that was better than the Atari Development toolkit, later released as Laser C)
- Megaroids (a game released with MegaMax C)
- Time Bandit
- SunDog: Frozen Legacy (a “Space Traders” game)



Oh, did we mention it had MIDI?

- Many musicians used the Atari ST because it had built-in MIDI ports.
- Many prominent musicians had Atari machines handling their music production.
- MIDI could also be used for simple networking.



https://www.youtube.com/watch?v=Mk-z9GgCinE

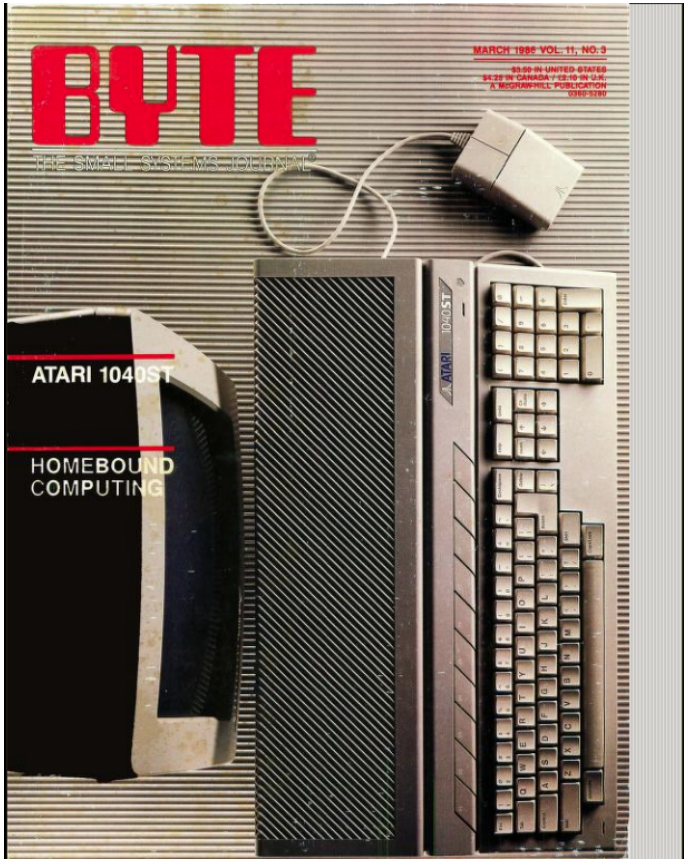

Musicians and The Atari ST (1989) Mike Pinder,Dave Grusin,Jimmy Hotz, Mick Fleetwood,Scott Gershin
Copy link
MORE VIDEOS
https://www.youtube.com/watch?v=hZSjxcvM1uM
6:51 / 29:53

The Lull (85-86)

- Many games were ports from other machines
- Took quite a while for folks to get familiar with the machine
- Some applications and games took advantage of the GEM desktop and made the applications easier to use.

Atari 1040ST

- Released in 1986
- First home machine to ship with 1MB of memory
- First machine to break the $1,000/MB price barrier.
- Featured on the cover of BYTE magazine, along with a several page article about the new machine.
- Had a built-in power supply and floppy drive.



https://archive.org/details/byte-magazine-1986-03/

BY PHILLIP ROBINSON AND JON R. EDWARDS

THE ATARI 1040ST

A *megabyte of memory for* $999

Editor's note: The following is a BYTE *product preview. It is not a review. We provide an advance look at this product because we feel that it is significant. A complete review will follow in a subsequent issue.*

Atari's new $999 1-megabyte 1040ST (see photo 1) establishes a price break reminiscent of the Commodore 64's. And, as table 1 shows, the 1040ST will be the first computer to begin its retail life at a price that represents less than one dollar per kilobyte. The 1040ST is clearly a bargain, with over 1 megabyte of RAM (random-access read/write memory), its operating system in ROM (read-only memory), an internal 720K-byte double-sided drive, an internal power supply, and the same features and functionality that already make the Atari 520ST an attractive purchase. [*Editor's note: See "The Atari 520ST" by Jon R. Edwards, Phillip Robinson, and Brenda McLaughlin, January* BYTE, *page 84.*]

SYSTEM DESCRIPTION

Our coverage of the 520ST adequately describes most of the features of the 1040ST (see also the "In Brief" box on page 86). The new computer has the same keyboard, the same ports (although these are now in new locations, see photo 2), and the same architecture. We remain uncomfortable with the keyboard, but the keytops are removable. We suspect that some speedy entrepreneur will provide alternative tapered keys for the ST machines.

The most obvious changes are cosmetic. The keyboard/computer unit is 2 inches deeper and 4½ pounds heavier than the 520ST, and the keyboard provides a much more substantial feel. The mouse/joystick ports are now located under the bottom right front of the unit, a significant improvement for left-handed users.

A number of changes are more than cosmetic. The internal power supply eliminates two of the external power supplies needed by the 520ST (wire haters rejoice). We left the unit on for five days and experienced no difficulties with overheating. There is no internal fan, but the unit appears to adequately dissipate heat. The internal disk drive supports both single- and double-sided disks. An RF (radio frequency) modulator will allow you to hook up the 1040ST to a television set; you might, therefore, obtain the high-resolution monochrome system for word processing and programming without sacrificing the use of low- and medium-resolution color. However, we received a preproduction unit lacking the RF modulator that will accompany the final product; therefore, we were unable to test the television quality of the computer's output.

The megabyte of RAM in the 1040ST isn't crammed into the case. The 520ST uses a custom Memory Controller chip to handle its sixteen 256K-byte dynamic RAM chips. The 1040ST uses the same Memory Controller. Because the controller can handle 32 RAM chips at a time, the Atari engineers simply had to find room for 16 more 256K-byte dynamic RAMs on the 1040ST circuit board to pump RAM capacity to a full megabyte (see photo 3). In fact, the Memory Controller can also govern 1-megabit dynamic RAM chips. Atari should have little difficulty designing an ST with 4 megabytes of memory.

Undoubtedly, the most interesting addition to this computer, apart from the extra memory, will be an empty socket for a graphics coprocessor. Our preproduction unit also did not include the socket, and it may not be offered with the first releases of the 1040ST. Phil Robinson discussed this and Atari's future plans with Shiraz Shivji, vice president of research and development for the company (see the text box "An Interview with Shiraz Shivji" on page 90).

TOS IN ROM

With TOS (the operating system for both the 520ST and the 1040ST) in ROM, the 1040ST boots more quickly than the 520ST. [*Editor's note: Atari is currently supplying the* ROM *chips to* 520ST *developers and will be making the chips available through users groups.*] Booting with a nonsystem disk takes less than 6 seconds, down from 37

(continued)

Phillip Robinson is a senior technical editor, and Jon R. Edwards is a technical editor for BYTE. *They can be contacted at* BYTE, POB 372, *Hancock*, NH 03449.

Photo 1: *The Atari* 1040ST.

PHOTOGRAPHED BY PAUL AVIS

The Atari Mega ST

- Released in 1MB, 2MB, and 4MB models.
- Detached keyboard with better feel than the 520/1040ST.
- On-board, real-time, battery-backed clock
- Essentially the 1040ST with more memory and Blitter chip (for improved video performance)
- Positioned as a desktop publishing solution with a SLM804 laser printer (which used the system memory for page layout, or could have an optional Postscript interface).
- Marketed as a complete desktop publishing system for under $4,000 with 4MB Mega ST 4 computer, 30MB hard drive, printer, and monitor.

The Atari STacy

- Portable Atari ST machine targeting musicians and the Macintosh portable.
- Had TOS 1.04 on it, along with a BLiTTER chip and optional modem.
- The Stacy was a global project, design work was carried out in the Sunnyvale HQ, Cambridge UK, final PCB board layouts were produced by Atari in Japan, which is where the first units were manufactured, with final manufacturing occurring in Taiwan
- Four Models:
  - Stacy : 1 MB Ram, 3.5" internal Floppy (Model code: LST-1141)
  - Stacy 2 : 2 MB Ram, 3.5" internal Floppy, 20 MB HD (Model code: LST-2144)
  - Stacy 2 : 2 MB Ram, 2 * 3.5" internal Floppy (Model code: LST-2124)
  - Stacy 4 : 4 MB Ram, 3.5" internal Floppy, 40 MB HD (Model code: LST-4144)
- Ran on 12 C cell batteries, but was a power hog. When they realized that the 12 C batteries were insufficient to power the machine they released subsequent machines with the lid glued shut.

The Atari STE

- Stands for ST Enhanced.
- Released in 1989 with BLiTTER support, 4,096 possible colors, Genlock (for video), and PCM audio. RAM could be upgraded using SIMMs.
- Unfortunately very little software support materialized for the features of the STE series of machines.
- The Mega STE had an optional 68881 FPU and a built-in hard drive bay, along with VME Expansion port, a network port, and TOS 2.0.

STE Chips and Features

- All of the features of the 520STFM/1040STFM
- Extended palette of 4,096 available colors to choose from
- BLiTTER chip to copy/fill/clear large data blocks in memory (with a max write rate of 4 Mbytes/s)
- Hardware support for horizontal and vertical fine scrolling and split screen (using the Shifter video chip)
- DMA sound chip with 2-channels stereo 8-bit PCM sound at 6.25/12.5/25/50 kHz and stereo RCA audio-out jacks (using enhancements to the Shifter video chip to support audio shifting)
- National LMC 1992 audio controller chip, allowing adjustable left/right/master volume and bass and treble EQ via a Microwire interface
- Memory: 30-pin SIMM memory slots (SIPP packages in earliest versions) allowing upgrades up to 4 MB Allowable memory sizes including only 0.5, 1.0, 2.0, 2.5 and 4.0 MB due to configuration restraints (however, 2.5 MB is not officially supported and has compatibility problems). Later third-party upgrade kits allow a maximum of 14MB w/Magnum-ST, bypassing the stock MMU with a replacement unit and the additional chips on a separate board fitting over it.
- Ability to synchronise the video timings with an external device so that a video Genlock device can be used without having to make any modifications to computer's hardware
- Analogue joypad ports (2), with support for devices such as paddles and light pens in addition to joysticks/joypads. The Atari Jaguar joypads and Power Pad joypads (gray version of Jaguar joypads marketed for the STE and Falcon) can be used without an adapter. Two standard Atari-style digital joysticks could be plugged into each analogue port with an adapter.
- TOS 1.06 (also known as TOS 1.6) or TOS 1.62 (which fixed some major backwards-compatibility bugs in TOS 1.6) in two socketed 128 kB ROM chips.
- Socketed PLCC 68000 CPU

Atari TT30

- Stands for “Thirty Two/Thirty Two” (The ST was Sixteen, Thirty Two).
- Was poised to be a UNIX workstation, but sadly the UNIX port didn’t arrive until two years later.
- Released in 1990 with a 68030 processor, but at an eye-watering $2,995 with low software support.
- Case was re-purposed for the last of the ST line, the Mega STE.

Atari ST BOOK

- Released in 1991, featuring a non-backlit 640x400 LCD screen.
- TOS 2.06
- Was extremely portable, and still managed to keep the 2 MIDI ports (looking at you, Apple).

Atari Falcon30

- Released in 1992
- 68030-based machine, similar to the TT30, but with 16 bit addressing bus.
- Supported sampling frequencies at 44.1kHz and higher, and could be used for hard disk recording.
- This was the last of the ST/TT series.
- “Released in 1992, the Falcon was discontinued by Atari the following year. In Europe, C-Lab licensed the Falcon design from Atari, and released the C-Lab Falcon Mk I (the same as Atari's Falcon except for some slight modifications to the audio circuitry), Mk II (as Mk I but with an internal 500 MB SCSI hard disk) and Mk X (as Mk II but in a desktop case). The C-Lab Falcons were also imported to the US by at least some Atari dealers.”

1993

Atari Corporation shifts its focus to the Atari Jaguar

1996

Atari Corporation agrees to a reverse merger with JTS Corporation

Atari ST postmortem

- The Atari ST was a triumph of engineering
- Had there been more forward-compatibility (the BLiTTER chip) the Atari ST might have been more graphically competitive with other machines.
- Like the Amiga, later models received scant attention. Software manufacturers wanted broad compatibility, not limited markets.
- Jack’s reputation at Commodore caused a lot of friction. Some companies flatly refused to port their software to the machine.

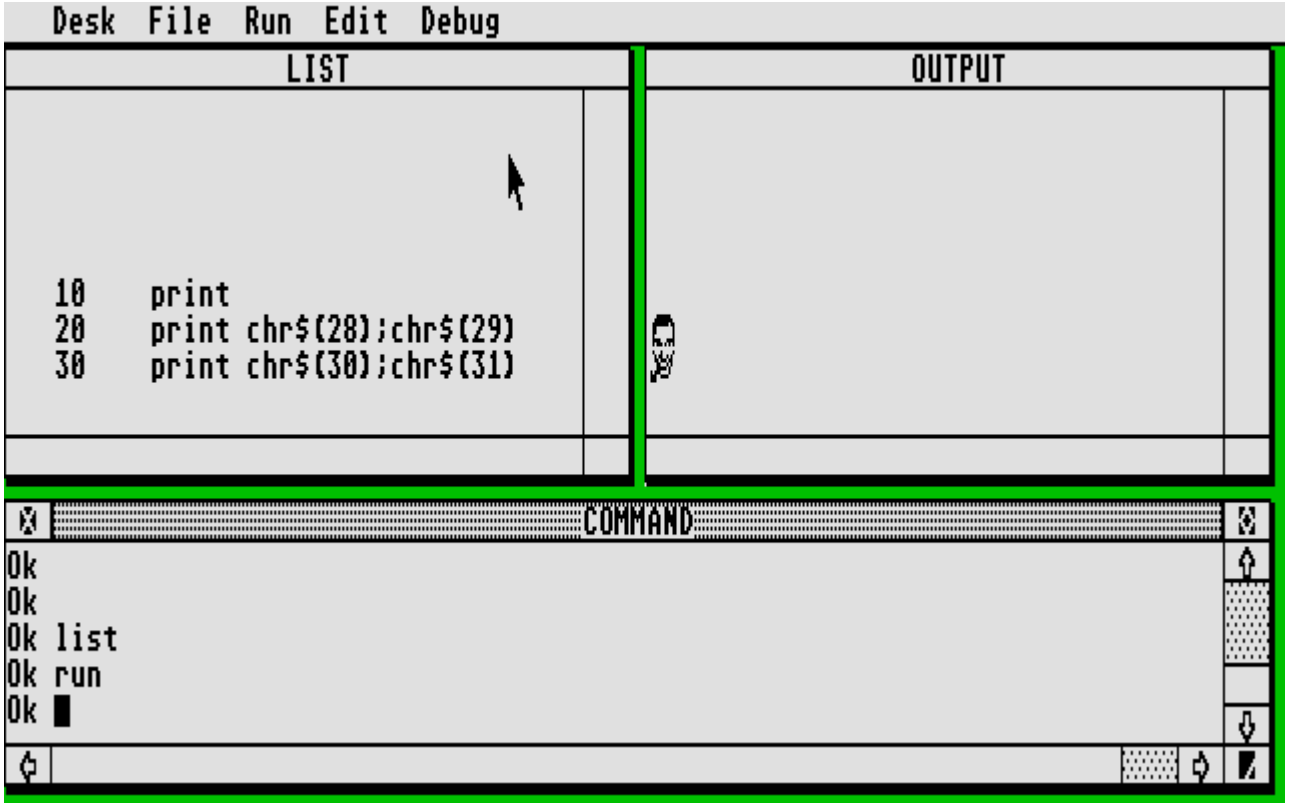
Atari ST postmortem

- Piracy: Piracy was (and in some ways is) a large problem for software publishers with limited resources. Piracy was pretty high on both the Atari ST and the Amiga, and is credited with limiting the profitability of software on those platforms. No software = no sales of computers.
- Atari believed that creating a developer-friendly machine would bring the software to it, but unfortunately that didn’t happen until much later. The machine was easier to develop for but the languages that were supported were different than what the 8-bit community used (C and 68K assembly instead of BASIC and 6502 / Z80 assembly).
- Folks pitted the Atari ST against the Amiga, but its main competition was the Macintosh. Unfortunately it didn’t help that Jack Tramiel had a grudge against Commodore, but had he ignored Commodore and left them to their own devices Atari might have survived a little longer.
- Atari Corporation was similar to Atari Inc in name only. Jack had no use for Atari’s games, which cut off one of the major reasons folks paid attention to Atari. Without leveraging the video game legacy of Atari Coin-op (which was separate from Atari Corporation) or the licenses that Atari Inc had acquired they were caught flat-footed when cheap gaming systems from Nintendo, NEC, and Sega began flooding and overtaking the 8-bit and 16-bit market.

Neat stuff about the Atari ST

- The Atari ST had several third-party packages for adding Macintosh compatibility with the use of Macintosh ROMs: Magic Sac, Spectre 128/GCR. With the “Transporter” it could also read Macintosh 800KB diskettes.

Neat stuff about the Atari ST



Atari ST Michigan Connections

- Abacus (book publisher) was based out of Grand Rapids and republished books from Europe over to the USA audience (many of these books are excellent, some of them not-so-much)
- Michtron (formerly Computer Shack) was based in Southfield, MI, and published many classic Atari ST titles including Time Bandit.
- Sheldon Leemon, writer of Instedit, Circuit Lab, and many fantastic Compute books including the definitive Atari ST references to VDI, AES, and TOS, was based out of Michigan.

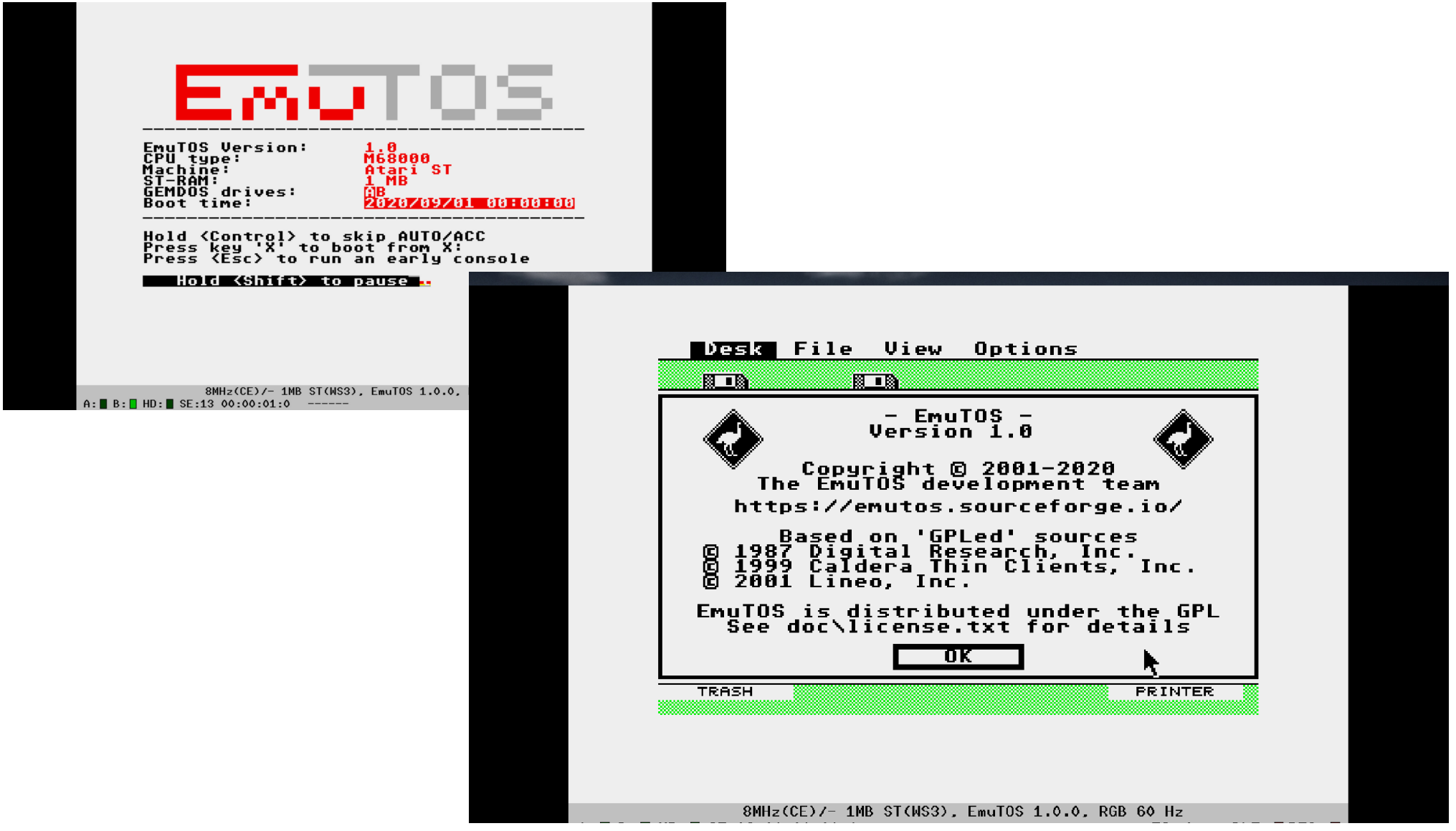
A curious path to today...

Caldera

- Acquired the assets of Digital Research Inc. in order to try to make a phone-based operating system out of GEM.
- Lineo was the thin client and embedded division spun out of Caldera Thin Clients July 1999.
- Caldera and Lineo realized that GEM and GEMDOS wasn’t going to do what they wanted it to do, so they released the source code under the GPL license.

EmuTOS

- A clean-room implementation of TOS based on the Caldera / Lineo source code, released under the GPL license.
- Many parts began life with the GEM Desktop / VDI / AES / GEMDOS code, but have been rewritten to fix bugs and bring them closer to how they were implemented on the Atari ST.
- Started in 1999, hit 1.0 release in 2020.
- Runs on all* Atari ST machines (can be burned to ROMs to replace TOS).
- Also can run on Amiga and Apple Lisa machines but won’t take advantage of custom hardware, or emulate custom hardware of the Atari ST on those machines.
- Also runs in emulators, and allows emulators and hardware to ship with an OS that doesn’t need to retrieved from another machine or other means.


EmuTOS
EmuTOS Version: 1.0
CPU type: M68000
Machine: Atari ST
ST-RAM: 1 MB
GEMDOS drives: AB
Boot time: 2020/09/01 00:00:00
Hold <Control> to skip AUTO/ACC
Press key 'X' to boot from X:
Press <Esc> to run an early console
Hold <Shift> to pause
8MHz(CE)/- 1MB ST(WS3), EmuTOS 1.0.0,
A: B: HD: SE:13 00:00:01:0 ------
Desk File View Options
- EmuTOS -
Version 1.0
Copyright © 2001-2020
The EmuTOS development team
https://emutos.sourceforge.io/
Based on 'GPLed' sources
© 1987 Digital Research, Inc.
© 1999 Caldera Thin Clients, Inc.
© 2001 Lineo, Inc.
EmuTOS is distributed under the GPL
See doc\license.txt for details
OK
TRASH
PRINTER
8MHz(CE)/- 1MB ST(WS3), EmuTOS 1.0.0, RGB 60 Hz

Hatari

- Hatari is an emulator for the Atari ST hardware, emulating most combinations of released Atari Hardware from the 520ST to the Falcon (some combinations better than others)
- Released under the GPL
- Started in 2001 to keep a cycle-accurate Atari ST emulator alive under Linux.
- Used CPU emulation from UAE, an Amiga Emulator
- Also the basis of Hataroid, an Android port of Hatari
- More on the history of Hatari at
  https://listengine.tuxfamily.org/lists.tuxfamily.org/hatari-devel/2021/03/msg00035.html

Modern Hardware

- Firebee (a hardware clone of the Atari Falcon with a Coldfire CPU.

- Many different FPGA versions, including the MIST, MISTer, and others.

Questions?

Thank you!

References and more

- Faster Than Light by James Lendino
- Hatari: http://hatari.tuxfamily.org/
- EmuTOS: https://emutos.sourceforge.io/
- MIST: https://lotharek.pl/productdetail.php?id=45
- MISTer: https://misterfpga.org/
- Firebee: http://firebee.org/fb-bin/index