Welcome to the comp.sys.atari.8bit newsgroup!

Atari 8-Bit Computers

Frequently Asked Questions List

| _____________ | _____________ | _____________ |
| 130XE         | 800XL         | 800           |
| 65XE          | 600XL         | 400           |
| 800XE         | XE            | 1200XL        |

Additions/suggestions/comments/corrections are needed! Please send to:

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*******************************************************************************
* For other 8-bit Atari related FAQs please see the "Welcome FAQ": *
* ftp://rtfm.mit.edu/pub/faqs/atari-8-bit/welcome *
* http://faqs.cs.uu.nl/na-dir/atari-8-bit/welcome.html *
*******************************************************************************

UPDATES SINCE PREVIOUS POSTING:
2012.01.15 6.7 Atari#: CO60479 UL Listed: 51B9 & new 60479-bottom.jpg
2012.01.15 9.2 added IPF
2012.01.10 7.6.2 Micro-SpartaDOS 4.6
2012.01.10 7.6.1 SpartaDOS X Version 4.45 (4 Nov. 2011)
2012.01.10 3.12 significant section upgrade
2011.12.05 6.8 6.5 11.1 CX70 and CX4124 released
2011.12.04 early software releases, including from 1980 ROM Cartridge Catalog
  thanks to Laurent Delsarte

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0.1) Table of contents

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Subject: 1.1) What is an Atari 8-bit computer?

Based in Silicon Valley in the U.S.A., the company known as Atari produced
a line of home computers from 1979 to 1992 often referred to collectively as
the "Atari 8-bits," the "8-bit Ataris," the "400/800/XL/XE series," etc.

The computers included the 400, 800, 1200XL, 600XL, 800XL, 65XE, 130XE, 800XE,
and the XE video game system.

Notable home computers that were introduced before the Atari 400/800:
1977: Apple II, Tandy Radio Shack TRS-80 (Model I), Commodore PET

Notable home computers that were introduced after the Atari 400/800:
1979: Texas Instruments TI-99/4
1980: Commodore VIC-20, TRS-80 Color Computer, Osborne 1
1982: Kaypro II, Sinclair ZX Spectrum, Commodore 64
1983: Coleco Adam, MSX
1984: Apple Macintosh, Amstrad CPC
1985: Atari ST, Commodore Amiga
1987: Acorn Archimedes
In marketing their computers to the public, Atari always had to contend with their company history and reputation as a maker of video games. While the 8-bit Atari computers in their heyday were technically quite comparable if not superior in the worlds of home and business personal computing, they also live up to the name "Atari" with a huge library of video games which were often outstanding for their time.

The 8-bit Atari computers do not use the same cartridges or floppy disks as any other Atari platforms, such as the 2600 Video Computer System (VCS), the 5200 SuperSystem, the 7800 ProSystem, or the ST/TT/Falcon computers. All of these but the 5200, however, do share the same joystick/controller hardware port.

The 5200 SuperSystem is actually nearly identical to the 8-bit computers internally, yet cartridges for the 5200 and the 8-bit computers cannot be exchanged, primarily due to the physically different cartridge ports.

Here are some of the performance specifications of the 8-bit Atari computers:

**CPU:**
- 6502B (most 400/800 machines)
- Atari SALLY 6502 (late 400/800 machines and all XL/XE machines)

**CPU CLOCK RATE:**
- 1.7897725 MHz (NTSC machines)
- 1.7734470 MHz (PAL/SECAM machines)

**FRAME REFRESH RATE:**
- 59.94 Hz (NTSC machines)
- 49.86 Hz (PAL/SECAM machines)

**MACHINE CYCLES per FRAME:**
- 29859 (NTSC machines) (1.7897725 MHz / 59.94 Hz)
- 35568 (PAL/SECAM machines) (1.7734470 MHz / 49.86 Hz)

**SCAN LINES per FRAME**
- 262 (NTSC machines)
- 312 (PAL/SECAM machines)

**MACHINE CYCLES per SCAN LINE**
- 114  (NTSC machines: 29859 cycles/frame / 262 lines/frame)
-      (PAL/SECAM machines: 35568 cycles/frame / 312 lines/frame)

**COLOR CLOCKS per MACHINE CYCLE**
- 2

**COLOR CLOCKS per SCAN LINE**
228  (2 color clocks/machine cycle * 114 machine cycles/scan line)

MAXIMUM SCAN LINE WIDTH = "WIDE PLAYFIELD"
176 color clocks

MAXIMUM RESOLUTION = GRAPHICS PIXEL
0.5 color clock

MAXIMUM HORIZONTAL FRAME RESOLUTION
352 pixels (176 color clocks / 0.5 color clock)

MAXIMUM VERTICAL FRAME RESOLUTION
240 pixels (240 scan lines per frame)

GRAPHICS MODES:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Graphics</th>
<th>Display Type</th>
<th>Resolution (full screen)</th>
<th>Number of Colors/Hues</th>
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<td>Char</td>
<td>40 x 24</td>
<td>1 *</td>
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<tr>
<td>1</td>
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<td>160 x 192</td>
<td>2</td>
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<td>1 **</td>
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<td>Map</td>
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<tr>
<td>F</td>
<td>Map</td>
<td>80 x 192</td>
<td>16 ***</td>
<td></td>
</tr>
</tbody>
</table>

* 1 Hue, 2 Luminances
** 1 Hue, 16 Luminances (GTIA); or, 1 Hue, 8 Luminances (FGTIA)
*** 16 Hues, 1 Luminance
+ require the GTIA/FGTIA chip. (1979-1981 400/800s shipped with CTIA.)
++ Not available via the BASIC GRAPHICS command in 400/800 version of OS.

(See a separate section in this FAQ list for a discussion of the "missing" ANTIC Modes 0 and 1.)

GRAPHICS INDIRECTION (COLOR REGISTERS AND CHARACTER SETS):
Nine color registers are available. Each color register holds any of 16 luminances x 16 hues = 256 colors. (Four registers are for player-missile graphics.)
Character sets of 128 8x8 characters, each with a normal and an inverse video incarnation, are totally redefinable.

PLAYER-MISSILE GRAPHICS:
Four 8-bit wide, 120 or 240 byte high single color players, and four 2-bit wide, 120 or 240 byte high single color missiles are available. A mode to combine the 4 missiles into a 5th 8-bit wide player is also available, as is a mode to OR colors or blacken out colors when players overlap (good for making three colors out of two players!) Players and missiles have adjustable priority and collision detection.

DISPLAY LIST:
Screen modes can be mixed (by lines) down the screen using the Display List - a program which is executed by the ANTIC graphics chip every screen refresh.

DISPLAY LIST INTERRUPTS (DLIs):
Other screen attributes (color, player/missile horizontal position, screen width, player/missile/playfield priority, etc.) can be adjusted at any point down the screen via DLIs.

SCROLLING:
Fine scrolling (both vertical and horizontal) can be enabled on any line on the screen.

SOUND:
Sound is monaural/monophonic (one channel output).

Up to 4 separate simultaneous voices can be produced, configured as one of the following:
- 4 voices, each with one of 256 unique frequencies/pitches
- 2 voices, each with one of 65,536 unique frequencies/pitches
- 1 voice with one of 65,536 pitches and 2 voices with one of 256 pitches

Each voice may be produced with one of 8 available "noise" settings/polynomial-counter combinations, commonly called "distortion" settings. (There are actually only 6 distinct combinations of 3 poly-counters offered, but one of the poly-counters has 2 available settings itself, resulting in 2 additional noise settings for the total of 8 available.)

Each voice may be produced at one of 16 volumes.

Direct control of the position of the speaker cone is also available, with 4-bit (16 position) resolution. Known as "volume only mode" on the Atari.

A fifth "voice" is produced as a separate signal by the internal speaker on the Atari 400/800. This is typically used only for keyclick and
buzzer. In XL/XE systems these sounds are output as part of the normal
monaural audio output signal.

VERTICAL BLANK INTERRUPTS (VBIs):
A software routine may be designed to execute as a VBI. There are two
varieties of VBI: Immediate and Deferred. An Immediate VBI completes
execution within the vertical blank time, which is the time allotted for a
CRT display to shut the electron beam off at the lower-right of the
display and reposition it back on the top-left of the display to commence
drawing of the next frame. A Deferred VBI routine completes execution
between the initiation of one vertical blank and the next.

Subject: 1.2) What is the Atari 400?

Released along with the 800 in 1979, the 400 was the low-end model of the two.
The only 8-bit Atari with a membrane keyboard rather than a full-stroke
keyboard. One of the few 8-bit Ataris lacking a composite monitor port.
Originally released with just 8K RAM, but most were sold with 16K RAM.

Atari sold the 48K RAM Expansion Kit for the 400, which required a little
soldering, to dealers only.

Most Atari 400 machines include a standard 6502 microprocessor, but late-
production units use a revised CPU Board that features Atari’s SALLY 6502.

On the 400, joystick controller port #4 is the only port that supports a light
pen or light gun.

Features unique to the 400/800 models:
- Four controller (joystick) ports
- Internal speaker for keyclicks and system buzzer
- Memo Pad mode
- +12 volts on pin 12 of the SIO port

Boot options:
Memo Pad
- Turn on computer with no cartridge inserted and no powered disk drive.
Cartridge
- Turn on computer with cartridge inserted.
Cassette
1. Hold down [START] while turning on the computer.
   (System buzzer sounds.)
2. Press [PLAY] on the program recorder.
3. Press [RETURN] to load and run cassette program.
Disk
- Turn on computer with disk inserted in powered disk drive.
Versions of the Atari 400:

- NTSC (North America) version
  - TV Channel switch: (2 - 3)
  - CTIA (early production) or GTIA (most)

- PAL (Europe) version
  - TV Channel switch (channels vary by country)
  - GTIA

Manuals:
- Atari 400 Operator's Manual CO14768

Power: Used with an external 9 volt AC transformer power supply rated for at least 19 watts, such as Atari#CO14319/C014319/CA014748 or C060592 (each detailed elsewhere in this FAQ list), or equivalent.

Rare variation of the 400:
- At least some of the few Atari 400 units (PAL) sold by Atari in France have been reported to include a built-in peritel cable. PICTURES, ANYONE???

Atari marketing used the trademark, The Basic Computer, as an alternative name for the 400 from 1981-1982.

The 400 was made in the USA (early production) and Hong Kong (later production).

Production of the 400 ended in May 1983.

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Subject: 1.3) What is the Atari 800?

Released along with the 400 in 1979, the 800 was the high-end model of the two. The 800 is the only 8-bit Atari with a Right Cartridge slot, in addition to the Left Cartridge slot as present on all 8-bit Ataris. Originally released with just 8K RAM, many were sold with 16K, later on 48K was standard.

The 800 is also the only 8-bit Atari with a four-slot modular design, where the first slot holds the CX801 (NTSC) or CX801-P (PAL) 10K ROM module, and the other three slots hold combinations of CX852 8K or CX853 16K RAM modules. Slots must be filled from front to back. And, if both 8K and 16K modules are to be used, the 16K module(s) must be used in front of the 8K module(s).

Jason Harmon writes: (12 Feb 2004)
"...the early ones had plastic cases on the ROM and RAM modules, and had two thumb tabs to remove the cover to access the modules. Later model 800s had 48K standard, and to improve cooling Atari installed them without the cases but put a small plastic strip across the tops of the cards to hold them in position. These machines also lost the thumb tabs and have regular screws to secure the cover over the memory slots."

Most Atari 800 machines include a standard 6502 microprocessor, but late-production units use a revised CPU Board that features Atari's SALLY 6502.

Features unique to the 400/800 models:
- Four controller (joystick) ports
- Internal speaker for keyclicks and system buzzer
- Memo Pad mode
- +12 volts on pin 12 of the SIO port

Boot options:
Memo Pad
- Turn on computer with no cartridge inserted and no powered disk drive.

Cartridge
- Turn on computer with cartridge inserted.

Cassette
1. Hold down [START] while turning on the computer.
   (System buzzer sounds.)
2. Press [PLAY] on the program recorder.
3. Press [RETURN] to load and run cassette program.

Disk
- Turn on computer with disk inserted in powered disk drive.

Versions of the Atari 800:

o NTSC (North America) version
  - TV Channel switch: 2 - 3
  - CTIA (early production) or GTIA (most)

o PAL (Europe) version
  - TV Channel switch (channels vary by country)
  - GTIA

Manuals:
- Atari 800 Operator's Manual CO14769

Power: Used with an external 9 volt AC transformer power supply rated for at least 19 watts, such as Atari#CO14319/C014319/CA014748 or C060592 (each detailed elsewhere in this FAQ list), or equivalent.
Rare variation of the 800:
  - At least some of the few Atari 800 units (PAL) sold by Atari in France have been reported to include an 8-bit DIN monitor port. PICTURES, ANYONE???

The 800 was made in the USA.

Production of the 800 ended in May 1983.

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Subject: 1.4) What is the Atari 1200XL?

Introduced as a big brother to the 400/800 in 1982 and shipped in 1983, the 1200XL was the biggest single step forward in development of the 8-bit Atari platform. Innovations in comparison to the 400/800 include a full 64K of RAM and a newly revised and expanded 16K Operating System.

The 1200XL is the only Atari to feature two LED indicator lights (L1, L2). Normally they are both on. L1 means the keyboard is disabled. L2 means the new International Character Set is selected.

Keyboard enhancements introduced with the 1200XL include the new [HELP] key as well as four programmable functions keys ([F1], [F2], [F3], [F4]). Clicks and system beeps output through the built-in speaker on the 400/800 are heard from the television or monitor speaker on the 1200XL. The toggle action of the [Caps/Lowr] key was altered compared to the 400/800. The key auto-repeat rate is user-alterable. The Reset key is directly wired to the 6502 reset line.

1200XL Function key effects, redefinable:
- [F1] Cursor up          [SHIFT]+[F1] Cursor to upper-left corner (home)
- [F2] Cursor down        [SHIFT]+[F2] Cursor to lower-left corner
- [F3] Cursor left         [SHIFT]+[F3] Cursor to start of physical line
- [F4] Cursor right        [SHIFT]+[F4] Cursor to end of physical line

1200XL Function key effects, non-redefinable:
- [CONTROL]+[F1] Keyboard enable/disable (console keys unaffected)
- [CONTROL]+[F2] Screen DMA (ANTIC) enable/disable
- [CONTROL]+[F3] Key click sound enable/disable
- [CONTROL]+[F4] Domestic/International character set toggle

Additional 1200XL Operating System enhancements compared to the 400/800:
- Text screen fine scrolling is available
- The Resident Diskette Handler can read/write disk sectors having variable length from 1 to 65536 bytes.
  Default = 128 bytes (matching the 400/800 static value)
- The Resident Diskette Handler can write a sector to the disk without a read-verify operation always following it.
- Universal OS for both NTSC and PAL systems (including independent values for cassette timings and for keyboard auto-repeat functions)

A few features from the 400/800 are lacking in the 1200XL. Most prominently, the 1200XL has only 2 controller ports, and no Memo Pad mode. Also, the 1200XL lacks the chrominance video signal on pin 5 on the Monitor port, and lacks the +12 volts on pin 12 of the SIO port. Furthermore, the 1200XL is the only Atari that lacks the +5 volts on pin 10 of the SIO port.

Boot options:
"ATARI" rainbow logo/graphics demo screen
- Turn on computer with no cartridge inserted and no powered disk drive.
- Press [HELP] from the "ATARI" logo screen to access Self Test program.

Cartridge
- Turn on computer with cartridge inserted.

Cassette
1. Hold down [START] while turning on the computer.
   (System buzzer sounds.)
2. Press [PLAY] on the program recorder.
3. Press [RETURN] to load and run cassette program.

Disk
- Turn on computer with disk inserted in powered disk drive.

Box: "A Step Into the Future" or "The Next Logical Step"

While a PAL version was planned, the 1200XL was only produced in an NTSC version for North America.

The 1200XL was made in the USA from January 1983 to May 1983, and in Taiwan from April 1983 to July 1983.

By analyzing 1200XL serial numbers, Karl Heller estimates that fewer than 120,000 units total were produced, and possibly fewer than 100,000. See the "1200XL Owners List" thread on AtariAge:

Scott Stilphen mentioned this 1200XL easter egg on 10 Feb 2006:
On 1200XLs, if you select 'all tests', when it gets to the keyboard test it'll type out the programmer's name.

1200XL visual tour: http://www.atari800xl.eu/public/1200xl/

Subject: 1.5) What is the Atari 600XL?

Released in 1983 as a replacement for the 400, the 600XL is the low-end version of the 800XL. The 600XL/800XL include most of the features of the
1200XL, minus the 4 Function keys, the 2 LED lights, and the "ATARI" logo screen. But both the 600XL and 800XL have the Atari BASIC language built-in. In addition, these two systems offer the Parallel Bus Interface (PBI), providing fast parallel access to the heart of the computer. The 600XL has 16K RAM.

The Atari 1064 Memory Module expands the 600XL from 16K to 64K RAM.

Boot options:
Atari BASIC (Rev. B)
- Turn on computer with no cartridge inserted and no powered disk drive.
Self Test program
- Hold down [OPTION] while turning on the computer with no cartridge installed and no powered disk drive.
Cartridge
- Turn on computer with cartridge inserted.
Cassette
1. Hold down [START] while turning on the computer.
   (System buzzer sounds.)
2. Press [PLAY] on the program recorder.
3. Press [RETURN] to load and run cassette program.
Disk, with Atari BASIC enabled
- Turn on computer with disk inserted in powered disk drive.
Disk, with Atari BASIC disabled
- Hold down [OPTION] while turning on computer with disk inserted in powered disk drive.

Box: "Feature For Feature, Your Best Value"

Versions of the Atari 600XL:

- NTSC (North America) version, produced fall 1983 to summer 1984 by Atari, Inc.
  - No Monitor port
  - TV Channel switch: 2 - 3

- PAL (Europe) version, produced fall 1983 to summer 1984 by Atari, Inc.
  - Includes Monitor port, but this lacks the separate luminance and chrominance video signals
  - No TV channel switch

Rare variations of the 600XL:
- Some late-model 600XLs were sold with 64K RAM. These may have only appeared in Canada. The box had a round gold foil sticker reading: "64k Memory -- Now with a full 64k of memory built-in."

5 different types of 600XL/800XL keyboards were nicely documented by Beetle here: http://www.atariage.com/forums/index.php?showtopic=105170
The Atari 600XL was utilized by Exidy as an embedded system in their Max-A-Flex coin-operated arcade conversion system (configurable to play: Astro Chase, Boulder Dash, Bristles, or Flip and Flop). See: http://www.myatari.co.uk/issues/jan2003/maxaflex.htm

The 600XL was made in Hong Kong and Japan.

Production of the 600XL was discontinued by July 1984.

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Subject: 1.6) What is the Atari 800XL?

Released in 1983 as a replacement for the 800 and 1200XL, the 800XL is the high-end version of the 600XL. The 600XL/800XL include most of the features of the 1200XL, minus the 4 Function keys, the 2 LED lights, and the "ATARI" logo screen. But both the 600XL and 800XL have the Atari BASIC language built-in. In addition, these two systems offer the Parallel Bus Interface (PBI), providing fast parallel access to the heart of the computer. The 800XL contains 64K RAM.

Boot options:
- Atari BASIC (Rev. B or Rev. C, see below)
  - Turn on computer with no cartridge inserted and no powered disk drive.
- Self Test program
  - Hold down [OPTION] while turning on the computer with no cartridge installed and no powered disk drive.
- Cartridge
  - Turn on computer with cartridge inserted.
- Cassette
  1. Hold down [START] while turning on the computer.
     (System buzzer sounds.)
  2. Press [PLAY] on the program recorder.
  3. Press [RETURN] to load and run cassette program.
- Disk, with Atari BASIC enabled
  - Turn on computer with disk inserted in powered disk drive.
- Disk, with Atari BASIC disabled
  - Hold down [OPTION] while turning on computer with disk inserted in powered disk drive.

Box: "More Memory Means More Power"

Versions of the Atari 800XL:

- NTSC (North America) version, produced fall 1983 to summer 1984 by Atari, Inc.
  - Monitor port lacks the chrominance video signal on pin 5
- TV Channel switch: 2 - 3
- Atari BASIC Revision B (most) or Revision C (late production)
- Made in Hong Kong and Taiwan.
- Some internal pics:
  http://atarinside.dyndns.org/gallery2/main.php?g2_itemId=74

- PAL (Europe) version, produced fall 1983 to summer 1984 by Atari, Inc.
  - Monitor port lacks the chrominance video signal on pin 5
  - No TV channel switch
  - Atari BASIC Revision B (most) or Revision C (late production)
  - More internal pics:
    http://atarinside.dyndns.org/gallery2/main.php?g2_itemId=73
  - Made in Hong Kong and Taiwan.

- PAL (Europe) version, produced fall 1984 by Atari Corp.
  - "800XLF" motherboard
  - FREDDIE memory management chip
  - Earlier production: Monitor port lacks the chrominance signal on pin 5
  - Later production: chrominance signal is present on Monitor port pin 5
  - No TV channel switch
  - Atari BASIC Revision C
  - Made in Taiwan.

- SECAM (France) version, produced fall 1984 by Atari Corp.
  - "SECAM ROSE" motherboard
  - FREDDIE memory management chip
  - FGTIA, paired with the PAL ANTIC
  - Monitor port has unique pinout, 6 pins instead of 5;
    includes composite video but not chrominance nor luminance signals
  - No TV jack
  - No TV channel switch
  - Internal color/monochrome switch
  - Atari BASIC Revision C
  - Visual tour: http://www.atari800xl.eu/public/800xlsecam
  - More internal pics:
    http://atarinside.dyndns.org/gallery2/main.php?g2_itemId=15
  - Made in Taiwan.

5 different types of 600XL/800XL keyboards were nicely documented by Beetle

Production of the 800XL was discontinued by 1985.

Subject: 1.7) What is the Atari 65XE?
Introduced in 1985 as a direct replacement for the 800XL, the 65XE is a low-end version of the 130XE.

The 65XE offers 64K RAM, and includes the FREDDIE memory management chip.

The 65XE does not include the PBI port as on the 600XL/800XL, but many 65XE machines include the similar (though physically incompatible) Enhanced Cartridge Interface (ECI).

Boot options:
  Atari BASIC (Rev. C)
    - Turn on computer with no cartridge inserted and no powered disk drive.
  Self Test program
    - Hold down [Option] while turning on the computer with no cartridge installed and no powered disk drive.
  Cartridge
    - Turn on computer with cartridge inserted.
  Cassette
    1. Hold down [Start] while turning on the computer.
       (System buzzer sounds.)
    3. Press [Return] to load and run cassette program.
  Disk, with Atari BASIC enabled
    - Turn on computer with disk inserted in powered disk drive.
  Disk, with Atari BASIC disabled
    - Hold down [Option] while turning on computer with disk inserted in powered disk drive.

Versions of the Atari 65XE:

  o NTSC (North America) without ECI port (common production)
    - TV Channel switch: 2 - 3
  o NTSC (North America) with ECI port (uncommon/rare late production)
    - NTSC 130XE motherboard
    - TV Channel switch: 2 - 3
  o PAL (Europe) version without ECI port (uncommon early production)
    - No TV channel switch
  o PAL (Europe) version with ECI port (common later production)
    - (Identical to 800XE)
    - PAL 130XE motherboard
    - No TV channel switch
    - Reports of some 65XE machines previously labeled as 800XE machines and vice versa.
  o PAL (Arabia) version: Atari Star 65XE
- Reportedly widely sold in Saudi Arabia and Egypt
- "65XEN" motherboard
- ECI port
- No TV channel switch
- Arabic localized OS
- Another analysis (Polish):
  atarionline.pl/v01/index.php?subaction=showfull&id=1184283958
  &archive=&start_from=20&ucat=6&ct=wynalazki
- Prototype NTSC version:
  http://www.savetz.com/vintagecomputers/arabic65xe/

The 65XE computer was also marketed (Mexico?) as the XE Video Game System, with Light Gun and Joystick: http://www.rhod.fr/ataripics/65xepack.JPG

(The 65XE was not marketed in France.)

The 65XE was made in Taiwan (common) and China (late production).

Subject: 1.8) What is the Atari 130XE?

Released in 1985, the 130XE is the high-end version of the 65XE/800XE.

The 130XE offers 128K RAM, and includes the FREDDIE memory management chip.

The 130XE does not include the PBI port as on the 600XL/800XL, but it does include the similar (though physically incompatible) Enhanced Cartridge Interface (ECI).

Boot options:
  Atari BASIC (Rev. C)
    - Turn on computer with no cartridge inserted and no powered disk drive.
  Self Test program
    - Hold down [Option] while turning on the computer with no cartridge installed and no powered disk drive.
  Cartridge
    - Turn on computer with cartridge inserted.
  Cassette
    1. Hold down [Start] while turning on the computer.
       (System buzzer sounds.)
    3. Press [Return] to load and run cassette program.
  Disk, with Atari BASIC enabled
    - Turn on computer with disk inserted in powered disk drive.
  Disk, with Atari BASIC disabled
- Hold down [Option] while turning on computer with disk inserted in powered disk drive.

Versions of the Atari 130XE:

- NTSC (North America) version
  - TV Channel switch: 2 - 3

- PAL (Europe) version
  - No TV channel switch

- SECAM (France) version
  - FGTIA; PAL ANTIC
  - No TV jack
  - No TV channel switch
  - Color/Monochrome switch
  - a distant image of the rear of the unit, middle unit pictured here:
    http://www.silicium.org/oldskool/images/catalog/atari/atari_3xe_culs.jpg

The 130XE was made in Taiwan (common) and China (late production).

Subject: 1.9) What is the Atari 800XE?

Introduced in 1987 in West Germany as a direct replacement for the 800XL, the 800XE is a low-end version of the 130XE.

The 800XE offers 64K RAM, and includes the FREDDIE memory management chip.

The 800XE does not include the PBI port as on the 600XL/800XL, but it does include the similar (though physically incompatible) Enhanced Cartridge Interface (ECI).

Boot options:
  - Atari BASIC (Rev. C)
    - Turn on computer with no cartridge inserted and no powered disk drive.
  - Self Test program
    - Hold down [Option] while turning on the computer with no cartridge installed and no powered disk drive.
  - Cartridge
    - Turn on computer with cartridge inserted.
  - Cassette
    1. Hold down [Start] while turning on the computer.
       (System buzzer sounds.)
    3. Press [Return] to load and run cassette program.
  - Disk, with Atari BASIC enabled
- Turn on computer with disk inserted in powered disk drive.
  Disk, with Atari BASIC disabled
  - Hold down [Option] while turning on computer with disk inserted in
    powered disk drive.

The 800XE was produced in a PAL (Europe) version only:
  - Identical to common PAL 65XE version with ECI port:
    - PAL 130XE motherboard
    - TV channel switch: some include it, some do not
  - Reports of some 800XE machines previously labeled as 65XE machines
    and vice versa.

Some images of the 800XE:
http://www.silicium.org/oldskool/atari/800xe.htm

Jindrich Kubec writes, "The problematic Chinese 800XEs with GTIA problems were
manufactured in 1992."

The 800XE was made in Taiwan (common) and China (late production).

The 800XE was last manufactured in 1992.

Subject: 1.10) What is the Atari XE video game system?

In a change of marketing strategy, Atari introduced the new XE video game
system in 1987. The XE System is a true 8-bit Atari computer system. It
offers the convenience of a detachable keyboard and built-in Missile Command
game, while offering 64K RAM and full compatibility with the XL/XE computers.
FREDDIE memory management chip included.

The components of the XE game system were sold by Atari in several different
packages.

USA:
  o XE4001 XE Game System
    XE Console + Keyboard + Light Gun + Joystick + Flight Simulator II
cartridge + Bug Hunt cartridge
    http://www.mr-atari.com/afbeeldingen/systems/xegamesystem.jpg

Europe (outside France):
  o XE Console + Joystick
    http://www.mr-atari.com/afbeeldingen/hardwarediv/xesystem1.jpg

  o XE Keyboard + Flight Simulator II cartridge
    http://www.mr-atari.com/afbeeldingen/hardwarediv/xesystem3to etsenbord.jpg
o XG-1 Light Gun + Bug Hunt cartridge
   http://www.rhod.fr/pages/atari/C100449.html

France:
o XE Console + Light Gun + Joystick + Bug Hunt cartridge
   http://www.rhod.fr/pages/atari/XE1.html

o XE Keyboard + XC12 + Flight Simulator II cartridge
   http://www.rhod.fr/pages/atari/XEkeyboard.html

Mexico?:
o XE Video Game System: 65XE computer + Light Gun + Joystick
   http://www.rhod.fr/ataripics/65xepack.JPG

XE System boot options:
Missile Command
(a) With XE keyboard not connected:
   - Turn on computer with no cartridge inserted and no powered disk drive.
(b) With XE keyboard connected:
   - Hold down [Select] while turning on the computer with no cartridge inserted and no powered disk drive.
Self Test program
   - Hold down [Option] while turning on the computer with no cartridge installed and no powered disk drive.
Cartridge
   - Turn on computer with cartridge inserted.
Cassette
   1. Hold down [Start] while turning on the computer.
      (System buzzer sounds.)
   3. Press [Start] on the XE console to load and run cassette program.
Disk, with Atari BASIC enabled
(a) With XE keyboard not connected:
   - Hold down [Select] while turning on computer with disk inserted in powered disk drive.
(b) With XE keyboard connected:
   - Turn on computer with disk inserted in powered disk drive.
Disk, with Atari BASIC disabled
   - Hold down [Option] while turning on computer with disk inserted in powered disk drive.

Versions of the Atari XE System produced:

o NTSC (North America) version
   - TV Channel switch: 2 - 3

o PAL (Europe) version
- No TV channel switch

- SECAM (France) version
  - FGTIA; PAL ANTIC
  - No TV channel switch

The XE System Console was made in Taiwan.

Subject: 1.10.5) What were the Atari 1400XL, 1450XLD, 65XEM, and 65XEP?

Atari publicly introduced several computers in the tradition of the 400/800/XL/XE series that ultimately never shipped.

The 1400XL was introduced by Atari, Inc. alongside the 600XL, 800XL, and 1450XLD at the June 1983 Summer Consumer Electronics Show in Chicago. Resembling the 1200XL in appearance, the 1400XL was to provide the features of the 800XL plus a built-in 300 baud modem and a built-in speech synthesizer. Prototype units exist, but the 1400XL never shipped. http://www.atarimuseum.com/computers/8BITS/XL/1400xl/1400.html

The 1450XLD was introduced by Atari, Inc. alongside the 600XL, 800XL, and 1400XLD at the June 1983 Summer Consumer Electronics Show in Chicago. The 1450XLD was to provide the features of the 1400XL plus a built-in double sided, dual/enhanced density 260K 5.25" floppy disk drive, with expansion space for a second disk drive. Atari continued to promote the 1450XLD through June 1984. Prototype units exist, but the 1450XLD never shipped. http://www.atarimuseum.com/computers/8BITS/XL/1450xld/1450xl.html

The 65XEM was introduced by Atari Corp. alongside the 65XE, 65XEP, and 130XE at the January 1985 Winter Consumer Electronics Show in Las Vegas. The 65XEM was to provide the features of the 65XE, plus advanced sound/voice synthesis capabilities thanks to the addition of the AMY Sound Processor chip. The 65XEM never shipped, and no working prototypes are known to exist. http://www.atarimuseum.com/computers/8bits/xe/xe_protos/65xe.html

The 65XEP was introduced by Atari Corp. alongside the 65XE, 65XEM, and 130XE at the January 1985 Winter Consumer Electronics Show in Las Vegas. The portable 65XEP was to provide the features of the 65XE, plus built-in 5" monochrome CRT display and 360K 3.5" disk drive. The 65XEP never shipped, and no working prototypes are known to exist. http://www.rhod.fr/ataripics/atari65xep.jpg

Subject: 1.11) What are SALLY, ANTIC, CTIA/GTIA/FGTIA, POKEY, and FREDDIE?
Portions of this section are based on the "System Overview" Section, written by Atari's Cris Crawford, of Atari's De Re Atari (Atari#APX-90008). The full text of De Re Atari: http://www.atariarchives.org/dere/

The internal layout of the Atari 8-bit computer is very different from other systems. It of course has a microprocessor (a 6502), random-access memory (RAM), read-only memory (ROM), and a peripheral interface adapter (PIA, CO12298/CO14795, a standard 6520). However, it also has three special-purpose large-scale integration (LSI) chips known as ANTIC, one of CTIA/GTIA/FGTIA, and POKEY. These chips were designed by Atari engineers primarily to take much of the burden of housekeeping off of the 6502, thereby freeing the 6502 to concentrate on computations. While they were at it, they designed a great deal of power into these chips. Each of these chips is almost as big (in terms of silicon area) as a 6502, so the three of them together provide a tremendous amount of power. Mastering the Atari 8-bit computers is primarily a matter of mastering these three chips.

6502/SALLY Central Processing Unit (CPU) -- 6502B (400/800,most):CO14377
6502/SALLY (400/800,late)(XL/XE,all):CO14806

The Microprocessor Unit (MPU), typically (and less-precisely) described as the Central Processing Unit (CPU), in most Atari 400/800 computers is a standard 40-pin 6502 microprocessor. More specifically, most Atari 400/800 computers use a 6502B, which is a standard 6502 rated for a maximum operating frequency of 3 MHz. The 6502 was designed by Chuck Peddle and Bill Mensch for MOS Technology in 1975. In addition to MOS Technology, the 6502B has also been produced by Synertek and Rockwell International.

Late production 400/800 computers (including all PAL 400/800 units?) and all of the Atari XL/XE computer models contain Atari's customized version of the 6502 chip, known as SALLY. The innovation of the Atari SALLY 6502 is the addition of the HALT' signal on pin 35. The SALLY 6502 also has a second R/W' signal on pin 36 (in addition to pin 34). Pins 35 and 36 are not connected on a standard 6502.

The Atari's second microprocessor, ANTIC, must routinely interrupt the 6502 in order to utilize the processor bus for itself for direct memory access (DMA). HALT' on the SALLY 6502 facilitates this system design. Atari's earlier implementation of the same functionality in the 400/800 with the standard 6502 requires a series of 4 additional chips that are unnecessary in computers designed for the SALLY 6502.

Most Atari documentation refers to the Atari SALLY 6502 by the name, "6502C". Atari's use of "6502C" is unfortunate, because outside of the Atari world a 6502C is defined as: a standard 6502 rated for a maximum operating frequency of 4 MHz. This FAQ List adopts the name "SALLY 6502" to clearly differentiate Atari's customized chip from a standard 6502C.
Other systems utilizing the Atari SALLY 6502 chip:
- Atari 5200
- Exidy Max-A-Flex coin-operated arcade conversion system
  (embedded Atari 600XL): Astro Chase, Boulder Dash, Bristles, Flip and Flop
- Atari 7800

6502.org "the 6502 microprocessor resource": http://www.6502.org/

ANTIC -- 400/800/1200XL,NTSC:CO12296  400/800,PAL:CO14887
========  600XL/800XL/XE,NTSC:CO21697  XL/XE,PAL:CO21698
(The XL/XE PAL ANTIC is also used in SECAM XL/XE machines.)

ANTIC ("AlphaNumeric Television Interface Controller" --FD100001 Rev.02 p.1-8)
is a microprocessor dedicated to the television display. It is a true
microprocessor; it has an instruction set, a program (called the display
list), and data. The display list and the display data are written into RAM
by the 6502. ANTIC retrieves this information from RAM using direct memory
access (DMA). It processes the higher level instructions in the display list
and translates these instructions into a real-time stream of simple
instructions to CTIA/GTIA/FGTIA.

Specific ANTIC functions include:
- DMA (Direct Memory Access) control
- NMI (Non-Maskable Interrupt) control. 3 types of NMI on the Atari are:
  1) Display List Interrupt (DLI)
  2) Vertical Blank Interrupt (VBI)
  3) System Reset (key)
- Vertical and Horizontal fine scrolling
- Light pen horizontal and vertical position registers
- Vertical line counter
- WSYNC (wait for horizontal sync) command -- allows the microprocessor to
  synchronize itself to the TV horizontal line rate

Other systems utilizing the Atari ANTIC chip:
- Atari 5200
- Exidy Max-A-Flex coin-operated arcade conversion system
  (embedded Atari 600XL): Astro Chase, Boulder Dash, Bristles, Flip and Flop

ANTIC(NTSC) C012296 techical documentation by Atari:

CTIA/GTIA/FGTIA -- CTIA(NTSC):CO12295  GTIA,PAL:CO14889
==================  GTIA,NTSC:CO14805  FGTIA(SECAM):CO20120
CTIA = "Color Television Interface Adaptor" --FD100001 Rev.02 p.1-10
GTIA = "Graphics Television Interface Adaptor" --FD100001 Rev.02 p.1-10
FGTIA = "French Graphics Television Interface Adaptor" (mc's guess)
The CTIA, GTIA, or FGTIA is the television interface chip. ANTIC directly controls most of the operations of the CTIA/GTIA/FGTIA, although the 6502 can also be programmed to intercede and control some or all of the functions of the CTIA/GTIA/FGTIA. The CTIA/GTIA/FGTIA converts the digital commands from ANTIC (or the 6502) into the video signal output.

In addition to its basic television/video interface function, the CTIA/GTIA/FGTIA performs color-luminance control for the entire video signal, player-missile control, and both priority control and collision detection among player-missiles and the background. The CTIA/GTIA/FGTIA also reads the controller port trigger inputs, it reads console keys (Start/Select/Option), and it controls the built-in speaker in the 400/800.

Early North American NTSC 400/800 models shipped with CTIA. Later NTSC 400/800 models, all PAL 400/800s, and all NTSC XL/XE and PAL XL/XE systems include GTIA. SECAM 800XL, 130XE and XE game systems include FGTIA.

The NTSC versions of CTIA/GTIA were designed to interface with the NTSC version of ANTIC. The PAL version of GTIA and the FGTIA were designed to interface with the PAL version of ANTIC.

Jerry Jessop adds:
"The very first proto systems did have the GTIA, but it had some problems and was not released in the consumer version until 1981. The GTIA was completed before the CTIA."

Robin Sherer of Santa Cruz Education Software as quoted in InfoWorld 3/15/82:
"That had [GTIA] designed before the computer even went to market. They had already ordered 100,000 of the CTIAs--that's the rumored number. Not wanting to throw away chips, they introduced [computers] in this country with the CTIA."

The GTIA is backwards-compatible with the CTIA, with the GTIA simply making available three additional graphics modes (GTIA Modes 1-3).

The FGTIA is software compatible with the GTIA. However, in GTIA Mode 1 the FGTIA can only display 8 distinct luminances, compared to the 16 distinct luminances that can be displayed in GTIA Mode 1 by the GTIA.

A substantial number of late-production Atari XE computer systems, especially later 800XE computers made in China, shipped with moderately defective GTIA chips. This page (in Polish) details the scope of the issue, including how to detect whether a given computer contains one of the faulty GTIA chips: http://atariki.krap.pl/index.php/GTIA

Whether CTIA or GTIA/FGTIA is installed can be determined by observing what happens as a result of trying to enter a GTIA graphics mode. In Atari BASIC, at the "READY" prompt, type POKE 623,64 [RETURN]. If the screen blackens, you
have the GTIA or FGTIA chip. If it stays blue, you have the early CTIA chip.

Bill Wilkinson offers a technique whereby software can determine whether a CTIA or a GTIA is installed in his "Insight: Atari" column in the January 1983 (#32) issue of Compute!, page 171, see:
http://www.atarimagazines.com/compute/issue32/085_1_INSIGHT_ATARI.php

Other systems utilizing the Atari GTIA chip:
- Atari 5200
- Exidy Max-A-Flex coin-operated arcade conversion system
  (embedded Atari 600XL): Astro Chase, Boulder Dash, Bristles, Flip and Flop

Technical documentation by Atari:
FGTIA:
http://ftp.pigwa.net/stuff/collections/nir_dary_cds/Tech%2520Info/FGTIA.PDF

POKEY -- CO12294

POKEY (name derived from POtentiometer and KEYboard) is a digital input/output (I/O) chip. It handles such disparate tasks as the serial I/O bus (SIO), audio generation, keyboard scan, timers, and random number generation. It also digitizes the resistive paddle inputs and controls selected maskable interrupt (IRQ) requests from peripherals (other IRQs are handled by the PIA/6520).

Other systems utilizing the Atari POKEY chip:
- 40 production coin-operated arcade games released by Atari or Atari Games, from Missile Command (June 1980) to Tetris and Vindicators Part II (both released February 1989). (Thanks to Laurent Delsarte for the list.)
- Centuri Tunnel Hunt, coin-operated arcade game licensed from Atari
- Atari 5200
- Exidy Max-A-Flex coin-operated arcade conversion system
  (embedded Atari 600XL): Astro Chase, Boulder Dash, Bristles, Flip and Flop
- Atari Ballblazer and Commando cartridges for the Atari 7800

POKEY Technical documentation by Atari:

FREDDIE -- 800XL(late),XE(all):CO61922/CO61991

According to Atari's design specification, the "Freddie RAM" Memory Control Unit (MPU) is a custom LSI chip providing dynamic RAM (DRAM) control functions. It replaces a number of small-scale integration (SSI) and medium-scale integration (MSI) transistor-transistor logic (TTL) parts, including a custom delay line. FREDDIE multiplexes 16-bit RAM addresses from the
processor bus into 8-bit row and 8-bit column addresses for direct use in the DRAM, and it generates row and column DRAM address timing strobes.

FREDDIE was initially designed by Atari Inc. in 1983 as chip that would cut production costs for future XL computers. FREDDIE was finally incorporated by Atari Corp. into late-production 800XL computers and in all XE computers systems.

"FREDDIE" or "FREDDY"?
Atari technical documentation consistently uses "FREDDIE" while Atari consumer documentation (Owner's Manuals for all XE systems) consistently uses "FREDDY." This FAQ List adopts the convention from Atari's technical documentation: "FREDDIE"

FREDDIE technical documentation by Atari:

Subject: 1.12) Why do the ANTIC Modes start with "Mode 2", what about 0 or 1?
This section started by: Laurent Delsarte. Thanks also to Alphasys.

Actually, the ANTIC graphic mode numbers are directly used as instructions in Display Lists (DL), to request the display of several lines of a specific text or graphic mode. For instance, the instruction "2" (for "Mode 2") in an ANTIC Display List requests 8 scan lines of "text 0".

But the instructions "0" and "1" already have other meanings in an ANTIC Display List program:
"0" means "display one blank line"
"1" means "jump to location"
and to be comprehensive, 16 (hex: 10), also means something special:
"16" means "display two blank lines"

Consequently, the first ANTIC mode is the "Mode 2", and the last one is "Mode 15".

Here is the context of the full ANTIC display list instruction set:

<table>
<thead>
<tr>
<th>Instruction</th>
<th>BASIC</th>
<th>Scan</th>
<th>Pixels</th>
<th>Bytes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>1 blank line</td>
</tr>
<tr>
<td>16</td>
<td>10</td>
<td>--</td>
<td>2</td>
<td>--</td>
<td>2 blank lines</td>
</tr>
<tr>
<td>32</td>
<td>20</td>
<td>--</td>
<td>3</td>
<td>--</td>
<td>3 blank lines</td>
</tr>
</tbody>
</table>
Character Mode instructions (text modes)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Value</th>
<th>Column</th>
<th>Line</th>
<th>Row</th>
<th>Page</th>
<th>480/240:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>40</td>
<td>40</td>
<td>Not</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>--</td>
<td>10</td>
<td>40</td>
<td>40</td>
<td>supported</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>12</td>
<td>16</td>
<td>40</td>
<td>40</td>
<td>by OS</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>13</td>
<td>24</td>
<td>40</td>
<td>40</td>
<td>400/800:</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>1</td>
<td>16</td>
<td>20</td>
<td>20</td>
<td>Not</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>2</td>
<td>16</td>
<td>20</td>
<td>20</td>
<td>supported</td>
</tr>
</tbody>
</table>

Map Mode instructions (graphics modes)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Value</th>
<th>Column</th>
<th>Line</th>
<th>Row</th>
<th>Page</th>
<th>480/240:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>8</td>
<td>3</td>
<td>16</td>
<td>40</td>
<td>10</td>
<td>Not</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>4</td>
<td>16</td>
<td>40</td>
<td>10</td>
<td>supported</td>
</tr>
<tr>
<td>10</td>
<td>A</td>
<td>5</td>
<td>24</td>
<td>40</td>
<td>20</td>
<td>by OS</td>
</tr>
<tr>
<td>11</td>
<td>B</td>
<td>6</td>
<td>16</td>
<td>40</td>
<td>20</td>
<td>400/800:</td>
</tr>
<tr>
<td>12</td>
<td>C</td>
<td>14</td>
<td>16</td>
<td>40</td>
<td>20</td>
<td>Not</td>
</tr>
<tr>
<td>13</td>
<td>D</td>
<td>15</td>
<td>16</td>
<td>40</td>
<td>20</td>
<td>supported</td>
</tr>
<tr>
<td>14</td>
<td>E</td>
<td>14</td>
<td>16</td>
<td>40</td>
<td>20</td>
<td>400/800:</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>8</td>
<td>1</td>
<td>40</td>
<td>40</td>
<td>Not</td>
</tr>
</tbody>
</table>

Jump instructions (three bytes long)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Value</th>
<th>Column</th>
<th>Line</th>
<th>Row</th>
<th>Page</th>
<th>480/240:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>JMP</td>
</tr>
<tr>
<td>65</td>
<td>41</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>JVB</td>
</tr>
</tbody>
</table>

Optional Modifiers to the above Character or Map Mode instructions:

<table>
<thead>
<tr>
<th>Modifier</th>
<th>Value</th>
<th>Column</th>
<th>Line</th>
<th>Row</th>
<th>Page</th>
<th>480/240:</th>
</tr>
</thead>
<tbody>
<tr>
<td>add</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>add</td>
</tr>
<tr>
<td>decimal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hex</td>
</tr>
<tr>
<td>hex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit</td>
</tr>
</tbody>
</table>

Vertical scroll 16 10 4
Horizontal scroll 32 20 5
LMS Load Memory Scan 64 40 6

Optional Modifier to the above Blank Line or Jump instructions:

DLI Display List Interrupt 128 80 7

More details of ANTIC display list programming can be found in the book "Mapping the Atari", Appendix 8
http://www.atariarchives.org/mapping/appendix8.php

and also in the book "De Re Atari", Chapters 2, 5 and 6
http://www.atariarchives.org/dere/chapt02.php
http://www.atariarchives.org/dere/chapt05.php
http://www.atariarchives.org/dere/chapt06.php

Scrolling
Subject: 1.13) What is the internal layout of the 8-bit Atari?

ASCII art by Thomas Havemeister.

```plaintext
+---------------------------------------+
|          +---------------+            |
|          |CPU/SALLY(6502)|        +-------+
|          +---------------+      RS-232 converter. So with that device you can have incoming and
| outgoing |
'calls' like modem ones via the internet.
```

I ran my Atari 8bit bbs with such a thing. The Lantronix MSS-10 or MSS-100 will do too. But in that case you have to make a custom RS-232 cable (easy job).

More info www.lantronix.com

this is the info of the UDS-10

www.lantronix.com/device-networking/external-device-servers/ uds-10.html
Now see the newer model, the UDS1100:
www.lantronix.com/device-networking/external-device-servers/ uds1100.html

It is REALLY a cool thing. Not only for you, but for more atari fans I guess."

Other, similar serial-to-Ethernet interfaces from Lantronix have been successfully utilized, including the MSS100:
www.lantronix.com/device-networking/external-device-servers/ mss100.html

as well as the discontinued MSS1-T.

Note that the UDS-10 lacks DNS support, while the MSS100 and MSS1-T include DNS support.

Option #2

The Atari 8-Bit Ethernet Project is developing a hardware/software solution that will be able to connect to the internet via an Atari 8-bit Ethernet Cartridge.

The hardware and software was originally developed by Chris Martin and tested by Mark Dusko. The software is based on the work already done in the Commodore 64 community, this adapter will allow you to take advantage of telnet, e-mail, web browsing and a web server via the Contiki Operating System.
and a Ciris Logic CS8900A ethernet controller chip.

The main component is called the IP Dragon II; the official cartridge name is the Dragon Cart.

Project website: http://www.atari8ethernet.com/

Subject: 6.1) What is the Atari 850 Interface Module?

While the Atari's SIO and controller ports did not conform to established industry standards, Atari produced the 850 Interface Module to address this issue. The 850 connects to the SIO port on the Atari, and provides:

- Four 9-pin RS-232-C serial ports
- One 15-pin Centronics-type parallel printer port

Many "industry standard" (of the time) printers, modems, and various other devices can be used with the Atari computer in combination with an 850 Interface Module. Also, Atari's own 825 printer and 830 modem are connected to the computer via the 850 Interface Module.

RS-232-C is a technical standard of the Electronic Industries Association (EIA). Published in August of 1969, it is titled "Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange." The standard specifies electrical signal characteristics and names and defines the functions of the signal and control lines which make up a standard interface, called RS-232-C.

The 850 should be thought of as an RS-232-C "data terminal" (DTE, or Data Terminal Equipment).

The 850’s RS-232-C serial ports support the following baud rates:

45.5 bps*, 50 bps*, 56.875 bps*, 75 bps**, 110 bps, 134.5 bps, 150 bps, 300 bps, 600 bps, 1200 bps, 1800 bps, 2400 bps, 4800 bps, 9600 bps

* These Baud rates are useful for communications with Baudot teletypes, for RTTY (radioteletype) applications. They are more commonly referred to as 60, 67, and 75 words per minute.

** This Baud rate is sometimes used for ASCII communications, and may also be used for 5-bit Baudot RTTY. The latter is commonly referred to as 100 wpm.

In order to utilize a device attached to one of the RS-232-C serial ports of the 850, an R: RS-232 serial port device handler must be loaded into memory. The 850 contains an R: handler, supporting devices R1: through R4:, in its ROM. The R: handler of the 850 can be loaded into the computer's RAM via a "Power-On Bootstrapping Operation" as follows:
Bootstrapping Operation Without Disk Drive:
When the Atari computer is turned on, it issues a disk request via SIO. If no Drive 1 is present with power ON, the 850 responds to the disk request. The computer then loads the bootstrapping program from the 850, as if it were reading from a disk. The bootstrapping program is then run, and it gets the RS-232-C handler from the 850 and relocates it into the computer’s RAM. The memory occupied by the bootstrapping program is then freed (but the handler remains).

Bootstrapping Operation With Disk Drive:
If there is a disk drive attached to the system (Drive 1 only), it responds to the disk request issued by the computer at power-on. The computer then reads a start-up program from that disk, such as a DOS. The 850 does not respond to the disk request if a disk drive responds first; therefore, the program loaded from disk must load the handler from the 850. Many varieties of DOS for the Atari include an explicit provision for loading and executing the bootstrapping program from the 850, such as through the use of an AUTORUN.SYS file. When the 850 bootstrapping program is executed, it gets the RS-232-C handler from the 850 and relocates it into the computer’s RAM. The memory occupied by the bootstrapping program is then freed (but the handler remains).

R: Handler Bugs and Alternatives
Multiple versions of the 850 R: handler ROM exist, as over time Atari attempted to eliminate what were generally minor bugs. The most well-known bug is a system hang caused by pressing the [SYSTEM RESET] key after the 850 R: handler has been loaded. One remedy to this problem is to use a debugged alternative 850 R: handler loaded from disk. DOS XL was distributed with such a handler for the 850, called: RS232FIX.COM

The resident P: Printer Handler of the Atari Operating System is able to fully utilize a printer attached to the parallel printer port of the 850 Interface Module.
- OS Rev.A/Rev.B (400/800): Responds to P: and ignores any device number
- OS Rev.10 and up (XL/XE): Responds to P:, P1:, and P2:

PINOUTS
=======
850 Serial Port No. 1 (9-pin female connector):
   1. Data Terminal Ready (DTR, Ready Out)
   2. Carrier Detect (CRX, In)
   3. Send Data (Out)
   4. Receive Data (In)
   5. Signal Ground
   6. Data Set Ready (DSR, Ready In)
   7. Request to Send (RTS, Out)
   8. Clear to Send (CTS, In)
Use a cable with the following connections to attach a standard RS-232 MODEM to an Atari via the 850's Serial Port No. 1 (equivalent to the Atari CX87 Modem Cable):

<table>
<thead>
<tr>
<th>DB25P (RS-232 MODEM)</th>
<th>DB9P (850 Interface)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>1 - DTR</td>
</tr>
<tr>
<td>8</td>
<td>2 - CRX</td>
</tr>
<tr>
<td>2</td>
<td>3 - XMT</td>
</tr>
<tr>
<td>3</td>
<td>4 - RCV</td>
</tr>
<tr>
<td>7</td>
<td>5 - GND</td>
</tr>
<tr>
<td>6</td>
<td>6 - DSR</td>
</tr>
<tr>
<td>4</td>
<td>7 - RTS</td>
</tr>
<tr>
<td>5</td>
<td>8 - CTS</td>
</tr>
</tbody>
</table>

Frame - to the shield wire | No connection to shield

850 Serial Port Nos. 2 and 3 (9-pin female connector):

| 5  1 | 1. Data Terminal Ready (DTR, Ready Out) |
| 0  0 0 0 0 | 3. Send Data (Out) |
| 0  0 0 0 0 | 4. Receive Data (In) |

| 9  6 | 5. Signal Ground |
| 6. Data Set Ready (DSR, Ready In) |

850 Serial Port No. 4 (9-pin female connector): When used with a 20 mA loop device:

| 5  1 | 3. Send Data (Out) |
| 0  0 0 0 0 | 4. Receive Data (In) |
| 0  0 0 0 0 | 5. Signal Ground |
| 9  6 | 7. Request to Send (RTS, Out)* |
| 9  6 | 9. Receive data - |

*These pins are not computer-controlled and are always ON (+10v).

850 Printer Port (15-pin female connector):

| 8  1 | 4. Data bit 2 |
| 0  0 0 0 0 0 0 | 5. Data bit 3 |
| 0  0 0 0 0 0 0 | 6. Data bit 4 |
| 15  9 | 7. Data bit 5 |
| 8  9 | 8. Data bit 6 |
| 9 | 9. Data pins pull-up (+5v) |
| 11  9 | 11. Signal ground |
| 12  9 | 12. Fault' (Must be +5 for printer port to operate) |
| 13  9 | 13. Busy |
| 15  9 | 15. Data bit 7 |

Use a cable with the following connections to attach a standard Centronics-type parallel printer to an Atari via the 850's Printer Port (equivalent to the Atari CX86 Printer Cable):

Page 32 of 214 ---- Generated from Megalextoria
<table>
<thead>
<tr>
<th>36-pin Centronics (male)</th>
<th>DB15P (850 Interface)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 - Data Strobe</td>
</tr>
<tr>
<td>2</td>
<td>2 - D0</td>
</tr>
<tr>
<td>3</td>
<td>3 - D1</td>
</tr>
<tr>
<td>4</td>
<td>4 - D2</td>
</tr>
<tr>
<td>5</td>
<td>5 - D3</td>
</tr>
<tr>
<td>6</td>
<td>6 - D4</td>
</tr>
<tr>
<td>7</td>
<td>7 - D5</td>
</tr>
<tr>
<td>8</td>
<td>8 - D6</td>
</tr>
<tr>
<td>16</td>
<td>11 - Gnd</td>
</tr>
<tr>
<td>32</td>
<td>12 - Fault</td>
</tr>
<tr>
<td>11</td>
<td>13 - Busy</td>
</tr>
<tr>
<td>9</td>
<td>15 - D7</td>
</tr>
</tbody>
</table>

Frame - to the shield wire | No connection to shield

Very early 850s are in an all-black brushed steel case, but most are in a beige plastic case matching the 400/800 computers.

Front of unit (left-to-right):
- Power In jack
- On power indicator light
- Power Off / On switch
- Two I/O Connectors (Atari SIO)

Right side of unit:
- Parallel Interface port

Rear of unit (left-to-right):
- Four Serial Interface ports, 4 - 3 - 2 - 1

Manuals:
- Atari 850 Operator's Manual (includes Programming Guide) CO15953

The 850 interface is used with an external 9 volt AC transformer power supply rated for at least 17 W, such as Atari#CO14319/C014319/CA014748 or C060592 (each detailed elsewhere in this FAQ list), or equivalent.

The 850 was designed by Scott Scheiman at Atari, according to:
http://www.atarimuseum.com/computers/8bits/400800/atari850.html

The 850 was manufactured by Atari in the U.S.A.

Because the 850 was relatively expensive, provided more capabilities than the average user was looking for, and was at times unavailable from Atari despite high demand, there were many 3rd-party interfaces designed to provide some compatible subset of the 850’s features. Perhaps the most prominent example of such a product is the P:R: Connection from ICD.
Subject: 6.2) What is the Atari XEP80 Interface Module?

(text from Atari’s XEP80 documentation)

The XEP80 is a video output device that also supports an 8 bit type parallel port. The video hardware generates an 80 column by 25 line text display through a video connector/cable plugged into a separately purchased monitor. The monitor can be any Composite Video input type, although for the best display a monochrome is strongly advised.

Internally, the XEP80 is a 256 character wide by 25 line high storage device with an 80 column wide display window. Characters may be placed anywhere within the device independent of the window location. The window may be scrolled across the 256 column wide field.

Optionally, the XEP80 may be placed into Pixel Graphics mode. This mode supports a bit mapped (pixel) screen of 320 dots (40 bytes) horizontal by 200 dots (lines) vertical. The output window displayed is approximately half the size of the text window.

Communication to and from the XEP80 is established through a joystick type cable that extends from the back of the unit. This cable will plug into either joystick port (1 or 2) on all Atari 8 bit computers. Through this cable the XEP80 receives commands and data from the computer and sends them to either the screen or the printer.
(Pin 1: computer -> XEP80; Pin 2: XEP80 -> computer)

The 8 bit parallel port allows Epson, Centronics, etc. type printers to be connected to the XEP80, which means the Atari Computer may now output to these printers. The parallel connector is a female 25 pin D type.

Audio may be supplied via a video cable from the Atari computer DIN plug to any suitable audio speaker input. This is required for any SOUND commands or keypresses.

Software is provided on diskette in the form of a DOS binary file named AUTORUN.SYS. This file is automatically loaded into memory and initialized by the DOS at boot (power on) time.

Contents of the XEP80 Boot Disk: (DX5087)
   DOS.SYS      DOS 2.5 FMS
   DUP.SYS      DOS 2.5 Disk Utility Package
   AUTORUN.SYS  XEP80 Handler and Relocator.
                Substitute versions for three OS-resident device handlers:
                - S: Display Handler
                - E: Screen Editor
Designed to be compatible with the standard E: device but for the 80-column screen display.
- P: Printer.
  Default configuration supports 8 different printer devices:
  - P1: XEP80 parallel port
  - P2: 850 Interface Module parallel port
  - P3: 1025 Printer
  - P4: 1020 Color Plotter
  - P5: 1027 Printer
  - P6: 1029 Printer
  - P7: XMM801 Printer
  - P8: XDM121 Printer
  The handler interprets P: (no device number) to mean P1:

RELOC.SRC Relocator in assembly source
XEP80HAN.SRC Handler in assembly source
DEMO80.BAS Demonstrates overall XEP80 features
MAKER.BAS Program to generate an AUTORUN.SYS from a custom-made Handler
ATTRIBUTE.BAS Demonstrates special text features
WINDOW.BAS Demonstrates the 256-character wide window
EIGHTY.BAS Displays a spreadsheet-like grid using the full XEP80 display
GRAPHICS.BAS Demonstrates graphics capability by drawing a sphere on screen
PRINTER.BAS Program to revise the default printer port configuration
XEP80.DOC Product Specification For XEP80 hardware and software

***********************
The key engineer/designer of the XEP80 was Jose Valdes at Atari.
Lane Winner was software developer for the XEP80 at Atari.
The XEP80 was made in Taiwan.

Editors for the XEP80:
(This should someday be expanded into a separate list of XEP80 software. -mc)
- AtariWriter 80 by Atari
- TurboWord by MicroMiser
- emacs subset by Stan Lackey
- MAE and its previous standalone editor ED

XEP80 P: Parallel port (female) pinout:

<table>
<thead>
<tr>
<th>13</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 o 0 o 0 o 0 o 0 o 0 o 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>0 o 0 o 0 o 0 o 0 o 0 o 0 o 0 o</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>14</td>
</tr>
</tbody>
</table>
1. Strobe
2-9. Parallel Data
10. Not Used
11. Busy
12-17. Not Used
18-25. Ground

The XEP80 draws 400mA of current from an external power supply. Use a power
supply that delivers 500mA 9V DC, such as Atari#CX261/CO16353/CO18084 or equivalent.

Subject: 6.3) How can I use a SCSI/SASI device with my Atari?

SCSI background sources include:

SCSI - Small Computer Systems Interface. Pronounced "scuzzy."

SCSI is an ANSI standard for connection peripherals/devices to your computer via a hardware interface, which uses standard SCSI commands.

In the early 1980s, Adaptec's founders, while at disk drive manufacturer Shugart Associates, developed a parallel I/O interface called SASI for Shugart Associated System Interface. When this specification was finalized, it was released to several different manufacturers and enjoyed commercial success. In 1982, SASI was presented to ANSI as a basis for standard. Because of the commercial success and widespread market use of SASI, ANSI formalized and extended the SASI specification and changed the name to SCSI (in part to separate the specification from any one vendor in particular). In June 1986, SCSI was formally adopted by ANSI.

The following hardware interface devices allow SASI/SCSI devices (such as hard disk drives) to be connected to the Atari:

==> Supra Hard Disk Interface / KPI Hard Disk Drive Interface, by Supra, 1986
- A SASI/SCSI interface
- PBI/ECI New Device
- Connects to PBI, or Cartridge/ECI with adapter
- Includes parallel printer port
- Supports one or two (identical) physical hard drives
- Have to use a bridge controller and use MFM hard drives
- Sold with MYDOS and software utilities supporting:
  - write-protect and write-enable the hard disk
  - control the flow of linefeeds to the printer
  - "park" the drive
  - format the hard disk, then check it for bad sectors
- See: http://www.atarimagazines.com/v5n6/Supradrivefor8Bit.html
- In 1989 the rights were obtained from Supra by K-Products (Bob Klaas), who produced/sold/supported the interface as the KPI Hard Disk Drive Interface

- PBI/ECI New Device
- Sold with one of:
  - BTL 2001 Connector for PBI
- BTL 2002 Connector for Cartridge/ECI
- Supports one or two physical hard drives
- Can handle as many as eight logical drives (partitioned disk sections)
  of up to 16 megabytes each, for a potential 128Mb system maximum
- Supplied with MYDOS. SpartaDOS 3.2 also supported.
- See: http://www.atarimagazines.com/v5n12/BTLHardDisk.html
  http://www.atarimagazines.com/v6n9/ShoppersGuide.html

===> Multi I/O (MIO), by ICD, 1987
- PBI/ECI New Device.
- Attaches via PBI, or Cartridge/ECI with adapter.
- Ramdisk: 256K or 1 MB RAM
- Printer Interface: "Centronics" type parallel, physical configuration same
  as on the Atari 850 (15-pin female, Atari CX86 Printer Cable compatible).
  Accessed as P1: or P2: with or without auto line feed.
  Will handle 19.2Kbps.
- Spooler: Use any amount of RAM as a printer spooler.
- Hard Disk Interface: Standard SCSI/SASI interface for connecting up to 8
  hard drives. Limited to 256-byte sector size.
- Allows booting from RamDisk or Hard Drive.
- Allows partitioning of hard drives (up to 16 Meg per partition) and RAM for
  RamDisks (up to 8 total drives).
- External AC power supply.
- Multi I/O (MIO) "new series" by Ken Ames / MEmalGuy66, 2006-2009
  - Drop-in replacement for the original board in the MIO (1 MB RAM)
  - Serial and Parallel ports have been "fixed" in this design, it
    accommodates standard PC-compatible printer and modem cables
  - Supports drives with 512-byte sectors
  - Allows the use of newer SCSI disks (32-bit LBA)
  - AtariAge thread:

===> Black Box, by CSS, 1989
- PBI/ECI New Device
- Has both PBI and Cartridge/ECI connectors
- RS-232 Serial Modem Port (19.2Kbps) w/ hardware flow control
- Parallel Printer Port
- SASI/SCSI Hard Disk Port
- Operating System Enhancements
  - optional 64K printer buffer
- Supports drives with 512-byte sectors
- Mathy van Nisselroy's Black Box page:
  http://www.mathylvannisselroy.nl/blackbox.htm
- The ASPI (Advanced SCSI Programming Interface) software layer standard
  (originally developed by Adaptec) has been implemented for the Black Box,
  as Black Box ATASPI (Atari ASPI). See Mathy van Nisselroy's Atari ASPI
Subject: 6.4) How can I use an IDE device with my Atari?

IDE background from TechWeb,  

IDE - Integrated Drive Electronics

IDE is a type of hardware interface widely used to connect hard disks, CD-ROMs and tape drives to a PC. IDE was always the more economical interface, compared to SCSI.

With IDE, the controller electronics are built into the drive itself, requiring a simple circuit in the PC for connection. IDE drives were attached to earlier PCs using an IDE host adapter card. Today, two Enhanced IDE (EIDE) sockets are built onto the motherboard, and each socket connects up to two drives via a 40-pin ribbon cable for CD-ROMs and similar devices and an 80-wire cable for fast hard disks.

IDE drives are configured as master and slave. Jumper pins on the drive itself are used to set up the first drive on the cable as master and the second one, if present, as a slave.

The IDE interface is officially known as the ATA (AT Attachment) specification. ATAPI (ATA Packet Interface) defines the IDE standard for CD-ROMs and tape drives. ATA-2 (Fast ATA) defined the faster transfer rates used in Enhanced IDE (EIDE).

The following hardware interface devices allow IDE devices (such as hard disk drives) to be connected to the Atari:

--- MIO II, from Fine Tooned Engineering (FTe)(Mike Hohman)(1994)
- A PBI -> IDE hard drive interface.
- Power supply supplies the computer, the interface, and the hard drive
  Only several prototypes were produced.

- An ATA/ATAPI host adapter for Atari XE computers
  (IDE disk drives and ATAPI CD-ROMs)
- Hardware designed and built by Jacek Zuk (Simius),
  Software by Konrad Kokoszkiewicz
- First publicly shown at an Atari meeting in January 1996
- PBI/ECI New Device.
- Plugs into the Cartridge/ECI connector at the back of the XE computer
- Can use two drives (master/slave)
- Data transfer is very fast. Depending on the partition "density" it may vary from about 35 to about 64 kilobytes per second under SpartaDOS X.
- Built-in ATA driver / HD BIOS currently imposes a limit of 8 GB per drive (24-bit logical sector addressing, i.e. 16777216 sectors, 512 bytes each)
- Each drive can consist of 1 to as many as 16 partitions
- Boot from any partition
- Sector sizes supported: 512 bytes (physical sector in ATA), 256 bytes (emulated by the BIOS) and 128 bytes (emulated by the BIOS)
- Frequent BIOS and software utility updates have been released
- IDEa (KMK/JZ)(2004)
  - Hardware by Michal 'Pasiu' Pasiecznik
  - Plugs into Cartridge/ECI, or can also be mounted inside any XL/XE
- Documentation/BIOS/Software:
  - http://drac030.krap.pl/ or http://drac030.atari8.info/

==>
SmartIDE, project by Bob Woolley (1996)
- Project for the 1200XL
- Published as a series of articles in Atari Classics magazine;
  - Web pages by Clarence Dyson
  http://www.wolfpup.net/atarimods/smartos-1.html
- "Dallas 'ROMs'" Fall 1996, p. 16
  http://www.wolfpup.net/atarimods/smartos-2.html
- "Smart IDE" Fall 1996, pp. 17-19
  http://www.wolfpup.net/atarimods/smartide-1.html
- "The IDEal Hard Drive" Fall 1996, pp. 20-22
  http://www.wolfpup.net/atarimods/smartide-2.html
- "IDE Driver Software" Fall 1996, pp. 23-27
  http://www.wolfpup.net/atarimods/smartide-3.html
Software (IDE38.ASM) download: http://www.wolfpup.net/atarimods/idecode.zip
- IDE (IDE_NKH.ASM 12/09/00; based on IDE38.ASM by Bob Woolley) by Nathan Hartwell adds the SIO command GET_CONFIG to the IDE Driver Software
  http://www.magelair.com/atari_8bit_stuff.html
- Extensions of the SmartIDE project:
  ==> 16-bit IDE, project by Nathan Hartwell (MageX)(2000)
    - based on the schematic for SmartIDE by Bob Woolley
    - SmartIDE Code (IDE_NKH.ASM 12/19/00) is based on IDE38.ASM by Bob Woolley
    - Project home: http://www.magelair.com/atari_8bit_stuff.html
  ==> PBI 16-bit IDE, project by Nathan Hartwell (MageX)(2000?)
    - Heavily modified from the SmartIDE schematic by Bob Woolley
    - Like SmartIDE, this is still an internal design that plugs into the CPU
      socket for most of the signals needed.
    - No PAL/GAL logic is used.
    - No code has yet been developed.
== msc IDE, by Stefan Birmanns and Matthias Belitz (1996)
* PBI/ECI New Device.
* Attaches to the PBI; a Cartridge/ECI adapter can also be used
* up to 240 partitions per hard disk supported
* emulates D1: until D9: of disk devices (access to 9 partitions at one time)
* full bootable from any partition (with standard XL-OS)
* write protection capability
* supports up to two hard drives (master/slave)
* transfer rate > 30 KB/s file access with SPARTA-DOS 3.2 gx (reading)
* transfer rate > 10 KB/s file access with SPARTA-DOS 3.2 gx (writing)
* software partially supports CD-ROM and ZIP drives.
* Partially software compatible with the KMK/JZ IDE interface
* No longer in production
* More information: http://www.birmanns.de/atar/

== BadSector "A", project by Gary Morton (2001)
- Control an IDE hard disk drive using the Atmel AT89S53 processor (or 8031 compatible processor).
- Compatible with all models of Atari due to the use of the SIO (serial bus)
- Project home: http://www.alma.demon.co.uk/Atari/AtariHwSw.html

== SIO2IDE, project by Marek Mikolajewski (MMSoft)(2001)
- Released versions available:
  - sio2ide 1.7 05.sep.2002
  - sio2ide 3.3 18.jul.2003
  - sio2ide 3.3a 09.apr.2005
  - sio2ide 4.4 18.mar.2005
  - sio2ide 4.4a 21.sep.2005
- Latest interface version 4.4a 21.sep.2005 features:
  * ATARI side:
    - uses standard Atari SIO at a speed of 19200 baud
    - works with Atari High Speed SIO (US and Happy) at a speed of 52000 baud
    - emulates Atari disks D1: to D8:
      disk D1: can be swapped with Common disk D1: (HD1_ZW jumper)
    - can be used with any Atari DOS and OS
    - can be used without any problems with other SIO devices (disk drivers, printers, modems, SIO2PC, second SIO2IDE etc)
    - can be easy installed inside your Atari with 2.5' laptop HD
    - is easy to configure via special fdisk.com utility software (changing disks sequence and active directory)
  * IDE device side:
    - all IDE ATA/ATAPI devices can be used: Disk Drives (2.5' and 3.5'), CD-ROMs, Compact Flash cards etc.
    - supports PC file systems, FAT16 and FAT32
    - supports CD file system, ISO9660
- supports ATR disk images (SD, DD up to 16MB)
- supports directory change (multiconfig)
- is easy to configure, many text configuration files (sio2ide.cfg) can be stored in different directories
- disk configuration can be checked by special checkfs.exe PC utility
  NOTE: checkfs.exe does NOT work with HDD connected via USB port
- standard disk utilities can be used (defrag.exe, scandisk.exe etc)
- Long File Name (LFN) support for HDD
- TEST mode for checking HDD initialization
* USB port side:
- interface works as Mass Storage Class device (removable drive)
- no drivers are needed for Windows 2K, ME, XP
- driver for Win98 is included in this SIO2IDE package

- Available, Version 3.3:
  http://mega-hz.no-ip.com/Angebote/SIO2IDE33/SIO2IDE33.html
- Available, latest version: http://afs.atari.org/sio2ide.htm
- SIO2IDE project home: http://www.atariarea.krap.pl/sio2ide/

--- MyIDE, by Mr.Atari (Sijmen Schouten)(2002)
- Originally released as plans, as a cartridge, or as a kit that could either be installed into a cartridge case or inside the computer.
  Software also included.
- Version 3.1 is an internal or external IDE interface for all Atari 8-bit XL/XE computers (2006)
- Authorized sales: http://www.atarimax.com/myide/
  - MyIDE+FLASH IDE Interface Cartridge for XL/XE Computers
  - MyIDE Internal Interface for XL/XE Computers (Except 1200XL & XEGS)
  - MyIDE Internal Interface for 1200XL Computer
  - MyIDE Internal Interface for XEGS Computer
- Authorized European sales: http://www.atari-shop.nl
- MyIDE project home: http://www.mr-atari.com/myidehome.htm

--- IDE Plus 2.0, by Jacek Zuk and Konrad Kokoszkiewicz (2011)
- An ATA/ATAPI host adapter for Atari XE computers (IDE disk drives and ATAPI CD-ROMs)
- Designed to improve upon the KMK/JZ IDE interface
- Hardware designed and built by Jacek Zuk (Simius), Software by Konrad Kokoszkiewicz
- PBI/ECI New Device.
- Has connectors for both PBI and Cartridge/ECI
- Provides pass-through Cartridge port
- Addresses well known problems with the PHI2 signal not being generated the same across various Atari XL and XE motherboard revisions, and across computers with different hardware extensions installed
- Does not require an external power-supply
- Contains 96 KB ISP Flash ROM and 32 KB RAM available to the internal PBI BIOS and flashable from the Atari
- Contains 512 KB or 1024 KB ISP Flash ROM for SpartaDOS X (or any other cartridge of such type), flashable from the Atari. This ROM can be physically disabled using a dedicated switch.
- Contains a real time clock circuitry to be used with SpartaDOS X.
- Contains a LED flashing during the I/O
- Frequent BIOS and software utility updates have been released
- AtariAge preorder thread:
- Documentation/BIOS/Software:
  http://drac030.krap.pl/ or http://drac030.atari8.info/

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Subject: 6.5) Can I attach an ISA card to my Atari?

ISA background from TechWeb,

ISA - Industry Standard Architecture. Pronounced "eye-suh."

An expansion bus formerly commonly used in PCs (but since phased-out in favor of PCI). It accepts plug-in boards that control the sound, video display and other peripherals.

Originally called the "AT bus," it was first used in the IBM AT, extending the 8-bit bus to 16 bits.

RoBue (Roland Buehler) of the Stuttgart ABBUC Regional Group has produced project plans for an ISA-Bus Interface for Atari 800XL/130XE Computer, ARGS.

Carsten Strotmann has released source code showing how to access a Hercules video card with the ISA-Bus Interface.

Visit:  http://atariwiki.strotmann.de/xwiki/bin/view/Main//PgmFardwRiverHerc

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Subject: 6.6) How can I use a USB device with my Atari?

Background from TechWeb,

USB - Universal Serial Bus

A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer and telephony devices. USB has a maximum bandwidth of 12 Mbits/sec (equivalent to 1.5 Mbytes/sec), and up to 127 devices can be attached.
USB ports began to appear on PCs in 1997. It has now essentially replaced the older RS-232 serial and Centronics-type parallel ports on modern PCs, and USB has become the primary means for connecting most external devices to today's computers.

The following project aims to provide USB compatibility to the Atari:

Project USB Cartridge
* Project Name  : USB Cartridge with two USB Slots
* Project Start : Summer 2002
* Project Member: Marc Brings, Thomas Grasel, Harry Reminder, Guus Assmann, Carsten Strotmann
http://atariwiki.strotmann.de/xwiki/bin/view/MicroUSB//ProjUSBCart

In cooperation with the above,

Atarimax(Steven Tucker)/ABBUC USB Cartridge:
http://www.atarimax.com/usbcart/

Subject: 6.7) What are the power requirements for my Atari components?

Some of the pictures were scraped from various Internet web sites by MC;
Some of the pics are originals by: MC (generally, common 120V supplies),
Laurent Delsarte (many of the 220V supplies, the 16804, the 9W CX261,
the CO17945/566T, the C060529), wood_jl (“Black Brick”),
Dan of www.southeast-homebrew.com (830 supply), dean_rambler (C062195),
E. Turner (CO60479)

The household "mains" electricity supply is an alternating current (AC) that can be described with two parameters: the voltage (in volts) and the frequency (in Hz).

In North America, the standard household wall outlet offers 120V/60Hz power. In some of the rest of the world, the mains is now standardizing to 230V/50Hz. However, other combinations of voltages of 100V-127V or 220V-240V paired with frequencies of either 50Hz or 60Hz remain standard. Here is the Wikipedia article listing current household power outlet standards in use throughout the world: http://en.wikipedia.org/wiki/Mains_power_around_the_world

In the time of 8-bit Atari computers and peripherals, North America still used 120V/60Hz, most of continental Europe used 220V/50Hz, and the UK used 240V/50Hz.

In any case, the household alternating current must be converted to a
direct current (DC) for use by electrical devices such as Atari computers and peripherals:

- In some cases, the entire conversion is done via an external "power supply" that sits between the wall outlet and the electrical device. Such power supplies both transform the household power to a lower voltage, and they also rectify the current from AC to DC.

- In some cases, the external "power supply" is simply a transformer that lowers the household voltage. The lowered AC voltage is rectified to DC inside the device.

- In some cases, both the transformer and the rectifier are located inside the computer or peripheral itself. The device plugs directly into the wall outlet, with no external "power supply" needed.

The INPUT of an external power supply will indicate:
1) Input voltage in units of volts (120V for N.Am., 220V Euro, 240V UK)
2) Input frequency in units of hertz (60Hz for N.Am., 50Hz Euro)
3) Peak power rating. The power rating is the highest amount of power the unit can supply, according to the manufacturer, but this is only for a very brief time. This peak power rating may be indicated in units of volt-amperes (VA) or in units of watts (W).

The OUTPUT of an external power supply will indicate:
1) Output Voltage, in units of volts (V)
2) Whether the output voltage is AC or DC
3) Either:
   - Sustained Output Current, in amperes ("amps") (A) or milliamps (mA)
   - Sustained Output Power, in volt-amperes ("volt-amps") (VA) or watts (W)

Higher-than-specified sustained power and current capacities are entirely usable, and often preferable because such supplies run cooler and last longer.

The power units VA and W are not identical:

Direct Current (DC):
\[ \text{Power (in watts)} = \text{current (in amps) } \times \text{voltage (in volts)} \]

Alternating Current (AC):
\[ \text{Apparent Power (in voltamperes)} = \text{current (in amps) } \times \text{voltage (in volts)} \]
\[ \text{Effective/True Power (in watts)} = \text{current (in amps) } \times \text{voltage (in volts)} \]
\[ \times \text{cosine(phase, or angle of lag)} \]

\[ \text{cosine(phase)} \text{ is known as the "power factor"} \]

N O R T H A M E R I C A INPUT = 117-120 VAC 60Hz
================================================================================================
AC supplies (external transformers)
Atari#: CO61516
"Plug in Power Supply"
"For Use With Atari Inc. Model 1010 Program Recorder"
UL Listed: 34J2, Made in Hong Kong
Input: 120 VAC  60 Hz  7.5 VA
Output: 9 VAC  500 MA
Shipped with: 1010
http://mcurrent.name/powersupplies/61516-bottom.jpg
http://mcurrent.name/powersupplies/61516-top.jpg

Atari#: C062195
"Power Adaptor" "For Use With 1030 Modem Only"
UL Listed: 967Z, Made in Taiwan
Type: DV-9750
Input: 120VAC 60Hz 12VA
Output: 9VAC 5.4VA
Shipped with: 1030
http://mcurrent.name/powersupplies/62195-top.jpg
http://mcurrent.name/powersupplies/62195-bottom.jpg

Atari#: CO14319 (unit) / C014319 (box) / CA014748 (box, USA)
"Power Supply" (unit) / "Power Adaptor" (boxes)
"Use with ATARI 400/800 Computer Systems (C014319 box)
"For Use With Atari 400/800 Personal Computer System" (top, some units)
UL Listed: 205E, Made in Sunnyvale CA
Input: 120 VAC  60 Hz  20W/18.5W (unit) / 105-125 V.A.C.  60 Hz (boxes)
(early units rated at 20W; most units rated at 18.5W)
Output: 9 VAC  15.3 VA (unit) / 9.5 V.A.C.  1.7 A (boxes)
Shipped with: 400,800,810(earliest),822,850,1200XL(earlier)
Works with: 400,800,822,850,1200XL,1010,1020
http://mcurrent.name/powersupplies/14319-bottom.jpg
http://mcurrent.name/powersupplies/14319-top.jpg
http://mcurrent.name/powersupplies/14319-alt-bottom.jpg
http://mcurrent.name/powersupplies/14319-alt-top.jpg
http://mcurrent.name/powersupplies/14319-box.jpg
http://mcurrent.name/powersupplies/14748-usa.jpg

Atari#: C016804
"Class 2 Transformer"
UL Listed: 622T, Made in Taiwan
Input: 120V  60Hz
Output: 9V AC  31 VA
Shipped with: 810 (rarely, 1981?)
Works/NOT recommended for: 400,800,810,822,850,1200XL,1010,1020,1050,XF551
Atari seems to have briefly (1981?) substituted this unit for the CO14319 for 810 disk drives. At least some C016804 units came in C014319 boxes.
NOTE: I (mc) had one of these fail in such a way that it damaged both our
810 and our 800. I suspect my experience is related to this being a rare unit--Atari may have quickly determined it was a poor design.

http://mcurrent.name/powersupplies/16804-bottom.jpg
http://mcurrent.name/powersupplies/16804-top.jpg

Atari#: CO17945 (unit) / C017945 (unit) / CA017964 (box, USA)
"Power Supply" (unit) / "Power Adaptor" (box)
"For Use With Atari 400/800 Personal Computer System" (top, 566T units)
UL Listed: 566T (uncommon/rare) or 771K (very common), Made in Taiwan
Input: 120V 60Hz 50W (unit) / 105-125 V.A.C. (box)
Output: 9V AC 31 VA (unit) / 9 V.A.C. 3.4A (box)
Shipped with (771K units): 810(later),1050,1200XL(later),XF551
Shipped with (566T units): 1020
Use with/Recommended for: 400,800,810,822,850,1200XL,1010,1020,1050,XF551
http://mcurrent.name/powersupplies/17945-bottom.jpg
http://mcurrent.name/powersupplies/17945-top.jpg
http://mcurrent.name/powersupplies/17945-566T-bottom.jpg
http://mcurrent.name/powersupplies/17945-566T-top.jpg
http://mcurrent.name/powersupplies/17964-usa.jpg

Atari#: CO61636 (unit)
"Power Supply" (unit) / "Power Adaptor" (box)
UL Listed: 566T, Made in Japan
Input: 120V 60Hz 60W
Output: 9.5V AC 40VA
Shipped with: 1027
http://mcurrent.name/powersupplies/61636-alt-bottom.jpg
http://mcurrent.name/powersupplies/61636-alt-top+box.jpg

Atari#: CO61636 (unit/box)
"Power Supply" (unit) / "Power Adaptor" (box)
UL Listed: 771K, Made in Taiwan
Input: 120V 60Hz 53W (unit/box)
Output: 9.5V AC 4.2A (unit/box)
Use with: 1027
http://mcurrent.name/powersupplies/61636-bottom.jpg
http://mcurrent.name/powersupplies/61636-top+box.jpg

Atari#: CO60479 (unit) / Atari#: CA060535 (box?)
Box: "Power Adaptor"
Top: "Use with 835 Modem Only"
Bottom: "Power Supply For Use With Modem"
UL Listed: 51B9, Made in U.S.A.
Input: 120 VAC 60 Hz 9 Watts
Output: 20 VAC 330 mA
Shipped with: 835
http://mcurrent.name/powersupplies/60479-bottom.jpg
http://mcurrent.name/powersupplies/60479-top.jpg
Novation#: 901017 (unit) / Atari#: CA016751-01 (box?)
Top: "Use with 830 Modem Only"
Bottom: "Novation AC Adaptor"
UL Listed: 883K, Made in Taiwan
Type: DV 2040
Input: 117V AC 60Hz 15W
Output: 20V AC 400 mA
Shipped with: 830
http://mcurrent.name/powersupplies/901017-bottom.jpg
http://mcurrent.name/powersupplies/901017-top.jpg

DC power supplies (external adapters)

Atari#: C070042-01 (nickname: "Logo")
Atari logo molded into case, at lower-left of top
"Power Supply" ; "For Use With Atari Computer"
UL Listed: 13JS, Made in Singapore
Input: 117V 60HZ 22VA
Output: 5VDC 1A
Shipped with: 65XE(most),XE Game System(later)
Use with/Recommended for: 65XE,XE Game System (stock 64K RAM and no ECI)
http://mcurrent.name/powersupplies/70042-01-bottom.jpg
http://mcurrent.name/powersupplies/70042-01-top.jpg

Atari#: C070042-011 (nickname: "Mini")
"Power Supply"
UL Listed: 94H6, Made in Taiwan
Type: DV-51AAT
Input: 120V AC 60Hz 17W
Output: +5V DC 1A
Shipped with: XE Game System(most)
Works with: 65XE,XE Game System (stock 64K RAM and no ECI)
Considered not as rugged as the C070042-01 "Logo" unit.
http://mcurrent.name/powersupplies/70042-011.jpg

Atari#: C061982 (nicknames: "White Brick" or "Beauty Queen")
XL colors (light top, dark bottom), "ATARI Power Supply" on top
"Power Supply"
UL Listed: 34J2, Made in Hong Kong
Input: 120V AC 60Hz 30W
Output: 5V DC 1.5AMP
Shipped with: 600XL(early),800XL(early). Rare!
Use with/Recommended for: 600XL,800XL,65XE,130XE,XE Game System
http://mcurrent.name/powersupplies/61982-White_Brick-bottom. jpg
http://mcurrent.name/powersupplies/61982-White_Brick-top.jpg
Atari#: C061982 (nicknames: "Ingot" or "Ugly Klunker")
"Power Supply"
UL Listed: 94H6, Made in Taiwan
Type: DV-512CM
Input: 120V AC  60Hz  40W
Output: +5V DC  1.5A
Shipped with: 600XL(most),800XL(most),65XE(some),130XE(some)
Works/NOT recommended for: 600XL,800XL,65XE,130XE,XE Game System
NOTE: This unit is known for its ability to fail in such a way that it can
damage your computer. While the 600XL/800XL are somewhat immune,
the XE computers are particularly vulnerable to such damage.
http://mcurrent.name/powersupplies/61982-Ingot.jpg

Atari#: C061982 (nicknames: "Black Brick" or "Black Beauty")
all black; top up-left: "For Use On Atari 600XL Atari 800XL" or Atari logo
"Power Supply"
UL Listed: 94H6, Made in Taiwan
Type: DV-512CM
Input: 120V AC 60Hz 40W
Output: +5V DC 1.5A
Shipped with: 600XL(later),800XL(later). Rare!
Use with/Recommended for: 600XL,800XL,65XE,130XE,XE Game System
http://mcurrent.name/powersupplies/61982-Black_Brick-bottom.jpg
http://mcurrent.name/powersupplies/61982-Black_Brick-bottom-label.jpg
http://mcurrent.name/powersupplies/61982-Black_Brick-top.jpg
http://mcurrent.name/powersupplies/61982-Black_Brick-top-alt.jpg

Atari#: C061982 (nicknames: "Box" or "Peanut")
"Power Supply"
UL Listed: 771K, Made in Taiwan
Type: SA R05-18
Input: 120V~60Hz 25W
Output: 5V-1.5A 7.5VA
Shipped with: 130XE(most)
Use with/Recommended for: 600XL,800XL,65XE,130XE,XE Game System
http://mcurrent.name/powersupplies/61982-Box.jpg

Atari#: CO16353-101 (unit) / CX261 (box)
"Plug-In Power Supply For Use With Models 2600, XEP80 or SX212" (unit)
"Power Adapter" (box)
"For Use with Atari Video Computer System Game, XEP80 or SX212" (box)
"For Use with Atari Video Computer System Game" (alt box)
UL Listed: 17J2, Made in Taiwan
Type: SPA-4190-1
Input: 120V 60Hz 12W
Output: 9V DC 500mA (center positive)
Shipped with: 2600,XEP80,SX212
Also works with: CX42
Atari#: CO16353-101 (unit) / CX261 (box)
"Plug-In Power Supply For Use With Models 2600, XEP80 or SX212" (unit)
"Power Adapter" (box)
"For Use with Atari Video Computer System Game, XEP80 or SX212" (box)
"For Use with Atari Video Computer System Game" (alt box)
UL Listed: 20J8, Made in Taiwan
Type: SA 9500-1
Input: 120V 60Hz 9W
Output: 9V DC 500mA (center positive)
Shipped with: 2600,XEP80,SX212
Also works with: CX42

Databyte#: DV-9319A
"Power Supply"
UL Listed: 883K, Made in Taiwan
Input: 120V AV 60Hz 33W
Output: 11.5V DC 1.95AMP (center positive)
Shipped with: Indus GT
Also works with: 5200

AC supplies (external transformers)

Atari#: CO61516/34
"A.C. Mains Adaptor"
"For Use Only With Atari 1010 Program Recorder"
"Disconnect The Mains Plug From The Supply Socket When Not In Use"
Made in the U.K.
Input: 240v~ 50Hz 5VA
Output: 8.5v~ 4.25VA
Shipped with: 1010 (UK)

Atari#: CO61516
"AC/AC Adapter"
Type: FW6399
Input: 220V~/50Hz/7VA
Output: 9V~/0.5A
Shipped with: 1010 (Europe)
http://mcurrent.name/powersupplies/61516-6399-bottom.jpg
http://mcurrent.name/powersupplies/61516-6399-top.jpg

Atari#: CO61516-11
"AC/AC Adapter"
Type: FW6399
Input: 220V~/50Hz/7VA
Output: 9V~/0.5A
Shipped with: 1010 (Europe)
http://mcurrent.name/powersupplies/61516-11-bottom.jpg
http://mcurrent.name/powersupplies/61516-11-top.jpg

Atari#: CO61516-13
Input: (220v 50Hz)
Output: 8.52vac 4.26VA
Shipped with: 1010 (New Zealand)

9.3 VAC  15.44 VA (1.66 A) Max:?  FW 6799/Atari#CA014748?(box?)
400,800,822,850,1010

9.5 VAC  1.5 A (14.25 VA) Max:? TaMOD M 5496  Input: 240V 50 Hz (UK)
400,800,822,850,1010  (shipped with UK PAL 400)

Atari#: CO60592-34 (unit), CA017964 (box, UK)
Type: TM 7498, SA 8547
Input: 240VAC 50Hz 0.037Kw
Output: 9VAC 3.4A
Use with: 400,800,810,822,850,1010,1020,1025(240V version),1050,XF551
http://mcurrent.name/powersupplies/17964-uk.jpg (box)
PICTURE OF THIS UNIT STILL NEEDED!

Atari#: C060592 (most units) or C060529 (rare? units)
"AC/AC Adapter"
Type: FW6699
Input: 220V~/50Hz/42VA
Output: 9V~/3A
Use with: 400,800,810,822,850,1010,1020,1025,1050,XF551
http://mcurrent.name/powersupplies/60592-bottom.jpg
http://mcurrent.name/powersupplies/60592-top.jpg
http://mcurrent.name/powersupplies/60529.jpg

Atari#: C060592-11
"AC Power Supply"
Type: PL028, Made in U.K.
Input: 220v~37W 50Hz
Output: 9v~27VA
Use with: 400,800,810,822,850,1010,1020,1050, XF551
http://mcurrent.name/powersupplies/60592-11-PL028.jpg

Atari#: C060592-11
"Power Supply"
Type: DV-9034A UP, Made in Taiwan
Input: 220V~ 50Hz 35W
Output: 9V~ 3A 27VA
Use with: 400,800,810,822,850,1010,1020,1050, XF551
http://mcurrent.name/powersupplies/60592-11-DV-9034A.jpg

Atari#: C061605-11
"AC/AC Adapter"
Type: FW6699
Input: 220V~/50Hz/50VA
Output: 9V~/4,2A
Use with: 1027
http://mcurrent.name/powersupplies/61605-11-bottom.jpg
http://mcurrent.name/powersupplies/61605-11-top.jpg

Atari#: 14750 "AC/AC Adapter"
Type: 102501
Input: 220V~/50Hz/38VA
Output: I 29V~/600mA
II 8,6V~/1A
Use with: 1025 (220V version)
http://mcurrent.name/powersupplies/14750-bottom.jpg
http://mcurrent.name/powersupplies/14750-top.jpg

DC power supplies (external adapters)

Atari#: C061763-34
Type: DV-515UK, Made in Taiwan
Input: 240V~50Hz 0.11A
Output: +5V - 1.5A, 7.5VA
Use with: 600XL,800XL,65XE,130XE,800XE,XE System
http://mcurrent.name/powersupplies/61763-34.jpg

Atari#: C061763-11
Type: DV-515UP, Made in Taiwan
Input: 220V~50Hz
Output: 5V=/1.5A  7.5VA
Use with: 600XL,800XL,65XE,130XE,800XE,XE System
http://mcurrent.name/powersupplies/61763-11-DV-515UP.jpg
http://mcurrent.name/powersupplies/61763-11-DV-515UP-top.jpg
Atari#: C061763-11
"AC/DC Adapter"
Type: FW1599
Input: 220V~/50Hz/26VA
Output: 5V-/1.5A
Use with: 600XL, 800XL, 65XE, 130XE, 800XE, XE System
http://mcurrent.name/powersupplies/61763-11-FW1599-bottom.jpg
http://mcurrent.name/powersupplies/61763-11-FW1599-top.jpg

Atari#: C061763-11/T
"Stromversorgungsgeraet"
Type: PS40, Made in Singapore by Magpower Manufacturers Pte Ltd
Input: 220V~, 50Hz 32VA
Output: 5V - 2A
Use with: 600XL, 800XL, 65XE, 130XE, 800XE, XE System
http://mcurrent.name/powersupplies/61763-11-T-bottom.jpg
http://mcurrent.name/powersupplies/61763-11-T-top.jpg

5 V DC 1.8 A (9.0 W) Atari#: CO61763-107 (Poland)
600XL, 800XL, 65XE, 130XE, 800XE, XE Game System

Atari#: C070045-01
"Power Supply"
Type: DV-51AUP, Made in China
Input: 220V~50Hz 19VA
Output: 5V - 1A 5VA
Shipped with: 800XE
Use with: 600XL, 800XL, 65XE, 130XE, 800XE, XE System
http://mcurrent.name/powersupplies/70045-01-bottom.jpg
http://mcurrent.name/powersupplies/70045-01-top.jpg

Atari#: n/a
"AC/DC Adapter"
Type: FW3199
Input: 220V~/50Hz/5,5VA
Output: 6V-/300mA
Shipped with: 410 ("410-P"/"410 P" versions)
http://mcurrent.name/powersupplies/3199-top.jpg
http://mcurrent.name/powersupplies/3199-bottom.jpg

Atari#: CO18084-117
"AC/DC Adaptor"
"For use with models CX2600 XEP80 or SX212"
Input: AC 220V 50Hz 9W
Output: DC 9V 500mA (center positive)
http://mcurrent.name/powersupplies/18084-117.jpg
http://mcurrent.name/powersupplies/18084-117-top.jpg
http://mcurrent.name/powersupplies/18084-117-bottom.jpg
Atari#: CO18084-117/A
"AC/DC Adaptor"
"For use with models CX2600 XEP80 or SX212"
Input: AC220V 50Hz 9W
Output: DC9V 500mA (center positive)
http://mcurrent.name/powersupplies/18184-117-A.jpg

9 V DC  500 mA  (4.5 VA)  Max:9W  Input: 240V 50Hz (UK)
Atari#CO18084-309/CO18084-306?
XEP80,SX212,2600,CX42 (center positive)

9.5 V DC  650 mA  (6.2 VA)  Max:15W  Input: 220V 50 Hz  (France)
Atari#C016507
XEP80,SX212,2600,CX42 (center positive)

MORE INFO
=============
These draw their power from the SIO +5 V:
XM301 (60 mA),XC11,XC12,ICD P:R: Connection,Wizztronics MidiMax,R-Verter

Draws power from the 600XL PBI:
1064

These have built-in power supplies (plug directly into the wall):
410(120V versions),815,820,825,1025(120V version),1029,XMM801,XDM121

OTHER:

Multi I/O (MIO), all versions, can use both AC and DC supplies, BUT:
stick to voltages of at least 6.2-7.2 V.
On 2003.09.01 James Bradford wrote: "Doesn't matter what polarity the
centre is, the MIO has a fullwave bridge rectifier in it.
AC would be better because the diodes would be used half the time."

Rana 1000: 9 VAC  3.4 A  (30.6 VA)

MPP1000C modem: 9 V DC  200 mA  (1.8 W)

References:
- "Secrets of XL/XE Power Supplies" by Benjamin L. Poehland, Current Notes,
  Vol. 10, No. 9, pp. 42-49.
  http://mcurrent.name/powersupplies/poehland.pdf
- B&C ComputerVisions http://stores.ebay.com/Atari-Sales-and-Service

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Subject: 6.8) What accessories/kits did Atari make for their 8-bit computers?

(Thanks Laurent Delsarte for pics of CX404, CX481, KX7097.)

This should be a complete list of Atari accessories and kits, marketed for or usable with the 8-bit computers.

Controllers marketed by Atari for the 2600 VCS and/or the 7800 also work on the 8-bit computers.

Controllers/Accessories

CX10 Joystick PCB replacement
CX11 Joystick plastic insert replacements
CX12 Joystick cable replacement
CX20-01 Driving Controllers: One Pair (One controller per plug)
  Used by Indy 500 for 2600
CX21 Video Touch Pad for 2600 Star Raiders. Compatible w/ CX23 and CX50.
CX22 (Pro-Line) Trak-Ball. Works in joystick or trackball modes. Round buttons.
  The trackball controller from the Atari Consumer Division (2600/7800).
  Various stylings (after the black 2600), functionally identical:
  1) "Atari 2600 Trak-Ball": cream ball, black top, black buttons, black label beneath ball with black lettering, black bottom. (Rare?)
  2) "Atari 2600 Pro-Line Trak-Ball": cream ball, black top, black buttons, black label beneath ball with silver lettering, black bottom. (Rare?)
  3) "Atari Trak-Ball": black ball, black top, black buttons, black label beneath ball with silver lettering, white bottom. (Rare?)
  4) "Atari Trak-Ball": cream ball, black top, black buttons, black label beneath ball with silver lettering, white bottom. (COMMON)
See: "Programming the CX-22 Track Ball" by William Bartlett (10/26/1983):
  http://www.atariarchives.org/cfn/05/07/0037.php
CX23 Kid's Controller. Used by 2600 Sesame Street titles.
  Compatible w/ CX21 and CX50
CX24 Pro-Line Joystick / Deluxe Joystick / Super Controller Joystick
CX30-04 Paddle Controllers: One Pair
CX40 Joystick Controller / Standard Joystick Controller / Standard Joystick
CX40-04 Joystick Controllers: One Pair
CX41 Joystick Repair Kit
CX42 Remote Control Wireless Joysticks
  (requires XEP80/SX212/2600 power adapter)
CX43 (Pro-Line) Space Age Joystick
CX50 Keyboard Controllers (One Set). Compatible w/ CX21 and CX23
CX70 Light Pen (RARE). Shipped with CX4124 demonstration program cassette.
  A light pen requires a cathode ray tube (CRT) television or monitor.
CX75 Light Pen. Shipped with RX8054 AtariGraphics cartridge.
  A light pen requires a cathode ray tube (CRT) television or monitor.
CX77 Touch Tablet.
  Shipped with RX8053 AtariArtist cartridge and DOS 2.0S or DOS 3 disk.
CX78 Joypad Controller (not marketed in USA)
CX80 Trak-Ball. Works in joystick or trackball modes. Triangular buttons.
  The trackball controller from the Atari Home Computer Division.
  XL computer styling: black ball, black top, black buttons, silver label
  above ball with black "Atari Trak-Ball" lettering, white or black bottom
  2 versions, externally identical:
    1) Trackball mode in earlier-production CX80s is compatible with the
       trackball mode of the CX22 Trak-Ball.
    2) Trackball mode in later-production CX80s is NOT compatible with the
       trackball mode of the CX22 Trak-Ball, but IS compatible with the
       Atari ST Mouse.
CX81 Atari I/O Data Cord (5 ft.)
CX82 B & W Monitor Cable. Package includes (thanks Laurent Delsarte):
  - Connection instructions
  - RCA-type adapter, part no. C016828
  - BNC adapter, part no. C016829
  - UHF adapter, part no. C016830
CX85 Numerical Keypad. Package includes:
  - CX8139 Numerical Keypad Handler Master Program Diskette
  - Keyboard overlay for use with additional programs
  - Owner's manual
  - Technical reference notes
CX86 Printer Cable (included with 825 printer)
CX87 Modem Cable (included with 830 modem)
CX88 Terminal Cable (null modem cable)
CX89 Color Monitor Cable
CA025462-001 Track & Field Arcade Controller
  (shipped only w/ Atari/Atarisoft Track & Field)
XES2001 XG-1 Light Gun
  A light gun requires a cathode ray tube (CRT) television or monitor.

Kits (actually marketed as kits: CX418,CX419,CX481,CX482,CX483,CX484,CX488)
=====
CX401 General Accounting System (Atari Accountant series)
  [package details go here]
CX402 Accounts Receivable System (Atari Accountant series)
  [package details go here]
CX403 Inventory Control System (Atari Accountant series)
  [package details go here]
CX404 Atari Word Processor (Atari 810 Version)
  * Easel-Back Notebook CA017717
  * Training Manual
  * Reference Manual
  * Program Master Diskette CX8119 (2 duplicate disks)
  * Training Data Diskette CX8120
* Audio Master Cassette CX4122
* Reference Card

CX405 PILOT (Educators' Package)
* PILOT Programming Language cartridge CXL4018
* PILOT Primer: The PILOT Programming Language Instruction Manual CO17809 (c1980 DYMAX)
* Student PILOT: Reference Guide CO17811
* Pocket Reference Card C017812
* 2 Demonstration Program Cassettes
  - CX4113A Side 1: PILOT Programs for Children
  - CX4113B Side 1: PILOT "Turtle Graphics" Demonstration
* PILOT Demonstration Programs: Users Guide C017810
* binder CA017805

CX406 Personal Financial Management System
[package details go here]

CX412 Dow Jones Investment Evaluator
[package details go here]

CX414 The Bookkeeper
* Data Entry Diskette CX8131
* Reporting Diskette CX8133
* Sample Data Base Diskette (Benson) CX8134
* Data Base Diskette CX8132
* The Bookkeeper User's Guide
* Simplified Guide

CX415 The Home Filing Manager
* The Home Filing Manager Program Diskette CX8129
* Formatted Diskette II CX8111
* Users Guide C060153

CX418 The Home Manager Kit or The Home Manager
v.1: Personal Financial Management System + The Home Filing Manager
v.2: The Home Filing Manager + Family Finances

CX419 The Bookkeeper Kit (box# CA060294 G-C060295)
* CX414 The Bookkeeper
* CX85 Numerical Keypad
* Bookkeeper Kit Manual

CX421 Family Finances
* 2 Diskettes.
[package details go here]

CX481 The Entertainer
Box v.1: (thanks Bill Demian) Text on the box indicates Computer Chess as the second game complementing Star Raiders. The illustration on the box actually shows a Music Composer box underneath the Star Raiders box. Kit contents:
  - Star Raiders + Missile Command + CX40-04 joystick pair
Box v.2: (thanks Laurent Delsarte) Text on the box correctly indicates Missile Command as the second game complementing Star Raiders. One
illustration on the box shows an unidentified box underneath the Star Raiders box; another illustration (in color) shows a Music Composer box underneath the Star Raiders box. (box# CA017748 G-C017749)

Kit contents:
Star Raiders + Missile Command + CX40-04 joystick pair + Owner's Guide
3rd version (also shipped in Box v.2?). Kit contents:
Star Raiders + Pac-Man + CX40-04 joystick pair

CX482 The Educator
* 410 Program Recorder
* CXL4002 Atari BASIC cartridge
* CX4112 States & Capitals cassette
* The Educator Owner's Guide

CX483 The Programmer
v.1: * Atari BASIC CXL4002
  * BASIC Reference Manual C015307
  * Atari BASIC (A Self-Teaching Guide, Wiley book) CO14385
v.2: * Atari BASIC CXL4002
  * BASIC Reference Manual C015307
  * Inside Atari BASIC CO60992
  * $5 rebate coupon for An Invitation to Programming 1, 2, or 3

CX484 The Communicator (850 Interface + 830 Acoustic Modem + TeleLink I cart)

CX488 The Communicator II
* CXL4016 Telelink II program cartridge
* 835 Direct Connect Modem
* Communicator II User's Guide

ROM/RAM Modules (used with the 800 only)

CX801 10K ROM Operating System (NTSC version)
CX801-P 10K ROM Operating System (PAL version)
CX852 8K RAM Memory Module
CX853 16K RAM Memory Module

Kits/Add-A-Paks/All-In-One-Paks

KX7097 Logo (kit). packaging: CA062166 C061965 REV. A
"16K Cartridge And User Manuals"
Consists of two boxes plastic-wrapped together:
- Atari Logo: Programming Language Cartridge (RX8032) box contains:
  * Atari Logo Computer Program cartridge RX8032
  * Atari Logo: Quick Reference Guide C061583
- Atari Logo: Atari Logo User Manuals (BX4208) box contains:
  * Atari Logo: Introduction to Programming Through Turtle Graphics
    C061590
  * Atari Logo: Reference Manual C061589

KX7098 The Atari Accountant Add-A-Pak (same as CX419). Released???????

KX7099 The BASIC Tutor I Add-A-Pak (An Invitation to Programming 2: Writing Programs One and Two + An Invitation to Programming 3: Introduction to
Subject: 6.9) What preventative maintenance can I do on my Atari system?

This new section could use more contributions! For starters, Russ Gilbert writes (2004.11.05):

The main suggestion I have is to use your A8s. This keeps the keyboard working. I didn't have a problem with my 800XLs, but my 1200XLs required typing the keys a bunch to get them to respond to every keypress. USE YOUR A8s.

The problem, I suspect, is oxidation of contacts, in the keyboard, at the cartridge slot, maybe the SIO port. Use of a soft eraser on cart edge connector is one thing I think helps.

I would guess one could take the 1200XL keyboard apart and clean the mylar traces with 90% isopropyl alcohol and a Q-Tip. I still have my original 800XL, it has copper switches in the keyboard, no mylar. I don't know what my 800s have in the keyboard, but I would guess copper switches. My original 800XL has all socketed chips also.

Here is a thread at AtariAge concerning cleaning the heads of Atari floppy disk drives:

Subject: 6.10) What graphics tablets were produced for the Atari?
According to Wikipedia, a graphics tablet (or digitizing tablet, graphics pad, drawing tablet) is a computer input device that allows one to hand-draw images and graphics, similar to the way one draws images with a pencil and paper. At the time of the Atari computer the more popular term was: touch tablet

Several graphics tablets were produced and marketed for the Atari 8-bit computers:

- **Animation Station by Suncom**
  - Shipped with DesignLab disk (Suncom version of Blazing Paddles)
  - Fully compatible with the earlier, popular KoalaPad
  - Work surface is about the same size as the one on the Atari Touch Tablet - about 50% larger than the KoalaPad's
  - A list of compatible software is elsewhere in the FAQ list.

- **Atari Touch Tablet**
  - Shipped with AtariArtist cartridge (Atari version of Micro Illustrator)
  - Also shipped with CX8104 Atari 810/1050 Master Diskette II disk (DOS 2.0S)
  - Similar to the popular, earlier KoalaPad, but returns reversed y-position values compared to the KoalaPad/Animation Station tablets
  - Device measures 7.5" x 9.5" x 1.25"
  - Drawing surface measures 5" x 6.5"
  - A list of compatible software is elsewhere in the FAQ list.

- **KoalaPad Touch Tablet by Koala Technologies**
  - Shipped with Micro Illustrator disk or KoalaPainter disk or cartridge
  - Device measures 8.5" x 6.5" x 2"
  - The square drawing area is 4.25" on each side.
  - Very popular
  - A list of compatible software is elsewhere in the FAQ list.

- **Kurta Graphics Tablet by Kurta Corporation**
  - Very early device
  - 400/800 only: requires controller ports 1, 2, and 3
  - Device measures 13" x 15.5"
  - Shipped with Kurta Demo Disk
  - Kurta Atari Graphics System, sold separately, includes software:
    - Road Map Distance Analysis
    - Length
    - Area - Calculation of areas (any shape)
    - Sound - display pen location by means of sound
    - Drawing
    - Graphics
    - See ANALOG #1 for a review (p. 16) and an ad (p. 17)

- **PowerPad by Chalk Board, Inc.**
  - Shipped with Micro Illustrator cartridge (Chalk Board PowerPad version)
  - A unique and very large device
- Device measures 17" x 19" x 1.5"
- 12" x 12" square drawing area
- Chalk Board released several cartridges for the PowerPad:
  - BearJam
  - CodeBreaker
  - Leo's "Lectric Paintbrush
  - Leo's Links
  - LogicMaster
  - MicroMaestro

- Super Sketch by Personal Peripherals, Inc. (PPI)
  - Atari version
  - Shipped with Graphics-Master cartridge
  - a 10" X 14" tablet
  - Similar to the earlier VersaWriter - trace or freehand a drawing into the computer.
  - Planned Atari software from PPI for used with Super Sketch (released??):
    - In-Store Demo (disk)
    - Printer Utility (disk)
    - Business Presentor (disk)
    - Master Home Planner (disk)
    - Super Music Box (cartridge)

- VersaWriter Drawing Tablet by Versa Computing, later by Peripherals Plus
  - Shipped with Graphics Software (2 disks)
  - trace or freehand a drawing into the computer
  - Dimensions: 12" x 13.5"
  - See ANALOG #4 (1981) p. 46 for ad, p. 47 for review
  - See Creative Computing vol. 8 no. 4 April 1982 p. 79 for another ad.
  - Reviewed (with picture) in Atari Classics June 1993 pp. 26-28

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Subject: 6.11) What light pens were produced for the Atari?

A light pen for the Atari requires a cathode ray tube (CRT) television or monitor.

- Atari Light Pen CX70 (RARE original beige Atari light pen. Came with demonstration program cassette.)
- Atari Light Pen CX75 (came with AtariGraphics cart.; it produces pictures with 127 sectors in length, thus not DataSoft Micro-Painter, nor Island Graphics Micro Illustrator compatible; however appropriate converter programs can be found in the public domain, e.g. the Rapid Graphics Converter)
- The Light Pen by Programmer's Institute / Futurehouse
- Edumate Light Pen by Futurehouse
  - sold with 5 or 6 programs for the Atari
Subject: 6.12) What light guns were produced for the Atari?

This section started by Andreas Koch.

A light gun for the Atari requires a cathode ray tube (CRT) television or monitor.

- Atari XES2001 XG-1 Light Gun
- "The Best" Light Gun by Best Electronics (a sort of self-made (?) Light Gun);
* Sega Light Phaser for the Sega Master System (normally not Atari compatible; but can be converted into an Atari compatible light gun easily);
- other light guns (most of these have to be converted)...

Note: After having 3-4 Atari and at least one (converted) Sega light gun, it is my personal impression, that the Atari light gun merely works ok on/with TV-sets (and not at all with a monitor), whereas the Sega light gun works alright on TVs and (most) monitors. Since I never had a Best light gun I cannot comment on this one... (Andreas Koch);

Subject: 6.13) What paddles were produced for the Atari?

This section by Andreas Koch.

- Atari Paddles (usually a pair of Paddles);
- Telegames Paddles (available as a) a single paddle and b) a pair of paddles);
- Reston Paddles (available as a) a single paddle and b) a pair of paddles);
- and many others...
Note: Both single and duo (pair) paddles are compatible to each other, using only one port-connector (only one joystick port). Thus, with a pair of paddles you can connect up to 4 paddles (2 pairs) to the XL/XE models and up to 8 paddles (4 pairs) to the Atari 400/800 models.

Subject: 6.14) What voice/sound synthesis hardware was produced for the Atari?

This section started by Andreas Koch.

- Voice-Box II by The Alien Group (a software and hardware package);
- Talk is Cheap by Ed Stewart, Antic Volume 2 Number 4, July 1983, pages 64-66; hardware schematics only (a test/demo program is mentioned in the text, but not printed in the magazine!);
- Cheap-Talk by Lee Brilliant, ANALOG #29, April 1985, pages 59-67; hardware schematics and software demos, for example "First Words);
- many other voice synthesizers (mostly self-made and based on a chip by National Semi Conductor);

Subject: 6.15) What sound-digitizers/samplers were produced for the Atari?

This section started by Andreas Koch.

- Parrot (2-Bit) by Alpha Systems, Anthony Ramos;
- Parrot-2 (2-Bit or 4-Bit?) by Alpha Systems, Anthony Ramos;
- Replay Cartridge (4-Bit) by 2-Bit Systems
- Sound N'Sampler (2-Bit) by Ralf David;
- Sound Digitiser (2-Bit) by Ralf David;
- Sound-Meister (2-Bit) by Irata;
- Sound-Digitizer (2-Bit) by Irata;
- Digitales Mikrofon (2-Bit) by Compy-Shop;
- Voice-Master (2-Bit) by Covox Inc.;
- Analog-Sample-Processor (2-Bit) by Steven Lashower (ANALOG Magazine);
- Atari-Sound-Sampler (2-Bit) by Andreas Binner and Harald Schoenfeld (German Atari Magazin 1/1989, pages 44-49, complete with schematics, documentation, sample-program and assembler-source);
- Alphasys Sample Cartridge (8-Bit) by ANG/Mirage;
  Accompanied software, made by Solarsystems, only used the upper 4 bits; Cartridge also has a "Replay Cartridge compatibility mode" so people could use it with the software by 2-bit systems.
- ARGS-XE-Sampler (8-Bit) by ABBUC regional group ARGS (only one or two prototypes exist, alas the hardware was never released due to lack
of (sampling/digitizing) software; maybe a good idea for the hardware
and software experts out there!);
- and many others ...

Subject: 6.16) What sound-enhancement upgrades were produced for the Atari?

This section started by Andreas Koch.

a) enhancements for 2- or 3-channel sound:

- POPS, polyphonic-pokey-sound by Lee Brilliant (3-channel support with one
  Pokey!); refer to ANALOG #66, november 1988, pages
  54-60; only 1-2 programs exist for this mod., see: 8.14 stereo-software
  for the Atari;

Lee Brilliant writes: (2006.08.09)
  In reality, the POPS device was only a set of connections to the Atari. The
  internal circuitry (Simple to build) was used ONLY to control the
  volume of the sound and to add amplification to power speakers. One
  could do without the amplifiers if they have their own. But the POPs
  did not give just two channel sound, it gave _three_. My design
  allowed for left, center, and right amplifiers and speakers. It always
  caused a stir at Atari conventions and user groups. The software I used
  with it was POKEY Player which was commonly available then. One had to
  get that separately and then modify it slightly to drive the three
  channels separately. At the time there was a lot of support for that
  program and lots of music for it.

- stereo with two Ataris (and thus 2 Pokey chips); use computer/pokey 1
  for the left channel and computer/pokey 2 for the right; no special
  hardware required for this trick (but specially programmed software!); see
  also: 8.14 stereo-software for the Atari;

- stereo with 2 Pokey chips (in one Atari!); refer to an article written
  by Chuck Steinman (which probably appeared in Atari classic?) on how
  to upgrade your Atari internally with a second Pokey chip; or ask
  Freddy Offenga for a deluxe-stereo-version, that uses a PCB instead of
  the piggy-back method. For a list of software that supports this mod.
  see also: 8.14 stereo-software for the Atari;

- Stereo-Blaster and Stereo-Phaser by Portronic/AMC-Verlag, these were
  hardware add-ons that connected via the monitor port to the Atari and
  gave you "another" monitor port and 2 cinch connectors to connect to
  the monitor and/or the hifi-system; various small paddles (4-10,
  depending on the model you have) make it possible to change amplitudes,
  frequencies, etc. and thus generate a "pseudo-stereo" sound. These
add-ons also amplified the sound and thus made quality recordings of Atari sounds much easier. Alas, these hardware add-ons were quite expensive and thus not many (less than 100) were sold. Therefore no special software is required, every A8 sound can be changed or enhanced to "simulated-stereo"...

- Stereo-Blaster-Pro, a hardware add-on by Portronic/AMC-Verlag similar to Stereo-Blaster and Stereo-Phaser, but programmable! This add-on had only 1 small paddle, to amplify the sound-volume; the stereo-sound could be generated via two simple Poke-Statements, a demo-disk therefore was included. Alas, not many items were sold and as far as I know no-one else programmed stereo-software for it. See also: 8.14 stereo-software for the Atari...

b) other sound enhancements:

- Covox Sound enhancement, originally developed in Poland; digital to analog (DAC) converter, uses a PIA and a resistor ladder to produce 8-bit sound playback. (A viable way to reproduce the 8-bit samples captured from the Alphasys Sample Cartridge.) (see also 8.14)

- SID-upgrade, the SID is the standard sound-chip in the C64 computers. Some Polish freaks/nerds have found a way to include it into an A8, but although I have seen quite a lot of pictures (for example at atariarea.nostalgia.pl) with this mod. and already found 1 or 2 programs that detect it (for example System Info 2.x by Draco), I have not yet found any schematics for this upgrade. Anyway, it exists, and with some programming skills it would surely be possible to write programs then, that playback SID sounds on those Ataris which have this upgrade installed...

- AMY sound-chip, the AMY sound-chip was originally produced by Atari and installed into the 65XEM computer. Alas, it was never available to the public and only very few prototypes of this 65XEM (maybe less than 10?) do exist. Besides of that RUMORS say, that Atari had quite some problems with this sound chip and never finished it completely/successfully. If the rumors are true, then this sound chip provided many more sound channels, more octaves and even more and better sound power than two Pokeys together (for more infos take a look at this URL:
http://www.atarimuseum.com/computers/8bits/xe/xe_protos/65xem.html)

- guess there are dozens of other sound enhancements, for example sound cards (like Adlib, etc.), sound-chips, midi-interfaces, etc. that could be attached or converted to the A8; I won't name them all here...(A.K.)
subject: 6.17) what midi enhancements are there for the atari?

this section started by andreas koch.

midi is standard on the atari st computers, because it is built-in into these computers. nevertheless, midi was long before the arrival of the st computers on the market and thus, it is no surprise that there are even midi-interfaces and enhancements for the classic 8bit ataris. the following "types" do exist:

- "midi-mate" and "midi-track" by hybrid arts (usa), comes with hardware + software, see reviews & tests in antic, analog and other magazines. miditrack requires 48k ram, miditrack ii 64k ram and miditrack iii 128k ram (xe compatible, not axlon compatible). midi-mate features midi in+out and sync in+out ports, but lacks a second sio port. mms (midi music system) is a midi version of amrs, also sold by hybrid arts and comes with amrs to mms converter software...

- "midi master" by 2-bit systems (uk), comes with hardware+software. features midi in+out ports, but no sync ports.
  see also reviews and ads in (new) atari user...

- "midi interface" by digicom (uk), comes with hardware + 'example programs'. features midi in, thru and out ports. there`s no word about a second sio port or any sync ports. see also reviews and ads in (new) atari user...

- "midimax" by wizztronics (uk), comes with hardware and software. features midi in+out ports and a second sio port. the mms software that comes with midimax requires 48k ram and is fully compatible to the hybrid arts hardware+software. this means, one can use the software with both midi-interfaces or use the interfaces with the software of both vendors...

- "atari-midi-interface" by karlheinz metscher (appeared in the german magazine computer kontakt june/july 1986, pages 69-75, complete with documentation, schematics and its first program "midi-receiver";
in computer kontakt october/november 1986 appeared the second program, called "midi-disk" - a midi recorder and player program);

- "midi-interface for atari xl/xe" by ireneusz kuczek (appeared in the german abbuc magazine, issue 65, pages 3-6); the paper-mag. includes a schematic for the midi-interface and some translated descriptions for the software (translated from polish to german language), whereas the disk-magazine contains the midi-programs "midiply version 1.3" by i. kuczek, "midi-recorder version 1.2" by i.kuczek, "rec to mid" by i. kuczek (a converter program for the ibm-pci), "midi-sequencer v.1.15" by maciej sygit and "midi-pattern-editor mpe v.2.3" by radek sterba.
These programs and many additional demo sounds are also available in the ABBUC PD library (PD numbers 625-632).

- guess there are several other (self-made) midi-interfaces for the Atari 8Bit available, alas they also require a keyboard or synthesizer and self-created (or downloaded) midi-sounds can only be played back via such a midi-interface and the aforementioned keyboard/synthesizer. As of yet, it seems there exists no midi-player program, that can playback any midi-sound via the Atari Pokey chip, nor any converter program, which can convert *.MID sounds into other Atari sound formats (that could be played back on the Atari then)...

Subject: 6.18) What graphics enhancements are there for the Atari?

Full-View 80, by Bit 3 Computer Corporation (1982)
- Plugs into RAM slot 3 of the Atari 800
- Composite video output;
  Recommended: Display monitor having a minimum bandwidth of 10 MHz
- 80 x 24 character display (no graphics modes)
- Characters are in a 8 x 10 matrix with full lowercase descenders
- Total screen resolution: 640 x 240 pixels

Austin 80, by Austin Franklin Associates (1983)
- Video Processor Board plugs into RAM slot 3 of the Atari 800;
  Console Software cartridge plugs into right cart. slot of the Atari 800
- Composite video output;
  Recommended: Display monitor having a minimum bandwidth of 10 MHz
- 4 RGBI color output bits
- Optional: RGBI Adapter Board for use with (color) RGB monitor
- 80 x 25 character screen (no graphics modes)
- 7 x 9 character size in a 8 x 10 block, with full descenders

XEP80 Interface Module, by Atari (1986)
- Plugs into joystick port 1 or 2
- Composite video output (high resolution monochrome recommended)
- Software driver on diskette
- 80 x 25 character screen (internal 256 x 25 character storage area)
- 7 x 10 character cells
- 320 x 200 Pixel Graphics mode
- See XEP80 section of this FAQ list for additional details

VBXE - VideoBoard XE (2008)
- Version 1 by Tomasz Piorek (Electron)
- Version 2 by Tomasz Piorek (Electron) + Sebastian Bartkowicz (Candle)
- External graphics card
- RGB output
Subject: 6.19) What types of memory upgrades are there for the Atari?

This section by Andreas Koch.

Just a short overview here, for a more detailed description (table), see also 8.10 kinds of atari RAMdisks (and 8.11 + 8.12 for programs that support or require a RAMdisk). The following memory enhancements do exist:
- Atari 400/800: RAMdisks on memory boards, that fit into the normal Atari 800 memory slots (Axlon and Mosaic types);
- Atari XL/XE: a) internal memory enhancements:
  - piggy-back versions,
  - professional PCB versions,
  - SIMM-module versions;
  
  b) external memory enhancements:
  - via XL-Parallel-Bus,
  - via XE-Cart.port+ECI,
  - Flash-ROM cart. versions,
  - other Cartridge versions,
  - RAM-Card versions,
  - SIO-cartridge versions,
  - ...

Note that many of these XL/XE memory enhancements are just hobbyist or self-made projects. Most versions which use newer PC technologies (Flash-ROM cart., RAM-Card, SIO-cart., etc.) are still under development!

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Subject: 7.1) What versions of the Atari Operating System (OS) are there?

Atari 8-bit Operating Systems
~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Version 3.6, 2009-05-05
By Freddy Offenga
400/800 10kB OS roms

<table>
<thead>
<tr>
<th>Rev. TV</th>
<th>Date</th>
<th>CRC-32</th>
<th>Part Nr(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>NTSC</td>
<td>1979</td>
<td>0xc1b3bb02 CO12499A, CO14599A, CO12399B</td>
</tr>
<tr>
<td>A</td>
<td>PAL</td>
<td>1979</td>
<td>0x72b3fed4 CO15199, CO15299, CO12399B</td>
</tr>
<tr>
<td>B</td>
<td>NTSC</td>
<td>1981</td>
<td>0x0e86d61d CO12499B, CO14599B, 12399B</td>
</tr>
<tr>
<td>B</td>
<td>PAL</td>
<td>(*)</td>
<td>(*)</td>
</tr>
</tbody>
</table>

(*) a real PAL.B rom hasn't been found.
If you do have this or have more information, please let me know!

XL/XE 16kB OS roms

<table>
<thead>
<tr>
<th>Rev. System</th>
<th>Date</th>
<th>CRC-32</th>
<th>Part Nr(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1200XL</td>
<td>10/26/1982</td>
<td>0xc5c11546 CO60616A, CO60617A</td>
</tr>
<tr>
<td>11</td>
<td>1200XL</td>
<td>12/23/1982</td>
<td>0x1a1d7b1b CO60616B, CO60617B</td>
</tr>
<tr>
<td>1</td>
<td>600XL</td>
<td>03/11/1983</td>
<td>0x643bcc98 CO62024</td>
</tr>
<tr>
<td>2</td>
<td>XL/XE</td>
<td>05/10/1983</td>
<td>0xf9cd270 CO61598B</td>
</tr>
<tr>
<td>3</td>
<td>800XE</td>
<td>03/01/1985</td>
<td>0x29f133f7 C300717</td>
</tr>
<tr>
<td>3B</td>
<td>65XE</td>
<td>07/21/1984</td>
<td>0x45f47988 C101700</td>
</tr>
<tr>
<td>4</td>
<td>XEGS</td>
<td>05/07/1987</td>
<td>0x1eaf4002 C101687</td>
</tr>
</tbody>
</table>

NOTES:
The 400/800 O.S. consists of three ROMs (two 4kB and one 2kB).
The 1200XL contains two ROMs for the OS (8k each), XL/XEs use a single 16k ROM and the 16k XEGS OS is stored in a 32k ROM (together with 8k BASIC and 8k for Missile Command).

Origins of ROM information

<table>
<thead>
<tr>
<th>Rev. 400/800</th>
<th>NTSC</th>
<th>PAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/800</td>
<td>C012989</td>
<td>C012989</td>
</tr>
</tbody>
</table>

All information from OS board C012989 (Rev D) and ROM dumps.

400/800 rev.A PAL
All info found in two Atari 400s and Atari 800 ROM module CX801.P

400/800 rev.B NTSC
Information from a ROM dump and the rev.B source listing.
The part numbers were listed in the catalog from [BEST].
According to [MAPPING] rev.B ROMs have a 'B' at the end of the part number, therefore I figure these part numbers are from rev.B.

400/800 rev.B PAL
Could exist, since the NTSC version exists and there's some conditional PAL/NTSC assembly in the rev.B source code.

1200XL rev.10
All info found in an Atari 1200XL (both US and Taiwan).
[REV2] refers to it as rev.10. [BEST] calls it rev.A.

1200XL rev.11
Information from ROM dump. Needs confirmation.
[REV2] refers to it as rev.11. [BEST] calls it rev.B.

600XL rev.1
All info found in an Atari 600XL.

XL/XE rev.2
All info from Atari 800XL machines (PAL, NTSC and SECAM).
This version is also used in 130XE and 65XE machines.

800XE rev.3
All info found in an 800XE machine.

65XE (Arabic) rev.3B
The OS rev.3B is a 16K rom dump from an 65XE Atari from Arabia.
It's probably based on rev.3. There are changes in the fonts (Arab characters) and several patches in the code [ARABIC2].

XL/XE rev.4
All info found in an Atari XE Game System (confirmed).

O.S. Authors and dates
~~~~~~~~~~~~~
The following info is from the Atari XL/XE rev.2 source code [REV2].

Revision A (400/800)
D.Crane / A.Miller / L.Kaplan / R.Whitehead

Revision B (400/800)
Fix several problems.
M.Mahar / R.S.Scheiman

Revision 10 (1200XL)
Support 1200XL, add new features.
Revision 11 (1200XL)
Fix several problems.
R.S.Scheiman 12/23/82

Revision 1 (600XL/800XL)
Support PBI and on-board BASIC.
R.S.Scheiman / R.K.Nordin / Y.M.Chen 03/11/83

Revision 2 (600XL/800XL)
Fix several problems.
R.S.Scheiman 05/10/83
Bring closer to coding standard (object unchanged)
R.K.Nordin 11/01/83

Vapour-ware
~~~~~~~~~~~~
The following OS roms originate from rare Atari 8-bit systems.
Since I don't own any of these (unfortunately), I don't have much
information about these roms. Who can help me?

1450XLD
~~~~~~
I've got two 16K rom dumps from the 1450XLD. Both IDs are rev.3.
The first dated 3/23/1984 comes from the 'Pooldisk Too' CD-ROM [POOL2]
(filename: 1540os3.v0) and the second dated 6/21/1984 was send to
me by Nir Dary (filename: os1450.128). Main differences between
these two are in the first 3K ($C000 - $CBFF).

<table>
<thead>
<tr>
<th>Rev. System</th>
<th>Date</th>
<th>CRC-32</th>
<th>Part Nr(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 1450XLD</td>
<td>3/23/1984</td>
<td>0xd477aa1</td>
<td>?</td>
</tr>
<tr>
<td>3 1450XLD</td>
<td>6/21/1984</td>
<td>0xd425a9cf</td>
<td>?</td>
</tr>
</tbody>
</table>

References
~~~~~~~~~~


[BEST] Best Electronics, catalog of Atari 8-bit parts.

[MAPPING] Mapping the Atari, revised edition, Ian Chadwick, Compute! books
publication, 1985.
Thanks to
~~~~~~~~~~
- Laurent Delsarte for Arabic ROM dump and additional info.
- Michael Current for good info about Rev.11 and the Arabic roms.
- Nir Dary for the rev.2 source code, rom dumps and the 1200XL.
- Sijmen Schouten for his reconstructed 400/800 Rev.B source code.
- Stephen Sheppard for 400/800 Rev.A/NTSC information and rom dumps.
- Steve Tucker for the 1200XL OS ROM dumps.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~


Also in 1982, Atari published the same OS Source Listing as part of the larger publication, Technical Reference Notes C016555.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

(end of section content by Freddy Offenga)

Some additional info about the Rev. 3 XL/XE OS from ST*ZMAGAZINE #36, Sept. 1, 1989 (as reprinted in PSAN Nov 89):

by Mark Elliot, Innovative Concepts
The following changes have been incorporated in the 130XE computer.

The O.S. has minor changes like:
A) The MEMORY TEST (from SELF TEST) tests the extra 64K now! (in 4 squares)
B) Also, the MEMORY TEST checks the first 48K over TWICE as fast as before!
C) The KEYBOARD TEST has the F1-F4 keys missing on top. (function keys), although the code that interprets them is probably there (like XEGS).
D) Also, it types out "COPYRIGHT 1985 ATARI" at the keyboard test, when all tests are done. (compared to COPYRIGHT 1983 ATARI, before)
E) And, the O.S. chip itself, is on a 27256 EPROM, but only half of it is used! (compared to the original, which was on a 16K x 8 ROM, 27128 comp.)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Software can reliably distinguish between whether it is running on a 400/800 or on an XL/XE system by checking the value of memory location $FCD8. (primary source: Atari XL Addendum OS Manual, p.28)

If $FCD8 = $A2 then the system is a 400/800.
If $FCD8 = $4C then the system is an XL/XE.

In Atari BASIC:
If PEEK(64728) returns 162 then the system is a 400/800.
If PEEK(64728) returns 76 then the system in an XL/XE.

Software can reliably determine the version of the Atari Operating System running as follows. (primary source: Atari XL Addendum OS Manual, p.28)

On the Atari 400/800:
If location $FFF8 = $DD and $FFF9 = $57 then OS is NTSC rev A.
If location $FFF8 = $D6 and $FFF9 = $57 then OS is PAL rev A.
If location $FFF8 = $F3 and $FFF9 = $E6 then OS is NTSC rev B.
If location $FFF8 = $22 and $FFF9 = $58 then OS is PAL rev B. (exists???)

In Atari BASIC:
If PEEK(65528)=221 and PEEK(65529)=87 then OS is NTSC rev A.
If PEEK(65528)=214 and PEEK(65529)=87 then OS is PAL rev A.
If PEEK(65528)=243 and PEEK(65529)=230 then OS is NTSC rev B.
If PEEK(65528)=34 and PEEK(65529)=88 then OS is PAL rev B. (exists???)

NOTE: If PEEK(65528) returns 255 then your system contains the early, ultra-rare 400/800 OS "Operating System 255" (NTSC)! More info:
http://mcurrent.name/os255/410insert-os255.htm
http://mcurrent.name/os255/softside.htm

**If your 400/800 runs either 400/800 OS PAL rev B. or "Operating System 255", PLEASE contact Freddy Offenga or Michael Current to share your rare find!!

On the Atari XL/XE, the 1200XL OS can be reliably distinguished from the non-1200XL OS as follows:
If location $FFF1 = $01, then XL/XE OS is 1200XL
If location $FFF1 = $02 then XL/XE OS is non-1200XL

In Atari BASIC:
If PEEK(65521)=1 then XL/XE OS is 1200XL
If PEEK(65521)=2 then XL/XE OS is non-1200XL

Also on the Atari XL/XE, the internal revision number of the XL/XE OS is available at memory location $FFF7. In Atari BASIC, PEEK(65527). Possible values:
Subject: 7.1.5) What other operating systems have been produced for the Atari?

This section started by Arianne Slaager (Alphasys).

Args OS 3 CRC32: 0x5B1EADF3
- Mostly a copy of the REV 2 XL rom, but boasts a ROM disk driver by Ralf David that activates by holding Select while resetting. How this works, I have no clue. ARGS stands for Atari Regional Gruppe Stuttgart. Need extra info on this one.

Bibomon V2.1 (c) 1084/85 E. Reuss CRC32: 0x41B80C28
- Option + Reset enters a built in machine language monitor. Also some colors have changed. Looks like Basic is disabled by default, and no way to enable it.

Highchip (c) Irata GmbH 1985 V.1.9 CRC32: 0x41BB4047
- Mostly a copy of REV 2 XL rom, but includes Happy Warp Speed boot and changed colors. Special options menu can be initialised by pressing Option + Select + Reset. Pressing Select + Start while booting, boots from cassette. Booting while holding Start tries to initialise Warp speed before booting.

Oldruner CRC32: 0x10ABFD80
- A copy of the OS-B for the 800, but tweaked to function with the XL/XE line of computers. Makes the XL/XE line able to run 400/800 software.

Omnimon 87 CRC32: 0x9B4F8FAD
- Byte Eaters OMNIMON V_r 1987: Added monitor, through Select+Reset, which replaced the self test, as was pretty much the standard at the time. Compatible with most 800 software. Classified as translator rom.

Omnimon XL CRC32: 0xBFA09B66
- David Young OMNIMONXL (C)1984: Added monitor, through Select+Reset, which replaced the self test, as was pretty much the standard at the time. Compatible with most 800 software. Classified as translator rom.
Omnimon XE CRC32: 0x64B77137
- David Young OMNIMONXL (C)1984: Added monitor, through Select+Reset, which replaced the self test, as was pretty much the standard at the time. Compatible with most 800 software. Classified as translator rom.

Omniview 5 CRC32: 0x5987F5D8
- (c) 1985 David Young. Based on rev B 800 rom. The extra 6kB holds the main feature: A 80 column E: handler that can be invoked from most programs including basic. This mode uses a Graphics 8 screen, with a 4-bit wide font. Not the best readability. Manual includes patches for (at the time) well known word processor software: Speedscript 3.0.

Omniview 6 256K CRC32: 0xEB0C62EB
- Only difference with Omniview 5 is a change of tagline. David Young tagline is replaced by the message "OS-80+ ext.256K rev.(C)1986". There is no extra support for additional ram. I suspect it's a rip-off.

Omniview XE CRC32: 0xE4BF5B98
- (c) 1985 David Young. Very alike Omniview 5. Same base, same feature, but with a reworked character set, which is a slight bit easier on the eyes. Minor changes in the code.

Pud CRC32: 0x95EC9329
- Proof of concept rom for a Power-Up display, made by Aegaeis Softscape. There might be many versions of this now, because it was advertised to sell, tailored to suit anyone with a name to stick in. Has no SelfTest, since that area is replaced with custom graphics/routines for the power-up display. Based on XE rom. Fully compatible.
- If booted with Select, the startup screen will be skipped. If left by its own devices, the startup screen will show for about 2.5 seconds. If Select is pressed in that time short time, it'll continue to show until Select is released again.

Q-Meg V2 CRC32: 0x51939D37
- Q-Meg OS versions incorporate a Machine language monitor, support for ramdisks, including BOOTING from them, without the need for a separate ramdisk driver. HIO (high speed SIO for Speedy extended drives) is built in aswell.
- Compatible with the XL/XE roms for normal use. Not recommended for emulators for all versions.
- Lower versions can adress drive 1-4 and 8, later ones can adress drive 1-8. Configurable ramdisks with 256kB of memory can be either 2 single density drives, 1 enhanced drive + one small x-drive, or one double density drive.
- Ramdisks may be filled from disk directly from the menu, aswell as written to disk, including formatting. They can also be protected from being overwritten by other software. Also Basic can be turned on/off.

Q-Meg V2.3 CRC32: 0xA1FB9BFA
Q-Meg V3.0 CRC32: 0xBE14E47E
Q-Meg V3.2 CRC32: 0x8CD48719
Q-Meg V3.8 CRC32: 0x78F2C102
Q-Meg V4.2 CRC32: 0x64CCFC53
Q-Meg V4.3 CRC32: 0xBE2442DA
Q-Meg V4.4 CRC32: 0x0547F499

Speedos CRC32: 0xA991769B
- I totally have no clue what this does, it just makes my computer crash like there's no tomorrow. I get the feeling this has Happy extensions that my drives just don't like, or something like that...

Supermon '85 CRC32: 0xBBDB8A8BD
- All Supermon versions are based on the 800 rom, as far as I've noticed so far.
- Machine language monitor through Select+Reset.

Supermon 2.0 CRC32: 0xFFDC4372
- This one is probably a rip off of the '86 version, as only the monitor tagline differs.

Supermon '86 (BRD) CRC32: 0x28DD9BE4
- Same as Supermon 2.0, just gives a german header when invoking the monitor.

Supermon HTT CRC32: 0x1101FF93
- Same as Supermon '85, with different colors and charset. Modified build for the High-Tech Team, a demo/developer group from the Netherlands.

Warpcopy CRC32: 0x21A89311
- Warp speed Happy extension included. Need extra info on this one.

Xos CRC32: 0x196C9B00
- Never found out how to get into special functions on this one yet. Need extra info on this one.

Subject: 7.2) What is the ATASCII character set?

ASCII is an acronym for the American Standard Code for Information Interchange. Pronounced ask-ee, ASCII is a code for representing English characters as numbers, with each letter assigned a number from 0 to 127. For example, the ASCII code for uppercase M is 77. Most computers use ASCII codes to represent text, which makes it possible to transfer data from one computer to another.

The 8-bit Atari computers use a modified version of the ASCII character set called Atari ASCII, or ATASCII.
David Moeser produced this nice translation table.

ASCII TRANSLATION TABLE -- IBM & ATARI 8-BIT (ATASCII)
===============================================

SECTION ONE: CONTROL CHARACTERS
===============================================

<table>
<thead>
<tr>
<th>DECIMAL</th>
<th>ATARI</th>
<th>IBM</th>
<th>ATARI</th>
<th>ASCII</th>
<th>NAME</th>
<th>KEY</th>
<th>GRAPHICS CHARACTER</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 00</td>
<td>NUL</td>
<td></td>
<td>^,</td>
<td>heart</td>
<td>heart</td>
<td>NUL</td>
<td>heart</td>
<td>Null</td>
</tr>
<tr>
<td>1 01</td>
<td>SOH</td>
<td></td>
<td>^A</td>
<td>smiley</td>
<td>smiley</td>
<td>-</td>
<td>smiley</td>
<td>Start of header</td>
</tr>
<tr>
<td>2 02</td>
<td>STX</td>
<td></td>
<td>^B</td>
<td>[smiley]</td>
<td>right</td>
<td></td>
<td></td>
<td>Start of text</td>
</tr>
<tr>
<td>3 03</td>
<td>ETX</td>
<td></td>
<td>^C</td>
<td>heart</td>
<td>(9:00)</td>
<td></td>
<td></td>
<td>End of last text</td>
</tr>
<tr>
<td>4 04</td>
<td>EOT</td>
<td></td>
<td>^D</td>
<td>diamond</td>
<td>-</td>
<td></td>
<td>diamond</td>
<td>End of transmission</td>
</tr>
<tr>
<td>5 05</td>
<td>ENQ</td>
<td></td>
<td>^E</td>
<td>club</td>
<td>(9:30)</td>
<td></td>
<td></td>
<td>Enquiry</td>
</tr>
<tr>
<td>6 06</td>
<td>ACK</td>
<td></td>
<td>^F</td>
<td>spade</td>
<td>/</td>
<td></td>
<td>spade</td>
<td>Acknowledge (handshake)</td>
</tr>
<tr>
<td>7 07</td>
<td>BEL</td>
<td></td>
<td>^G</td>
<td>rain dot</td>
<td>|</td>
<td></td>
<td>rain dot</td>
<td>Bell</td>
</tr>
<tr>
<td>8 08</td>
<td>BS</td>
<td></td>
<td>^H</td>
<td>doorbell</td>
<td>L triangle</td>
<td></td>
<td>doorbell</td>
<td>Backspace</td>
</tr>
<tr>
<td>9 09</td>
<td>HT</td>
<td></td>
<td>^I</td>
<td>o</td>
<td>low-R-sq.</td>
<td></td>
<td>o</td>
<td>Horizontal tab</td>
</tr>
<tr>
<td>10 0A</td>
<td>LF</td>
<td></td>
<td>^J</td>
<td>[doorbell]</td>
<td>R triangle</td>
<td></td>
<td>[doorbell]</td>
<td>Line feed</td>
</tr>
<tr>
<td>11 0B</td>
<td>VT</td>
<td></td>
<td>^K</td>
<td>Mars</td>
<td>hi-R-sq.</td>
<td></td>
<td>Mars</td>
<td>Vertical tab</td>
</tr>
<tr>
<td>12 0C</td>
<td>FF</td>
<td></td>
<td>^L</td>
<td>Venus</td>
<td>hi-L-sq.</td>
<td></td>
<td>Venus</td>
<td>Form feed</td>
</tr>
<tr>
<td>13 0D</td>
<td>CR</td>
<td></td>
<td>^M</td>
<td>note</td>
<td>high bar</td>
<td></td>
<td>note</td>
<td>Carriage return</td>
</tr>
<tr>
<td>14 0E</td>
<td>SO</td>
<td></td>
<td>^N</td>
<td>2 notes</td>
<td>low bar</td>
<td></td>
<td>2 notes</td>
<td>Shift out</td>
</tr>
<tr>
<td>15 0F</td>
<td>SI</td>
<td></td>
<td>^O</td>
<td>sun</td>
<td>low-L-sq.</td>
<td></td>
<td>sun</td>
<td>Shift in</td>
</tr>
<tr>
<td>16 10</td>
<td>DLE</td>
<td></td>
<td>^P</td>
<td>R pennant</td>
<td>club</td>
<td></td>
<td>R pennant</td>
<td>Data link escape (break)</td>
</tr>
<tr>
<td>17 11</td>
<td>DC1</td>
<td></td>
<td>^Q</td>
<td>L pennant</td>
<td>(3:30)</td>
<td></td>
<td>L pennant</td>
<td>Device #1 (P:)</td>
</tr>
<tr>
<td>18 12</td>
<td>DC2</td>
<td></td>
<td>^R</td>
<td>V arrows</td>
<td>--</td>
<td></td>
<td>V arrows</td>
<td>Device #2</td>
</tr>
<tr>
<td>19 13</td>
<td>DC3</td>
<td></td>
<td>^S</td>
<td>!!</td>
<td>cross</td>
<td></td>
<td>!!</td>
<td>Cross (deselects P:)</td>
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<td>20 14</td>
<td>DC4</td>
<td></td>
<td>^T</td>
<td>paragraph</td>
<td>cloudy</td>
<td></td>
<td>paragraph</td>
<td>Device #4 (stop)</td>
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<tr>
<td>21 15</td>
<td>NAK</td>
<td></td>
<td>^U</td>
<td>section</td>
<td>low block</td>
<td></td>
<td>section</td>
<td>Negative acknowledgement (error)</td>
</tr>
<tr>
<td>22 16</td>
<td>SYN</td>
<td></td>
<td>^V</td>
<td>short -</td>
<td>left</td>
<td></td>
<td>short -</td>
<td>Synchronous idle</td>
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<tr>
<td>23 17</td>
<td>ETB</td>
<td></td>
<td>^W</td>
<td>base-V-arrs.</td>
<td>low T</td>
<td></td>
<td>base-V-arrs.</td>
<td>End of block</td>
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<tr>
<td>24 18</td>
<td>CAN</td>
<td></td>
<td>^X</td>
<td>up arrow</td>
<td>hi perf.</td>
<td></td>
<td>up arrow</td>
<td>Cancel memory (in buffer)</td>
</tr>
<tr>
<td>25 19</td>
<td>EM</td>
<td></td>
<td>^Y</td>
<td>DN arrow</td>
<td>left half</td>
<td></td>
<td>DN arrow</td>
<td>End medium (tape drive)</td>
</tr>
<tr>
<td>26 1A</td>
<td>SUB</td>
<td></td>
<td>^Z</td>
<td>R arrow</td>
<td>(3:00)</td>
<td></td>
<td>R arrow</td>
<td>Substitute</td>
</tr>
<tr>
<td>27 1B</td>
<td>ESC</td>
<td></td>
<td>EE</td>
<td>L arrow</td>
<td>escape</td>
<td></td>
<td>L arrow</td>
<td>Escape</td>
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<tr>
<td>28 1C</td>
<td>FS</td>
<td></td>
<td>E^-</td>
<td>(3:00)</td>
<td>up arrow</td>
<td></td>
<td>E^-</td>
<td>File separator</td>
</tr>
<tr>
<td>29 1D</td>
<td>GS</td>
<td></td>
<td>E^=</td>
<td>ice needles</td>
<td>DN arrow</td>
<td></td>
<td>ice needles</td>
<td>Group separator</td>
</tr>
<tr>
<td>30 1E</td>
<td>RS</td>
<td></td>
<td>E^+</td>
<td>up triangle</td>
<td>L arrow</td>
<td></td>
<td>up triangle</td>
<td>Record separator</td>
</tr>
<tr>
<td>31 1F</td>
<td>US</td>
<td></td>
<td>E^*</td>
<td>DN triangle</td>
<td>R arrow</td>
<td></td>
<td>DN triangle</td>
<td>Unit separator</td>
</tr>
<tr>
<td>32 20</td>
<td>SPC</td>
<td></td>
<td>bar</td>
<td>space</td>
<td>space</td>
<td></td>
<td>space</td>
<td>Space</td>
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SECTION TWO: SPECIAL CHARACTERS
### SECTION THREE: KEYBOARD CHARACTERS

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<th>DECIMAL</th>
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<td>KEY CHAR.</td>
<td>KEY CHAR.</td>
<td>KEY CHAR.</td>
<td>KEY CHAR.</td>
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<td>33</td>
<td>21</td>
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<td>S1 !</td>
<td>81</td>
<td>51</td>
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<td>S4</td>
<td>$</td>
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<td>$</td>
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<td>S5</td>
<td>%</td>
<td>S5</td>
<td>%</td>
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<td>26</td>
<td>S7</td>
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<td>S9</td>
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<td>27</td>
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<td>28</td>
<td>S8</td>
<td>*</td>
<td>S8</td>
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<td>41</td>
<td>29</td>
<td>S9</td>
<td>(</td>
<td>S9</td>
<td>(</td>
</tr>
<tr>
<td>42</td>
<td>2A</td>
<td>S+</td>
<td>+</td>
<td>S+</td>
<td>+</td>
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<td>+</td>
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<td>,</td>
<td>,</td>
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<td>2D</td>
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<td>-</td>
<td>93</td>
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<td>46</td>
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<td>. . .</td>
<td>. . .</td>
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<td>5E</td>
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<td>47</td>
<td>2F</td>
<td>/ / /</td>
<td>/ / /</td>
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<td>5F</td>
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<td>0 0 0</td>
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<td>1 1 1</td>
<td>1 1 1</td>
<td>97</td>
<td>61</td>
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<td>32</td>
<td>2 2 2</td>
<td>2 2 2</td>
<td>98</td>
<td>62</td>
</tr>
</tbody>
</table>
Subject: 7.2.1) How can my program detect keypresses directly?

modified slightly from text by JB in Atari Customer Service Demopac #3, 5/82

For reading keypresses of most keys on the Atari keyboard, one can look directly at the memory location where the keycode for the last key pressed is stored.

To read directly from the keyboard buffer, check the value of memory location CH (decimal 764; hex $2FC). This location returns a keycode, rather than a letter or ATASCII value. The keycode is an arbitrary code which is unique for each key. It reflects whether SHIFT or CONTROL is pressed, and in some cases whether SHIFT and CONTROL are both pressed. If you use this method, you must

A graphical ATARI / ASCII Table made by Florian Dingler is available at:
http://www.akk.org/~flo/ATASCII.pdf
translate the keycode in your own program. There is a translation table on page 50 of the Operating System User's Manual, or you can PEEK the location and create your own table. This method is useful if you are simply checking for a particular keypress, i.e. PRESS "C" TO CONTINUE. The Atari BASIC program code for this would be:

```
10 PRINT "PRESS C TO CONTINUE"
20 If PEEK(764)18 THEN GOTO 20
```

Checking CH, the keyboard buffer, bypasses the K: keyboard handler altogether. A disadvantage is that you have to interpret the keycode yourself. An advantage is that you don't have to press RETURN, and in bypassing the handler, you also bypass the keyboard beep.

Subject: 7.2.5) How is the Input/Output subsystem of the Atari OS organized?

Derived primarily from the Operating System User's Manual and De Re Atari.

The Input/Output (I/O) subsystem of the Atari Operating System (OS) comprises a collection of software routines that allow you to access peripheral and local devices at three different levels:

1) The CIO (Central I/O Utility) provides the highest level, device independent access to devices.
2) Direct communication with system devices via device handlers.
3) The lowest level is the SIO (Serial I/O bus Utility) routine.

Any lower level access to a device involves the direct reading and writing of the hardware memory registers associated with the device.

1) CIO features:
   - The transfer of data is device independent.
   - Byte-at-a-time, multiple byte and record-aligned accesses are supported.
   - Multiple device/files can be accessed concurrently.
   - Error handling is largely device independent.
   - New device handlers can be added without altering the system ROM.
   - I/O is organized by "files," where a file is a sequential collection of data bytes. Some files are synonymous with a device (e.g., a printer), while other devices can contain multiple files, each with a unique name (e.g., a disk drive).

2) Device handlers provided by the Atari OS:
   - K: Keyboard Handler
   - S: Display Handler
   - E: Screen Editor
     Uses the K: Keyboard Handler and the S: Display Handler to provide "line-at-a-time" input with interactive editing functions, as well as formatted output.
   - C: Cassette Handler
- P: Printer
- OS Rev.A/Rev.B (400/800): Supports a single printer device; any device number is ignored. All powered printers attached via SIO or the 850 parallel port respond to all print commands.
- OS Rev.10 and up (XL/XE): Supports 8 different printer devices P1:-P8:.
  P: (no device number) is interpreted to mean P1:.
  Printer devices are associated with specific models of Atari printers as follows:
  P1: All printers attached via SIO or the 850 parallel port
  P2: 850 Interface Module parallel port
  P3: 1025 Printer
  P4: 1020 Color Plotter
  P5: 1027 Printer
  P6: 1029 Printer
  P7: XMM801 Printer
  P8: XDM121 Printer

Kr0tki contributes the following information (May 2011):
This feature is buggy in OS Rev.10/Rev.11/Rev.1. Behavior was fixed to reliable operation as of OS Rev.2.

- Diskette Handler (not CIO-compatible)

3) The SIO bus Utility performs the following functions:
- Control of all Serial bus I/O, conforming to the bus protocol
- Bus operation retries on errors
- Return of unified error statuses on error conditions
- (The OS-resident K:, S:, and E: handlers do not use SIO.)

There are four types of I/O system control blocks, used for communications between levels of the I/O subsystem:

1. Input/Output Control Block (IOCB)
   Eight IOCBs (0-7) in the OS are used to effect communication between user programs and CIO. Each IOCB can be assigned to control any device/file.

   IOCB #0 is assigned by the OS to the E: Screen Editor at power-up and system reset.

   Software programming environments may reserve other IOCBs for internal use. For example, Atari BASIC uses IOCB #6 to interact with the S: device when using graphics modes other than zero, and uses IOCB #7 for I/O with the printer, disk drive, and cassette. (Patchett/Sherer, Master Memory Map, http://www.atariarchives.org/mmm/iocbs.php)

2. Zero-Page I/O Control Block (ZIOCB)
   Used to communicate I/O control data between CIO and the device handlers.

3. Device Control Block (DCB)
   Used by device handlers (including the OS-resident Diskette Handler) that
require the use of I/O over the serial bus (SIO Utility).

4. Command Frame Buffer (CFB)
   Used by SIO bus Utility while performing serial bus operations.

Subject: 7.3) What is attract mode?

From the Atari Operating System User’s Manual p. 215:

Attract mode is a mechanism that protects the television screen from having patterns “burned into” the phosphors due to a fixed display being left on the screen for extended periods of time. When the computer is left unattended for more than 9 minutes, the color intensities are limited to 50 percent of maximum and the hues are continually varied every 8.3 seconds. Pressing any keyboard data key will be sufficient to remove the attract mode for 9 more minutes.

Laurent Delsarte contributes:

To launch the attract mode from BASIC, use a "POKE 77,128"
To disable the attract mode from BASIC, use a "POKE 77,0"

Subject: 7.4) What is Atari BASIC?

BASIC is an acronym for Beginner’s All-purpose Symbolic Instruction Code. Developed by John Kemeney and Thomas Kurtz in the mid 1960s at Dartmouth College, BASIC is one of the earliest and simplest high-level programming languages, incorporating components of FORTRAN and ALGOL.

In October 1978 Atari contracted with Shepardson Microsystems, Inc. (SMI) to create a version of BASIC for the upcoming Atari personal computers. The following worked together on the project at SMI, resulting in Atari BASIC:
  Paul Laughton  - project leader
  Kathleen O’Brien - major contributor
  Bill Wilkinson  - preliminary specifications for the language, floating point scheme design
  Mike Peters     - “keypuncher, computer operator, junior programmer, troubleshooter”
  Paul Krasno    - implemented the math library routines
  Bob Shepardson - Modified IMP-16P cross-assembler to handle the syntax table pseudo-operations

Revision A
Atari BASIC Rev. A was produced by Atari on cartridge in mass quantities before SMI had finished debugging it. One place these bugs are documented is in this article by Steve Hanson from Compute! magazine, Oct. 1981:
http://www.atarimagazines.com/compute/issue17/171_1_DOCUMENTED_ATARI_BUGS.php

On February 25, 1981, the source code to Atari BASIC was purchased from SMI by Optimized Systems Software (OSS), headed by former SMI employees Bill Wilkinson and Mike Peters.

http://users.telenet.be/kim1-6502/6502/absb.html

Revision B
----------
When the 600XL/800XL computers were released in 1983 they included a newly debugged Atari BASIC Rev. B in ROM. The new version was also produced on cartridge (rare). Unfortunately, while most existing bugs were fixed, Rev. B introduced a new bug more serious than any of the earlier problems. In his article in the June 1985 issue of Compute!, Bill Wilkinson writes:

Each time you LOAD (or CLOAD or RUN "filename") a program, rev B adds 16 bytes to the size of your program. If you then save the program, the next time you load it in it grows by _another_ 16 bytes, and so on.

http://www.atarimagazines.com/compute/issue61/323_1_INSIGHT_Atlari.php

The problem can be alleviated by periodically, if not exclusively, using LIST instead of SAVE or CSAVE to save your programs.

Revision C
----------
Atari BASIC Rev. C, introduced in 1984, is the final "fully debugged" version. It is provided in ROM in late-production 800XL computers and in all Atari XE systems, and it was also produced on cartridge (rare).

"Revision C Converter: Type-in fix for buggy BASIC revision B" by Matthew Ratcliff was published in the September 1985 issue of Antic:
http://www.atarimagazines.com/v4n5/revisioncconverter.html

Determining Revision version
----------------------------
When running Atari BASIC, memory location 43234 ($A8E2, BASIC ROM) indicates which Revision of BASIC is running. At the READY prompt, enter:

? PEEK(43234)

If the result is: You have Revision:     Atari Part#:
162    A     CO12402+CO14502
96     B     CO60302A
234    C     CO24947A
All 3 versions of Atari BASIC may be available for download here: 
http://members.chello.nl/taf.offenga/atari_dev.htm

Subject: 7.5) What is Atari DOS, and what versions did Atari release?

This FAQ section describes the various DOS versions produced by Atari for use with their 8-bit computers: DOS I, DOS 2.0S, DOS 3, DOS 2.5, DOS XE, DOS XLE

On the Atari, a complete Disk Operating System (DOS) consists of a complex, flexible combination of software components provided in the Atari OS on ROM with software components loaded into RAM from disk:

1) SIO (Serial I/O bus Utility) routine
   - Component of the Atari OS
   - Generalized low level communications with SIO bus devices, including disk drives
   - Utilized by the Resident Diskette Handler
   - Normally utilized by the FMS

2) Resident Diskette Handler
   - Component of the Atari OS
   - Utilizes SIO for communications with disk drives
   - Supports just five functions (four on the 400/800):
     1. GET SECTOR
        - Read a specified sector
     2. PUT SECTOR WITH VERIFY
        - Write sector; check sector to see if written
     3. STATUS REQUEST
        - Ask the disk controller for its status
     4. FORMAT
        - Issue a format command to the disk controller
     5. PUT SECTOR WITHOUT VERIFY
        - Write sector (don't check sector to see if written)
          - Available on XL/XE; not available on 400/800
          - 400/800: Uses 128 byte sectors
          - XL/XE: Can read/write disk sectors having variable length from 1 to 65536 bytes. Default=128 bytes
          - Except for Atari DOS I, only used to load the FMS from disk

3) FMS (File Management System)
   - Must be loaded from disk (using the Resident Diskette Handler)
   - Normally utilizes SIO for disk drive communications
   - Except for Atari DOS I, does not utilize the Resident Diskette Handler
   - Normally provides a D: Disk File Manager device handler that is compatible with CIO

4) CIO (Central Input/Output Utility) routine
   - Component of the Atari OS
- Generalized high level, device independent access to device handlers, including any disk drive device handler provided by a FMS

5) DUP (Disk Utility Package/Programs) or equivalent software program(s)
   - Optionally provided with a FMS
   - Must be loaded from disk using the FMS
   - Typically a DOS menu program, but could take any form of software that provides a user interface to FMS management functions
   - Normally utilizes CIO for carrying out disk management operations

In practice, those DOS components loaded into memory from disk, that is, a FMS and any additional programs distributed with that FMS (such as a DUP), are normally collectively described as a "DOS" on the Atari.

DOS I

-----

DISK OPERATING SYSTEM  9/24/79  COPYRIGHT 1979 ATARI

- Developed at Shepardson Microsystems, Inc. (SMI) for Atari. Team at SMI:
  Paul Laughton - project leader (had earlier authored Apple DOS)
  Kathleen O'Brien - major contributor
  Mike Peters    - "keypuncher, computer operator, junior programmer, troubleshooter"
  Bob Shepardson - Modified IMP-16P cross-assembler to handle the syntax table pseudo-operations

- Shipped with 810 disk drives until 1981.
- Disk Utility Package (DOS menu) is loaded into memory with the FMS
- Uses the OS-resident Diskette Handler for all disk communications via SIO
- Disk drive type supported: Atari 810
- Disk utilization/filesystem: "DOS I"
  - 128 total bytes/sector, with 3 bytes of each sector used to address the next sector
  - 40 tracks * 18 sectors/track = 720 total sectors, with 11 sectors used for software control or unused by the Disk File Manager.
- Data capacity per diskette:
  709 sectors x 125 bytes/sector = 88,625 bytes/disk
- Requires a 1 sector boot
- Cannot read disks written with DOS II, which require a 3 sector boot
- 11 special sectors:
  - 1 FMS Boot record
  - 360 Volume Table of Contents
  - 361-368 File Directory
  - 720 unused by Disk File Manager
- Maximum of 64 files for any volume
- Uses binary file format unsupported by any other DOS version for the Atari
- D: Disk File Manager can address drives up to 4, D1: through D4:
- AUTO.SYS can be used to automatically poke data in RAM locations on system startup.
- Files copied or duplicated in small buffer
- Must redisplay menu before issuing new command
- Can only write DOS system file to drive 1
- Can open 3 files simultaneously (default setting)
- N. DEFINE DEVICE menu option: "The full implementation of this selection is not supported, so use it with caution." --Atari DOS Reference Manual p.39
- DOS I is not compatible with the 850 Interface Module R: device handler
- Disk File Manager Master Copy (CX8101) disk contains:
  - DOS.SYS  FMS with D: Disk File Manager, loaded by OS-resident Diskette Handler on system startup
- Shipped with Atari Disk Operating System Reference Manual C015200

DOS 2.0S
--------

DISK OPERATING SYSTEM II VERSION 2.0S COPYRIGHT 1980 ATARI
- FMS (DOS.SYS) developed by Paul Laughton at Shepardson Microsystems for Atari, based on Atari DOS I.
- Shipped with 810 disk drives, and earlier 1050 disk drives, from 1981-1984. It also shipped with earlier CX77 Touch Tablets.
- Disk Utility Package (DOS menu) is separate from the FMS, and optional for use of the FMS, freeing up memory for user programs when the DUP is not needed.
- Does not use the OS-resident Diskette Handler once the FMS is loaded.
- Utilizes SIO for disk drive communications
- MEM.SAV file can be employed to preserve the contents of memory to disk when DUP.SYS is loaded.
- Introduces support for AUTORUN.SYS binary file launch upon system boot (replaces AUTO.SYS of DOS I)
- Disk drive type supported: Atari 810
- Disk utilization/filesystem: "DOS 2.0 Single Density"
  - 128 total bytes/sector, with 3 bytes of each sector used to address the next sector
  - 40 tracks * 18 sectors/track = 720 total sectors, with 13 sectors used for software control or unused by the Disk File Manager.
- Data capacity per diskette:
  - 707 sectors x 125 bytes/sector = 88,375 bytes/disk
- Requires a 3 sector boot (provision for double density version)
- 13 special sectors:
  - 1-3 FMS Boot record
  - 360 Volume Table of Contents
  - 361-368 File Directory
  - 720 unused by Disk File Manager
- Maximum of 64 files for any volume
- Backwards compatible with DOS I disk utilization/filesystem
- Established standard binary file format supported by ALL other DOS versions for the Atari (exception: Atari DOS I)
- CIO-compatible D: Disk File Manager can address drives up to 8, D1: through D8:
- Files copied or duplicated into buffer which can be as large as user memory area
- SAVE BINARY FILE has "/A" option allowing two files to be appended together
- Can create load-and-go type file which enables you to select a file and have it automatically run without entering a RUN address
- Diskette with bad sectors detected cannot be formatted
- Screen margins are reset when DUP is entered
- DUP: May enter another command or resdisplay menu after a command
- Can write DOS files to any drive
- Can have up to 8 files open simultaneously (default setting)
- NOTE/POINT are available for random file access
- Atari 810 Master Diskette II / Atari 810/1050 Master Diskette II (CX8104) contains:
  - DOS.SYS  FMS with D: Disk File Manager, loaded by OS-resident
            Diskette Handler on system startup
  - DUP.SYS  Disk Utility Package (DOS menu)
  - AUTORUN.SYS  Loads the R: device handler from an 850 Interface Module
- On February 25, 1981, the source code to the Atari DOS 2.0S FMS (DOS.SYS) was purchased from SMI by Optimized Systems Software (OSS), headed by former SMI employees Bill Wilkinson and Mike Peters.
- DOS Utilities Source Listing (DOS II) (Atari# C017894, August 1981) made the source code to the Atari DOS 2.0S DUP (DUP.SYS) available to the public.  Source code version: 2.9, 11/18/80
- Inside Atari DOS (Compute! Books, 1982, 0-942386-02-7), authored by Bill Wilkinson, made the source code to the Atari DOS 2.0S FMS (DOS.SYS) available to the public.  Available:
  - http://www.atariarchives.org/iad/
- Modified versions of DOS 2.0S were widely created and exchanged among Atari users.  Also notably, the first 3rd-party disk drive for the Atari, the Percom RFD40-S1, was initially (1982) distributed with a program that modifies Atari DOS 2.0S to support the double density capability of the Percom drive.

DOS 3
-----
Atari DOS 3  Copyright 1983
  It also shipped with later CX77 Touch Tablets.
- Disk drive types supported:
  1) Atari 810
  2) Atari 1050
  3) Atari 1450XLD built-in (double-sided, enhanced/dual density)
     Minimal support only: A single 1450XLD disk drive appears to DOS 3 as two Atari 1050 drives.  That is, side 1 is accessed as D1: and side 2 is accessed as D2:.
- Disk utilization/filesystems:
  1) "DOS 3 Single Density"
     - sector = 128 bytes
     - block = 8 sectors = 1024 bytes
- track = 18 sectors = 2304 bytes
- Disk contains 40 tracks, or 720 sectors, or 90 blocks;
  2 blocks are used for booting the system;
  1 block is used by DOS 3 for the index file
- Data capacity per diskette:
  87 blocks x 1024 bytes/block = 89,088 bytes/disk
2) "DOS 3 Double Density" (enhanced/dual density)
- sector = 128 bytes
- block = 8 sectors = 1024 bytes
- track = 26 sectors = 3328 bytes
- Disk contains 40 tracks, or 1040 sectors, or 130 blocks;
  2 blocks are used for booting the system;
  1 block is used by DOS 3 for the index file
- Data capacity per diskette:
  127 blocks x 1024 bytes/block = 130,048 bytes/disk
  -- Smallest unit of disk utilization is the 1024-byte "block".
  -- Maximum disk size filesystem could support is 128K (limited by the
    index file size of 1 block)
- Keyboard Command Processor (KCP) is separate from the FMS, and optional for
  use of the FMS, freeing up memory for user programs when the KCP DOS
  subfunctions and the DOS menu are not needed.
- KCP Overlay (DOS menu) is separate from the FMS and KCP, and optional for
  use of the FMS and KCP, freeing up memory for user programs when the DOS
  menu is not needed.
- MEM.SAV file can be employed to preserve the contents of memory to disk
  when the KCP Overlay (DOS menu) is loaded.
- Supports AUTORUN.SYS binary file launch upon system boot
- File manager and buffers now take up less space than the DOS 2 equivalents.
  All utilities, such as COPY, INIT, DUPLICATE (all UTL files) are called
  into memory only as needed. Each is maintained in a separate file.
- Provides a direct method for the user to modify the FMS parameters
- Provides an online HELP feature
- Compared to DOS 2: The NOTE and POINT commands return a pointer number
  relative to the start of a file (byte 0) rather than an absolute sector and
  byte location within the sector.
- Master Diskette 3 (DX5052) contains:
  FMS.SYS    FMS with D: Disk File Manager, loaded by OS-resident
    Diskette Handler on system startup. Contains subfunctions:
      ERASE FILE, RENAME FILE, PROTECT FILE, UNPROTECT FILE, LOAD
  KCP.SYS    Keyboard Command Processor, loaded on system startup if a
    cartridge is present. Contains subfunctions: SAVE,
      GO AT HEX ADDRESS, TO CARTRIDGE, COPY FILE, INIT DISK,
      DUPLICATE DISK, ACCESS DOS 2
  KCPOVER.SYS  KCP Overlay, displays the DOS menu and process commands
  COPY.UTL    COPY/APPEND utility
  DUPDISK.UTL DUPLICATE utility
  INIT.UTL    INIT Disk utility
  CONVERT.UTL ACCESS DOS 2 utility, use to copy files from a DOS 2.0S disk
to a DOS 3 disk
HELP.UTL     HELP utility
HELP.TXT     Text information displayed by the HELP utility
HANDLERS.SYS Loads the R: handler from an Atari 850 Interface Module
during system boot up, if this file is on the drive 1 diskette.

- DOS 3 Anomalies (Atari DOS 3 Reference Manual Errata 05/01/84) -
  Early versions of DOS 3 used a random access method that was incompatible
  with large files. To determine if you have an early version, boot your
  copy of DOS 3 with Atari BASIC, and execute the following BASIC command:
    PRINT PEEK(1816)
  If the value returned is '53', your copy of DOS 3 is the latest released.
  If the value returned is '51' or '56', Atari Customer Relations offered a
  program to update DOS 3 to the latest revision level.

DOS 2.5
-------

DISK OPERATING SYSTEM II VERSION 2.5  COPYRIGHT 1984 ATARI CORP.
- Shipped with 1050 disk drives and early XF551 disk drives from 1985-1988
- Developed by Optimized Systems Software (OSS - Bill Wilkinson) for Atari
- Disk drive types supported:
  1) Atari 810
  2) Atari 1050
  3) Atari 130XE RAMdisk (65,408 bytes)
- Disk utilization/filesystems supported (detected automatically):
  1) DOS 2.0 Single Density
  2) "DOS 2.5 Enhanced Density" (or just "DOS 2.5")
    - 128 total bytes/sector, with 3 bytes of each sector used to address
      the next sector
    - 40 tracks * 26 sectors/track = 1040 total sectors, with 30 sectors
      used for software control or unused by the Disk File Manager.
    - Data capacity per diskette:
      1010 sectors * 125 bytes/sector = 126,250 bytes/disk
  3) "DOS 2.5 130XE RAMdisk"
    - 128 total bytes/sector, with 3 bytes of each sector used to address
      the next sector
    - 511 total sectors, with 12 sectors used for software control
    - Data capacity per diskette:
      499 sectors * 125 bytes/sector = 62,375 bytes/disk
- 12 special sectors:
  1-3 FMS Boot record
  360 Volume Table of Contents
  361-368 File Directory
- Maximum of 64 files for any volume
- Backwards-compatible with DOS 2.0 Single Density

- DOS 2.5 (DX5075) disk contains:
  DOS.SYS      FMS with D: Disk File Manager, loaded by OS-resident
                Diskette Handler on system startup
  DUP.SYS      Disk Utility Package (DOS menu)
  RAMDISK.COM  If present on startup disk on an XL/XE with 128K RAM or more:
                1) Displays a message that it is initializing the RAMdisk
                2) Sets up a 64K RAMdisk as D8:
                3) Copies DUP.SYS to D8: and establishes MEM.SAV on D8:
  SETUP.COM    External utility has 3 functional options:
                1) Change current drive number
                2) Change system configuration.  3 configurable options:
                   i) Active drives numbers (1 to 4)
                   ii) Max number of simultaneous files (1-7)
                   iii) Disk writes with or without verify
                3) Create an AUTORUN.SYS that does either one or both of:
                   - Load the R: handler from an Atari 850 Interface Module
                   - Load and RUN a BASIC program from the boot disk
  COPY32.COM   Utility to copy files from a DOS 3 disk to a DOS 2.5 or to a
                DOS 2.0S disk
  DISKFIX.COM  DiskFix Utility can be used to:
                - Unerase a file (under certain circumstances)
                - Verify the soundness of every file on a disk
                - Rename a file by number (solves problem of files with
                  duplicate names)

DOS XE
------

DOS XE DISK OPERATING SYSTEM COPYRIGHT 1988 ATARI CORP.  VERSION 01.00
- Shipped with XF551 disk drives after 1988; also sold separately
- Developed by Bill Wilkinson for Atari.  Known as "ADOS" prior to release
- Requires an XL/XE; does not run on the 400/800
- Disk Utility Package (DOS menu) is loaded into memory with the FMS
- Disk drive types supported:
  1) Atari 810
  2) Atari 1050
  3) Atari XF551 -- XF551 high-speed supported
  4) Atari 130XE RAMdisk (64K)
  5) SSDD 5.25" Single-Sided, Double Density
- Disk utilization/filesystems:
  1) "DOS XE" via the native D: Disk File Manager:
     - All disks are addressed in 256 byte sectors.  Simulates 256 byte
       sectors on 810 and 1050 disk drives, which have 128 byte sectors,
       by reading and writing sector pairs.
- Filesystem could handle disk drives up to 64K sectors = 16 MB
  (64K x 256 bytes = 16 Megabytes)
- Sector labels feature data, including a randomly-generated two-byte
  volume number, useful for restoring damaged files
- Five different types of sectors:
  1) Boot sectors
     - 3 sectors, always disk sectors 1-3
     - Contain a 32 byte Drive Table describing the physical and
       logical layout of the disk. RAM disk has no boot sectors.
  2) Volume Table of Contents (VTOC) sector(s)
     - Starts in sector 4. Contained entirely in sector 4 for
       supported drive types
  3) Directory sectors
     - The first directory block immediately follows the VTOC sectors.
     - Additional directory blocks are allocated as needed and may be
       scattered throughout the disk. (linked by pointers)
  4) File Map sectors
     - 2-bytes long, holding pointers to the data blocks
  5) Data sectors
     - Subdirectories
     - Date-stamping of files
     - Files can be up to 8 Megabytes long.
- 2) DOS 2.0 Single Density via the optional DOS 2.x A: Disk File Manager
- 3) DOS 2.5 Enhanced Density via the optional DOS 2.x A: Disk File Manager
- Disk File Managers can address drives up to 8 (D1: to D8:, A1 to A8:).
- Hybrid interface is both menu driven and command driven, including stacked
  command entry
- Batch files can be used to automate tasks;
  AUTOEXEC.BAT run automatically when DOS XE is booted.
- DOS XE Master Diskette (DX5090) contains:
  DOSXE.SYS     FMS with D: Disk File Manager, loaded by OS-resident
  Diskette Handler on system startup
  DOS2.SYS      A: Disk File Manager for DOS 2.x filesystem support
  SETUP.COM     External setup utility. Configures:
  - The number and type of drives
  - The number of file buffers
  - Installation of the 130XE RAMdisk
  - Whether the RS-232 handler should be loaded automatically
    on system startup
  - Whether a BASIC program should be run automatically
    on system startup
  RDRIVER.SYS   Used by DOS XE to load R: handler from 850 interface
  COPY3_XE.COM  DOS 3 to DOS XE copy program
  WELCOME.BAS   Sample program provided for experimentation with SETUP.COM

DOS XLE
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DOS II Version XLE ("DOS XLE") (P) 1990 Atari (Germany)
Andreas Koch writes (January 2010):
"programmed by Reitershan in 1990 (as requested by Atari Deutschland then for the XF551 drive), it is not only similar, but fully compatible to Turbo-DOS XL/XE (also by Reitershan). It uses the well-familiar DOS 2.5 DUP-menu, with a few enhancements, like e.g. 1-8 for Dir. of drive 1-8, formats 90k-360k and ramdisks up to 256k; there is even an option (P) to switch back to standard DOS 2.5; this DOS has been written with the source-code of DOS 2.5 (made available for Reitershan by Atari Deutschland), so it is as compatible as possible to DOS 2.5 but still offers some enhancements; luckily all Turbo-DOS XL/XE utilities can be used with this DOS (e.g. the Ramdisk-driver from Turbo-DOS!);

Subject: 7.6.1) What are RealDOS, SpartaDOS X, and XDOS?

The continuing development of various modern mass storage options for the 8-bit Atari computers has necessitated ongoing development of supporting disk operating systems. This section describes full-featured disk operating systems (DOS) for the Atari that remain actively developed today.

RealDOS
=======

Real.dos Build 0030: RealDOS Ver 1.0a 4-Apr-11 Copyright 2011 ILS
- Shareware from Integrated Logic Systems (ILS, Stephen J. Carden)
- XL/XE with 64K RAM required.
- Disk utilization/filesystems:
  - RealDos uses the CLASSIC ICD SpartaDOS file system.
  - RealDos contains both the mux and non mux sio.
  This dos will realize how it is being called and will load the proper siov handler for your needs. RealDos will configure itself by detecting your hardware configuration.
  - RealDOS was written to fully utilize the Black Box (all Versions), ICD Mio, Ken Jones Mio, KPI interface, Supra Interface, IDEa, SIO2PC, Ape Register Version, SIO2SD and the Multiplexer.
  - RealDos was also designed to work with the Atari800win emulator.
  - RealDos does not support at this time the cart version of the MYIDE product.

Old version/Release history:
RealDOS (or Real.DOS) shares its development heritage with disk-based SpartaDOS version 3.2c from ICD (which is described elsewhere in this FAQ list). The features and capabilities of RealDOS may thus be further described in terms of changes and improvements made since ICD SpartaDOS 3.2c...

(Note: Prior to Real.Dos Build 0026, distribution of RealDOS was private. Exception: the Video 61 SpartaDOS 3.3C cartridge described below.)

-- SpartaDOS Ver 3.2p "30-Jan-86 Copyright (C) 1986 by ICD, Inc."
  o Support for the Multiplexer ("MUX") from Computer Software Services (CSS) in the form of a MUX-specific SIOV
Being based on SpartaDOS 3.2c, does not have the open file/directory bug/error found in later official SpartaDOS versions (3.2d, 3.2f, 3.2g, 3.2gx), a problem known to be capable of trashing a hard drive.

What was privately distributed as SpartaDOS 3.2p was initially developed from SpartaDOS 3.2c source code that was privately shared by ICD. During the development process all new/modified sources were lost, so new sources were then reverse-engineered (by Ken Ames for Steve Carden) from surviving working executables and from memory, leading finally to SpartaDOS 3.2p.

Date of distribution unknown -- unreflected in the Version info

-- SpartaDOS Pro Ver 3.3a  3-Nov-94  "Copyright (C) 1994 by FTe"
  o Support for a Drive 9
  o MS-DOS work-alike command set

-- SpartaDOS Pro Ver 3.3b 25-Dec-95  "(S)hareware 1995 by IFYB, Inc."
  o Same as 3.3a but includes the Sparta High Speed SIOV (for US Doubler & compatible) instead of the MUX SIOV as in 3.3a.

-- SpartaDOS Pro Ver 3.3c 19-Dec-97  "(S)hareware 1997 by IFYB, Inc."
  o Same as 3.3a or 3.3b, but includes both SIOV versions, auto-selected based on hardware detected

-- Sparta DOS 3.3C  "(c) 1998 Video 61"
  o Same as Ver 3.3c 19-Dec-97 but modified by Video 61 to operate from a 16K ROM cartridge. Available commercially: http://www.atarisales.com/

According to Lance Ringquist of Video 61:
  K-Products (Bob Klaas) contracted with FTe (Mike Hohman) to develop SpartaDOS Pro 3.3 for exclusive use and distribution with K-Products' BBS Express! Pro. When Video 61 purchased all rights associated with BBS Express! Pro from K-Products, the rights to SpartaDOS Pro 3.3 were included.

According to Stephen Carden:
  The SpartaDOS Pro 3.3 versions were developed privately as hacks to ICD SpartaDOS 3.2c, the rights to which remain with FTe to this day.

-- SpartaDOS Ver 3.3d  1-Jan-98  "(S)hareware 1998 by IFYB, Inc."
  o Same as 3.3c, but further debugged for use with the ICD MIO

-- Real.dos Build 0003  10/21/2002 sjc
  o added NTSC/PAL Control

-- Real.dos Build 0004  10/22/2002 sjc

-- Real.dos Build 0005  10/27/2002 sjc
  o Deciphered all the look up tables

-- Real.dos Build 0006  10/30/2002 sjc

-- Real.dos Build 0007  11/03/2002 sjc
  o Changed some zpage definition

-- Real.dos Build 0008  06/08/2003
  o Jeff Williams added Documentation to file.

-- Real.dos Build 0009  07/28/2003 sjc

-- Real.dos Build 0010  04/16/2004 sjc
  o added some stuff for the bbs ack
• Real.dos Build 0011  12/28/2004  sjc
  o Fixing bugs
• Real.dos Build 0012  2/16/2005  sjc
• Real.dos Build 0013  2/17/2005  SJC
  o Added APE Detection
• Real.dos Build 0014  7/01/2005  sjc
  o Fixed a mio bug
• Real.dos Build 0015  8/07/2005  sjc
  o Put a mux override need to use the Select key
• Real.dos Build 0016  8/22/2005  sjc
  o Added some code not to lock up kpi
• Real.dos Build 0017  11/19/2005  sjc
  o corrected a date problem
• Real.dos Build 0018  01/11/2006  sjc
  o added ape warp + and My ide detection
• Real.dos Build 0019  02/18/2006  sjc
  o added detection for IDE interface 4.1 and changed default
• Real.dos Build 0020  02/20/2006  sjc
  o ciov handler to none high speed
• Real.dos Build 0021  03/03/2006  sjc
  o Starting to convert to xasm.. got a lot to map out
• Real.dos Build 0022  03/31/2006  sjc
  o Resolving a few parms and doing cleanup. Has bugs.
• Real.dos Build 0023  09/30/2006  sjc
  o Resolving a few parms and cleanup with support for pbi,mux,my-ide

• Real.dos Build 0024  10/02/2006  sjc
  o Trying to get a bit of memlow back added SIOV menu
• Real.dos Build 0025  01/04/2009  sjc
  o Fixing bugs
• Real.dos Build 0026  02/12/2010  sjc
  o put a switch function for upcase and unify

Available:
- http://www.tcpipexpress.com/
- telnet tcpipexpress.com Port 8888 or 8889
- http://www.atariage.com/forums/topic/158254-realdos-is-share ware/

SpartaDOS X
============
SpartaDOS X Version 4.45 (4 Nov. 2011), by DLT Ltd.
  - Often abbreviated: SDX
  - 48K RAM required; more recommended
  - A 128K ROM cartridge (v.4.40+ ; earlier versions 64K)
Can be hosted on the following hardware:
  - intSDX128
  - Maxflash 1Mb and 8Mb
  - IDE Plus 2.0 interface
  - Ultimate1MB
- SIC! Cartridge
- Turbo Freezer 2005
- SIDE HDD cartridge
- Maxflash MyIDE+Flash
- an upgraded SpartaDOS X cartridge from ICD
- SDX 128 "flash" cartridge
- AtraX SDX 128 cartridge

Proprietary kernel does not rely on the Central Input/Output (CIO) portion of the Atari OS to communicate with devices. Standard Atari CIO communication is also supported for full software compatibility.

Disk utilization/filesystems:
1) SpartaDOS
2) Atari DOS 2
   - Can read MYDOS subdirectories
     (but cannot create, delete, or set working MYDOS subdirectories)
   - Can read extended sectors of DOS 2.5 (but cannot write to them)

Filesystems explicitly NOT supported include:
- Atari DOS 3, Atari DOS XE, OSS OS/A+ Version 4

Support for up to 15 disk drives (v. 4.40+)

Support subdirectories:
- Up to 1423 entries of files and other subdirectories per directory
- Supports disk sectors of 128, 256 and 512 bytes (v.4.40+) per sector
- Supports disks formats of up to 65535 logical sectors
- Maximum total disk size of 32 MB (v.4.40+ ; 16 MB in earlier versions)
- Support for up to 16 open files at the same time
- Supports high speed disk I/O with US Doubler, Atari XF551, Synchromesh 38.4kbps (via CA2001.SYS) and Synchromesh 68.2kbps (via INDUS.SYS)
- No source code in common with any version of disk-based SpartaDOS or RealDOS.

Old versions/release history:
SpartaDOS X was originally developed by Mike Gustafson for ICD.
ICD SpartaDOS X release history: (version numbering started with 4.0)
- SpartaDOS X 4.17 ??-??-88
- SpartaDOS X 4.18 10-29-88
- SpartaDOS X 4.19 1-16-89
- SpartaDOS X 4.20 2-06-89
- SpartaDOS X 4.21 7-10-89

The rights to SpartaDOS X were purchased from ICD by Fine Tooned Engineering (FTe, Mike Hohman) in 1993 (November?).
FTe SpartaDOS X release history:
- SpartaDOS X 4.22 11-05-95

A group of SpartaDOS X enthusiasts calling themselves DLT Ltd. have taken it upon themselves to carry the development of SDX forward.
DLT SpartaDOS X release history:
- SpartaDOS X 4.39RC (1 Oct. 2006)
- SpartaDOS X 4.41 (8 Feb. 2008)
- SpartaDOS X 4.42 (25 Dec. 2008)
- SpartaDOS X 4.43 (updated 14 Apr. 2011; first released 10 Apr. 2011)
XDOS
====

XDOS 2.43 (c) 2009 by Stefan Dorndorf
- "Extended Disk Operating System"
- A compact yet more capable alternative to Atari DOS 2.5
- Two versions:
  1) XDOS 2.4N supports all standard ATARI drives (810, 1050, XF551), and supports XF551 and Hyper-XF high speed input/output.
  2) XDOS 2.4F adds high speed input/output with: SIO2USB, SIO2SD, Speedy 1050, Happy 1050, Turbo 1050
- Disk utilization/filesystems:
  1) DOS 1 (not append)
  2) DOS 2.0
  3) DOS 2.5
  4) DOS 2.2/2.3 (931 sectors format)
  5) DOS XL
  6) (Happy) DOS II + / D (All versions)
  7) BIBO-DOS (except Quad-format)
  8) Turbo-DOS (except Quad-format)
  9) MyDOS (except sub-directories, disks with more than 1040 sectors, and append to MyDOS files)
- RAM disks: 14KB-256KB
- Command driven
- Can use batch files
- D: Disk File Manager supports D1: through D9:
- H: device of Atari800Win emulator is supported

Old versions:
- Happy-Computer DOS II+/D V:4.5M Copyright 1985 by Stefan Dorndorf
  - Commonly known as "Happy-DOS"
  - Published in issue 3/1986 of Happy Computer magazine
- DOS II+/D - Version 6.1 Copyright 1987 by Stefan Dorndorf
- DOS II+/D - Version 6.4 (c) '87 by S.D.
- XDOS 2.3 (p) 1990 S.Dorndorf
  - Adds DOS 2.5/MYDOS enhanced density compatibility

Available: http://std.gmxhome.de/atari/system.atr
A "miniature DOS" / "gameDOS" / "microDOS" is a DOS version that is designed to provide minimal capabilities. Typically, this type of DOS makes the disk bootable, and supports the launching of files on the disk. This section describes current miniature DOS versions for the Atari.

**MyPicoDos**

MyPicoDos 4.05 (C) 1992-2010 by Matthias Reichl

A "game-DOS" for DOS 2.x/MyDOS compatible disks with the following features:

- It supports loading of COM/EXE, BIN (boot image) and BAS files.
- It works with single and double density (hard-) disks from 720 up to 65535 sectors.
- Drives D1: to D8: can be accessed.
- It supports MyDOS style subdirectories.
- It supports Bibo-Dos style long directories (128 files per disk).
- It supports XF551 format detection.
- Builtin highspeed SIO code: compatible with ultra speed (Happy, Speedy, AtariSIO/SIO2PC/APE/...), Happy 810 Warp Speed, XF551 and Turbo 1050, up to 126 kbit/sec (Pokey divisor 0)
- It supports displaying long filenames and a disk/directory title.
- On XL/XE-type computers MyPicoDos can automatically switch basic on when loading a basic program, and switch basic off when loading a COM/EXE/BIN file.
- Joystick support: either use arrow keys or a joystick to select the file.
- Optional builtin atariserver (AtariSIO) remote console.
- Separate "barebone" version without highspeed SIO support and remote console support (for those who want to save space)
- Separate boot-sector-only version "PicoBoot" supporting a single COM file on a disk
- Separate "SDrive" version which configures the SDrive to use 110 or 126 kbit/sec transfer speed.

Old versions/Changelog:

MyPicoDos V2.1 1992-03-15
- Only supports DD disks with more than 1023 sectors!

MyPicoDos V3.0 2003-02-23
- Initial GPL release.
- Support for 128-bytes-per-sector disks.
- Support for disks smaller than 1024 sectors.

MyPicoDos V3.1
- Rewrote density-check code to fix XF551 density recognition bug.
- Fixed manual density selection code.
- Added drive number selection to MyPicoDos initializer program.
- Fixed old-OS bug in initializer program.
- Added support for "large" Bibo-Dos directories (128 Files).
- Fixed DOS2.5-format file display bug.
MyPicoDos V4.0
- Added support for long filenames in PICONAME.TXT.
- Many changes in the internal structure to lower the memory usage of the BAS and COM loader.
- Created separate "highspeed" and "standard SIO" versions. The highspeed version now contains a built-in Happy/Speedy/AtariSIO/SIO2PC/APE/... - compatible highspeed-SIO routine
- Added long filename editor to init-program with support to read existing long names and with an option to alphabetically sort the long filenames,
- "PICODOS.SYS" and "PICONAME.TXT" are excluded from the directory listings.
- Internal basic can be automatically switched off when loading COM/EXE/BIN files, and switched on when loading BAS files.
- Added "smart" highspeed mode: the built in highspeed code is automatically disabled in case a drive doesn't support highspeed SIO.
- Used memory is now fully cleared before loading a file.
- Fixed system crash with some Basic programs.
- Fixed XF551 boot problems with QD disks.
MyPicoDos V4.01 2004-10-28
- Bugfix: Write protected directories were not displayed.
- Pressing reset will now result in a cold-start instead of activating the selftest/memopad.
MyPicoDos V4.02 2004-11-02
- Fixed corrupted screen in standard SIO version.
MyPicoDos V4.03 2005-03-01
- Added joystick support.
- Bugfix: Fixed KMK/JZ IDE interface problems in initializer program.
MyPicoDos V4.04 2007-08-11
- Added support for Turbo 1050, XF551 and 810 Happy highspeed SIO
- Added atariserver remote console support
- Fixed MyIDE density recognition problems
- New "standalone" .COM version of MyPicoDos (can be loaded from DOS)
- In AUTO disk format mode the file status bit 2 is used to activate 16-bit sector links
- APE PC-Mirror subdirectories are now handled properly
- Changed screen layout so that the file display is 15 instead of 12 lines, added arrow indicators if more files are available by scrolling up/down
- Major code cleanup to reduce the size of MyPicoDos
- Added configurable "autorun" feature: if enabled and only one file is present, it will be loaded automatically
- Added "barebone" version without highspeed SIO and remote console
MyPicoDos V4.05 2010-11-25
- Added boot-sector-only version "PicoBoot"
- Updated highspeed SIO code to latest version (1.30)
- Added option to enable highspeed SIO while booting MyPicoDos
- Added fallback to OS SIO in case of highspeed SIO errors while booting MyPicoDos
- Added SDrive version

MyPicoDOS is developed by Matthias 'Hias' Reichl.

Micro-SpartaDOS
===============
Micro-SpartaDOS 4.6 (MSDOS.COM), 2010-09-07
Micro-SpartaDOS 4.5 (MSDOS.COM), 2010-06-12
- Versions through 2.2: by Jiri Bernasek (BEWESOFT)
  Versions 2.3+ by Tomasz Pecko ('pecus') and Pawel Kalinowski ('pirx')
- Disk allocation/filesystem:
  - SpartaDOS
  - Maximum number of directories entries is only limited by available RAM

Old versions/Changelog:
MSDOS22.COM - original BEWESOFT version
  - by Jiri Bernasek - BEWESOFT (Prague, 93-05-03)
  - Version 2.2 supports also a high speed SIO for Speedy 1050, XF551 and the HDI.
Pecus & Pirx modifications:
MSINI2.COM - Pecus & Pirx variation on the menu editor.
MSDOS23.COM - Pecus modified version with multi disc operation.
  - Keys 1-8 - select working drive and read the main directory.
MSDOS30.COM - This version supports XF551 drives with HS, Happy Warp/
  US-Doubler drives with High Speed, and Speedy HS (only in US-Doubler mode).
  - Version 3.x+ are compatible with the SIO2IDE interface -
MSDOS43.COM - Warsaw, 2010-05-26
  - Version 4.3 of MSDOS is a serious rewrite, done primarily by Pecus. It uses a novel approach to mapping index sectors.
  - Version 4.3 supports quadruple sectors (512 bytes long); expands the available partition size to 32MB.
  - Version 4.3 contains only the most popular Happy / UltraSpeed routines.
  - Holding [SHIFT] during booting turns off HS I/O entirely.
  - This version detects BASIC and QMEG. With QMEG the High Speed I/O is turned off as QMEG handles HS I/O by itself.
MSDOS45.COM - Warsaw, 2010-06-12
  - Several bug fixes
  - Screen colors and TURBO mode configurable per directory.
  - Supports drives 1-15.

Available:
http://pecus.pigwa.net/pliki/Atari/
Subject: 7.6.3) What other 3rd-party DOS versions were released for the Atari?

This section attempts to list all released 3rd-party "full-featured" DOS versions, beyond RealDOS, SpartaDOS X, and XDOS (which are described in another section of this FAQ list).

This list is presented in chronological order by date of first (known) release.

OSS OS/A+  -  ATARI version 1.2  Copyright (C) 1981   OSS
OSS OS/A+  -  ATARI version 1.2e  Copyright (C) 1981   OSS
OSS OS/A+  -  ATARI version 2.00  Copyright (C) 1982   OSS,Inc.
OS/A+ version 2.1 (1982? MC is still looking for a copy of this version)
OS/A+ version 4.0 (1982? MC is still looking for a copy of this version)
OSS OS/A+  -  ATARI version 4.10  Copyright (C) 1982   OSS
OSS DOS XL -  ATARI version 2.20  Copyright (C) 1983   OSS,Inc.
OSS DOS XL  -  ATARI version 2.30  Copyright (C) 1983   OSS,Inc.
OSS DOS XL  -  ATARI version 2.30C  Copyright (C) 1983   OSS,Inc.
OSS DOS XL  -  ATARI version 2.30X  Copyright (C) 1983   OSS,Inc.
OSS DOS XL Atari v2.30  Axlon RamDisk  Copyright (C) 1984   OSS,Inc.
OSS DOS XL Atari v2.30C Axlon RamDisk  Copyright (C) 1984  OSS,Inc.
OSS DOS XL Atari v2.30 Mosaic RamDisk  Copyright (C) 1984   OSS,Inc.
OSS DOS XL Atari v2.30C Mosaic RamDisk  Copyright (C) 1984   OSS,Inc.
FTe DOS XL -  ATARI version 2.30  Copyright (C) 1994 by FTe
FTe DOS XL -  ATARI version 2.30C  Copyright (C) 1994 by FTe
FTe DOS XL -  ATARI version 2.30X  Copyright (C) 1994 by FTe

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- Developed by Optimized Systems Software (OSS)
- Direct successors to Atari DOS 2.0S, from the developers of Atari DOS I and Atari DOS II.
- Original version of the Console Processor and the original version ("version 2") of the File Manager System (identical with Atari's DOS 2.0S) were written by Paul Laughton. Other portions primarily by Mark Rose, with collaboration of Bill Wilkinson and Mike Peters.
- Command line driven, with optional menu available

- Versions 1.x
  - Disk drive type supported: Atari 810
  - Disk allocation/filesystem: Atari DOS 2.0 Single Density

- Versions 2.x
  - Disk drive types supported:
    1) Atari 810
    2) SSDD 5.25" Single-Sided, Double Density
  - Disk allocation/filesystems:
    1) Atari DOS 2.0 Single Density
    2) "Atari DOS 2.0 Double Density"
      - Format developed with Atari & Percom for Atari 815 and Percom single-sided, double density disk drives
      - 256 total bytes/sector, with 3 bytes of each sector used to
address the next sector. Exception: sectors 1-3 are single
density, 128 bytes/sector.
- 40 tracks * 18 sectors/track = 720 total sectors, with 13
sectors used for software control or unused by the Disk File
Manager.
- Data capacity per diskette:
  707 sectors x 253 bytes/sector = 178,871 bytes/disk
- 13 special sectors:
  1-3 FMS Boot record (single density sectors, 128 bytes/sector)
  360 Volume Table of Contents
  361-368 File Directory
  720 unused by Disk File Manager
- Maximum of 64 files for any volume (same as DOS 2.0S)
- Supports any mixture of up to 8 single and/or double density disk drives
- No smart density switching. Drive 1 acquires the density of the booted master disk. DOS XL automatically asks each drive what density it is during the boot process. From then on, may use the CONFIG command to manually change a disk drive’s density.
- STARTUP.EXC batch file of DOS XL commands (ATASCII text) runs at system boot (after AUTORUN.SYS)
- RS232FIX.COM provided as a debugged alternative to the R: handler contained in the ROM of the Atari 850 interface.
- Version 2.20 can save 5K of user RAM by occupying memory which is bank-switched with an OSS SuperCartridge, via DOSXL.SYS
- Version 2.30C is Version 2.30 with DOSXL.SUP enabled as DOSXL.SYS, which saves 5K of user RAM by occupying memory which is bank-switched with an OSS SuperCartridge
- Version 2.30X is Version 2.30 with DOSXL.XL enabled as DOSXL.SYS, which saves 3K of user RAM by occupying memory available under the Atari OS (requires an XL/XE computer with at least 64K RAM).
- BitWedge (BIT3.COM) Version 1.1 - 20DEC83
  Copyright (c) 1983 by Harald E. Striepe
  - Provided by OSS for use with the Bit 3 Full-View 80 on the Atari 800.
  - For use under DOS XL Version 2.30 and up
- v2.30 Axlon RamDisk. Version by Harald E. Striepe and OSS.
  - Version 2.30 with RAMdisk support with the Axlon RAMPOWER 128 on an Atari 800. 883 single density sectors.
- v2.30C Axlon RamDisk. Version by Harald E. Striepe and OSS.
  - v2.30 Axlon RamDisk with DOSXL.SUP enabled as DOSXL.SYS, which saves 5K of user RAM by occupying memory which is bank-switched with an OSS SuperCartridge
- v2.30 Mosaic RamDisk. Version by Harald E. Striepe and OSS.
  - Version 2.30 with RAMdisk support with Mosaic 64K RAM Select boards installed on an Atari 800. From 371 (64K plus 32K of standard RAM) to 896 sectors (two 64K boards plus a 32K board).
- v2.30C Mosaic RamDisk. Version by Harald E. Striepe and OSS.
  - v2.30 Mosaic RamDisk with DOSXL.SUP enabled as DOSXL.SYS, which saves 5K of user RAM by occupying memory which is bank-switched with
an OSS SuperCartridge
- OSS/Indus DOS XL 2.35 is OSS DOS XL 2.30 plus GTSYNC.COM, the
Two versions of DOS 2.35 were released by Indus:
- OSS DOS XL - ATARI version 2.35I1 Copyright (C) 1983 OSS,Inc.
  - GTSYNC.COM VID: 01.02\01.01\01.01\01.21\01.21.
  - Supports Synchromesh 38.4 kbps on:
    Indus GT, LDW Super 2000, CA-2001
- OSS DOS XL - ATARI version 2.35I2 Copyright (C) 1983 OSS,Inc.
  - GTSYNC.COM VID: 01.10\01.01\01.10\01.30\01.30.
  - Supports Synchromesh 68.2 kbps on:
    Indus GT, LDW Super 2000, XFD601, XFD602
- DOS XL 2.35I1 and DOS 2.35I2 were often (always?) distributed with
  RAM130.COM, written by Joseph Segura in 1985: a 64K RAMdisk for the
  130XE. Synchromesh (GTSYNC.COM) must be disabled in order to use
  RAM130 -- effectively, RAM130 is for DOS XL 2.30.
- "DOS XL 2.35L" is described in the manuals for the LDW Super 2000 and
  CA-2001 disk drives. However, original disks shipped with these drives
  are reported to be identical to DOS XL 2.35I1 (including RAM130.COM).
- Version 2.30p is a patched Version 2.30 that fixes two bugs:
  1) A boot disk created from the DOS XL menu couldn't boot unless the
  MENU.COM file was the disk.
  2) A boot disk initialized in a drive other than 1 would always boot
    up with that drive number as the working drive at the initial
    command line prompt.
- OSS published a patch to convert version 2.30 to version 2.30p in
  their Spring 1984 Newsletter. OSS then published a corrected version
  of the 2.30p patch in their Fall 1986 Newsletter. See:
- Shipped with disk drives/devices including:
  Percom (most), Astra 1620 (earlier), Indus GT, Amdek Amdisk III AMDC,
  LDW Super 2000, CA-2001
- Versions 4.x
- Requires minimum of 32K RAM to run
- Disk allocation/filesystem:
  - Random access to data files
  - Disks with 128, 256, or 512 bytes per sector
  - Drives ranging in storage size from 128K bytes to 32 Megabytes
- Shipped with: Percom disk drives (some/early); Software Publishers ATR8000 (early)
- Rights purchased from OSS by ICD in January 1988
  (but ICD discontinued DOS XL in favor of their own SpartaDOS)
- Rights purchased from ICD by Fine Tooned Engineering (FTe) in 1993
- FTe DOS XL 2.30 (including 2.30C and 2.30X) released on 6/22/94.
  They are identical to the OSS releases of the same versions.


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DOS-MOD (1983)
(c) 1984 R.K. Bennett
TOP-DOS v1.1
(c) 1984 R.K. Bennett
TOP-DOS v1.20
TOP-DOS 1.4 (1984)
TOP-DOS 1.5 (c) 1985 R.K. Bennett
TOP-DOS 1.5a (c) 1985 R.K. Bennett
TOP DOS 1.5 Plus (1986)
TOP DOS Professional (1986)

- Developed by R.K. Bennett for Sunny Software / Eclipse Software
- Sold commercially by Sunny Software (original DOS-MOD release) or Eclipse Software (later DOS-MOD release and all releases of TOP-DOS)

- DOS-MOD: Enhances Atari DOS 2.0S
  o Menu-driven, Full screen use
  o Command files
  o Expanded wildcard capability
  o Fixes 11 bugs in DOS 2.0S
  o Single and Double Density versions
  o DD version supports HELLO command file option on startup
  o DD version supports cartridge-bypass feature on startup
  o DD version can also run in the SD mode

- TOP-DOS: Standalone product, includes all the features of DOS-MOD
  o Uses Atari DOS 2 single and double density filesystems, or proprietary variations on the DOS 2 filesystem. The TOP-DOS unique filesystem is not supported by any other DOS for the Atari.
  o 1 to 8 disk drives
  o alphabetization and compression of the disk directory
  o drive support: 5.25": SD, DD, DSDD. 8": DD
  o specify the number of sectors desired, up to 944 per side in single density and up to 1968 in double density
  o Reformat only the VTOC, on a previously formatted disk
  o RAMdisk support: Axlon and Mosaic 64K RAM Select boards
  o Shipped with: Astra "Big D" (later), Astra "The One"

- TOP-DOS 1.5:
  o RAMdisk support: 130XE Extended
  o 1050 Enhanced Density Support
  o "WISE" Density Control
  o High Speed Data Transfer (Happy Warp Speed support)
  o Improved Status Display
  o Hex-Decimal Conversion
  o 90K buffer for one-pass disk duplication
o Four-level command file nesting
o Ad: Antic v4n9 Jan86 p.44
- TOP DOS 1.5 Plus:
o Allows multiple RAM disks, SD or DD
o Accesses Atari DOS 2.5 files
o Supports other RAM boards
o New sector number display and tone control
o Better warp speed and group autorun control
o BASIC enable/disable for XE/XL with built-in BASIC
- TOP DOS Professional:
o Up to 16 Megabyte disk capacity
o Sub-directories
o Sector read, write & compare
o File compare
- 1.5 Plus / Professional ad: Antic v5n2 Jun86 p.27
- Apparently released into the public domain, approximately 2005:

MYDOS 3.07 -- copyright 1983,WORDMARK (August 16, 1983)
MYDOS 3.08 -- copyright 1983,WORDMARK
MYDOS 3.010 - copyright 1983,WORDMARK
MYDOS 3.011 - copyright 1984,WORDMARK
MYDOS 3.013 - copyright 1984,WORDMARK
MYDOS 3.18 -- copyright 1984,WORDMARK ATR8000 RS232 Version, by C. Marslett
MYDOS 3.014 - copyright 1985,WORDMARK (February 18, 1985)
MYDOS 3.19 -- copyright 1985,WORDMARK ATR8000 RS232 Version, by C. Marslett
MYDOS 3.016 - copyright 1985,WORDMARK
MYDOS 3.216 - copyright 1985,WORDMARK ATR8500 RS232 Version, by C. Marslett
MYDOS 4.0 --- copyright 1985,WORDMARK
MYDOS 4.2 --- copyright 1985,WORDMARK
MYDOS 4.2C -- copyright 1985,WORDMARK
MYDOS 3.216A--copyright 1986,WORDMARK ATR8500 RS232 Version, by C. Marslett
MYDOS 4.3B -- copyright 1986,WORDMARK
MYDOS 4.50 -- Copyright 1988,WORDMARK (11/28/88 release from Bob Puff)
MYDOS 4.50T - Copyright 1988,WORDMARK
MYDOS 4.51 -- copyright 1989,WORDMARK (6/14/89)
MyDOS 4.53/3 and 4.53/4 (David R. Eichel rel.ver.1/1/90)
MyDOS 4.55 Beta (Lee Barnes March 17, 2003)

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- Primarily developed by Charles W. Marslett
- Menu driven, modelled after Atari DOS 2
- Uses Atari DOS 2 single and double density file systems, with added support
  for smart density changing, subdirectories, and higher capacity floppy and
  hard disk drives.
- Versions 3.x variations:
  - 3.0x are the main releases
  - 3.1x are for use with the SWP ATR8000
- 3.2x are for use with the SWP ATR8500
- Versions 4.x have full read compatibility with the Atari DOS 2.5 format, but will only write to the first 720 sectors of the disk. (MYDOS has its own format for enhanced density disks that allows full access.)
- MYDOS shipped with: Astra 1620 (some), Astra 2001 (some), Astra "Big D" (earlier), ATR8000, ATR8500, SupraDrive, Supra Hard Disk Interface, BTL Hard Disk System, BTL 2004 SASI Hard Disk Adapter, TOMS 720, Karin Maxi
- MyDOS 4.53 was released by David R. Eichel on 1/1/90, making minor changes from the released 4.50 and 4.51 source code.
  - Supports multiple AUTORUNs at boot up (*.AR0 through *.AR9).
  - Fixes broken Axlon RAMdisk support
  - Version 4.53/4 is the same as 4.53/3, but uses a minimum of four characters in the sector count just like most versions of MyDOS.
- More recent work on MyDOS by Lee Barnes is available, along with many earlier MYDOS versions, from Mathy van Nisselroy's MyDOS page: http://www.mathyvannisselroy.nl/mydos.htm

DOS 4.0 (1984)
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- Developed at Atari. Known before its release as "QDOS"
- Copyright 1984 Atari, published 1984 by Antic Magazine
- Copyright 1984 Michael Barall, published 1984 by Antic Magazine
- Supports "a variety of different disk drives, single density or double density, and single-sided or double-sided"
- Disk drive types supported, by bus connection:
  1) internal (1450XLD)
  2) external (parallel bus)
  3) external (serial bus)
- Filesystem could support disks up to 384k (drac030, AA Forums 2010.07.21)
- Filesystem uses logical sector size of 1.5K (drac030, AA Forums 2010.07.21)
- Supports 8 physical drives (1-8), and 10 logical drives (D0:-D9:)
- DOS 2 to DOS 4 Conversion Program
- DOS 3 to DOS 4 Conversion Program

SmartDOS Beta Test Version 1.5R (C)1984 John Chenoweth & Ron Bieber
SmartDOS (C)1984 John Chenoweth & Ron Bieber
distributed by Rana Systems 6.1D
SmartDOS (C)1984 John Chenoweth & Ron Bieber
for The Programmer's Workshop 8.2D

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- Disk drive types supported:
1) Atari 810
2) SSDD 5.25" Single-Sided, Double Density

- Disk allocation/filesystems:
  1) Atari DOS 2.0 Single Density
  2) Atari DOS 2.0 Double Density

- Menu additions that allow sector copying, drive speed checking, bad sector testing, write verify on/off, and drive reconfiguration

- Shipped with: Rana 1000, Astra 1620 (many), Astra 2001 (most), Astra 1001

Mach DOS v2.1 XL (c) 1984 stace
Mach DOS v2.6 XL (c) 1984 stace
MachDOS v3.7a (c) 1985 stace

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- Released directly into the public domain
- Disk drive types supported:
  1) Atari 810
  2) SSDD 5.25" Single-Sided, Double Density

- Disk allocation/filesystems:
  1) Atari DOS 2.0 Single Density
  2) Atari DOS 2.0 Double Density
  3) DOS 2.0 Double-Sided, Double density

- Intelligent detection and support for double density and double-sided disks
- v.3.7a RAMdisk support: 130XE, 800XL; 800 with MOSAIC, INTEC, AXLON, MACE, and 800+ memory expansion systems.
- [SELECT] key toggles menu on-screen
- Distributed with the 810 Turbo (810 drive upgrade from NCT)

SpartaDOS Version 1.1 Copyright (C) 1984 by ICD, INC.
SpartaDOS Version 2.3b D Copyright (C) 1985 by ICD, INC.
SpartaDOS Version 2.3b C Copyright (C) 1985 by ICD, INC.
SpartaDOS Ver 2.3e 1-Nov-85 D Copyright (C) 1985 by ICD, INC.
SpartaDOS Ver 2.3e 1-Nov-85 C Copyright (C) 1985 by ICD, INC.
SpartaDOS Ver 3.2c 30-Jan-86 Copyright (C) 1986 by ICD, Inc.
SpartaDOS Ver 3.2d 17-Feb-86 Copyright (C) 1986 by ICD, Inc.
SpartaDOS Ver 3.2f 25-Feb-94 Copyright (C) 1994 by FTe
SpartaDOS Ver 3.2g 04-Jun-94 Copyright (C) 1994 by FTe
SpartaDOS Ver 3.2gx 04-Jun-94 Copyright (C) 1994 by FTe

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- SpartaDOS was developed by Mike Gustafson for ICD.
- Native SpartaDOS file system, supporting:
  o Subdirectories, up to 128 files per directory
  o Time/date stamping
  o Disks have volume names
  o Up to 16 MB per drive
- Includes AT_RS232 R: handler for ATR8000 support
- Version 1.1:
  o Requires 32K RAM 400/800/XL/XE
  o Not Atari DOS 2 compatible
- Several flavors of Version 1.1:
  o SPEED.DOS - RAM resident full powered DOS; UltraSpeed supported
  o STANDARD.DOS - RAM resident full DOS; no UltraSpeed support
  o NOCP.DOS - No command processor; tries to load an AUTORUN.SYS file
    before it passes control onto the cartridge; UltraSpeed supported
  o NOWRITE.DOS - Can only read from disk, very low memory usage,
    UltraSpeed supported; useful as a game loader

- Changes for Version 2.3:
  o Requires a 64K XL/XE
  o An enhanced Atari DOS 2 handler: Can read, write, and run Atari DOS 2
    formatted diskettes in both single and double density
  o Supports 8 disk drives (as opposed to 4)
  o UltraSpeed High Speed built in
  o 14 new internal command processor commands
  o 8 new XIO functions
  o Extra 4K program area

- Two flavors of 2.3 (2.3b, 2.3e) versions:
  o XD type (XD23B.DOS or XD23E.DOS) is the full powered DOS; recognizes
    the STARTUP.BAT file when booted and priority is given to DOS (rather
    than the cartridge).
  o XC version (XC23B.DOS or XC23E.DOS) is the same as XD versions except
    AUTORUN.SYS is recognized when booted and control priority is given to
    the cartridge.

- Changes for Version 3.2:
  o Better time and date support (internal TD, TIME, DATE commands)
  o Internal R-Time 8 interface
  o Internal JIFFY clock interface (for non-R-Time 8 users)
  o Internal 32 character keyboard buffer (and KEY command)
  o Automatic mini-buffer system for fast byte PUT and GET functions
  o New vectors added for machine language support
  o Control returned to DOS if DOS was active during RESET
  o Supports both a STARTUP.BAT and an AUTORUN.SYS file
  o Compatible with BASIC XE, 1200XLs and many modified Operating Systems
  o BASIC ON/OFF command operation from within a batch file (not end only)
  o NOISY I/O flag recognized
  o Support for the Supra Hard Disk Interface
  o All command entry in upper or lower case
  o Full read capability for Atari DOS 2.5 type enhanced density format

- Several notable patches to SpartaDOS 3.2d have been developed, such as:
  o Bob Woolley created a patch utility program that will modify SpartaDOS
    3.2d to support the XF551's high speed I/O
  o "SpartaDOS 3.2z" was the result of a patch developed and distributed by
    Computer Software Services (CSS, Bob Puff) for SpartaDOS 3.2d to allow
    SpartaDOS to support the CSS Multiplexer (MUX).
    See: http://nleaudio.com/css/products/Mux_docs.htm

- Rights purchased from ICD by Fine Tooned Engineering (FTe, Mike Hohman) in
  1993 (November?).
- FTe SpartaDOS 3.2g changes included:
  o Support for a ninth drive, D9:
  o D: means current working drive, instead of D1:
  o Full support for upper/lower case
  o CWD, CREDIR, DELDIR commands changed to CD, MD, RD
  o TDLINE Y2K bug fixed
  o 1200XL function keys work properly

SpartaDOS 3.2gx differs only in that it locates the disk buffers under the OS to save RAM. 3.2gx is intended for use in systems that include a PBI device (MIO, Black Box); it is not compatible with BASIC XE nor any other programs using RAM under the OS.

- Many disk-based SpartaDOS versions are available for download from Thunderdome, kept by SysOp Fox-1: http://thunderdome.atari.org/ or http://www.mixinc.net/atari/download_a8/sdsys.htm

Warp Speed DOS V 2.0
Warp Speed 7 (1985)

- From Happy Computers (USA)
- For use with Happy 810 Enhancement or Happy 1050 Enhancement
- Disk allocation/filesystems:
  1) Atari DOS 2.0 Single Density
  2) Atari DOS 2.0 Double Density
- Supports Warp Speed read and write with verify

SuperDOS V2.9 (C) 1986 Paul Nicholls
SuperDOS for Happy (c)1986 by H.C.I.
SuperDOS V4.3T(C) 1986 Paul Nicholls
SuperDOS V4.4 (C) 1988 Paul Nicholls
SuperDOS V5.0 (C) 1988 Paul Nicholls
SuperDOS V5.1 (C) 1988 Paul Nicholls

- Developed by Paul Nicholls for Super Products (Australia), Happy Computers (USA), Technical Support (USA), Antic Arcade Catalog (USA)
- Disk drive types supported:
  1) Atari 810
  2) Atari 1050
  3) SSDD 5.25" Single-Sided, Double Density
  4) Supermax Highspeed (versions 4.x and up)
  5) XF551 Highspeed (versions 5.x)
  6) US Doubler UltraSpeed (versions 5.x)
- Disk allocation/filesystems:
  1) Atari DOS 2.0 Single Density
  2) Atari DOS 2.0 Double Density
  3) Atari DOS 2.5
  4) "Atari DOS 2 Skewed Sectors" for Supermax drives
     Antic: "Skewed sector disks read and write much faster than standard format disks (while Atari DOS 2.0 and 2.5 can still read and write
- Fully RAM-resident. Highly configurable.
- Supports four floppy disk drives and assumes that any drive reference above 4 is a RAMdisk.
- RAMdisk support is provided for the Atari 130XE and upgrade formats including 128K and 256K Axlon, 256K XL and 320K XE.
- V5.0 changes:
  1. Full support for the Atari XF551 disk drive, including Double-sided/Double density and high speed transfer.
  2. Complete XF551 compatibility with previous disk drives. Double density drives can read files on Double-sided disks (just as Single density drives can read Enhanced density disks).
  3. High speed transfer and skewed sectors for US Doubler, XF551, and SUPERMAX.
  4. Full sector count displayed, no more 999+.
  5. Full support for Newell 256K memory upgrade for 800XL.
  6. Hold down [Esc] during boot up to reserve the 130XE memory banks for your program. 256K and 320K computers can use BASIC XE and a RAMdisk.
  7. Bug in RAMdisk reboot (coldstart) routine fixed.
  8. The right margin is no longer set to 37.
- Rights and source code purchased by James Bradford (1994?)

BiboDOS V 5.1N (p) E.Reuss (c) 1987  COMPY SHOP
BiboDOS V 5.2F (p) E.Reuss (c) 07/1987 Compy-Shop
BiboDOS 5.4RF (p) E.Reuss (c) 06/1988 Compy-Shop
BiboDOS 6.4RF (p) E.Reuss (c) 06/1988 Compy-Shop
BiboDOS 5.4AN Turbo-BASIC-Version/R-Disk Jan/89
Bibo-DOS 7.0 (p) E.Reuss (c) 1990 by J.Kruszona

- Densities supported: single, medium, double
- Disk allocation/filesystems:
  1) Atari DOS 2.0 Single Density
  2) Atari DOS 2.5 Enhanced Density ("Medium Density")
  3) Atari DOS 2.0 Double Density
  4) "Atari DOS 2.0 Quad Density" (XF551 DSDD 360K)
     - Version 6 and up only
     - Extension to above standards:
       - Long/large directories (128 files per disk)
- F-versions support high speed with the Speedy 1050 and Happy Enhancement

XF-DOS (date of release???? MC is still looking for a copy of this!)
Turbo-DOS XL/XE 1.5 (1988)
Turbo-DOS XL/XE 1.7 (1988)
Turbo-DOS XL/XE 2.0 (1989)
Turbo-DOS XL/XE 2.1 (1990)

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- Developed by Martin Reitershan, Herbert Barth, and Frank Bruchhaeuser for Martin Reitershan Computertechnik
- Supports a wide range of relatively advanced hardware while maintaining a very high degree of compatibility with Atari DOS 2.5.
- According to Andreas Koch, Reitershan worked with Atari Germany to gain access to the DOS 2.5 source code for development of XF-DOS and Turbo-DOS.
- Master-Disk produces 4 different versions:
  1) Normal Version
  2) HS: Version for 1050 with Happy Enhancement or Speedy 1050
  3) XF: Version for XF551 highspeed
  4) EX: Full version (all three versions)
- Andreas Koch contributes:
supports 256k Xtra RAM / RD and supports use of batchfiles; has converter for DOS 3 and DOS 4; supports 4 formats, up to 360k; does not use RAM under OS ROM; DUP uses a Command Processor; all commands are available via HELP key; works with XL/XE computers only, does not load/boot on Atari 400/800.
- Atari DOS XLE (1990), developed by Reitershan, was built upon Turbo-DOS.

BW-DOS Ver. 1.00 (C) BEWESOFT 1994 (Jiri Bernasek)(94-06-16)
BW-DOS Ver. 1.10 (C) BEWESOFT / ABBUC 1994 (94-07-14)
  - Update #1 Released: 4/95
BW-DOS Ver. 1.30 (C) BEWESOFT 1995 (Jiri Bernasek)(95-12-17)
  - Update #2 Released (with Ver. 1.30): 95-12-17
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Another popular, powerful DOS is BW-DOS (it is pronounced "Bay Vay Dos"), freeware by Jiri Bernasek - BEWESOFT.
Andreas Koch writes: "SpartaDOS compatible. Does not use any speeder internally, but comes with external XF551 speeder. Supports 4 drives and RAMdisk, comes with RAMdisk driver for XE compatible RAMdisks up to 1Megabyte; supports 4 densities: a) Single (90k), b) Enhanced/Medium (130k), c) Double (180k) and d) DSD (360k); does not use any RAM under OS ROM (so it works on an Atari 800 and with Turbo-BASIC XL); unlike SpartaDOS most commands are external, thus the DOS is only 5kbytes short; supports a PAL clock (made by ABBUC regional group "ARGS"); comes with many great utilities (which can also be used with SpartaDOS)."
- Ver. 1.10 distributed by ABBUC as the "Jahresgabe" 1994
- BW-DOS Update #1 Released: 4/95
  - New versions of: MENU, RAMDISK, DIRMAST.
  - New commands: MOVE, RTIME8, ARGSRTC
  - New driver: ARGSPRN
  - New program: BWDFUNCT.BAS
- New in BW-DOS 1.30:
  - Reading the last byte of a file is now indicated by status 3.
  - Installation of new "E:" drivers is now allowed.
  - The command "TYPE" is no more limited to 64 characters per line.
  - The method of handling the allocation pointers (positions 18 and 20 in sector 1) was changed. The new method provides much better protection of the directory-area on disk, and so the directories are not mixed
between data sectors as often as under older BW-DOS versions or SpartaDOS. This results in faster access to directories. 100% read/write compatibility with every SpartaDOS versions 2.x and later retained.

- BW-DOS Update #2 Release: 12/95 with BW-DOS 2.30
- New versions of: BACKUP, COPY, UNERASE
- New commands: DOSDRIVE, NEWED
- New driver: RAMBOX

Available:

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Subject: 7.7) How do I modify Atari DOS to support more than two drives?

When running Atari DOS II and compatibles, memory location 1802 ($70A, DRVBYT) indicates the number of disk drives allocated. At the Atari BASIC READY prompt, enter "? PEEK(1802)" to read the value of this location. Possible values include:

1 = Drive 1 only
3 = Drives 1 and 2 (default value)
7 = Drives 1, 2, and 3
15 = Drives 1, 2, 3, and 4

The value of DRVBYT can be changed with the Atari BASIC POKE command. For example, "POKE 1802,7" to set DOS to support drives 1-3.

To save a changed value for DRVBYT that will be in effect when the computer starts up, go to the DOS menu (enter "DOS" at the READY prompt), then choose menu option H, Write DOS Files. This disk will now boot with support for the number of disk drives of your choosing.

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Subject: 7.8) Are there Graphical User Interfaces (GUIs) for the Atari?

Much of this section by: Andreas Koch
Other contributors: Mathy van Nisselroy, Kathleen Ferrante

- G.O.S. by Total Control Systems (David Sullivan), 1986, public domain

- RAOS (Rat Actuated Operating System) by Zobian Controls, 1986/1987
  o Z-DOS desktop DUP.SYS replacement
  o For use with SuperRAT mouse by Zobian Controls
  o Released?

- GOE, developed by Total Control Systems (David Sullivan)
  (co-marketed by Merrill Ward & Assoc. / Shelly Merrill as "ST Jr." early 1988)
Demo disk version(s?) released 1988, full cartridge version unreleased.

- Diamond GOS, developed by Reeve Software / ReeveSoft (Alan Reeve)
  - Supports: DOS 2.5 and compatible, SpartaDOS, DOS XE
    - Diamond GOS version 1 (1988)
      - Diamond DeskTop 1.0 (disk) DUP.SYS replacement
    - Diamond GOS version 2 (1989) package:
      - Diamond DeskTop 2.0 (cartridge) + Utility Diskette
      - Diamond Programmer's Kit (Programmer's Manual)
      - Diamond Paint (disk)
    - Diamond GOS version 3 (1991) package:
      - Diamond DeskTop 3.0 (cartridge) + utility diskette
      - Diamond Paint (disk)
      - Diamond Write (disk)

- Screen Aided Management (SAM) by RaindorfSoft for Power Per Post (Germany)
  - It is available in two different versions:
    a) Type-in listing from Atari magazine and/or the Lazy finger disks (PD)
    b) the commercial version 2.0 which has many add-ons
  - Supports: Atari DOS 2.5
  - V1.25i, 1994 is available from DGS, http://www.dgs.clara.net/
    DGS SAM page: http://www.dgs.clara.net/sam.htm

- BOSS-XL by Mirko Sobe (MS Software)
  - Requires 64K XL/XE
  - Supports: ATARI-DOS, Turbo-DOS
  - System Software:
    - File Manager (Desktop was the BOSS-XL V2.0)
    - BOSS-font editor (XE-version)
    - Icon Editor (XL-/XE-Version)
  - Written in Turbo-BASIC XL
  - Available: http://www.atarixle.de/

- BOSS-XE by Mirko Sobe (MS Software)
  - Requires 64K XL/XE, 128K or more recommended
  - Supports: ATARI-DOS, Turbo-DOS
  - Written in Turbo-BASIC XL
  - System Software:
    - BOSS parameter
    - BOSS-font editor (XE-version)
    - Icon editor (XL / XE version)
  - Available: http://www.atarixle.de/

- BOSS-X by Mirko Sobe (MS Software)
  - Requires 128K XL/XE, 256K or more recommended
- Supports: MYDOS 4.50 and above; Atari ST Mouse
- Written in Turbo-BASIC XL
- System Software:
  - File Manager
  - BOSS parameter
  - BOSS-font editor (X version)
  - Icon editor (X version for colored symbols)
  - BOSS-X framework
  - multiple screen savers
- Available: http://www.atarixle.de/

- XL-TOS a small and "cheap" GUI version from Atari magazin (i.e. a type-in listing; the BASIC file, which consists of many data lines creates a short object code file); unfortunately this GUI only looks good, it loads almost nothing... PD;

- ST-TOS a small BASIC program, that looks like a GUI; it can merely load BASIC files and do a few DOS commands, like lock, unlock, delete and such... (PD)

- BASIC desktop, a GUI written in BASIC just as a sample, what can be done with an 8-bit computer; this one loads BASIC and text files (maybe also ML files); PD;

- DCS, the desktop construction set from Tom Hunt; there are 3 different versions available, a) for DOS 2.5, b) for MyDOS and c) for Sparta-DOS; I have tested the Sparta DOS version, which worked with batchfiles and could easily load some ML files, text files and BASIC files (which were already on the DCS disk); it also works with high densities and/or hard disk partitions up to 16MB and supports subdirs of course; hmm, freeware or shareware ?!?  

- ATOS - GUI by Tom Hunt/Closer To Home.  
  1) Lets you use any demo or intro as a screen saver!!  
  2) Works with all Atari hardware, BB, MIO and Hard drives, SpartaDOS support  
  3) Lets you run files like full games and demos and then return back to the desktop. It uses Overlays.

- Atari Desktop by ABC software (Poland), includes editors, converters, file copiers, sector copy, tape+turbo tape copy, small games, CMC finder and player and much much more; works with 64k RAM and keyboard input; disk manuals only in Polish language...


- TRS Desktop by Tristesse. A graphic user interface for SpartaDOS X to be used with hard drives.
- there are a lot more GUI programs, however many of them are written in BASIC or Turbo-BASIC XL and are very restricted; most of them merely look like a GUI but need too much memory for everyday use. That's why most users still prefer those DOS or Gamedos (Gameloader, Multiloader, etc.) programs...

Subject: 7.9) What should I know about modem device handlers?

In order to use a modem on the Atari, a modem software handler, or R: device handler, must be loaded into memory.

There are several families of R: handlers, corresponding to the different ways in which a modem may be attached to the Atari.

Except for family #8 below, these handlers are used in one of two ways. Either they are (A) loaded into memory from DOS just before running the main terminal application, or (B) the terminal program is appended to the handler, so that in practice, a single file is loaded from DOS which contains both the R: device handler and the application itself.

1) 835/1030/XM301 modems. Atari-only modems, interface via SIO

2) MPP/Supra modems. Atari-only modems, interface via joystick port

3) R-Verter Serial Bus Modem Adapter.
   Standard Hayes-type RS-232 modems, interface via SIO

   The R-Verter was distributed with four different R: handler versions:
   RHAND1.OBJ - R: handler supporting DSR & RD
   RHAND1C.OBJ - R: handler supporting DSR & CD
   RHAND2.OBJ - R: handler supporting DSR & RD and translation tables
   RHAND2C.OBJ - R: handler supporting DSR & CD and translation tables

   The R-Verter handler was originally written by Royce W. Powell for A.I.D. in 1984.

4) SX212 modem. Interface via SIO

   The SX-212 Companion!

   Marc Ingle and Tom Neitzel of S*P*A*C*E (Seattle & Puget Sound Atari Computer Enthusiasts) adapted the R-Verter R: handler for use with the SX212. Carrier Detect for the SX212 was added by Tom Neitzel and DTR emulation was added by Marc Ingle, December, 1987. Modifications to the
Status routines were also made. Two versions of The SX-212 Companion! were distributed:

1) LOADER.LOW
   This version loads at $1D00 and works with most DOSes in their standard configuration (generally 2 or 3 drives, with a LOMEM of $1D00 or lower).

2) LOADER.HI
   This version loads at $2000 and allows more memory for drive buffers but will reduce your terminal buffer by about 750 bytes.

Available:
http://www.umich.edu/~archive/atari/8bit/Telecomm/Handlers/sx212a.arc

Atari official SX212 handler
-----------------------------

Atari SX Express! was distributed with an R: handler developed by Paul Swanson called: HANDLER.OBJ

5) 850 Interface and compatible (P:R: Connection, etc.), internal

This type of "mini handler" simply loads the R: device handler code from a ROM chip inside the 850 interface. A long beep is heard through the speaker when the handler is loaded into the computer's RAM.

Many varieties of DOS for the Atari include an explicit provision for loading this type of R: handler into memory from the ROM of an 850 or compatible interface.

Also, this type of R: handler is automatically loaded when any 8-bit Atari computer is turned on with a powered 850 interface or compatible connected, and no powered disk drive is present.

6) 850 Interface and compatible (P:R: Connection, etc.), external

Used with an 850 or compatible in place of the built-in R: handlers of these interfaces.

DOS XL was distributed with such a handler for the 850, called:
RS232FIX.COM

The P:R: Connection was also distributed with an alternative external handler, called:
PRC.SYS

7) ATR8000/ATR8500 interfaces by Software Publishers, Inc. / SWP, Standard Hayes-type RS-232 modems via this interface.

Richard Anderson writes (Oct 2 02):
Mine originally came with a driver program; and, I believe, a BASIC program to set up the driver from BASIC. Later they shipped with a
special version of MyDOS with the R: handler built in.

SpartaDOS from ICD (disk versions) shipped with an R: handler for the ATR8000 called:
   AT_RS232

8) MIO/Black Box interfaces, internal

These interfaces utilize the PBI or ECI parallel ports on the Atari. They include their own R: handlers in ROM, which do not need to be loaded into computer RAM in order to function.

9) MIO/Black Box interfaces, external:

Hyperspeed
----------
Developed by Len Spencer, this handler is "optional" for the Black Box, but "essential" for the MIO in order to take full advantage of the high-speed hardware handshaking capabilities of these two interfaces.

Hyperspd.arc is available at:
http://www.lenardspencer.com/Lenspencer/hyperspd.htm

Subject: 8.0.5) What should I know about filenames and filename extensions?

Atari disk operating systems generally support file specifications in the form of a filename of 1 to 8 characters, with an optional filename extension of zero to 3 characters.

Valid characters for use in filenames/filename extensions:
(varies somewhat by DOS version)
- The letters 'A' to 'Z'
- The digits '0' to '9'
  (many DOS versions do not permit filenames to start with a digit)
- The underscore character ('_') (DOS XE,SpartaDOS,RealDOS)
- The "at" symbol ('@') (DOS XE)

Spaces and other characters are generally not permitted.

File naming conventions can be helpful. The most common method is to reserve specific extensions for certain types of files. The following list contains some of the more commonly used extensions and their typical corresponding file types. Filenames reserved by Atari DOS, SpartaDOS, RealDOS, or XDOS are listed as well.

File formats are binary unless described below as "text" where:
- Binary format files are made up of a sequence of bytes of any value from
- Text format files (technically, a special-case of binary files) are limited to printable/displayable alpha-numeric characters and symbols, organized into lines.

..ACT ACTION! source program
..ARC Compressed Archive of one or more files. See:
   http://en.wikipedia.org/wiki/ARC_(file_format). On the Atari, popularly supported by SuperARC, SuperUnArc, and the ARC external command provided with SpartaDOS X.
..ASM Assembly language source file
..ASC ASCII text file
..ATA ATASCII text file
..BAS BASIC SAVEd program
..BAT Batch file of DOS commands (DOS XE,SpartaDOS,RealDOS). ATASCII text.
   - AUTOEXEC.BAT batch file runs at system boot
     (DOS XE,SpartaDOS,RealDOS)
..BIN Binary file. Commonly, a cartridge ROM dump file
..BXL BASIC XL SAVEd program
..BXE BASIC XE SAVEd program
..CMD Batch file of DOS Commands (XDOS). ATASCII text.
..COM DOS external Command (DOS 2.5,DOS XE,SpartaDOS,RealDOS,XDOS)
   or, binary/machine language program, usually executable
..CTB Compiled Turbo-BASIC XL program
..DAT Data file (typically created/used by another program)
..DCM Disk Communicator 3.2 disk image file. Less common: .DSK or .DC3
..DOC Text Document (perhaps ASCII or ATASCII)
..DOS DOS system file (SpartaDOS,RealDOS)
..EXE Executable binary/machine language program
..HLP Help text file (perhaps ASCII or ATASCII)
..LST LISTed BASIC program. ATASCII text. Less common: .LIS
..M65 MAC/65 SAVEd machine language source file
..OBJ Binary Object code file, possibly an executable program
..PRN Text file formatted for copying to Printer (perhaps ASCII)
..ROM ROM dump file. Either an Operating System dump or a cartridge dump.
..SAV File named MEM.SAV may be employed by DOS to preserve the contents of memory to disk when DUP.SYS (DOS 2.0,DOS 2.5) or KCP.SYS (DOS 3) is loaded into memory.
..SCP SpartaDOS SCOPY disk image file. Used with SCOPY, an external command distributed with SpartaDOS 3.2.
..SFX Self-Extracting archive file. Created with the CTH SFX program.
..SYS DOS System file or driver
   - AUTO.SYS can be used to automatically poke data in RAM locations on system startup (DOS 1)
   - AUTORUN.SYS binary file is launched on system boot
     (DOS 2.0,DOS 3,DOS 2.5,RealDOS,XDOS)
   - AUTORUN.SYS batch file of DOS commands runs at system boot (XDOS)
..TUR Turbo-BASIC XL SAVEd program. Less common: .TBS
Subject: 8.1) What programming languages are available for the Atari?

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http://members.chello.nl/taf.offenga/atari_dev.htm

additions/edits to this version by mc:
2011.02.20 Quick Assembler clarifications from Tomasz Krasuski
2009.02 edits: The BASIC Compiler; BASIC XE;
   Microsoft BASIC; Microsoft BASIC II; CLSN Pascal; Logo; PILOT;
   Action!, Kyan Pascal, Lightspeed C versions from Atari Explorer mags
2006.01.16 added: Xasm 3.0.0, 2005 from Piotr Fusik

Revision : 2.0
Date.... : 2005-2-20

5/8/2011 SECTION TEMPORARILY REMOVED DUE TO FAQ TECHNICAL DIFFICULTIES.
PLEASE SEE http://members.chello.nl/taf.offenga/atari_dev.htm

==================================================================

The goal is to give information about all available languages
for the Atari 8-bit computer. This information includes:
title, last version, author, date and a short description.
It would also be nice to know how to get it and where to get
more information (like reference cards, reviews and such).

Maintainer: Freddy Offenga
Email : taf.offenga [at] chello.nl (replace " [at] " with "@")
URL : http://members.chello.nl/taf.offenga/atari.htm

==================================================================
There are quite a lot! To get some structure in this section it's divided into the following categories:

a) ASSEMBLER  
b) BASIC  
c) C  
d) PASCAL  
e) LISP  
f) FORTH  
g) PILOT  
h) LOGO  
i) All the rest

The following format is used:

- Language title (medium)  
  version, year : version, year  
  author/company : author/company  
  available..... : where/how to get it  
  package....... : programs, documentation  
  features...... : main features  
  Description.

The question marks (?) indicate that more information is required about that topic.

Credits
======

- The Multi-lingual Atari, Analog magazine 45, August 1986  
- A bunch of manuals  
- Some copy-pasted lines from the Atari 8-bit newsgroup  
- umich (University of Michigan Atari archive)  
- David Wyn Davies (PL65)  
- Kevin Savetz (APX titles)  
- Maury Markowitz  
- Michael Current  
- JT (ValForth)  
- Andreas Koch  
- Winston Smith  
- Carsten Strotmann  
- Brad Arnold

Revision history
================

2.0  
- Added Atari Pilot info from Brad Arnold
1.9
- X-Assembler updated
- Added "QS FORTH" info from Winston Smith
- Added FORTH section work from Michael Current (thanks to Carsten Strotmann)
  (see also: http://atariwiki.strotmann.de/xwiki/bin/view/Main//LangForth)
- Several updates in the assembler section

1.8
Thanks to Andreas Koch for these updates:
- Added "Mesa-Forth"
- Added "130XE Assembler 4.32"
- Updated "SynAssembler"

1.7
Thanks to Maury Markowitz for these updates:
- Updated "A BASIC Compiler"
- Added "Der BASIC Compiler", "MMG BASIC Compiler"
- Added "Frost BASIC", "TT-BASIC XL"

1.6
Synchronized with Atari 8-bit FAQ May-2002:
- Added "X-Assembler"
- Added "CTH Fast Basic"
- Added availability for "Deep Blue C"
- Added availability for "Atari Pascal"
- Ignored changes "Kyan Pascal" (need more info)
- Updated "ValForth"
- Updated "Extended fig-Forth"
- Updated "fun-Forth"
- Added "Extended WSFN"
- Removed e-mail addresses
- Added availability for "A65"
- Updated "PL65"

1.0 .. 1.5
Changes not noted.
Old versions are available on request.

a) ASSEMBLER

- 130XE Makro Assembler (disk)
  version, year : 4.32, ?
  author/company : Torsten Karwoth
  available..... : freeware, ABBUC PD #297
  package....... : assembler, editor, menu, monitor,
    batch enhancement, linker/packer
Two pass 6502 assembler with integrated menu, editor and monitor shell for 128KB RAM Ataris. Source format is derived from Atmas Makroassembler.

- 130XE+ Makro Assembler (disk)
  version, year : 2.2, 1992
  author/company : Torsten Karwoth
  available..... : freeware, ABBUC PD #368
  package....... : assembler, editor, menu, monitor,
  batch enhancement, linker/packer
  features...... : macros
  New version with 128KB - 1088KB RAM support.
  Two pass 6502 assembler with integrated menu, editor and monitor shell. Needs extra RAM banks. Source format is derived from Atmas Makroassembler.

- A65 (disk)
  version, year : ?, 1989
  author/company : Charles Marslett, WORDMARK Systems
  package....... : assembler, manual
  features...... : source include
  Two pass 6502 assembler. Source format is based on the Atari Macro Assembler. Assembler source included.

- Alfasm, Turbo-Assembler/16 (disk)
  version, year : 1.0, 1990
  author/company : Jeff Williams, DataQue Software
  available..... : ?
  package....... : assembler, docs
  features...... : source include
  Two pass 6502/65816 assembler.

- Assi (download)
  version, year : 0.0.41, 2000
  author/company : MacFalkner
  available..... : ?
  package....... : assembler, file linker
  features...... : source include, data include, code relocation
  Cross assembler for Win32. Source code is highly compatible with Atmas for the Atari.

- Atari Assembler/Editor (cart)
  version, year : ?, 1981
  author/company : Atari
  available..... : ?
  package....... : assembler, editor, monitor, manual
features...... : - 
Two pass 6502 assembler with integrated editor/monitor

- Atari Macro Assembler (disk)
  version, year : 1.0C, 1981
  author/company : Atari, APX
  available..... : ?
  package....... : assembler, editor, debugger, manual
  features...... : macros, source include
Two pass 6502 assembler.

- ATasm (disk)
  version, year : 0.92, 1999
  author/company : Mark Schmelzenbach
  available..... : umich
  package....... : assembler
  features...... : macros, source include, optionally target .XFD
  disk images and machine state files (Atari800 / Atari800Win),
  conditional assembly. Two pass 6502 portable cross assembler.
  Highly compatible with MAC/65.

- Atmas Makroassembler (disk)
  version, year : 2, 1985
  author/company : Peter Finzel, Hofacker
  available..... : ?
  package....... : assembler, editor, monitor, manual
  features...... : macros
  Two pass 6502 assembler with integrated editor/monitor.

- Bibo Assembler (disk)
  version, year : 1.0, 13/12/1986
  author/company : E.Reuss, Compy-Shop
  available..... : ?
  package....... : assembler, editor, monitor
  features...... : source include, data include
  Two pass 6502/65c02 assembler with integrated editor/
  monitor.

- Datasm/65 assembler (disk)
  version, year : 2.0, 1981
  author/company : DataSoft Inc.
  available..... : ?
  package....... : assembler, editor, menu, manual
  features...... : -
  Two pass 6502 assembler.

- EASMD (disk)
  version, year : 1.0, 1981
Two pass 6502 assembler with integrated editor/monitor.

- Fast Assembler (disk)
  version, year : 1.5, 1995
  author/company : MMMG Soft
  available..... : ?
  package....... : assembler, editor, disassembler
  features...... : -

- Kasm65 (disk)
  version, year : 2.51, 1997
  author/company : Ken Siders
  available..... : shareware, umich
  package....... : assembler, editor, linker, docs
  features...... : macros, relocation, source include,
                  conditional assembly
  Two pass 6502 assembler. Relocatable object files are
  compatible with ra65. Source format is derived from
  the Atari Macro Assembler.

- MAC/65 Macro Assembler (disk|cart)
  version, year : 1.01, 1984
  author/company : Stephen D. Lawrow, OSS
  available..... : ?
  package....... : ?
  features...... : -

- MAC/65 Macro Assembler (disk|cart)
  version, year : 2.00, 1982
  author/company : Stephen D. Lawrow, OSS
  available..... : ?
  package....... : assembler, editor, monitor, manual
  features...... : macros, source include
  Two pass 6502 assembler with integrated editor/monitor.
  Mac/65 is a direct descendant of the Atari Assembler/
  Editor (via EASMD).

- MAC/65 Macro Assembler (disk)
  version, year : 4.20, 1994
  author/company : Stephen D. Lawrow, Fine Tooned Engineering
  available..... : ?
  package....... : ?
  features...... : -
- MAC/65 Macro Assembler (disk)  
  version, year : 4.20 demo version, 1982  
  author/company : Stephen D. Lawrow, OSS  
  available..... : ?  
  package....... : ?  
  features...... : -

- MAE (disk)  
  version, year : .96, 1996  
  author/company : John Harris  
  available..... : umich  
  package....... : assembler, menu, editor, monitor, docs  
  features...... : macros, source include, data include,  
                  conditional assembly  
  Two pass 6502/65816 assembler with integrated editor/ 
  monitor. Extra RAM supported.

- NASM65 (disk)  
  version, year : ?, 1992  
  author/company : Nat!  
  available..... : ?  
  package....... : assembler, linker, librarian  
  features...... : macros, relocation, source include  
  One pass 6502 portable cross assembler (initially for  
  the ST). Highly compatible with MAC/65.

- PC-65 (disk)  
  version, year : 1.0 beta, 1996  
  author/company : Jan Feenstra & Freddy Offenga  
  available..... : -  
  package....... : assembler  
  features...... : macros, source include, data include,  
                  boundary directive  
  Two pass 6502 cross assembler for PC/DOS. The source  
  format is highly compatible with the ST-65 assembler.

- Quick Assembler (disk)  
  version, year : 1.0, 1991  
  author/company : Janusz B. Wisniewski, L.K.Avalon  
  available..... : -  
  package....... : assembler, editor, menu, debugger  
  features...... : source include  
  Two pass 6502 cross assembler with integrated editor.  
  Very user friendly menu environment.

- Ra65 (disk)  
  version, year : 1.0, 1989  
  author/company : John R. Dunning
available..... : public domain, umich
package....... : assembler, linker, librarian
              : part of cc65 (c-compiler)
features...... : -

- Synassembler (disk|cart)
  version, year : 4.0, 1982
  author/company : Steve Hales, Synapse Soft
  available..... : http://www.atariland.com/members/oldatarian/
  package....... : assembler, editor, monitor, manual
  features...... : source include
Two pass 6502 assembler.
An Adaptation by Steve Hales of the S.C. Assembler II.

- ST-65 (disk)
  version, year : ?, 1991
  author/company : A. Stauffenberg, F. Offenga
  available..... : -
  package....... : assembler, menu shell, manual
  features...... : macros, conditional assembly,
              : source include, data include,
              : boundary directive
Two pass 6502/65c02 cross assembler for the Atari ST
written in 68000 assembly. As far as I know this is
the first assembler with the boundary directive.

- Xasm
  version, year : 2.5.2, 2002
  author/company : Piotr Fusik
  available..... : http://xasm.atari.org
  package....... : assembler, docs
  features...... : conditional assembly, source include,
              : binary include, pseudo commands,
              : pseudo addressing modes
Two pass 6502 cross assembler for PC/DOS. The source
format is backward compatible with Quick Assembler.

- Xasm
  version, year : 3.0.0, 2005
  author/company : Piotr Fusik
  available..... : http://xasm.atari.org
  package....... : assembler, docs
  features...... : conditional assembly, source include,
              : binary include, pseudo commands,
              : pseudo addressing modes
Two pass 6502 cross assembler for PC/DOS. The source
format is backward compatible with Quick Assembler.
b) BASIC

- A BASIC Compiler (?)
  version, year : 1.05, 1987
  author/company : Monarch Data Systems
  available..... : ?
  package....... : BASIC compiler
  features...... : -

- Advan BASIC (disk)
  version, year : ?, ?
  author/company : Advan Language Designs
  available..... : ?
  package....... : BASIC compiler
  features...... : -

- Atari BASIC (cart)
  version, year : Rev.C, 1983
  author/company : Atari
  available..... : standard ROM in Atari XL/XE
  package....... : BASIC interpreter, manual
  features...... : pretty plain BASIC implementation

- Atari Microsoft BASIC (disk)
  version, year : 1.0, 1981
  author/company : developed by Microsoft, published by Atari
  available..... : CX8126
  package....... : BASIC interpreter
  features...... : Based on the full language level of Microsoft BASIC

- Atari Microsoft BASIC II (cart + extensions disk)
  version, year : 2.0, 1983, c1982
  author/company : developed by Microsoft, published by Atari
  available..... : AX2025 box contains:
    * Microsoft BASIC II Programming Language cart. RX8035
    * Microsoft BASIC II Extension Diskette DX5046
  package....... : BASIC interpreter
  features...... : Based on the full language level of Microsoft BASIC
    "Programs developed under the diskette-based version of
    Atari Microsoft BASIC can be run using Atari Microsoft
    BASIC II."

- BASIC A+ (disk)
  version, year : 3.05, 1981
- The BASIC Compiler (disk)
  version, year : 1.4, 1983
  author/company : Datasoft
  available..... : ?
  package....... : BASIC compiler
  features...... : four-pass compiler; compiles Atari BASIC programs into 6502 machine language; produces DATASM compatible assembler files

- BASIC XL (cart)
  version, year : ?, ?
  author/company : OSS
  available..... : ?
  package....... : BASIC interpreter
  features...... : -

- BASIC XE (cart + extensions disk)
  version, year : 4.1, 1985
  author/company : OSS
  available..... : ?
  package....... : BASIC interpreter
  features...... : requires XL/XE; supports 130XE extended memory

- CTH Fast Basic (disk)
  version/year : ?
  author/company : Tom Hunt/Closer to Home
  available......: PD, Freeware or Shareware;
  package........: language plus several test files and examples; English docs;
  features.......: faster than Atari Basic, not much slower than TB, does not use RAM under OS;
  available at Tom Hunt's homepage or elsewhere...

- Frost BASIC (?)
  version, year : 1.04, 1985
  author/company : Frank Ostrowski, Happy Computer
  available..... : ?
  package....... : BASIC interpreter, compiler
  features...... : -
  Version of Turbo-Basic XL that runs on 48k machines (400/800).

- MMG BASIC Compiler 2.0 (?)
  version, year : 2.0, 1984
It appears that this is a newer version of Der BASIC Compiler, licensed to some other company.

- TT-BASIC XL (disk)
  version, year : 2.11, 1985
  author/company : Frank Ostrowski, Happy Computer
  available...... : ?
  package....... : BASIC interpreter, compiler
  features...... : -
  Published in the German magazine "Happy Computer". Appears to be a newer version of Turbo Basic XL.

- Turbo Basic XL (disk)
  version, year : 1.5, 1985
  author/company : Frank Ostrowski, Happy Computer
  available...... : ?
  package....... : BASIC interpreter, compiler (V1.1)
  features...... : -
  Published in the German magazine "Happy Computer".

c) C

- ACE C (disk)
  version, year : ?
  author/company : John Palevich & Ralph Walden
  available...... : ?
  package....... : ?
  features...... : -
  This is a newer version of 'Deep Blue C'.

- C/65 (?)
  version, year : ?
  author/company : OSS
  available...... : ?
  package....... : ?
  features...... : -
  Probably derived from Dr.Dobbs "Small C". Compiles to 6502 code which emulates the 8080 instruction set.

- C65 (?)
  version, year : ?
  author/company : Keith Ledbetter
  available...... : ?
package....... : ?
features...... : good macro assembler
This compiler does not support structs.

- CC65 (disk)
  version, year : 1989
  author/company : John R. Dunning
  available..... : umich archive,
  http://www.umich.edu/~archive/atari/8bit/Languages/Cc65/
  package....... : compiler, linker, assembler, librarian
  features...... : -
  Public domain compiler. Also used as cross compiler.
  Relocatable object linkage files, and the most thorough
  K&R C for the 8-bit. Comes with an relocatable assembler.

- CC8 (disk)
  version, year : 2.3
  author/company : John Palevich & Steve Kennedy
  available..... : ?
  package....... : Compiler
  features...... : -
  ACE C with more "real" C support (e.g. arrays of pointers
to structs). Requires ACE C runtime libs and linker.

- Deep Blue C (disk)
  version, year : 1.2, 1982
  author/company : John Palevich, APX
  Source code "Deep Blue Secrets" downloadable at
  package....... : Compiler, Linker
  features...... : -
  Deep Blue C was originally an independent product, but it
then became available from APX. It converts C to pseudo-
code and then interprets the pseudo code (8080 instruction
set emulation).
  Drawn from Ron Cain's public domain C-compiler (Small-C).

- DVC C (disk)
  version, year : 1.05, 1985
  author/company : Ralph E. Walden
  available..... : ?
  package....... : Editor, Compiler, Optimizer, Linker
  features...... : Quite user friendly program
  The compiler generates special object files (.CCC)
  which can be optimized and linked. The package uses a
  special DOS called DVC DOS which contains runtime stuff.
- Lightspeed C (disk)
  version, year : 3.0, 1988
  author/company : Clearstar Softechnologies
  available..... : ?
  package....... : Compiler, Optimizer, Linker
  features...... : -
  Runs under CLI DOSes and MENU DOSes.

- Tiny-C
  version, year : ?
  author/company : OSS
  available..... : ?
  package....... : ?
  features...... : -
  First sold C compiler by OSS. This compiler was used to compile itself! First true language "bootstrap" on any 8-bit machine (it was also available for Apple and CP/M machines). Derived from Dr.Dobbs "Small C". Compiles to 6502 code which emulates the 8080 instruction set.

d) PASCAL

- Atari Pascal (disk)
  version, year : 1.0, 1982
  author/company : APX
  available..... : APX-20102
  package....... : ?
  features...... : -
  Needs two drives.

- CLSN Pascal (disk)
  version, year : 1989?
  author/company : CLSN Software
  available..... : ?
  package....... : editor, compiler
  features...... : generates 6502 machine code;
                  requires 128K XL/XE

- Draper Pascal (disk)
  version, year : 2.1, 1989
  author/company : Norm Draper
  available..... : ?
  package....... : ?
  features...... : -

- Kyan Pascal (disk)
version, year : 2.02, 1986
author/company : Kyan Software
available..... : ?
package....... : editor, compiler, linker, macro-assembler
                and manual
features...... : -


e) LISP

- INTER-LISP/65 (disk)
  version, year : 2.1, 1981
  author/company : Special Software Systems, DataSoft
  available..... : ?
  package....... : ?
  features...... : -

- INTER-LISP/65 (disk)
  version, year : 2.2, 1982
  author/company : Special Software Systems, DataSoft
  available..... : ?
  package....... : ?
  features...... : -

f) FORTH

- ES-FORTH
  version, year : 1.2, 1984
  author/company : The English Software Company
  available..... :
                         http://atariwiki.strotmann.de/xwiki/bin/view/Main/LangForth%20ESForth
  package....... : ?
  features...... : -
  Seems to be based on fig-FORTH, but with some unique "Words".
  Works with normal DOS.

- Extended fig-FORTH, (disk)
  version, year : 11/10/1981
  author/company : Patrick Mullarky, APX
  available..... : APX-20029
  package....... : ?
  features...... : -

- Extended fig-Forth (disk)
  version, year : 1.1 Rev. 2.0, 01/15/82
  author/company : Patrick Mullarky, APX
available..... : APX-20029
package....... : ?
features...... : -

- fig-FORTH
  version, year : 1/26/81 and 4/01/82 releases
  author/company : Steven R. Calfee "Team FORTH"
  available..... :
    http://www.atariarchives.org/APX/showinfo.php?cat=unknown_fi g
  package....... : ?
  features...... : -

  based on 4/1/82 release of fig-FORTH by Steve Calfee

- fig-FORTH
  version, year : 4/10/82
  author/company : Peter Lipson / Robin Ziegler "Team FORTH"
  available..... : ?
  package....... : ?
  features...... : -
  based on 4/1/82 release of fig-FORTH by Steven R. Calfee

- fig-FORTH
  version, year : 5/5/82 - 10/16/82
  author/company : Harald Striepe "Team FORTH"
  available..... : ?
  package....... : ?
  features...... : -
  based on 4/10/82 release of fig-FORTH by Peter Lipson / Robin Ziegler

- fig-FORTH, Antic (disk)
  version, year : 1.4S REV.H, 18Jun85
  author/company : John Stanley/Antic Magazine "Team FORTH"
  available..... :
    http://atariwiki.strotmann.de/xwiki/bin/view/Main//LangForth Antic
  package....... : ?
  features...... : -
  based on 10/16/82 release of fig-FORTH by Harald Striepe

- fun-Forth (disk)
  version, year : ?
  author/company : Joel Gluck, APX
  available..... : APX-20146
  package....... : ?
  features...... : -

- Grafik-FORTH
  version, year : 1990
author/company : RAI Production
available..... :
http://atariwiki.strotmann.de/xwiki/bin/view/Main//LangForth GraphicForth
package....... : ?
features...... : -
based on fig-FORTH 1.4S and TURBO-GRAPHICS-SYSTEM 256

- MesaForth
version, year : 12/03/81
author/company : ?
available..... :
http://atariwiki.strotmann.de/xwiki/bin/view/Main//LangForth Mesa
package....... : language, source code, documents, examples
features...... : -
based on 6502 fig-Forth. The major difference is in the size of the screen on disk (512 bytes instead of 1024 bytes).
Runs under ATARI DOS 2.0S.

- QS FORTH
version, year : 1.0, 3/27/81
author/company : James Abanese / [QS] Quality Software
available..... :
http://atariwiki.strotmann.de/xwiki/bin/view/Main//LangForth QS
package....... : Editor, Assembler, I/O routines
features...... : -
Single Density 5.25 Floppy and Manual in Binder
based on fig-FORTH.

- Turbo-4th
version, year : January 1985
author/company : Steven R. Calfee
available..... : ?
package....... : ?
features...... : -
compatible with fig-FORTH and Team FORTH. It's fast.
Not threaded, it is a true compiler

- ValForth (disk)
version, year : 1.1, 1982
author/company : Valpar International
available..... : ?
package....... : (8) disks in the set including: 1)master disk,
2)display formatter, 3)text compression and auto text formatting,
4)valDOS-I, 5)valDOS-II, 6)player-missile graphics, character editor and sound editor, 7)general utilities and video editor, 8) Turtle & valGraphics and advanced floating point routines.
features...... : -
based on fig-FORTH
- **X-FORTH**
  version, year : 26 Jan 2003
  author/company : Carsten Strotmann
  available..... :
    http://atariwiki.strotmann.de/xwiki/bin/view/Main//ProjXFort h
  package........ : binary, source, disk image with samples & editor
  features....... : aims to be compatible with new ANSI standard.
                  works with normal DOS.

**g) PILOT**

- Programming Language Pilot Educators Package,
  Pilot with "Turtle" Graphics (CX405) (cart, tape)
  author/company : Atari
  available..... : ?
  package........ :
    * Pilot Cartridge (CXL4018)
    * Two demonstration program cassettes (CX4113A/B)
    * Pocket Reference Card C017812 Rev2 - Program (c)1980, Manual (c)1981
    * Pilot Demonstration Programs Users Guide C017810 Rev1 - Program
       (c)1980, Manual (c)1981
    * Pilot Primer: The Pilot Programming Language Instruction Manual
       C017809 Rev2 - Program(c)1980 Atari, Manual (c)1980 Dymax
    * Student Pilot: Reference Guide C017811 Rev1 - Program (c)1980,
       Manual (c)1981.
  features...... : -

**h) LOGO**

- Atari LOGO (cart)
  version, year : 1983
  author/company : LCSI, Atari
  available..... : ?
  package........ : ?
  features...... : -

**i) All the rest**

- Action! (cart)
  version, year : 3.6, 1983
  author/company : Action! Computer Services (Clinton Parker), pub. by OSS
  available..... : ?
  package........ : compiler, editor, monitor and library
features....... : fast compiler which generates good code
Needs cartridge for runtime procedures. A PD runtime
library is also available.
All variables are static, so recursive routine calls
are not possible. No floating point type (though a
PD library should make this possible). No arrays of
objects (arrays of POINTERS to objects are possible).

- Extended WSFN, WSFN = Which Stands For Nothing
  version, year  : ?
  author/company : Harry Stewart, APX
  available..... : APX-20026
  package........ : ?
  features....... : -

- Quick (disk)
  version, year  : 2.0, 1990
  author/company : Raindorf Soft
  available..... : ?
  package........ : ?
  features....... : -
  This is the "poor man's Action!". Same restrictions as
  Action! apply also to Quick. Further restrictions are:
  only simple assignment expressions, no records and no
  pointers.

- PL65 (disk)
  version, year  : 1.0, 1987
  author/company : Noahsoft
  available..... : commercial, Extremely rare.
  package........ : compiler, editor, library, sample game
  features....... : Similar features to Action with same restrictions.
  Highly flexible language that includes inline assembler features and
  pointers. Robust and well-engineered editor. Does not require
  additional runtime library - automatically generated and included in
  the compiled code during compilation.

- Test Computer Language (disk)
  version, year  : 2.2, 1985-1990
  author/company : D.Firth
  available..... : public domain, ?
  package........ : compiler and editor
  features....... : -

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Subject: 8.2) What cartridges were released for the Right Slot of the 800?
This should be a complete list of commercial cartridges produced for use in the Right Cartridge slot of the Atari 800.

ACE-80 by Claus Buchholz for Amiable Computer Enhancements / TNT Computing
(80 column editor, compatible with Atari BASIC, and patches available for:
  OS/A+, EASMD, Letter Perfect v.6, Data Perfect, Atari Logo)
Austin 80 Console Software by Austin Franklin Associates
(for use with the Austin 80 Column Video Processor Board)
Block (first right cart/first "backup" program hardware device)
Cartridge Maker by Radical Systems (EPROM burner)
KISS by Eastern House
Magic Dump by Geminisoft/Eric Wolz for Sar-An Computer Products (SCP)
Magic Dump II by Geminisoft/Eric Wolz for Sar-An Computer Products (SCP)
Monkey Wrench by Eastern House
Monkey Wrench II by Eastern House
R-Time 8 by ICD (battery-backed clock, for left or right cart slots)
Real Time Cartridge by Sunmark

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Subject: 8.3) What games support 4 or more simultaneous players?
Section started by Andreas Koch; See also this thread at AtariAge:
http://www.atariage.com/forums/topic/155696-4-player-simultaneous-games/

a) The following games support 4 joystick head-to-head play:
(Only possible on the 400/800 since only these computer models have 4 controller ports)

- Ali Baba and the Forty Thieves by Stuart Smith for Quality Software
- Aliens a PD-game by ??? using an altered Dandy program
  (the Dandy font and thus the graphics were changed, however, the levels remain the same and can be used in both games);
- Asteroids cart. by Atari,
- Basketball cart. by Atari,
- Battle Room (CIA vs. KGB) a PD game by SNACC
- Dandy disk by John H. Palevich for APX,
- Depth Warrior by ??? for ROM magazine (Canada) v1n7 ***
- Floyd of the Jungle by MicroProse (1982 and 1983 releases)
- GEM by Joel Gluck
- Killa Cycle by Simon Goodwin & David Muncer
- Hockey by Gamma Software
- Major League Hockey cart. by Thorn EMI,
- Major League Soccer cart. by Thorn EMI,
- Maze War disk or cart. by ???,
- Mouse Party by Bill Halsall for New Atari User #39 Aug/Sep 1989
- M.U.L.E. disk by Electronic Arts
- The Return of Heracles by Stuart Smith for Quality Software
- Road Block / Roadblock by Brian Holness for Compute! v5n7 #38 July 1983
- Silicon Warrior, developed by The Connelley Group for Epyx
- Sky Warrior by Jack Chung for ROM magazine (Canada) v1n6
- Soccer by Gamma Software
- Survivor by Richard Carr for Synapse
- Tank Battle by Fred Pinho from Antic magazine: http://www.atarimagazines.com/v3n2/animate.html
- Volleyball by ??? (PD game written in Atari BASIC)
- Yellow-Brick-Road by ??? for ROM magazine (Canada) v1n2 ***

*** these programs are reported to be 4-player programs, I'm not sure if they are meant to be 4-players simultaneously or 4-players - one after another (try to find out!);

b) The following games support 4 paddle head-to-head play:

- Castle Crisis by Bryan Edewaard, 2004
- IQ by David S. Maynard for CRL, 1987 (same game as "Worms?")
- JunkYard Racing (Tim Gearin, 1999)
- Space Arena by Fandal, 2009
- Warlords by ?, year? (pd version, unlicensed)
- Worms? by David S. Maynard for Electronic Arts, 1983

c) The following game supports 4 players on all machines, using special 4-button keypad controllers linked together with RJ-11 jacks (standard phone jacks) to a box with 2 joystick port connectors:

- PQ: The Party Quiz Game by Suncom

d) The following programs support multi-joystick games, using extra hardware called Quadrotron (from the German Atari Magazin 2/1989):

- test program for 4 joysticks (and assembler source)
- Quadro-Tron by H.Schoenfeld (4-player Tron-clone)

e) The following programs support multi-joystick games, using extra hardware called Multijoy (multijoy4 for up to 4 players, multijoy8 for up to 8 players and multijoy16 for up to 16 players; originally developed by Raster/Radek Sterba, but also available from ABBUC):

- Astro4Road by Fandal
- Bremspunkt (demo-version) by T. Butschke
- Bremspunkt (full-version) by T. Butschke
- Card Grabber by F. Dingler
- Cervi by R.Sterba
- Cervi 2 by R. Sterba
- Fujirun by Schmutzpuppe (see below!)
The following patches are available at:
http://mitglied.lycos.de/gunnarbusse/bajamar/download.htm
- Asteroids, modified for Multijoy by Schmutzpuppe
- Basketball, modified for Multijoy by Schmutzpuppe
- Dandy, modified for Multijoy by Schmutzpuppe
- M.U.L.E., modified for Multijoy by Schmutzpuppe
- Tennis, modified for Multijoy by Schmutzpuppe

And the following patched versions are available at:
http://atari.fandal.cz/
- Astrowarriors M4, modified for Multijoy by Fandal
- Battle Room modified for Multijoy by Fandal
- Floyd of the Jungle modified for Multijoy by Fandal
- (Gamma) Hockey modified for Multijoy by Fandal
- (Thorn EMI) Hockey modified for Multijoy by Fandal
- Mazewar modified for Multijoy by Fandal
- Mouse Party M4 modifed for Multijoy by Fandal
- Silicon Warrior by Epyx modified for Multijoy by Fandal
- (Gamma) Soccer modified for Multijoy by Fandal
- (Thorn EMI) Soccer modified for Multijoy by Fandal
- Survivor modified for Multijoy by Fandal
- Tank Battle M4, modified for Multijoy by Fandal
- Wingman, modified for Multijoy by Fandal

Subject: 8.4) What programs run only on the 400 and 800 models, and why?

The following are reported as incompatible with models other than the original Atari 400/800. Many can nevertheless be made to run on XL/XEs if you use the Atari Translator (DX5063 NTSC version or FK100807 PAL version) or equivalent to run the original 400/800 OS on your XL/XE.

Apple Panic                      Broderbund
Aquatron                         Sierra On-Line
Astro Chase                      (by First Star Software) Parker Bros.
Atari Word Processor             Atari
Atlantis (early only?)           Imagic (at least most copies OK on XL/XE)
Attack at EP-CYG-4               (by Bram) Romox
Bacterion! Kyle Peacock/Tom Hudson/ANALOG#20
patch for XL/XE available:

Bandits Sirius Software
BearJam Chalk Board
Chicken Synapse
Crossfire Sierra On-Line (keyboard doesn't work on XL/XE)
Dancing Feats (by Softsync) Romox
Demon Attack Imagic (Activision re-release fixed for XL/XE)
Disk 50 Star Soft International (SSI)

Dreadnaught Factor, The Activision
Drelbs Synapse
File Manager 800+ Synapse
Forbidden Forest (early only?) Cosmi (at least most copies OK on XL/XE)
Fort Apocalypse -- cartridge Synapse (all disk/tape releases OK on XL/XE)
Galahad And The Holy Grail APX
Go Hayden
Gorf Roklan
Jawbreaker II Sierra On-Line
Jet Boot Jack (early only?) English Software (at least most OK on XL/XE)
Juggler IDSI
K-Razy Antiks (by Kay Enterprises for K-Byte) CBS
K-Razy Kritters (by Kay Enterprises for K-Byte) CBS
K-Razy Kritters (by Kay Enterprises) K-Byte
K-Star Patrol (by Kay Enterprises for K-Byte) CBS
Kangaroo (prototype) (Atari)
KoalaPainter Koala
Leo's 'Lectric Paintbrush Chalk Board
Leo's Links Chalk Board
Letter Perfect (before v6) LJK (all version 6.x releases OK on XL/XE)
LogicMaster Chalk Board
Mac/65 [ver. 1.00, orange] OSS (all releases after 1.00 OK on XL/XE)
Maze Epyx
Micro Illustrator Chalk Board
MicroMaestro Chalk Board
Monkey Wrench Eastern House
Monster Maze Epyx
Ms. Pac-Man Atari (glitches with late-production XE units)
M.U.L.E. (early only?) (by Ozark Softscape) Electronic Arts
   (most copies/releases OK on XL/XE)
Nautilus Synapse
   XL/XE workaround: hold down START to skip the title screen,
   which is where it locks up. --Scott Stilphen, 6 Jun 2007
Picnic Paranoia Synapse
Pool 1.5 IDSI
Pool 400 IDSI
Protector II Synapse
QS Forth James Abanese / [QS] Quality Software
Rack ‘Em Up  Rocklan
Shamus  Synapse
  XL/XE workaround: hold down START or SELECT to skip the title screen, which is where it locks up.
  A re-release by Americana/Synsoft corrects the incompatibility problem.
  (http://www.atarimania.com/game-atari-400-800-xl-xe-shamus_6174.html)
--Scott Stilphen, 6 Jun 2007
Slime  Synapse
Snapper  Silicon Valley Systems
Space Dungeon  Atari
Squish ‘Em  Sirius
Story Machine -- cartridge  Spinnaker (disk release OK on XL/XE)
Synassembler  Synapse
Text Wizard  Datasoft
Zaxxon (early release?)  Datasoft (most copies/releases OK on XL/XE)

Konrad M.Kokoszkiewicz writes:

XL/XE software won't work on 400/800 if:

1) it uses shadow RAM at $C000-$CFFF and $D800-$FFFF
2) it uses RAM expansions at $4000-$7FFF controlled by PORTB $D301
3) it uses specific XL OS functions (like JNEWDEVC)
4) it uses illegal XL OS addresses.
5) it uses European Charset :)

Andreas Koch adds:

To get an overview or see a chart of OS changes from the 800 to the XL line, refer to Antic magazine Volume 3, Number 2 (June 1984), pages 10-14;
(online: http://www.atarimagazines.com/v3n2/insideatari.html )
Also note, that some software will not work correct (or not at all) on newer XE/XEGS versions (which have a new OS with a new version number, a new Self Test/Memory Test/Keyboard Test, larger RAM chips, etc. etc.);

Thomas Richter contributes further details (16 Jan 2004):

There are a couple of reasons why some games don't run on the XL/XE models. I try to order them by "likeliness", of course biased by my personal observations:

i) The printer buffer of the XL Operating System in page 3 is a couple of bytes shorter. The additional bytes are used for extended OS variables not available in the 800 series. Most prominent is the $3fa location, holding a shadow register of GTIA's TRIG3 signal. While a true joystick trigger line in the 400/800 series, this signal is used as "cart inserted" signal for XL/XE models. Unfortunately, the OS compares GTIA trig3 with the shadow register at $3fa in each vertical
blank, running into an endless loop if the register contents don't match. This causes hangs for games using page 3 either as copy-buffer or for player-missile graphics. (Hangs by Ms. Pac-Man and Bacterion! are caused by this, and many others...) This is "fixable" either by the translator disk, or by a quick hack into the game, replacing the OS vertical blank or poking TRIG3 frequently into its shadow. The reason for the OS behavior might be that Atari wanted to prevent crashes if the cartridge is inserted or removed while the machine is running. The 400/800 is powered down when a cart is inserted, the XL/XE lacks the cover of the older models that triggered a little switch to interrupt the power line.

ii) Similar to the above, writes to $3f8. This OS equate defines whether on a warm start, the BASIC ROM shall be mapped back in. If its contents are altered, a program triggering a reset as part of its initialization will find itself then with 8K less RAM occupied by a BASIC ROM, making it crash. Similarly, writes to the cartridge checksum $3eb could cause a cold-start on a "reset initialization". This is fixable by the translator disk.

iii) Some games use a four-joystick setup, or at least initialize PIA itself. If this happens inadequately, PIA Port B, bit 0 gets changed, disabling the ROM, and thus crashing the machine. This is not fixable by the translator since it is a hardware issue.

iv) Direct jumps into the OS ROM, not using the documented vectors in the $e450 area. Interestingly, this fault is not as common as it may sound since games hardly ever use the OS. It causes failures of some "serious applications", most notably "QS Forth" and applications compiled by it. This is fixable by the translator disk.

As a side remark, it is interesting to note that no such documented jump-ins exist for the math-pack ($d800 to $dff). It is not really part of the OS, but looks more like a part of the BASIC interpreter that didn't make it into the OS because there was no room left. Thus, direct jump-ins have to be used here that are documented in the De Re Atari (for example). Atari never changed them, but it seems likely that this documentation happened more or less as an accident since the same source also lists some mathematics-related jump-ins into the Basic (namely, to compute SIN and COS and related) that are only valid for the Rev. A BASIC. Thus, the math pack might be a couple of routines that have been originally intended for "private use" of the BASIC ROM, but then have been found "too useful" by many others to remain "closed". Otherwise, it is hard to explain why the otherwise pretty cleaned-up OS comes with a construction like this.
Subject: 8.5) What programs use a light pen or a light gun?

Contributor to this section: Bertrand M. (LEXX), Andreas Koch

The Atari computer reads the horizontal and vertical positions of a light pen or a light gun in the same way. Consequently, while software programs may be intended for one or the other, these two types of controllers may often substitute for each other.

Programs designed for a light gun:

Alien Blast, Richard Gore for DGS, 1993
Alien Invaders (TB-XL or CTB) disk by R.Gore (available from DGS);
Barnyard Blaster, James V. Zalewski for Atari, 1987
Bembel Wo by Thorsten Butschke for Foundation Two, 1998
Bug Hunt, Alan Murphy and Rob Zdybel for Atari, 1987
Cementerio, Pelusa Software, 1989
Click!, Chris Martin, 2008
Crime Buster, Ron Andrzejewski & James Zalewski for Atari, 1988
Crossbow by Atari, 1988
Flyshot or Flyshoot a PD game by Kemal Ezcan
Gangsters by Houra, Pesout, Stefek, Sterba, Svoboda, 2007
Gangstersville, Emanuele Bergamini for Lindasoft, 1988
Geisterschloss, KE-Soft, 1992
Guntris by Richard Gore, 1996
Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
Hit the Mole by Carsten Strotmann, 2004
Invasion, Pelusa Soft
Light Gun Blaster, Andre Willey, Atari User Feb. 1988
Light Gun Blaster (enhanced) by Pedrokko
Messe Hanau, Kemal Ezcan, 1995
Operation Blood (light gun) by Bulkowski & Kalinowski for ANG, 1992,
light gun conversion by The Missing Link/John Maris
Operation Blood II - Special Forces disk, ANG/Mirage
Pajaki II, Arkadiusz Lubaszka for ArSoft, 1996
Schiessen, L. Franzky (Abbuc magazine)
Sharp Shooter, Matthew Ratcliff, 1989
Sniper, Premysl Stefek, Radek Sterba, Petr Svoboda and Fandal, 2007
Special Forces (light gun) by Mirage, light gun conversion by Homesoft
- See also Fandal site search for games that use a light gun:
  http://atari.fandal.cz/search.php?search=light+gun&butt_details ils_x=x
- See also AtariMania list of games that use a light gun:
  www.atarimania.com/list_games_atari-400-800-xl-xe-light-gun_control_5_8_G.html
- See also http://atari.panprase.cz/?action=lg-hry

Programs designed for a light pen:

- Alien Blast, Richard Gore for DGS, 1993
- Alphabet Construction Set (Playground Software) by Futurehouse
- Animal Crackers (Playground Software) by Futurehouse
- AtariGraphics by Steve Gibson for Atari, c1984 (RX8054, shipped with CX75)
- Blazing Paddles by Baudville, 1986
- Computer Crayons (Playground Software) by Futurehouse
- Concentration by Stack Computer Services, 1983
- Crossword Twister by Stack Computer Services, 1983
- Demonstration program cassette by Atari, 1980 (CX4124, shipped with CX70)
- Draughts by Stack Computer Services, 1983
- Go by Stack Computer Services, 1983
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Hit the Mole by Carsten Strotmann, 2004
- Language Skills - Alphabet Recognition by Futurehouse, 1982
- Language Skills - Different Symbol Discrimination by Futurehouse, 1982
- Language Skills - Letter Sequences by Futurehouse, 1982
- Language Skills - Like Symbol Discrimination by Futurehouse, 1982
- Letter Tutor by Edgework for Atari, 1984 prototype
- Life by Stack Computer Services, 1983
- Light Pen Doodle by John and Mary Harrison for Antic, 1984
- Little Red Riding Hood (Playground Software) by Futurehouse, 1983
- Lost in the Labyrinth by Stack Computer Services, 1983
- Math Fun for the Young - Level I by Tech-Sketch, 1983
- Math Fun for the Young - Level II by Tech-Sketch, 1983
- Matrix by Dave Oblad, 1985
- Micro Illustrator by Island Graphics for Tech-Sketch
- Othello by Stack Computer Services, 1983
- Paint-N-Sketch Level I by Tech-Sketch, 1983
- Paint-N-Sketch Level II by Tech-Sketch, 1983
- Peripheral Vision by Futurehouse
- Seek and Destroy by Stack Computer Services, 1983
- Shape and Color Recognition by Tech-Sketch, 1983
- Shuffler by Stack Computer Services, 1983
- Simon by Stack Computer Services, 1983
- See also AtariMania lists of games and utilities that use a light pen:

Note that on the 400, the light gun / light pen will only work in joystick
port 4. This renders much light gun and light pen software unusable on the
400.

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Subject: 8.6) What programs have a trackball mode or support a mouse?

Programs that use the trackball mode of the Atari CX22 Trak-Ball or the
earlier-production CX80 Trak-Ball:
- Catch 88 by Simon Trew, 1991
- Supports Multi-Mouse Trakball Driver by Simon Trew
- Centipede 5200 by Atari with track-ball support by Peter Meyer, 2009 ([CTRL+T] for trackball mode)
- Final Legacy by Atari, 1984
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Kriss Kross by Simon Trew, 1992
  - Supports Multi-Mouse Trakball Driver by Simon Trew
- Knight Quest by Simon Trew, 1991
  - Supports Multi-Mouse Trakball Driver by Simon Trew
- Missile Command by Atari ([CTRL+T] for trackball mode)
- Missile Command+ by Paul Lee, 2005 ([CTRL+T] for trackball mode)
- Multi-Mouse Trakball Driver by Simon Trew for New Atari User #42 1990
- Othello by Simon Trew, 1991
  - Supports Multi-Mouse Trakball Driver by Simon Trew
- Slime by Steve Hales for Synapse, 1982 (press [T] for trackball mode)
- See also Atarimania list of games that use CX22 trackball mode:
  atarimania.com/list_games_atari-400-800-xl-xe-trak-ball_conrol_23_8_G.html
- See also Fandal site search for games that use the CX22 trackball mode:
  http://atari.fandal.cz/search.php?search=trak-ball&but_t_details=ils_x=x

Programs that use the Atari ST Mouse or the trackball mode of the later-production CX80 Trak-Ball:
- 8Bit-Mouse (PD by BPAUG)
- AMC calculator
- Artprog (PD)
- Black Magic Composer by Sven Tegethoff for Ulf Petersen, 1991
- Bomb Down by The Roemer (Markus Roemer)/U.N.O.
- BOSS-X by Mirko Sobe / MS Software, 2003
- The Brundles by KE-Soft, 1993
- The Brundles Editor by KE-Soft, 1994
- CardStax 2.1 by David A. Paterson, 1993
- Catch 88 by Simon Trew, 1991
  - Supports Multi-Mouse ST Mouse Driver by Simon Trew
- Celebrity Cookbook by U.S.A. Media
- Centipede 5200 by Atari with track-ball support by Peter Meyer, 2009 ([CTRL+T] for trackball mode)
- Click! by Chris Martin, 2008
- Copy F'n'F by Mirko Sobe / MS Software, requires BOSS-X
- Datenbank by Mirko Sobe / MS Software, requires BOSS-X
- Diamond GOS by Reeve Software
- Diamond Develop by Reeve Software, requires Diamond GOS
- Diamond News Station by Reeve Software, requires Diamond GOS
- Diamond Paint by Reeve Software, requires Diamond GOS
- Diamond Write by Reeve Software, requires Diamond GOS
- Enigmatix! by Stephen A. Firth for Page 6, 1993
- Faecher Patience by Kemal Ezcan for Zong mag, 1993
- Final Legacy by Atari, 1984
- FireBall (a Breakout game, requires SAM)
- GOE by Total Control Systems (PD)
- Guntris by Richard Gore, 1996
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Hong Kong by KE-Soft / Kemal Ezcan (ZONG mag.), 1993
- KE-Mouse drivers by KE-Soft
- Klony 2010 by Arkadiusz Lubaszka for ArSoft, 2010
- Kriss Kross by Simon Trew, 1992
  - Supports Multi-Mouse ST Mouse Driver by Simon Trew
- Knight Quest by Simon Trew, 1991
  - Supports Multi-Mouse ST Mouse Driver by Simon Trew
- Macao XL by KE-Soft (ZONG mag.)
- Mau Mau X by Mirko Sobe / MS Software, requires BOSS-X
- Minesweeper by Harald Schoenfeld for PPP, 1992
- Mine Sweeper by Raindorf Soft
- Mine Sweeper 3 (PD)
- Missile Command by Atari ([CTRL+T] for trackball mode)
- M.O.S. (from Abbuc mag.)
- Mouse-DOS by KE-Soft (ZONG mag.)
- MS-Copy 1.1 by Mirko Sobe / MS Software, requires BOSS-X
- Multi-Mouse ST Mouse Driver by Simon Trew for New Atari User #42 1990
- Multi-Player by Madteam
- Multi-DOS (PD)
- Numblines by Jaroslaw Kucisz & Tomasz Kucisz for Utopia Software, 1997
- Othello by Simon Trew, 1991
  - Supports Multi-Mouse ST Mouse Driver by Simon Trew
- Pad 1.2 (Padnoid) by Nelson Ramirez / New Age, 1995
- Patience by Kemal Ezcan for KE-Soft, 1993
- P-Graph(s) by ??? (PD)
- QUICK Ed Character Editor by PPP
- SAM (Screen Aided Management) by Power Per Post & Raindorf Soft (a GUI!)
- SAM Budget (80 column spreadsheet program, requires SAM)
- SAM Convert (text files to/from the SAM Texter format, requires SAM)
- SAM Creator (SAM Painter files to/from Micro-Painter format, requires SAM)
- SAM Designer (drawing and design / desktop publishing, requires SAM)
- SAM Memobox (card filing program, requires SAM)
- SAM Monitor (view and change memory, requires SAM)
- SAM Painter (128 color paint program, requires SAM)
- SAM Texter (80 column word processor, requires SAM)
- Shanghai by Peter Sabath for Activision, 1987
- Special Forces by Mirage Software, 1993
- Sprint XL (from Abbuc)
- Tommingi by Tomek Borygo
- TRS Desktop by Tristesse, 2006
- Unriagh II by Uwe Hartwig, 1986
- UPN calculator (PD)
- Vanish by Kemal Ezcan for KE-Soft, 1993
- Vier gewinnt (PD)
- See also Fandal site search for games that use the Atari ST mouse or the
trackball mode of the later-production CX80 Trak-Ball:
http://atari.fandal.cz/search.php?search=mouse&butt_details_x=x
- See also AtariMania lists of programs using the Atari ST mouse or the
trackball mode of the later-production CX80 Trak-Ball:
www.atarimania.com/list_games_atari-400-800-xl-xe-mouse_control_4_8_G.html
www.atarimania.com/list_games_atari-400-800-xl-xe-mouse_control_4_8_U.html

Programs that use The Rat or the SuperRAT (both by Zobian Controls):
- Accu-Draw by Zobian Controls
- Artist Unleashed by MTS Software
- AtariArtist (Atari cartridge version of Micro Illustrator;
  Distributed with the Atari Touch Tablet)
- Business Manager by Reeve Software
- Control by Zobian Controls
- Master Disk Directory II by Zobian Controls
- RAMbrandt by Bard Ermentrout for Antic, 1985
- RAOS (Rat Actuated Operating System) by Zobian Controls
- Super 3-D Plotter II by Elfin Magic
- Z-DOS by Zobian Controls (requires RAOS)

Programs that use the Amiga mouse:
- Black Magic Composer by Sven Tegethoff for Ulf Petersen, 1991
- Bomb Down by The Roemer (Markus Roemer)/U.N.O.
- Global War by P.M.M. Elfinger & D.J. Garbowski for L.K. Avalon, 1993
- Klony 2010 by Arkadiusz Lubaszka for ArSoft, 2010
- Multi-Player by MadTeam (PD)
- Najemnik - Powrot by LK APM for Krysal Software
- Operation Blood by Pawel Bulkowski & Pawel Kalinowski for Mirage, 1992
- Samurai’s Game by Rafael Soft for Krysal Software, 1992
- TRS Desktop by Tristesse, 2006
- See also Fandal site search for games that use the Amiga mouse:
  http://atari.fandal.cz/search.php?search=amiga+mouse&butt_details_x=x

Programs that use the Commodore 1351 mouse (mouse for Commodore 64/128):
- Klony by ArSoft, 2006

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Subject: 8.7) What programs use paddle controllers?

- AE (Jun Wada & Makoto Horai for Broderbund)
- Arkanoid (Taito)(Mike Hutchinson for Imagine, 1987; for The Hit Squad, 1987)
- Arkanoid II (Prof Soft Amsterdam, 1987)
- Asteraxis 2k (Waldemar Pawlaszek & Remigiusz Zukowski, 2001)
- Avalanche (Dennis Knoble for APX, 1980)
- Balloon Game (Kelly Jones & Bill Williams, 1984)
- Balloon Pop (White Bag Software, 1986)
- Bird-Man-3D demo (AMC-Verlag)
- Blazing Paddles (Baudville, 1986)
- Block Buster (Bradshaw & Griesemer for APX, 1981; Quality Software, 1981)
- Body Parts (Dominick A. Scalzo for PartlySoft Software, 1983)
- Breakout / Breakout!!! / brkwall.bas (public domain, author unknown)
- Burgers! (Douglas Crockford, 1983)
- Bust Out (Dennis Debro, 1989)
- Cascade (F. Neil Simms for ANALOG #28, March 1985)
- Castle Crisis (Bryan Edewaard, 2004)
- Checkers (David Slate for Odesta, 1982)
- Chess 7.0 (Larry Atkin for Odesta, 1982)
- Chicken (Mike Potter for Synapse, 1982)
- Chiseler (public domain, author unknown)
- Clowns and Balloons (Frank Cohen for Datasoft, 1982)
- Comment Compter ("Counter" by Al P. Casper for Atari France)
- Computer Quarterback (Dan Bunten for SSI, 1983)
- Counter (Al P. Casper for APX, 1982)
- David's Midnight Magic (David Snider for Broderbund, 1982)
- Descente a Ski ("Downhill" by Mark Reid for Atari France)
- Diamond Drop (Matthias M. Giwer for Computel!, 1983)
- Downhill (Mark Reid for APX)
- Dragonriders of Pern (Jim W. Connelley for Epyx, 1983)
- Etch-1 (public domain, author unknown)
- Frog (Stan Ockers 5/82 for A.C.E. Newsletter, July 1982)
- Frog (Stan Ockers 6/82 for Antic, Oct/Nov 1982)
- Golden Oldies Volume 1 v2.2 (Mike Fitch for Software Country, 1985)
- Golden Oldies Volume 1 v2.3 (Mike Fitch, The Software Toolworks, 1987 c1985)
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Horse of a Different Color V1.0 (Gus Makreas, 3/1/81)
- Insomnia (Bob Fraser for APX, 1981)
- IQ by David S. Maynard for CRL, 1987
- Kaboom! (Larry Kaplan & Paul Willson for Activision, 1983)
- Junkyard Racing (Tim Gearin, 1999)
- Landing Simulator (by Jake Jacobs for Creative Computing magazine, written for Apple, Atari translation by Bruce Jordan)
- Laser Game (public domain, author unknown)
- Laser Wars (Mike Potter for Crystalware, 1981)
- Lie Detector (Michael Krueger for Antic, 1986)
- Livewire (Tom Hudson - ANALOG #12)
- Livewire 2 (Tom Hudson - ANALOG #12 - Modified by Wolf)
- Lunar Lander (Wes Newell)
- Midnight Strip (M. L. Clayton, 1982)
- Night Driver (Dudek, Szpilowski, Ziembik, 2008)
- Nineball (Jay M. Ford for ZiMAG, 1982)
- One on One! (Chris York for Compute!, 1983)
- Paratroop Attack (David Plotkin for Compute!'s Second Book of Atari, 1982)
- "Perfected Pong" see: Pong! ("Perfected Pong") below
- Personal Fitness Program (Dave Getreu for APX, 1981)
- Pinball Construction Set (Electronic Arts)
- all pinball games created with Pinball Construction Set
- PlatterMania (Michael Farren for Epyx, 1982)
- Pong ("Super Pong") (Gary Domrow/Summit Software Group, ANALOG #39 Feb.1986)
- [Pong] ("Pong 2", pong2.com, public domain, author unknown)
- Pong! ("Perfected Pong") (Bob Ayik for Antic, May 1988)
- Pool 1.5 (Howard De St. Germain for IDS!, 1981)
- Popcorn! (Cathy Sloatman, Mark Sloatman)
- Prisonball (John Scarborough for Compute!, 1986)
- Probe One - The Transmitter (Lloyd Ollmann for Synergistic Software, 1982)
- Safe Cracker (Mike Starnes)
- Space Arena (Fandal, 2009)
- Space Bombs (John Y. Hsu, 1984)
- Space Eggs (Dan Thompson for Sirius, 1981)
- Speedblaster (Pinball Construction Set Game by MR Datentechnik)
- Spy's Demise (Robert Hardy & Alan Zeldin for Penguin Software, 1983)
- Stardust (MR Datentechnik)
- Starshot (Matthias M. Giwer for Compute!, 1983)
- States and Capitals (David J. Bohlke for SoftSide, 1980)
- Stereo 3-D Graphics Package (Clyde Spencer for APX, 1982)
- Super Ball (Compyshop mag.)
- Super Ball 2 (Compyshop mag.)
- Super Ball 3 (Compyshop mag.)
- Super Ball 4 (Compyshop mag.)
- Super Breakout by Larry Kaplan for Atari, 1979
- "Super Pong" see: Pong ("Super Pong") above
- Stretch (public domain Gr. 15 pict. stretcher, author unknown)
- Superski (AMC, 1994 - patch for paddles by HOMESOFT)
- Tilter (public domain, author unknown)
- Uranium Core (Martin Stiby for Computer & Video Games mag, 1982/11)
- Warlords (The Webbed Sphere BBS)
- Wavy Navy (Rodney McAuley for Sirius, 1983)
- Wayout (Paul Allen Edelstein for Sirius, 1982)
- WildWest (Stan Ockers for ACE Newsletter, 1983)
- Word Radar (Jerry Chaffin & Bill Maxwell & Barbara Thompson for DLM, 1984)
- Worms? by David S. Maynard for Electronic Arts, 1983
- See also AtariMania lists of games & utilities that use paddle controllers:
  www.atarimania.com/list_games_atari-400-800-xl-xe-paddles_control_2_8_G.html
  www.atarimania.com/list_games_atari-400-800-xl-xe-paddles_control_2_8_U.html
- See also Fandal site search for games that use paddle controllers:

Note that the Atari Touch Tablet, the KoalaPad Touch Tablet and the Suncom Animation Station are read by the computer in the same way that the computer receives data from paddle controllers, making software designed for these graphics tablets at least somewhat usable with paddles as well. See a separate section in this FAQ list for a list of programs supporting these graphics tablets.
Subject: 8.8) What programs have a CX85 Numerical Keypad mode?

This section started by Andreas Koch.

- Bomb Down by The Roemer/U.N.O.
- The Bookkeeper (Atari);
- Ball Harbour (Zong 8/1992);
- The Big Quest (Zong 7/1992);
- Blob (Zong 2/1992);
- Bomb Down by The Roemer (Markus Roemer)/U.N.O.
- Bomber Jack (KE-Soft);
- The Brundles by KE-Soft, 1993
- The Brundles Editor by KE-Soft, 1994
- UPN calculator (PD);
- Catch (Zong 6/1992);
- Click! (Chris Martin 2008);
- Code table (Zong 11+12/1993);
- CX-85-Driver (Zong 7+8/1994);
- CX-85-Keycode-driver (Zong 7+8/1995);
- Donald (by KE-Soft);
- Drag (by KE-Soft);
- Dragon Fire (Zong 1/1993);
- FlickerTerm 80 v.0.51 by LonerSoft (Clay Halliwell)
- Gravitar (Zong 4/1992);
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Hungry Goblin (Zong 5/1992);
- Invaders (Zong 5+6/1993);
- Joshi (Zong 3+4/1993);
- Lasermaze (by KE-Soft);
- Lost in the Antarctic (Zong 2/1992);
- Mampfman (Zong 8/1992);
- Minipac (Zong 3/1992);
- Minipac 2 (Zong 6/1992);
- Money Raider (Zong 2/1992);
- Monster Tracking (Zong 9/1992);
- Numerical Keypad Handler Master Program Diskette CX8139 (Atari, 1982)
- Oblitroid (by KE-Soft)
- Pac-Man (Zong 11/1992);
- Schlumpf/Smurf (Zong 5/1992);
- Slurp (Zong 3/1992);
- Super ReeveKey (Reeve Software);
- Techno Ninja (by KE-Soft)
- Transsylvania (Zong 3+4/1993);
- Viro-Mania (Zong 2/1993);
- Zador XL (by KE-Soft)
- Zador II (by KE-Soft)
- many more games from KE-Soft and Powersoft;
  (forgot their names, help needed!)

Subject: 8.9) What programs use: Touch Tablet or KoalaPad/Animation Station?

Thanks to Andreas Koch for the initial version of this section, and for providing copies of some of the rare programs listed here.

The Atari Touch Tablet and the KoalaPad/Animation Station tablets, while very similar, are slightly incompatible with each other in that y-position values are reversed.

The following programs use the Atari Touch Tablet:

- AtariArtist (Atari cartridge version of Micro Illustrator; 
  Distributed with the Atari Touch Tablet)
- Atari Rechner Simulation mit UPN (bin/oct/dec/hex calculator)
- CardStax 2.1 by David A. Paterson, 1993
- Catch 88 by Simon Trew, 1991
  - Supports Multi-Mouse Touch Tablet Driver by Simon Trew
- Click! (Chris Martin, 2008)
- Colour Enhancer by David Blackshaw, (c) 1986/1987 Hillside Software
- Desktop Performance Studio (Virtuoso)
- Diamond GOS by Reeve Software
- Diamond Develop by Reeve Software, requires Diamond GOS
- Diamond News Station by Reeve Software, requires Diamond GOS
- Diamond Paint by Reeve Software, requires Diamond GOS
- Diamond Write by Reeve Software, requires Diamond GOS
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Hit the Mole by Carsten Strotmann, 2004
- Knight Quest by Simon Trew, 1991
  - Supports Multi-Mouse Touch Tablet Driver by Simon Trew
- Koala Cursor Demonstration Program by Karl E. Wiegers for Antic, Jan. 1985
  (article name: "Touch Tablet Cursor" ; original filename: KOALA.BAS)
- Kriss Kross by Simon Trew, 1992
  - Supports Multi-Mouse Touch Tablet Driver by Simon Trew
- Macro Edit / EDMAC (character set/screen editor) by John Oakley
- Multi-Mouse Touch Tablet Driver by Simon Trew for New Atari User #42 1990
- Musorqa by Ron Torborg for ANALOG #34, Sept. 1985
- Othello by Simon Trew, 1991
  - Supports Multi-Mouse Touch Tablet Driver by Simon Trew
- Pixel Artist Deluxe version 1.3 by Art Horan, 1988
- The Print Shop (Broderbund)
- The Print Shop Companion (Broderbund)
- QUICK Ed Character Editor by PPP
The following programs use the KoalaPad or the Animation Station:

- Alphabet Construction Set (Playground Software) by Futurehouse
- Animal Crackers (Playground Software) by Futurehouse
- Blazing Paddles (Baudville)
- The Brundles by KE-Soft, 1993
- The Brundles Editor by KE-Soft, 1994
- Click! (Chris Martin, 2008)
- Computer Crayons (Playground Software) by Futurehouse
- Desktop Performance Studio (Virtuoso)
- DesignLab (Suncom version of Blazing Paddles; Distributed with the Suncom Animation Station)
- Diamond GOS by Reeve Software
- Diamond Develop by Reeve Software, requires Diamond GOS
- Diamond News Station by Reeve Software, requires Diamond GOS
- Diamond Paint by Reeve Software, requires Diamond GOS
- Diamond Write by Reeve Software, requires Diamond GOS
- Hardwaretester/Peripheral Test 2.0 by Florian Dingler, 2008
- Hong Kong by KE-Soft / Kemal Ezcan (ZONG mag.), 1993
- Koala Cursor Demonstration Program by Karl E. Wiegers for Antic, Jan. 1985 (article name: "Touch Tablet Cursor"; original filename: KOALA.BAS)
- Koala Painter, 1983 (Koala Technologies version of Micro Illustrator; distributed with most KoalaPads)
- Koala Sketch by Charles F. Johnson
- Little Red Riding Hood (Playground Software) by Futurehouse
- Macro Edit / EDMAC (character set/screen editor) by John Oakley
- Micro Illustrator by Steven Dompier & Robert Leyland for Island Graphics, 1983 (distributed with early KoalaPads)
- News Station (Reeve Software)
- Pixel Artist Deluxe version 1.3 by Art Horan, 1988
- Planetary Defense (Charles Bachand and Tom Hudson for ANALOG #17 March 1984)
- The Print Shop (Broderbund)
- The Print Shop Companion (Broderbund)
- RAMbrandt by Bard Ermentrout for Antic, 1985
- Reader Rabbit (The Learning Company)
- Rubber Stamp (XLEnt)
- Smart Art II by Sean Puckett, 1984?
  - includes SMARTTAB patch for Touch Tablet/Koala support
  - includes TTCALIB.BAS Touch Tablet Calibration utility
- Trails!
- Typesetter (XLEnt)
- Word Search (original author unknown)
  - upgrade, screen output and Touch Tablet support by Warren Lieuallen 10/86
- See also Atarimania lists of programs using the KoalaPad/Animation Station: http://www.atarimania.com
  /list_utilities_atari-400-800-xl-xe-koala-pad_control_12_8_G.html
http://www.atarimania.com
  /list_utilities_atari-400-800-xl-xe-koala-pad_control_12_8_U.html

Note that the Atari Touch Tablet, the KoalaPad Touch Tablet and the Suncom Animation Station are read by the computer in the same way that the computer receives data from paddle controllers, making software designed for paddles at least somewhat usable with these graphics tablets as well. See a separate section in this FAQ list for a list of programs that use paddle controllers.

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Subject: 8.10) What kinds of extra RAM and RAMdisks can be installed?

This section by Andreas Koch -- Version 3.6 from June 2008

A) Atari 400/800 RAMdisks:

- Size: 64k XRAM (+ 32k RAM)
  Banks: 0 thru 3  (total memory = 96k RAM)
  Types: Axlon (=Atari) and compatibles;

- Size: 128k XRAM (+ 32k RAM)
  Banks: 0 thru 7  (total memory = 160k RAM)
  Types: Axlon (= Atari) and compatibles;

- Size: 256k XRAM (+ 32k RAM)
  Banks: 0 thru 15  (total memory = 288k RAM)
  Types: D. Byrd and other self-made / Axlon-compatible RDs;

- Size: 512k XRAM (+ 32k RAM)
  Banks: 0 thru 31  (total memory = 544k RAM)
  Types: self-made / Axlon-compatible RAMdisks;

- Size: 1024k XRAM (+ 32k RAM)
  Banks: 0 thru 63  (total memory = 1056k RAM)
  Types: self-made / Axlon-compatible RAMdisks;

- Size: 2048k XRAM (+ 32k RAM)
Banks: 0 thru 127  (total memory = 2080k RAM)
Types: self-made / Axlon-compatible RAMdisks;

- Size:  4096k XRAM (+32k RAM)
  Banks: 0 thru 255  (total memory = 4128k RAM)
  Types: self-made / Axlon-compatible RAMdisks;

=> Note that all so-called Axlon "compatible" (256k-4096k) RAMdisks
  normally do not homebank when RESET is pressed (a fix should be
  available somewhere), whereas original Axlon RAMdisks do homebank
  properly !!  (Special thanks to Lee Barnes for this note !!)

Axlon supporting software includes: MyDOS, TopDOS, Synfile +,
Syncalc +, and more (I cannot test it, alas)

- Size:  64k for 48k RAM and 4 banks of 4k XRAM
  Banks: 4x 4k banks (bankswitching via $C000-CFFF)
  Types: one Mosaic 64k "RAM-Select" board

- Size:  128k for 48k RAM and 20 banks of 4k XRAM
  Banks: 20x 4k banks (bankswitching via $C000-CFFF)
  Types: two Mosaic 64k "RAM-Select" boards

- Size:  192k for 48k RAM and 36 banks of 4k XRAM
  Banks: 36x 4k banks (bankswitching via $C000-CFFF)
  Types: three Mosaic 64k "RAM-Select" boards

Mosaic supporting software includes: Mosaic`s Super Drive (a kind of
virtual DOS), Visicalc, TopDOS, and more (again, I cannot test this!)
For the XL/XE Ataris there are some translator disks, that enable this
mode (e.g. the Ultra-Translator) with 48k + 4k RAM...

B) XL/XE - 64k base RAM plus XRAM:

- Size:  64k (total = 128k RAM, 4 banks)
- Banks:  3, 7, B, F
- Blocks: E, = 1 block * 4 banks
- Types:  130XE RAMdisk, Turbo-Freezer-XL + 64k, self-made RAMdisks...

- Size:  128k (total = 192k RAM, 8 banks)
- Banks:  3, 7, B, F
- Blocks: AE, = 2 blocks * 4 banks
- Types:  Compy-Shop 600XL with 192k, Turbo-Freezer-XL + 128k,
  self-made RAMdisks...

- Size:  256k / 26AE (total = 320k RAM, 16 banks)
- Banks:  3, 7, B, F
- Blocks: 26AE, = 4 blocks * 4 banks
- Types: Compy-Shop 800XL RD., Compy-Shop 130XE RD., Peters/David Megaram 1, Peters/David Megaram 2, Peters/David Megaram 3 with 256k, self-made RDs...

- Size: 256k / 8ACE (total = 320k RAM, 16 banks)
- Banks: 3, 7, B, F
- Blocks: 8ACE, = 4 blocks * 4 banks
- Types: Newell, Rambo-XL, Scott Peterson, Atari Magazin, TOMS, self-made RDs...

- Size: 512k / 26AE (total = 576k RAM, 32 banks)
- Banks: 1, 3, 5, 7, 9, B, D, F
- Blocks: 26AE, = 4 blocks * 8 banks
- Types: none (that I know of) at the moment - but possible!

- Size: 512k / 8ACE (total = 576k RAM, 32 banks)
- Banks: 1, 3, 5, 7, 9, B, D, F
- Blocks: 8ACE, = 4 blocks * 8 banks
- Types: Scott Peterson, TOMS, self-made RDs...

- Size: 512k / 02468ACE (total = 576k RAM, 32 banks)
- Banks: 3, 7, B, F
- Blocks: 02468ACE = 8 blocks * 4 banks
- Types: 1) upgrade / combination of 26AE and 8ACE RAMdisk types to 512k RAM or into *one* 02468ACE RAMdisk; idea by me, built by Bernhard Pahl
  2) Upgrade of the Rambo XL to 512k by Dan Schmid (see Pooldisk Too, Subdir ACE/ Acec202a.ATR and Acec202b.ATR) and of course 3) self-made RAMdisks...
  3) 512k SRAM upgrade by Bernd Herale, available from mega-hz, Wolfram Fischer: www.

- Size: 1024k / 02468ACE (total = 1088k RAM, 64 banks)
- Banks: 1, 3, 5, 7, 9, B, D, F
- Blocks: 02468ACE, = 8 blocks * 8 banks
- Types: Newell, Scott Peterson, TOMS, Satantronic`s 1MB-PC-SIMM-RD, self-made RDs...

- Size: 1024k / 26AE (total = 1088k RAM, 64 banks)
- Banks: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blocks: 26AE, = 4 blocks * 16 banks
- Types: Mathy van Nisselroy`s 1024k XEGS-PC-SIMM-Upgrade! (with some changes probably also usable for XL and XE, see also: http://www.mathyvannisselroy.nl/)

- Size: 1024k / 8ACE (total = 1088k RAM, 64 banks)
- Banks: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blocks: 8ACE, = 4 blocks * 16 banks
- Types: none (that I know of) at the moment - but possible!

- Size: 1024k / 0123456789ABCDEF (total = 1088k RAM, 64 banks)
  - Banks: 3, 7, B, F
  - Blocks: 0123456789ABCDEF, = 16 blocks * 4 banks
  - Types: luckily, none at the moment...

- Size: 1024k / ?? (max. memory = 1088k, 64 banks)
  - Port-Bits / Control-Bits: $D301 = 2,3,6,7
    $D600 = 0,1 (or switches);
  - Banks: $D301: 3, 7, B, F, $D600: ??
  - Blocks: $D301: 26AE, $D600: ??
  - Types: David/Peters Megaram 3 with 1024k RAM (and the switches positioned to 1 x 1024k)

- Size: 2048k / 02468ACE (total = 2112k, 128 banks)
  - Banks: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
  - Blocks: 02468ACE, = 8 blocks * 16 banks
  - Types: self-made RAMdisks...

- Size: 2048k / 0123456789ABCDEF (total = 2112k, 128 banks)
  - Banks: 1, 3, 5, 7, 9, B, D, F
  - Blocks: 0123456789ABCDEF, = 16 blocks * 8 banks
  - Types: self-made RAMdisks...

- Size: 4096k / 0123456789ABCDEF (total = 4160k, 256 banks)
  - Banks: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
  - Blocks: 0123456789ABCDEF, = 16 blocks * 16 banks
  - Types: Newell, FTE, self-made RAMdisks...

Well, I will not go into details with the disadvantages and possible software-problems with RAMdisks beyond 512k RAM (possible problems might be the unavailability of the Self Test, XL/XE Basic, RAM under the OS, separate Antic access, etc. depending on the type of RD/XRAM)...

C) XL/XE - XRAM minus 64k Base-RAM:

- Size: 192k / 8AE (total = 256k RAM, usable = 12 banks)
  - Banks: 3, 7, B, F
  - Blocks: 8AE, = 3 blocks * 4 banks
  - Types: older Newell RAMdisks (replace 64k by 256k);

- Size: 192k / ACE (total = 256k RAM, usable = 12 banks)
  - Banks: 3, 7, B, F
  - Blocks: ACE, = 3 blocks * 4 banks
  - Types: newer Newell RDs, newer Buchholz-RDs, Rambo-XL, self-made RAMdisks (replace 64k by 256k)...
Although these RAM upgrades are relatively easy to build (and to install into the computer), they make problems with quite some software. Some programs tend to use the base RAM as extra RAM / RAMdisk with these upgrades, which will most often result in a crash of the computer. Next, most extra RAM testers will show more extra RAM (or a bigger RAMdisk) than there is really available (e.g. with a 256k upgrade you will see 240k extra RAM, but there is only 64k base RAM + 192k extra RAM). Alas, this is a typical hardware problem for these upgrades and it cannot be solved or avoided with software...

D) XL/XE: Parallel-Bus-Devices:
(600XL/800XL = Parallel Bus, XE = Cart.-Port + ECI)

- Size: 64k / E (total = 128k RAM, 4 banks)
  - Banks: 3, 7, B, F
  - Blocks: E, = 1 block * 4 banks
  - Types: Turbo-Freezer-XL by Bernhard Engl with 64k XRAM

- Size: 128k / AE (total = 192k RAM, 8 banks)
  - Banks: 3, 7, B, F
  - Blocks: AE, = 2 blocks * 4 banks
  - Types: Turbo-Freezer-XL by Bernhard Engl with 128k XRAM

- Size: 256k / 9ABE (total = 320k RAM, 16 banks)
  - Banks: 3, 7, B, F
  - Blocks: 9ABE, = 4 blocks * 4 banks
  - Types: Turbo-Freezer-XL by Bernhard Engl with 256k XRAM

- Size: 256k / ??? (total = 320k RAM, 16 banks)
  - Banks: unknown !!
  - Blocks: unknown !!
  - Types: Yorky-XL by Richard Gore / Derek Fern (from GB/UK) with 256k XRAM
- Blocks: unknown !!
- Types: Multi-Input-Output-Hard disk-Interface (MIO) with 256k XRAM by ICD and its re-release by MetalGuy

- Size: 1024k / ??? (total = 1088k RAM, 64 banks)
- Banks: unknown !!
- Blocks: unknown !!
- Types: Multi-Input-Output-Hard disk-Interface (MIO) with 1024k XRAM by ICD and its re-release by MetalGuy

E) XL/XE: RAM/Flash-ROM/... Cartridges:

- Rambox II with 256k RAM by JRC (Czech Republic; with special RAMdisk drivers for TT-DOS and Bewe-DOS!)
- Ramcart 64k by LK Avalon (Poland)
- Ramcart 128k by LK Avalon (Poland; binaries of the EPROM and GAL chips of this cart can be found on ABBUC magazine 64)
- Ramcart 256k by Zenon/Dial (Poland)
- Ramcart 512k by Zenon/Dial (Poland)
- Ramcart 1024k by Zenon/Dial (Poland)
  (for some hints and pics see: www2.asw.cz/~kubecj/acarts.htm)
- Flash-ROM cart 128k / 1Mbit "Atarimax" by Stephen Tucker
  (although they are not usable as extra RAM / RAMdisk at the moment,
   I am quite sure that it is possible to write some drivers and thus
   use the Atarimax Flash-ROM carts as extremely fast floppy drives!)
- Flash-ROM cart 1024k / 8Mbit "Atarimax" by Stephen Tucker
  (for information and complete documentation plus software see:
   www.atarimax.com/flashcart/documentation/index.html)
- and many others I do not know and I do not have any info about;

Even cartridges can be used as RAMdisks (= fast floppy drives),
especially RAM-carts or Flash-RAM carts. But they function like
most other Super- or Mega-Carts, meaning the bank-switching
techniques are also used there. Since the subject carts and
bank-switching carts is quite enormous, I will not discuss it or
present any information here. Just try to find a large description
by John K. Picken ("RAM/ROM Control on an XL/XE") if interested in that
subject (e.g. at Jindrich Kubec’s homepage: www2.asw.cz/kubecj/...).

Finally thanks and credits for this subject and lots of (used /
borrowed) information therefore go to: Lee Barnes, Russ Gilbert,
Mathy van Nisselroy, Erhard Puetz, Mathias Reichl, Ron Hamilton,
Wes Newell, Guy Ferrante, XI of Satantronic, Bernhard Pahl, Walter
Lojek and Voy/Dial. Also thanks to John K. Picken who wrote an
excellent article about A8 extra RAM / RAMdisks and A8 cartridges and
their technique of bank-switching. I know this list has still some
errors and is missing some information, alas, without your help I am
unable to correct the errors or to fill in the missing information...
Subject: 8.11) What programs support more than 64K RAM?

This section by Andreas Koch -- Version 3.6 from June 2008

The following Atari 8Bit programs support more than 64k RAM, but still work alright (with multiple loads / disk-swaps) on standard 64k machines:

a) "TOOLS" that support more than 64k RAM:

- A-Base (???, 64k RAMdisk, block E),
- Alphasys-Sample Software (Mirage/ANG, 64k XRAM, block E),
- A-Text (???, 64k RAMdisk, block E),
- Atari Writer 80 (Atari, 64k RAMdisk, block E),
- Atari Writer Plus (Atari, 64k RAMdisk, block E),
- BASIC XE (OSS/ICD/FTE, 64k XRAM, block E),
- Bewe-DOS 1.x (Bewesoft, up to 1024k RD, all banks),
- Bibo-DOS 5.x (Compy-Shop, up to 256k RD, E/AE/26AE/8ACE),
- Bibo-DOS 6.x (Compy-Shop, up to 256k RD, E/AE/26AE/8ACE),
- Datei 4.x (N. Schlia, up to 256k XRAM, E/AE/26AE),
- Desktop Atari (HBSF, 64k RAMdisk, block E),
- Diskworker (Petsoft, 64k RAMdisk, block E),
- Diskcommunicator 3.x (Robert "Bob" Puff, if there is more than 64k RAM, answer the startup question with "Y" to use it as XRAM or with "N" to use it as RAMdisk; up to 256k XRAM: E/AE/ACE/8ACE; RD = DOS depend.),
- DOS 2.5 (Atari, original driver = 64k RD, block E; other drivers: up to 2x 128k RAMdisks, E/AE/8ACE),
- DOS II+D Version 6.x (S. D., up to 2x 128k RDs, E/AE/ACE/8ACE/26AE),
- DOS XE 1.x (Atari, 64k RAMdisk, block E),
- Extended Atari Basic (???, 64k XRAM, block E),
- Extended Turbo Basic (???, 64k XRAM, block E),
- Fampy 2.3 (Wolfgang Freitag, up to 128k XRAM, E/AE),
- Fampy 6.1 (Wolfgang Freitag, up to 128k XRAM, E/AE),
- Howfen DOS 3.x (???, up to 128k XRAM, E/AE),
- Howfen Tape to Disk (???, up to 128k XRAM, E/AE),
- Inertia 2.x (MadTeam, up to 256k XRAM, E/AE/8ACE),
- Inertia 3.x (MadTeam, up to 256k XRAM, E/AE/(ACE)
- Inertia 4.x (MadTeam, up to 1024k XRAM, all combinations !)
- Midi Mate II (Hybrid Arts, 64k XRAM, block E),
- Midi Pattern Editor (Raster, 64k XRAM, block E),
- Midi Player (I. Kuczek, 64k XRAM, block E),
- Midi Recorder (I. Kuczek, 64k XRAM, block E),
- Midi Sequencer (M. Sygit, 64k XRAM, block E),
- MSC-IDE-Software (M. Belitz + S. Birrmanns, 64k XRAM, block E),
- My-DOS 3.x (Wordmark, up to ??k RAMdisk),
My-DOS 4.x               (Wordmark, up to 1024k RAMdisk, all banks),
Paperclip II             (Batteries Included, 64k XRAM, block E),
Super DOS 2.x            (P. Nichols, up to 2x 128k RDs, E/AE/ACE/8ACE),
Super DOS 5.x            (P. Nichols, up to 256k RD, E/AE/ACE/8ACE/26AE),
The [Sparta DOS] Browser (Tom Hunt, up to 1024k RAMdisk, RD-driver dep.),
The Sound Utility         (Tom Hunt, up to 1024k XRAM?, bug-free only under Sparta/Bewe-DOS, one can choose between 64k/128k/256k/576k/1088k RAM, alas all setups with more than 64k RAM produced some strange sound noises on my 576k XL when playing waves or samples...),
Theta Music Composer 2.x (Jaskier, 64k XRAM, block E),
 Turbo DOS 1.x            (Reitershan, up to 256k RD, E/AE/ACE/8ACE/26AE),
 Turbo-DOS 2.x            (Reitershan, up to 256k RD, E/AE/ACE/8ACE/26AE),
 Top-DOS 1.x              (R.K. Bennett, 64k RAMdisk, block E),
 Top DOS Plus             (R.K. Bennett, up to ???k RAMdisk),
 Top DOS Prof.            (R.K. Bennett, up to ???k RAMdisk),
 Typesetter               (XLent, 64k XRAM, block E),
 X-DOS 2.x                (S. D., up to 256k RD, E/AE/ACE/8ACE/26AE),
 X-RAM 0.21               (Satantronic, tests up to 4 MB!, all banks!)
and most Text-Editors (e.g. Speedscript, Antic Writer, T-Edit, Page 6 Writer, Compy-Shop Editor, Textpro, etc.) as long as they are running under a DOS 2.x (meaning a DOS 2 derivative) or Sparta / Bewe DOS and the appropriate RAMdisk driver...;

b) "Games" that support more than 64k RAM:

Adalmar                  (Falk Buettner, 64k RAMdisk, block E),
A.R. - The Dungeon       (Philipp Price, 64k XRAM, block E),
Bop N'Wrestle            (Mindscape, 64k XRAM, block E),
The Brundles              (KE-Soft, up to 256k XRAM, E/AE/26AE),
Human Torch & the Thing  (Questprobe, 64k XRAM, block E),
Johnny's Problem         (ANG, 64k XRAM, block E),
Megablast 1              (Thorsten Karwoth, 64k XRAM, block E),
Mental Age               (???, 64k XRAM, block E),
Problem Jasia            (Mirage, 64k XRAM, block E),
[The Amazing] Spiderman  (Questprobe, 64k XRAM, block E);

c) "Demos" that support more than 64k RAM:

ABBUC Magazine Intro 52  (Heaven, 64k XRAM, block E),
ABBUC Magazine Intro 55  (Heaven, 64k XRAM, block E),
Anime 4ever              (Sente Software Group, 256k XRAM, 8ACE),
Grafik + Sound Demo     (Peter Sabath, 64k XRAM, block E),
I. K. Plus Demo          (???, 64k XRAM, block E),
Sweet Fantasy            (Tight, 64k XRAM, block E),
The Top 3 Demo           (WFMH, "Veronika Part", 64k XRAM, block E);

Thanks and credits for this subject go to: Bernhard Pahl, Russ Gilbert,
Subject: 8.12) What programs require more than 64K RAM?

This section by Andreas Koch -- version 3.6 from June 2008

The following Atari 8Bit programs require more than 64k RAM, and thus do not work at all (or not alright/bug-free) on standard 64k machines:

a) "Tools" that require more than 64k RAM:

128k Memory Testers      (quite many programs, 64k XRAM, block E),
130XE Bank/Mem.-Testers   (quite many programs, 64k XRAM, block E),
130XE Sectorcopiers       (quite many programs, 64k XRAM, block E),
130XE Utilities           (HAPS PD 0031, 64k XRAM, block E),
192k Memory Testers       (some PD programs, 128k XRAM, blocks AE),
256k Memory Testers       (Newell, ICD, etc., 192k XRAM, blocks ACE),
320k Mem. Testers 8ACE    (Atari Mag., TOMS, etc., 256k XRAM, blocks 8ACE),
320k Mem. Testers 26AE     (Compy-Shop, etc., 256k XRAM, blocks 26AE),
576k Memory Testers       (Peterson, TOMS, etc., 512k XRAM, blocks 8ACE),
1088k Memory Testers      (Newell, TOMS, etc., 1MB XRAM, blocks 02468ACE),
4160k Memory Tester       (Newell, 4MB XRAM, blocks 0123456789ABCDEF),
APC Archiver 1.x          (LBS/APC, 256k XRAM, 8ACE only!),
APC Packer 1.x            (LBS/APC, 256k XRAM, 8ACE only!),
A. W. P. Super Menu       (Ken Siders, min. 64k XRAM, block E),
A. W. P. XE Super Menu    (Ken Siders, min. 192k XRAM, blocks ACE),
Audio/Studio Master       (Mirage/ANG, 256k XRAM, 26AE only?),
Boot Majster              (Electron, 64k XRAM, block E),
Boss X [Vers. 10.x]       (M. Sobe, with any DOS min. 64k RAMdisk, block E; with MyDOS 4.x it supports up to 1MB RD, subdirs and up to 16MB HD part.),
Boss XE [Vers. 8.x]       (M. Sobe, with any DOS min. 64k RAMdisk, block E; with Turbo-DOS or MyDOS 4.5x it supports bigger RAMdisks, but no subdirs!),
CAD XE                    (HAPS PD 0350, 64k XRAM, block E),
Diskettenverwaltung XE    (ABBUC PD 86, 64k XRAM, block E),
Draw XE                    (ABBUC PD 387, 64k XRAM, block E),
Dream Vision             (ABBUC PD 480, 192k XRAM, blocks ACE?),
Fraktale & Colorprint    (P. Woetzel, 64k XRAM, block E),
Grafik Zeilen Editor     (HAPS PD 0296, 64k XRAM, block E),
Hires Dump                (ABBUC PD 113, 64k XRAM, block E),
Inertia 3.x               (MadTeam, min. 64k XRAM, block E; supports up to 256k XRAM, AE/ACE/26AE/8ACE with almost any DOS),
Inertia 4.x               (MadTeam, min. 64k XRAM, block E; supports up to 1024k XRAM - all possible bank combinations!),
Macro Assembler XE        (T. Karwoth, 64k XRAM, block E),
Macro Assembler XE+       (T. Karwoth, min. 64k XRAM, block E; supports up
to 1024k XRAM - all possible bank combinations!),

Masher XE  (???, min. 64k XRAM, block E; supports up to 256k XRAM: AE/ACE/8ACE),

Menu 130  (Les Howarth, 64k XRAM, block E),
Midi Mate III  (Hybrid Arts, 64k XRAM, block E),
Monitors, Debuggers, ... (HAPS PD 0109, 64k XRAM, block E),
Multi DOS 130  (Kuchera/Excellent, 64k XRAM, block E),
Multi DOS 320  (Kuchera/Excellent, 256k XRAM, 8ACE only!),
Multi Tasking OS  (???, min. 64k XRAM, block E),
MTOS 256  (Tom Hunt, 192k XRAM, blocks ACE),
MTOS XE  (Tom Hunt, 64k XRAM, block E),
Neo-Tracker 1.x  (Epi, min. 64k XRAM, block E; under MyDOS 4.5x or Sparta DOS X cart. it supports up to 1MB XRAM, all bank combinations!),
Newspaper Editor  (HAPS PD 0294, 64k XRAM, block E),
Protracker 1.5  (MadTeam, min. 64k XRAM, block E; supports up to 256k XRAM: AE/ACE/8ACE/26AE),
Rechnen fuer Kinder  (ABBUC PD 85, 64k XRAM, block E),
Rund um die RAMdisk  (ABBUC PD 383, HAPS PD 1084, contains info texts and pgms. for upgrading the 800 or XL/XE and testing its XRAM up to 1 MB; the docs use English language and provide detailed information for Axlon compatible 800 XRAM and Newell/Buchholz/Peterson compatible XL/XE XRAM),
Sample Art XE  (Mozart/WSL, min. 64k XRAM, block E; supports up to 1024k XRAM, all bank combinations, alas the program is faulty/buggy!),
Shrink XE  (P. Fitzsimmons, 64k XRAM, block E),
Snapshot  (???, 64k XRAM, block E),
Tape RAMdisk Drivers  (Pokey, SAG, etc., 64k XRAM, block E),
Text 130  (B. Russmann, 64k XRAM, block E),
Textpro "+" [e.g. 4.5+]  (Ronnie Riche, 64k XRAM, block E),
Textpro 5.x  (Ronnie Riche, 64k XRAM, block E),
The Code Cruncher 2.x  (Soused Teat, min. 64k XRAM, block E),
The Code Cruncher 3.x  (Soused Teat, min. 64k XRAM, block E),
The Cruncher 5.x  (MSL/Magnus, min. 64k XRAM, block E),
The Small Printery  (W. Lojek, min. 64k XRAM, block E; supports up to 1024k XRAM, all bank combinations!),
The [Sparta DOS] Wedge  (Ed Bachmann, 64k XRAM, block E, sep. Antic!),
The Works  (Tom Hunt, min. 64k XRAM, block E),
Wuersttemberger Disk  (ABBUC PD 361, HAPS PD 1050, 64k XRAM, block E; mainly/only because side 2 contains the XE version of Gizmo's castle),
XL-2  (J.K. Picken, min. 64k XRAM, block E; under MyDOS or Sparta DOS it supports up to 1024k XRAM !),
Zeitungsredakteur  (ABBUC PD 121, 64k XRAM, block E);

b) "Games" that require more than 64k RAM:

Castle of Blackthorne  (T. Graef, 64k RD, block E),
Cavepack XE  (XE-version by K. Ezcan, 64k RD, block E),
Computer Baseball  (D. Blackwell, 64k XRAM, block E),
Der Neffe  (XE-version by ???, 64k XRAM, block E),
Gizmo's Castle (XE-version by M. Kugler, 64k XRAM, block E),
Kaiser II (128k version by C. S., 64k XRAM, block E),
Kaiser II (320k version by C. S., 256k XRAM, 26AE & 8ACE),
Minesweeper 1-4 (4 versions by J.R. Chicco, 64k XRAM, block E),
Mister X (S. Soelbrandt, 64k RD, block E),
Oelbaron (XE-version by ???, 64k XRAM, block E),
Space Harrier (C. Hutt, 64k XRAM, block E),
Strategy Baseball (HAPS PD 0302, 64k XRAM, block E),
T-34 the Battle (ANG, 64k XRAM, block E),
Yie Ar Kung Fu (????, 256k XRAM, blocks ????, get the latest
versions from Fandal`s or Homesoft`s homepage...),
Zargon XE (ABBUC PD 611, HAPS PD 0485, 64k XRAM, block E),

Please note, that hackers, crackers and pirates also made file versions
of (most of) the XE / XEGS 64k and 128k carts available. Due to cart.
bankswitching, a 64k XL/XE was enough for these super-carts; not so with
the file versions, they do (mostly) require more than 64k memory...

Next, there are also "un-official" (pirated, hacked, cracked, patched)
cart. versions of former disk-based games, that require XRAM, which they
originally did not (example: Conan, the multi-stage disk-version by
Datasoft requires 64k RAM, whereas the single-stage version of the
Sunmark multicart. req. 128k RAM). It is quite likely, that more games
will occur in the Atari scene with the same behavior...

c) "Demos" that require more than 64k RAM:

130XE Artshow (HAPS PD 0013, 64k XRAM, block E),
130XE Autoshow (HAPS PD 0637, ABBUC PD 191, 64k XRAM, block E),
130XE Demo (S.A.G., 64k XRAM, block E),
130XE Impossible Demo (R. Haegemann, 64k XRAM, block E),
3D Scroll (Jaskier/TQA, 64k XRAM, block E),
American Natives (Fox-1, 192k RD, RAMdisk = DOS dependant),
Amiga Boink XE (B. Armour, 64k XRAM, block E),
Animkom. meet B. V. (Animkomials + B.V., 64k XRAM, block E),
(The) Asskicker (Shadows, 64k XRAM, block E; hold Select!),
Back to Life 2 (Jaskier/TQA, 256k XRAM, auto-setup!),
Base 33 (AIDS, 256k XRAM, hold SHIFT for setup!),
Bill Pie Demo (MadTeam, min. 64k XRAM, block E; supports up
to 256k XRAM: AE/8ACE with more frames),
BMW Animation (Mirko Sobe, 64k XRAM, block E),
Brull (Pin/Trs, 1MB XRAM for a sample demo),
CES XE Demo (full 580 sectors version by XANTH, 64k XRAM,
block E; includes the Swan-, Fuji-Boink- and Robot-Demo all in one file!),
Cogito Demo (AIDS, uses blocks 8C, thus 8ACE only!),
Critical Sounddemo (Innovative, 64k XRAM, block E),
Danielle (Gr.9) Ani (B. Kendrick, 64k XRAM, block E),
DoXEpin (AIDS, 64k XRAM, block E),
Edelweiss Demo (A.R.+C.S.S.+S.V.L., 256k XRAM, 26AE only!),
Ergo Bibamus (Quasimodos, 64k XRAM, block E),
Extract Slideshow (Replay/Bit Busters, 64k XRAM, block E),
Fat Bottomed Girls (???, 64k XRAM block E for a Queen sample),
Forever 1ktro (New Generation, 64k XRAM block E for a 1k demo),
Forsaken Love (New Generation, 256k XRAM, 26AE & 8ACE; simply delete "BANKS.DAT", reboot and create a new one for your kind of XRAM!),
Glasshead Demo (A.R.+C.S.S., 256k XRAM, 26AE only!),
Halle 1994: The Wormhole (Magic Arts, 256k XRAM, 26AE only!),
Hardware Demo (A.R.+C.S.S., 256k XRAM, 26AE only!),
Igor Demo (Side A) (MadTeam, 64k XRAM, block E - use 128k.BAT),
Igor Demo (Side B) (MadTeam, 128k XRAM, blocks AE - use 192k.BAT),
Igor Demo (Side A+B) (MadTeam, 256k XRAM, 8ACE only - use 320k.BAT),
Imperial Sounddemo (Innovative, 256k XRAM, 26AE & 8ACE),
Impossible but Real (MacGyver, 192k XRAM, auto-setup!),
Incredible (Excellent, 64k XRAM, block E),
Inside Out (Taquart, 64k XRAM, block E),
Isolation Demo (M.E.C., 64k XRAM, block E),
Journey Demo (Boot version by Polynomials, min. 64k XRAM, block E; supports up to 256k XRAM: AE/8ACE),
Journey Demo (File version by MadTeam, min. 64k XRAM, block E; supports up to 192k XRAM: AE/ACE),
Journey into Sound (DGS / D. Garaghty, 64k XRAM, block E),
Khai Et (AIDS, 256k XRAM, 26AE & 8ACE, SHIFT for Setup!),
Killer Whales Ani (MadTeam, min. 64k XRAM, block E, supports up to 256k XRAM: AE/8ACE with more frames!),
Landscape-XE Demo (Karl Pelzer, 64k XRAM, block E),
Manga Ani (MadTeam, min. 64k XRAM, block E),
Megablast Sounddemo (DGS / D. Garaghty, 64k XRAM, block E),
MTV's Danielle = Danielle (Gr.9) Ani,
Nascar Ani (M. Sobe, 64k XRAM, block E),
Nonjm Demo (Tight, 64k XRAM, block E),
Numen Demo (Taquart, 256k XRAM, 26AE & 8ACE, auto-setup!),
Ogluszacz Sounddemo (AIDS, 64k XRAM, block E),
Owca Demo (Animkomials, 64k XRAM, block E),
Owca 2 Demo (Animkomials, 64k XRAM, block E),
Pacem in Terris (Quasimodos, 256k XRAM, 26AE & 8ACE, auto-setup),
Parrot XMAS Demo (A. Ramos, 64k XRAM, block E),
Pedrokkko Sounddemos (a collection of 10 disks / 20 sides by Pedrokkoko, the player program assumes a 64k RD, block E),
Raytracing Ani/128k (K. Pelzer, 64k XRAM, block E),
Raytracing 320k (Elsni / S. Elsner, 256k XRAM, 8ACE only!),
Raytracing 1088k (Solocoder of A.C.E., 1024k XRAM, works only on K.P. 1MB Megaram III, 8 bootdisks, loading time approx. 17 minutes !!!),
Oreditus Demo (Zelax, 192k XRAM, 26AE & 8ACE, auto-setup),
Render Ani (MadTeam, min. 64k XRAM, block E),
Revenge of Hacker (Rasero Team, 128k XRAM, blocks AE),
Running Cow ASCII Ani (MadTeam, 64k XRAM, block E),
Sheol Demo               (Bit Busters, 256k XRAM, 8ACE only!),
Shiny Bubbles            (XE version by B. Paul, 64k XRAM, block E),
Stash 98 Demo            (Rasero Team, 256k XRAM, 26AE & 8ACE via a buggy
setup: 1) for 8ACE XRAM press A in the 1st or 2nd menu, 2) for 26AE press
B in the 1st menu and C in the 2nd menu; don't use the CS auto-setup!),
Starwars Demo            (A.R.+C.S.S., 256k XRAM, 26AE only!),
The Wormhole              (Magic Arts, 256k XRAM, 26AE only!),
Timekeep(er)             (New Generation, 256k XRAM, 8ACE only! wait!),
Tit Demo                 (Mad Team, 192k XRAM, auto-setup!),
Too Hard 3 Demo          (Animkomials, 128k XRAM, blocks AE),
Too Hard 4 Demo          (Animkomials, 256k XRAM, auto-setup!),
Total Dazed               (Tight, 64k XRAM, block E),
Trabant Demo             (A.R.+C.S.S., 256k XRAM, 26AE only!),
Trip 6                    (Shadows, 64k XRAM, block E),
Turtles Demo             (Ultra Software, 64k XRAM, block E),
Ultra Demo                (Taquart, 64k XRAM, block E),
Ultra 2 Preview           (Taquart, 64k XRAM, block E, unfinished!),
Vengeance                 (Excellent, 64k XRAM, block E),
Vent XE                   (Exc.+Pentagram, 64k XRAM, block E),
WAF-Demo                  (W.A.F., diskside B = 64k XRAM, block E),
Worms Demo               (Datri, 256k XRAM, 8ACE otherwise buggy!),
X-Demo                    (MadTeam, 256k XRAM, 26AE),
X-Files Ani               (MadTeam, 64k XRAM, block E),
X-Files 2 (TV-Ani)        (MadTeam, 256k XRAM, 26AE & 8ACE),
Xyberscape XE             (XE version by Bill Le Masurier, 64k XRAM, E),
Zero Demo                 (New Generation, 64k XRAM, block E);

Thanks and credits for this subject go to Russ Gilbert, Bernhard Pahl,
Ron Hamilton, Mathy van Nisselroy, Stephan Pollok and Miker for sharing
their information with me. Any corrections and/or updates are welcome...
-Andreas Koch

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Subject: 8.13) What voice/sound synthesis software is there for the Atari?

This section by Andreas Koch.

- S.A.M. - the Software Automated Mouth by Don't Ask Software (a
  software package; you can find it at Don's / the author's homepage:
  http://www.retrobits.net)
- Softsynth (a PD program, that creates sounds and sound effects via
  modulation of the tv/monitor speaker; available from the ABBUC library);
- MOD-Sounds (sound-MODulation, although I do not know any software to
  create such sounds on an A8, some programs to edit (Protracker) and
  playback (Inertia, Modplayer, Neotracker, etc.) these sounds do exist);
Subject: 8.14) What programs support stereo and upgraded sound?

This section by Andreas Koch.
(POPS info updated 8/15/06 by mdc thanks to Lee Brilliant)

There is already a lot of stereo software for the upgraded Atari computers available, of course most of these programs are limited to certain/special upgrades and merely perform their stereo effects on these items (with otherwise upgraded or non-upgraded Ataris, the sounds or programs will only play in mono):

a) software for the various stereo-upgrades:

- 3 channels with one Pokey (POPS-software): As far as I know for this kind of upgrade, there merely exists a patched version of the Pokey player program, I am not sure if there is anything else for it; anyway, refer to ANALOG #66, November 1988, pages 54-60;

- stereo with two computers (thus two Pokeys): As far as I know for this simple trick there merely exist two programs, they are "Perestroyka" and "Sky Network" by T.Liebich. In order to achieve the stereo effect, you have to boot/load one of these demos on two computers (connected to different TVs or monitors, there is no need to connect the computers to each other!). When done, press 1-5 on the first computer while pressing Shift-1-5 on the second computer. Meaning, if you want to hear the first sound in stereo then press 1 on computer 1 and press Shift-1 on computer 2 simultaneously (that`s a little tricky, I know). If you want to hear sound 5 in stereo, then press 5 on computer 1 and Shift-5 on computer 2 simultaneously. Tricky at first, but sooner or later you will get the hang of it. Of course you can also connect the two Ataris to a hifi-system, using the sound output of one Atari for the left channel and the sound output of the other Atari for the right channel...

- stereo-sound with Stereo-Blaster Pro (Portronic/AMC): As far as I know there was at least one demo disk (early version was single-sided only, later versions were double-sided), that contained some demo-software, namely the simple "Stereo-demos" (by AMC, side 1) and the "Stereoblaster-Demo" (by HU-Soft, side 2 if available). The Stereoblaster demo was written in Turbo-Basic and played back via Compiled-Turbo-Basic, it uses Chaos Music-Composer Sounds (*.CMC) and a few of these provide stereo effects, if equipped with a stereo-blaster-pro and a hifi-system. The simple stereo-demos included some programs written in Atari Basic, for example a (pong-like) bouncing ball and a flying helicopter. Equipped with a stereo-blaster-pro and a hifi-system, one could see the ball bouncing left and right and simultaneously hear the sound fx on the left or right channel. The helicopter started at the left side and produced a
loud sound on the left channel, when it was flying to the right side, the sound faded on the left channel and got louder on the right channel, until the helicopter disappeared (and the sound completely faded away). There were some more of these simple demos available, but I don’t remember them anymore.

- Stereo with two Pokeys: There already exist dozens of sounds and demos, that support this upgrade, most of these programs were made in Poland, but a few sound-demos were also made in other countries. Anyway, the following programs support stereo via two Pokey chips:

  - Alf-Demo by the Unknown Base (Netherlands);
  - Alpha-Demo by GMG (Slovakia);
  - AMS-Stereo player by ??? (author unknown), USA;
    (there are at least two AMS-stereo-players, that let you play *.AMS sounds in true stereo or at least simulated stereo);
  - Ballada sound by DJ V / BK (Poland);
  - Base 33 by AIDS (msx by Greg, Poland);
  - Chaos Music Composer version x.x patched by ???, Poland;
    (=> the original version by Janusz Pelc / LK Avalon is only mono, but there is a stereo-patch available, as well as various patched CMC stereo-versions on the internet);
  - (many) *.CMC sounds created by one of the many stereo-versions of Chaos Music Composer;
  - Cogito-Demo by AIDS (Poland)
  - Do you see the light? sound-demo by Roemer of UNO (Germany);
  - Draconus, patched version by ANG and/or Micro Discount (NL/UK)
    (the original version by Zeppelin games is only mono!);
  - Dynakillers (Game) by GMG, Slovakia;
  - First of All (sound) by Raster, Czech Republic;
  - Impossible but Real Demo by MacGyver (Poland);
  - King of Aggregat by X-Ray / Slight (Poland);
  - Megaplayer Versions 1.6 and 2.0 by MacGyver (Poland)
    (=> and thus all *.CMC, *.MPT, *.TMC, etc. sounds played with this sound-player tool can be heard in true or simulated stereo!);
  - Multi-Pro-Tracker 2.4s by Jaskier/Taquart, (original mono version by SoTE; thus *.MPT sounds can be generated in stereo!, Poland;
  - (many) *.MPT sounds created by the stereo-version of Multi Protracker;
  - Nazebany by DJ V / BK (Poland);
  - Overload sound by X-Ray / Slight (Poland);
  - Raster Music Tracker 1.x by Raster, Radek Sterba (a PC program that creates mono or stereo *.RMT sounds that can be played back on the A8 or any Atari 800/XL/XE emulator);
  - *.RMT stereo-sounds created by Raster Music Tracker;
  - Stereo-Patch for Pokey Player by Chuck Steinman
    (=> thus all Pokey-Player / *.V sounds can be heard in stereo!);
  - Stereo-Patch for Softsynth by Freddy Offenga (Netherlands)
    (=> thus Softsynth will create stereo-sounds!);
- Stereo Patch for World of Wonders by Freddy Offenga (Netherlands) 
  (World of Wonders is a great Softsynth sound-demo!); 
- Still Alive (TMC-sound) by Greg, Poland; 
- Time sound by X-Ray / Slight (Poland); 
- Theta-Music-Composer version 1.x by Jaskier/Taquart 
  (=> thus *.TMC sounds can be generated in stereo!); 
- Theta-Music-Composer version 2.x by Jaskier/Taquart 
  (supports 1, 2 or even 4 Pokey sound-chips !) 
- (most) *.TMC sounds created by Theta Music Composer; 
- Vanity sound by Kuchara / Excellent (Poland) ; 
- Worms (320k-Demo) by Datri, Czech Republic; 
- Zybex, patched version by ANG and/or Micro Discount (NL/UK) 
  (the original version by Zeppelin games is only mono!); 
- that's all what I found so far... 

b) software for other sound enhancements: 

- enhanced-sound with Covox: As far as I know this upgrade will playback 
  digitized or sampled sound in 8Bit resolution rather than in 4Bit 
  resolution. The following programs support the Covox-Upgrade: 
  - Inertia 2.x, a MOD-player by MadTeam; 
  - Inertia 3.x, a MOD-player by MadTeam 
  - Inertia 4.5, a MOD player by MadTeam; 
  - Protracker 1.5, a MOD-editor and player by MadTeam; 
  - NeoTracker 1.x, a MOD+NEO+SMP player by EPI/Allegresse; 
  - that's all I have found so far; 
  note that all these programs will still work with pokey... 

Subject: 8.15) What games support online action via modem? 

This section by Andreas Koch. 

- Modem Chess, a PD game in Basic by ??? 
- Modem-Battleships, a PD game in Basic by ??? 
- Tele-Chess, a PD game in Basic by ??? 
- Jelly Beans a ML game by Chris Martin 
- "Battleships ST-XL" by Florian Dingler 
  (German name: Schiffe versenken ST-XL) 
- Midi Maze by XANTH (prototype) 
- Commbat by Adventure International 

(I have also seen an advert from GCP in ANALOG or Antic, that listed 
the following games: The City, Cybertank, Cybership, Bio-War, Lords 
of Space; I am not sure if they are all available for the Atari, A.K.) 

To play these games online, one would not only require an Atari computer,
but also a modem, a modem-driver and/or a terminal program (like Kermit, Bobterm, Teleterm, A-Term, Ice-T, BBS Express! Pro, etc.). See also the sections 7.8, 10.1 and 10.2 which tell you more about modem/terminal programs and modem hardware for the Atari. Emulator users have it a little easier and can use the built-in modem emulation in Ape-DOS, Ape-Win, Atari 800 DOS, Atari 800 Win, etc.

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Subject: 8.16) What programs support Atari computer networking?

This section by Andreas Koch.

There are two different hardware add-ons which provide a "computer-network" (two or more Ataris linked together). Thus, there is software that supports either one or the other hardware (namely Gamelink-1 or Gamelink-2). The following software supports the networking hardware:

- Gamelink-1 (by Dataque):
  - info-text about GL-1 and where to buy it, by Dataque;
  - Tic-Tac-Two by J.Potter/Dataque, a tic-tac-toe clone;
  - Modem-Battleships, patched by Rick Detiefsen for Gamelink-1;

- Gamelink-2 / Multilink (by Dataque & Bewesoft):
  - Maze of Agdagon demo (1 player only) by Dataque;
  - Maze of Agdagon (full version, 2-8 players) by Dataque;
  - Multi-Dash (2-8 players, XL/XE only) by Bewesoft;
  - Multi-Race (2-16 players, XL/XE only) by Bewesoft;
  - Multi-Worms (2-8 or 2-16? players, XL/XE only) by Bewesoft;
  - "starter-kit" module to use in your own networking-games by Bewesoft (free use of this module is granted by Bewesoft/Jiri Bernasek);
  - Speed-Up by Radek Sterba
  - Speed-Up Gold by Radek Sterba

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Subject: 9.1) How can I work with .arc files on my 8-bit Atari?

ARC.EXE for MS-DOS was released by System Enhancement Associates (SEA) around 1985. It will compress and store groups of files as one file, making it easier and quicker to download programs and support files at once. Because of the ease of use and availability of this program, it quickly became the de facto standard for file archives on Intel-based IBM machines. Files compressed and stored with ARC or a compatible utility are normally given the filename extender ".arc".

The 8-bit Atari computers have several software utility options that are fully compatible with ARC.EXE, the most important being:
Super UnArc 2.4 and Super Arc 2.4 - shareware by Bob Puff, released 01/31/89
Available:
http://www.nleaudio.com/css/files/superarc.arc (complete package + docs)

Also, SpartaDOS X includes a fully compatible ARC command for both creating
and extracting .arc files.

Subject: 9.2) What file formats for entire disks/tapes/cartridges are there?

It is now common, especially when working on Windows PCs or Macs, to work with
Atari software as files or "images" containing the data from an entire disk,
data cassette, or cartridge as duplicated from the native media for the Atari.

Here is a list of file formats, arranged by their associated filename
extensions. These are all filename extensions used to name files containing
entire 8-bit Atari floppy disk images, cassette tape images, or cartridge
images.

..ATR -Image format invented by Nick Kennedy, for his SIO2PC project.
    Very similar to .XFD but with an added 16 byte header.
    This is the most common image format, used with most 8-bit Atari
    emulators running on other computer platforms.
    SIO2PC is at http://pages.suddenlink.net/wa5bdu/sio2pc.htm

..ATX -Image format invented by Jorge Cwik, for VAPI project. Goal of Vapi is
    the preservation of Atari software in its original unmodified form,
    including custom format or copy protection. http://vapi.fxatari.com/

..CAS -Cassette image format invented by Ernest R. Schreurs, for his
    Digital Cassette Image system (includes CAS2SIO, WAV2CAS, and CAS2WAV
    MS-DOS utilities. See: http://home.planet.nl/~ernest/.
    The .CAS format was extended by Tomasz Krasuski (kr0tki), for his
    A8CAS system. See: http://a8cas.sourceforge.net/

..DCM -Image format invented by Bob Puff for his Disk Communicator 3.2 utility.
    Used when working with native Atari hardware. A compressed data format.
    DISKCOMM is at http://www.nleaudio.com/css/files/DISKCOM.ARC
    .DCM specs at: http://home.planet.nl/~ernest/diskcomm.zip

..DD -Early filename extension used with double density disk images for use
    with the Xformer emulators. Replaced by the .XFD extension.

..DI -Image format invented by Kolja Koischwitz & Christian Krueger for
    800XL DJ, their 1050/XF551 disk drive emulator for the Atari
    ST/TT/Falcon.
See also:
Atari Disk Image FAQ (Steve Tucker)
http://www.atarimax.com/ape/docs/DiskImageFAQ/

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Subject: 9.3) How can I copy my copy-protected Atari software?

This section by Russ Gilbert.

Almost all commercial software for the A8 is/was copy protected.

For boot disks, this usually involved a large number of special formatting
that couldn't be copied using ordinary sector copiers. Usually the boot
process involved checking to see if a certain sector error occurred, then
proceeding. If the error did not occur, the disk was a copy and would not
work.

Alphasys adds (2009.03):
Some protection schemes involved special sector skewing, which involved
special timing during loading, duplicate sector numbers with differing content, or tracks with more or less than the usual number of sectors. With duplicate sector numbers, I mean physical duplication, involving sector header code that is read by the drive only, not any part of the sector data transferred to the computer.

For carts, usually the method of protection was to write to the cart area of memory and see if the value changed. If the value changed, the cart program was in RAM, not ROM and would fail to operate.

For tapes, again a fair number of schemes were used. Some varied the speed at which the tape loaded. I'm not familiar with tape protection schemes.

With all software media (cart, tape, disk), there may be program encryption, which must be decrypted before the program can run. This to make more difficult disassembly of the program.

There were/are a number of products to defeat copy protection/allow copying of protected software for the A8. The most common way to defeat copy protection was to disassemble the software and revise sections of code so that the copy protection was defeated. A software with defeated copy protection is called a 'cracked' software. The basic procedure is to understand how cart/tape/disk software initializes, loads and runs. Usually make a file out of the software and 'follow the code', starting with loading of the program, to decryption to the actual running of the program. Today, it is unnecessary to copy original commercial A8 software because it has already been defeated and may be found at a few FTP sites.

Besides 'cracking' software, there were/are hardware devices to copy commercial protected software. The Happy 1050 and the Archiver, and probably other modifications to the 810, or 1050 allowed 'bit image' copying and reproduction of the special formatting that copy protected disks had.

Alphasys (2009.03):
For the Speedy, there is a special program called Speedy Backup, which can copy about 80% of the protected disks.

Using these archiving disk drives, a copy of the original disk, including all special formatting and the original code is copied, thus making a copy protected copy, not cracked, just like the original.

For carts, copying could involve cracking or again there were/are products to reproduce the cart and simulate a ROM. Or the cart might be copied and burned on the correct type of EPROM, to make a plug in cart. 'The Impersonator', the 'Pill' are two cart copy schemes copy the cart to a file, then don't change the code, but use a 'dummy cart' to fool the software into thinking there is a ROM present.
Basic tools for copying, then cracking, carts and disks are a sector editor and disassembler. Carts are usually most easily dumped using a special OS, like Omnimon, to interrupt the cart and dump memory to disk. There are a few pd cart copiers that have the user plug the cart in when the program is running, I don't believe these pd cart copiers are very good or very wise to use.

So, the basic answer to 'how do I make a copy of my copy protected commercial software' is don't bother. Find it on the net.

There is one exception, in that this 'solution' involves a minimum of effort and is relatively safe. I refer to 'Chipmunk' and 'Black Patch' software to make cracked boot disk copy of commercial disks. HOWEVER, even if you use these two commercial archival tools, be sure you write protect your originals, and be careful not to accidentally write to the original disk.

Finally, I'll mention a very modern (I mean 1997) product. The APE ProSystem, by Steven Tucker, in the registered version of this shareware allows making disk images called 'Pro' images. APE (Atari Peripheral Emulator) requires a cable, called the SIO2PC cable, that connects the A8 13 pin serial port to a serial port on the IBM PC clone. To make 'Pro' images, a special adapter cable is needed, not just the 'standard' SIO2PC cable. The 'Pro' image can 'capture' the copy protection of an original commercial disk. The 'Pro' image can then be loaded into an A8 using the APE registered version software, thus backing up your original disk software. Note the 'Pro' image will only be of use to person(s) owning registered APE software and 'Pro' adapter cable.

Subject: 10.1) What programs can log in to other computers via modem?

Here are some of the more popular PD/freeware/shareware terminal emulator and related programs available. Use one of these programs for accessing a dial-up Bulletin Board System (BBS) with your Atari, or for accessing a dial-up "shell account" with your Internet Service Provider (ISP). Dial-up shell accounts are no longer widely available here in the 21st century! (There is no general-purpose PPP capability for the 8-bit Atari that I am aware of.)

ATAR-Z-MODEM 1.2, 5/29/94, shareware by Larry Black
   Emulates: n/a
   Text: 40 columns in gr.0
   File Xfer: ZMODEM download
   Autodial: No
   Backscroll buffer: No
   Capture-to-disk: no
   Summary: Intended to be used as an external ZMODEM receive utility in conjunction with other terminal programs, especially BobTerm
BobTerm 1.2x, 1990-1993, shareware by Bob Puff
Emulates: VT52
Text: 40 columns in gr.0; 80 col. w/ XEP80
File Xfer: XMODEM, YMODEM, FMODEM
Autodial: Yes
Backscroll buffer: No
Capture-to-disk: Yes
Summary: Feature-filled; best for BBSing
Version 1.21, 4/27/1990 final complete package:
http://www.nleaudio.com/css/
Version 1.22 update, 05/1990:
ftp://ftp.pigwa.net/stuff/collections/holmes%20cd/Holmes%203/LACE/LACE021A.ATR
ftp://ftp.pigwa.net/stuff/collections/holmes%20cd/Holmes%203/LACE/LACE021B.ATR
Version 1.23 update, 03/1993:
http://www.mixinc.net/atari/download_a8/datacom/bobt123.lzh or
http://members.chello.nl/becotel/atari/software.html

FlickerTerm 80 v.0.51, freeware by LonerSoft (Clay Halliwell)
Emulates: VT100, IBM ANSI
Text: 80 column via a special Graphics 0 screen (no hardware required)
File Xfer: None
Autodial: No
Backscroll buffer: No
Capture-to-disk: No
Summary: Fast and complete VT100 emulation; readability a minus

Ice-T XE v2.72, (c)1997 by Itay Chamiel, February 12, 1997
* Requires an XL/XE with at least 128K RAM
* Complete VT-102 and ANSI-BBS emulation, including boldface/blink support
* Takes advantage of XE/upgraded-XL banked RAM to provide many features
* Supports up to 19,200 baud, with no data loss
* Readable 80-columns, usable even with color TV
* Fully menu driven
* Xmodem-CRC, Xmodem-1K, Ymodem-batch, Ymodem-G, ZMODEM download protocols
* ASCII upload, 16K capture buffer
* 16K scrollback buffer
* Auto-dialer, with a directory of up to 20 numbers
* Text file viewer
* Fine scroll
* Print screen
* Ice-T 800 v1.1 also available:
  - Requires 48K RAM, runs on all machines including 400/800
  - Has a reduced feature set relative to Ice-T XE 2.72

Kermit-65 3.7, PD by John R. Dunning
Emulates: VT100
Text: 40 columns in gr.0; 80 col. in gr.8; 80 col. w/ XEP80 (sort of)
File Xfer: Kermit
Autodial: No
Backscroll buffer: No
Capture-to-disk: No
Summary: Excellent VT100 emulation; rock-solid Kermit Xfers
filenames: k65v37.arc ; k65doc.arc - docs ; k65src.arc - source

OmniCom by CDY Consulting (David Young)
Emulates: VT100
Text: 80 columns in gr.8
File Xfer: XMODEM, Kermit
Autodial: No
Backscroll buffer: No
Capture-to-disk: No
Summary: Only option combining VT100, XMODEM, Kermit
filename: omnicom.arc

PabQwk 2.0, 1 Feb 1994, shareware by Low-Budget Productions (Pab Sungenis)
Requires: 128K XL/XE
Emulates: n/a
File Xfer: QWK upload/download
Summary: The Professional QWK reader for the Atari 8-bits. (QWK is a packet format created in the IBM BBS community for reading mail offline.)

Term80 1.9 (5.19.96), by CTH Enterprises (Tom Hunt)
Requires: MIO or Black Box
Emulates: ANSI
Text: 80 columns in gr.8
File Xfer: XMODEM receive, YMODEM send/receive
Autodial: Yes
Backscroll buffer: No
Capture-to-disk: Yes
Summary: Designed for calling IBM ANSI BBSs at the highest possible speeds supported by the MIO and Black Box (14.4 Kbps)

VT850 B1, shareware by Curtis Laser
Emulates: VT100/VT102 (plus complete VT220 keymap)
Text: 40 columns in gr.0; 80 col. w/ XEP80
File Xfer: None
Autodial: No
Backscroll buffer: No
Capture-to-disk: Yes
Summary: Only option for VT100 emulation on the XEP80; 1200bps top speed
filename: vt850b1.arc

Subject: 10.2) What programs can I use to host a BBS on the Atari?
Contributors to this section include: Winston Smith, Steven Sturza, Chad Hendrickson, Don Fanning, Matt Singer, Pete Davis, Jeff Williams, Rod Roark

"A BBS, plain and simple, is some hobbyist setting up their own computer to answer incoming calls from other hobby computers. The visiting person leaves messages on this computer for other visitors, plays games while visiting, sends and receives files, and all that." -- Greg Goodwin, 2005

The 8-bit Atari was particularly popular for hosting a dial-up Bulletin Board System (BBS). This section attempts to list all BBS programs for the Atari.

For most programs listed, a link is provided to the corresponding section at http://www.bbsdocumentary.com/software/ which is a comprehensive collection of BBS information, screenshots, and downloads collected by Jason Scott.

- AMIS BBS -- Atari Message & Information System
  The "granddaddy" of BBS programs for the 8-bit Atari.
  The AMIS BBS was written in BASIC. It included designs for a ring-detector. You needed a sector editor and had to allocate message space by hand, hex byte by hex byte.
  Several versions of AMIS, all released directly to the public domain:
  * AMIS (Standard, original version; 04/17/83?)
    by Tom Giese (coding?) and Arlan R. Levitan (system designer?)
    for Hayes Smartmodem connected via 850 interface
    http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/AMIS/
  * MACE AMIS
    Revisions by Larry Burdeno and Jim Steinbrecher
    http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/MACEAMIS/
  * Carnival BBS
    Revisions by ???????
    - "essentially AMIS with an overlay to allow for private messages and passwords." --Antic v3n9Jan85
    - "demands a large amount of disk space and requires every bit of memory your system has." --Antic v3n9Jan85
    http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/CARNIVAL/
    http://www.atarimagazines.com/v3n4/communications.html
    http://www.atarimagazines.com/v3n9/communications.html
  * Fast AMIS
    Revisions by Stan Subeck & Susie Subeck (??????)
    According to Antic v3n9Jan85:
    - Built-in modem commands for a Hayes Smartmodem.
    - Requires some modification to run with an MPP, Signalman Mark 7 or Mark 12 modem.
    - Requires a different method of auto-answer than other BBS programs, and demands a different setting of the modem's internal DIP switches.
    - Message files compact automatically.
* Comet AMIS
  Revisions by Matt Pritchard and Tom Johnson
  "Comet was the finest Atari based system in its day, and deserves to be remembered." - Trent Condolone,
  http://bbslist.textfiles.com/704/oldschool.html
  - Early version by Matt Pritchard called MPP AMIS, for MPP modems only
* AMIS XM301 - Mike Olin and Mike Mitchell (Catspaw Software Systems)
* TODAMIS 1.0, for 1030/XM301, 1986, Trent Dudley

- ADCM BBS
  - Version 1.00 (C) 1985 ADCM Systems
  - (C) ADCM Systems  Version 1.35 - January 15th, 1986
  - For use with the Pocket Modem by BOT Engineering
  - jacobus writes (11/2010):
    "Features a command driven interface, private mail, public message board, upload and downloads. Handles up to 255 users up to 500 baud."
    "The author is Julius Oklamcak"

- ARMUDIC, by Frank Huband
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/ARMUDIC C/
  From the Atari club of Washington, D.C.
  Greg Leslie writes "It was written (in BASIC with machine language subroutines) by Frank Huband, and the name came from the numbers used to dial the original BBS.

- ATABBS - Atari Bulletin Board System
  Rod Roark writes (3/12/03):
  This is really straining my memory -- don't recall exactly when I wrote the thing (maybe '80 or '81), but as far as I know ATABBS was the world's first BBS for the Atari 400/800.
  I ran it out of my condo in Atlanta on a 48K 400 with an 80K floppy drive and a 300 bps Hayes Smartmodem. The 48K memory module was a third party add-on, not Atari's.
  It was written in Atari BASIC with a few bytes of machine language thrown in.

- AtariLink -- by Pab Sungenis.
  From his blog at http://atari8programming.blogspot.com/ on 3/20/06:
  In 1985-1986 I wrote and eventually released the AtariLink BBS software. This came out of necessity, since most Atari BBS programs at the time (especially FoReM and its bastard children) didn't fully support the 1030 modem that I used (or the XM301 that followed afterward). I eventually adapted the program to work with Atari's 1200 bps SX212 modem when that was released, and in the process threw the program open to just about every modem out there. AtariLink
floated in the wild, passed from BBS to BBS for a while, before an Atari magazine (I forget which one) distributed the software as its disk of the month.

- ATKeep -- An Atari 8-bit version of CITADEL BBS, by Brent Barrett
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/ATKEEP/
  ATKeep is a Citadel-like BBS system for eight-bit Ataris. ATKeep runs under SpartaDOS and requires BASIC XE and 128K of RAM. Originally "MBBBS (Message Base Bulletin Board System) 1.0, March 24th, 1986" MBBBS was changed to Atari Keep, or, ATKeep for short, around version the time version 4.0 was released (June 15, 1986).

ATKeep 7.0 finally took the aide and cosysop commands out of a menu section and put them into extended commands, where they belonged. It also added a SYSOP level command set. Users were no longer "users" "aides" or "cosysops," they had become level "A" (SYSOP) through level "Z" (READ ONLY). The system had become extremely complex. Public, hidden OR password protected PRIVATE rooms. Each room now had its own access level (thus keeping people of lower level from getting in EVEN if they knew the room name). Each room was assigned a RWRT (or Read WRiTe status), which determined who could enter messages in it, and whether or not public or private messages, or both were to be allowed.

Before version 7.0, ATKeep only worked with the Atari 1030 or XM301 modems. ATKeep 7.0 was rewritten to accommodate the 850 or PRC interface allowing use of any Hayes compatible modem.

ATKeep version 7.50 was released (1987), was version 8 released?

- BBCS -- Bulletin Board Construction Set, by Scott Brause/Antic, 1985
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/ABBCS/
  A machine language program, developed as the Jersey Atari Computer Group (JACG) BBS system.

BBCS was known for its great flexibility. The sysop was offered easy customization by the use of menus. Many BBSes before it required that you had to actually change the BASIC code in order to customize your BBS.

Unfortunately, it also suffered from a reputation for stability problems.

  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/BBSEXPRRESS/
  Written in compiled Action!. 835/1030/XM301 and 850 versions.

- BBS Express! Professional ("Pro")--6.0b 1999, Lance Ringquist/Video 61
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/BBSEXPRRESSPRO/
  Originally released in 1988 by Keith Ledbetter and Chris King from Orion Micro Systems. bf2k+ wrote (May 2010) that version 2.1a was the last version
compiled by Keith Ledbetter before he sold it.

Version 5.0 Copyright 1995 by K-Products (Bob Klaas) credited to:
Stephen J. Carden, Keith Ledbetter, and Chris King

Currently owned by Lance Ringquist/Video 61.

Written in 100% machine language. Requires XL/XE, SpartaDOS 3.2+, hard drive highly recommended, or at least a large RAMdisk. R-Time 8 is fully supported.

- Carina BBS, Jerry Horanoff
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/CARINA/

- Carina II BBS -- v2.7 (1995), David Hunt/Shadow Software
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/CARINA/
  Originally developed by Jerry Horanoff; a complete re-write of Carina BBS.

Requires an XL or XE computer, at least 500K of storage capacity (including RAMdisk and drives), and SpartaDOS version 2.3 or greater. Recommended: 192K RAMdisk or greater, and an R-Time cartridge. Fully supported: An MIO interface and a hard drive.

Pete Davis writes (15 Aug 2002):
Carina was a pretty powerful BBS system. Though it was written in BASIC (with a number of machine language routines), it was expandable and was able to load new BASIC programs with the BBS running. In fact, it was quite modular and would load different sections of the BBS at runtime. I actually used it when I ran a BBS some time back.

- FoReM BBS -- Friends of Rick E. Moose BBS.
  Developed/sold by Matthew R. Singer.
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/FOREM/

Versions that operate with the Atari 850, the ATR 8000 CP/M interface, and other configurations. Written in Atari BASIC.

Matt Singer writes:
FoReM BBS derived from an early AMIS. When multiple message areas were added the name was extended to FoReM 26M. Then, When OSS released BASIC XL the program was rehacked and called FoReM XL... Bill Dorsey wrote most of the Assembler routines (where is he now?).

- FoReM MPP BBS -- developed by Matt Singer, sold by MPP
  FoReM BBS version for the MPP direct-connect modems.

- FoReM 26M BBS -- developed/sold by Matt Singer.
  FoReM BBS updated to support multiple message area.
- FoReM XL BBS -- developed/sold by Matt Singer. FoReM 26M updated to take advantage of BASIC XL from OSS.

- FoReM XE BBS -- developed by Matt Singer
  This version of FOREM BBS requires the commercial BASIC XE cartridge in order to run. It is in the public domain and can import and export messages from the Atari PRO! BBS EXPRESS-NET (7-bit text only, control ATASCII graphics are reserved for message data-structure bytes).

- FoReM XE Professional BBS / FoReM XEP BBS -- by Len Spencer
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/FOREMX E/
  A re-write of FoReM XE BBS, last version was 5.4, Jan 5 1993.
  FXEP requires an XL/XE computer with at least 128k of memory, the BASIC XE cartridge from OSS/ICD, SpartaDOS 3.2 (this program will NOT work with any other version), and at least 500K of storage.

  FXEP is available at: http://www.lenardspencer.com/Lenspencer/fxep.html

- Marsh BBS -- written by Matt Arrington
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/MARSH/
  Primarily written in machine language.
  "very structured and very customizable at the same time" - Brian A. Diaz

- MBBBS (Message Base Bulletin Board System)
  -- early name for ATKeep, see above

- NITE-LITE BBS -- Paul Swanson's BBS with RAMdisk.
  http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/NITELI TE/
  Paul Swanson was a programmer from the Boston, Massachusetts, USA, area.

  "1983: Nite-Lite B.B.S. goes on the air. (Was it running A.M.I.S. ?) It is called "Nite-Lite" because the computer monitor casts an eerie glow about the room. 1984: Paul Swanson writes his own BBS hosting software for the ATARI 6502 8-bit computer. He names it "Nite-Lite". The Nite-Lite BBS hosting software goes on to be the most successful commercial BBS software ever written for the ATARI 6502 8-bit computer. 1989: Nite-Lite BBS puts in a second line. (MichTron boards eventually take the place of all of the ATARI Nite-Lite boards.)" - Winston Smith

  This BBS was the first to support a RAMdisk, which Paul Swanson called a "V:" device for "virtual disk". This BBS was written in Atari BASIC and required a joystick hardware "dongle" device. This was notable as being one of the first Atari 8-BIT BBSs that could actually go for a week without having to be rebooted. Pointers to the message base were kept in an Atari "very long string" (for which Atari BASIC is famous). The BBS would only have problems (for the most part) if this string became corrupted.
OASIS (the commercial version) / OASIS Jr. (the pd version)
http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/OASISIV/
http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/OASISJR/
The original OASIS BBS System was written by Rich Renner and Ralph Walden with
tech support and input from Leo Newman. It was first published by OASIS BBS
Systems (Renner/Walden/Newman) in 1986, and distributed by Leo Newman. Later,
the rights were transferred to Glenda Stocks/Z INNOVATORS, then later (1991)
to Jeff Williams ("Alf").

All machine language. OASIS is very crash-resistant and comes with a "dial
out" screen so that the Sysop can use the BBS as a terminal program to call
and fetch files without having to bring the BBS down and reload a terminal
program. OASIS supports "Door programs" which it refers to as "OASIS PAL
modules". An excellent message system, and a complex file system. It
consists of "file libraries" with suites of "file types". There is quite a
bit of overhead involved in performing a download (which may be a good thing,
as it discourages file hogs). OASIS IV performs networking. SpartaDOS 3.2x
recommended, but any DOS supported. R-Time 8 clock cartridge supported.

Glenda Stocks writes at http://world.std.com/~snet/glenda.htm:
I purchased the source code rights to OASIS and began marketing the BBS
software to Atari 8-bit enthusiasts around the world. I felt that I had the
superior BBS software because I had programmed in the ability to run external
programs, including online games and user surveys. I also had added color
prompts for IBM clone users who called Atari boards running my OASIS software.
Sometime in 1991...I sold the rights to OASIS to a man in Canada.

Jeff Williams ("Alf") writes: (12/6/02)
OASIS was around prior to either PRO or BBS Express! IIRC, I don't know when
exactly it showed up, version 3.09 was the first one I remember seeing. What
made it nifty was it was very fast, being all assembler, and having some
different features that things like Forem & Carina didn't have. Compared to
something like Forem MPP at the time, it was kind of amazing.

Ralph Walden sold it to Glenda Stocks, who chopped it up into modules and sold
it as ver 4.7. PRO was out by then, and was a much more complete offering
imo. Glenda wrote some modules for 4.7, but it never really went anywhere
because the architecture was so cramped with her changes.

Eventually she gave up and sold me the source. I looked it over and realized
it was a mess and nothing was going to happen with it. I worked on a version 5
for a while, but never made much progress.

Puff BBS -- by Robert (Bob) Puff
http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/PUFFBB/
"came with a hardware component to both provide ring detect for the Atari
(none existed in the modem) and to serve as a hardware key/dongle associated
with the software."
SMART BBS -- by Marco Benton
http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/SMARTBBS/
This program is written entirely in BASIC. It expects to be running under a SpartaDOS environment. This BBS program uses a "modem clock string" rather than an R-Time 8 cartridge in order to retrieve the current time. It also comes with an Atari BASIC game door called "Sabotage".

TART-BOARD -- by Bob Alleger
Early Atari BBS.

XeBBS+ -- by Jonathan Taylor
http://www.bbsdocumentary.com/software/ATARI/EIGHTBIT/XEBBS/
for the Atari 130XE / Expanded 800XL, required BASIC XE, designed to work with the Supra 10 megabyte hard drive. "used the Automatic Modem Processor (AMP) code from FoReM XE, but was otherwise written from scratch." - Jonathan Taylor

835 & 1030 Modem Bulletin Board
-- by Gardner Computing (earlier) / Duplicating Technologies (DT)(later)
Auto answer, XMODEM upload/download, sold with ring detector.
Ads: ROM #9 Dec'84/Jan'85 p. 37; Antic v4n10 Feb 86 p. 44

Subject: 10.3) How can I read/write 8-bit Atari disks on an MS-DOS PC?

There are several programs that allow an MS-DOS system to work with an Atari-format 5.25" diskette. Most of these work with the Atari SS/DD 180K format.

There is also a device, detailed below, that allows an external 5.25" floppy disk drive to be connected to a modern PC via a USB port, and which supports reading Atari DOS 2 SS/DD 90K floppy disks.

Atari-Link PC (AtariDsk) V1.2 (c) 95-12-09
==================================================================================================
by HiassofT (Matthias Reichl)
Ataridsk is a program for MSDOS-PCs that allows you to access Atari floppy disks in double density (180k). All you need is a PC (XT or 286 should be sufficient) and a 5.25" floppy drive. Features of this tool:
  * Menu driven user interface
  * read, write and format Atari disks on the PC
  * small size (only 35k)
http://www.horus.com/~hias/atari/

WriteAtr V0.92b
==================================================================================================
by HiassofT (Matthias Reichl)
With WriteAtr you can write double density ATR-images to Atari floppy disks on your MSDOS-PC. You can also create ATR-images of double density floppy disks! All you need is a PC and a 5.25" and/or a 3.5" floppy drive.
Version 0.92b added experimental support for the enhanced density (1040 sectors/128 bytes per sector) format. Please note: this format doesn't work with a lot of floppy controllers - use it at your own risk!
http://www.horus.com/~hias/atari/

MyUTIL
=======
- by Mark K Vallevand
- Based on Charles Marslett's UTIL.
- http://www.umich.edu/~archive/atari/8bit/Diskutils/Transfer/ myutil.zip
- Includes SpartaDOS disk utility v0.1e to access 180K SpartaDOS disks

ATARIO
=======
- by Dave Brandman w/ Kevin White
- Reads SS/DD 180K Atari disks.
- www.umich.edu/~archive/atari/8bit/Unverified/Diskutils-redirect/atario21.arc

SpartaRead
==========
- by Oscar Fowler
- Reads SS/DD 180K SpartaDOS disks.
- http://www.umich.edu/~archive/atari/8bit/Diskutils/Transfer/ sr.arc

UTIL
=====
- by Charles Marslett
- Reads/Writes SS/DD 180K Atari disks.
  http://www.wordmark.org/

==============================================================================
Here's some advice on using the above utilities from Hans Breitenlohner:

There are two technical obstacles to interchanging disks between DD Atari drives and PC drives.

1. The Atari drive spins slightly slower (288 rpm instead of 300 rpm).
   If you format a disk on the Atari, then write sectors on the PC, it is possible that the header of the next physical sector will be overwritten, making that sector unreadable. (The next physical sector is usually the current logical sector+2). The solution to this is to format all disks on the PC.
   (Aside: Does anybody know how this problem is handled on the XF551? Is it also slowed down?)
Konrad Kokoszkiewicz answers: "The XF551 disk drive is not slowed down - these drives are spinning 300 rotations per minute. To prevent troubles with read/write disks formatted and written on normal Atari drives (288 rot/min), the main crystal frequency for the floppy disk controller is 8.333 MHz (not 8 MHz, as in 1050, for example)."

2. If the PC drive is a 1.2M drive there is the additional problem of the track width.
   The following is generally true in the PC world:
   - disks written on 360k drives can be read on either drive
   - blank disk formatted and written on 1.2M drives can be read on either kind
   - disks written on a 360k drive, and overwritten on a 1.2M drive, can be read reliably only on a 1.2M drive.
   - disks previously formatted on a 360k drive, or formatted as 1.2MB, and then reformatted on a 1.2M drive to 360k, can be read reliably only on a 1.2M drive.
   (all this assumes you are using DD media, not HD).

   Solution: Use a 360k drive if you can. If not, format disks on the Atari for Atari to PC transfers, format truly blank disks on the PC for PC to Atari transfers.

Jon D. Melbo sums it up this way:
   So a basic rule of thumb when sharing 360KB floppies among 360KB & 1.2MB drives is: Never do any writes with a 1.2MB drive to a disk that has been previously written to in a 360KB drive....UNLESS... you only plan on ever using that disk in the 1.2Mb drive from then on out. Of course a disk can be reformatted in a particular drive any time for use in that drive. As long as you follow that rule, you can utilize the backwards compatible 360KB modes that most 1.2MB drives offer.

AnaDisk + DeAna

While the above mentioned utilities work with SS/DD 180K Atari-format disks or SS/DD 180K SpartaDOS disks, the following combination of utilities has been used successfully to read SS/SD 90K Atari-format disks. So if you only have standard Atari 810 and/or Atari 1050 drives, you could look into:

AnaDisk -- now a product of New Technologies Inc. (NTI)
See: http://www.forensics-intl.com/anadisk.html
The current version is "not made available to the general public" (!)
Previously a product of Chuck Guzis @ Sydex, http://www.sydex.com/
Older versions available: http://ch.twi.tudelft.nl/~sidney/atari/
- Reads/Writes "any" 5.25" diskette

DeAna by Nate Monson
Available: http://ch.twi.tudelft.nl/~sidney/atar/- converts AnaDisk dump files from Atari format

See http://ch.twi.tudelft.nl/~sidney/atar for tips on using this combination of utilities.

Preston Crow writes:
"As best as I can figure it out, if your PC drive happens to read FM disks (I'm not sure what the criteria for that is), then you can read single density disks on your PC by dumping the contents to a file with AnaDisk, and then using Deana.com to convert the dump file into a usable format.

For enhanced density disks, Anadisk generally only reads the first portion of each sector, but it demonstrates that it is possible for a PC drive to read enhanced density disks."

FC5025 USB 5.25" floppy controller
==================================
- by Device Side Data
- Plugs into any computer’s USB port and enables you to read data from an external 5.25" floppy drive.
- Sold as a controller board only without a drive mechanism.
  - It has been tested to work well with the TEAC FD-55GFR drive and should also work with most other 5.25" drives.
  - The FC5025 is read-only. It cannot write to floppies.
  - The FC5025 may be unable to read disks that are damaged or copy-protected.
  - The FC5025 is intended for 5.25" disks only, not 3.5" or 8" disks.
  - The FC5025 may be unable to read the second side of "flippy" disks, depending on the drive it is attached to.
  - The included software works on 32-bit Windows (not 64-bit Windows).
  - The included software supports reading Atari 810 disks.

OmniFlop
=========
- by Sherlock Consulting (Jason Watton)
- a 'universal' floppy disk reader, writer, and tester for the IBM PC or compatible which can handle alien floppy disk formats not normally supported by DOS, Windows and Linux.
- OmniFlop on its own transfers disks between systems. If you want to access files, for example, on these disks then you need more - you will need to use OmniFlop to image the disk, then other software to interpret the filing system. OmniFlop alone only handles whole disks.
- Features include:
  - Read, write, and format Atari 8-bit format (90kB). (Charles Doty)
  - runs under Windows 2000, Windows XP, Windows Vista and Windows 7;
Subject: 10.4) How can I read/write MS-DOS PC disks on my Atari?

Several 3rd-party hardware upgrades add the capability of working with MS-DOS diskettes to your Atari system:

Happy 1050 Enhancement upgrade for the Atari 1050
-- read/write 180K 5.25" MS-DOS floppies with IBMXFR IBM Transfer Program

CSS XF Single Drive Upgrade for the Atari XF551
-- replace the 5.25" mechanism with a 3.5" mech.
-- read 720K 3.5" MS-DOS disks
  see http://www.nleaudio.com/css/products/XFsingdrup.htm

CSS XF Dual Drive Upgrade for the Atari XF551
-- add 3.5" drive without losing the 5.25" drive
-- read 720K 3.5" MS-DOS disks
  see http://www.nleaudio.com/css/products/XFdualdrup.htm

CSS Floppy Board, for the CSS Black Box
-- adds support for PC 720K and 1.44MB 3.5" drives to your Atari system
-- adds support for PC 1.2MB and 360K 5.25" drives to your Atari system
-- read/write 5.25" and 3.5" MS-DOS disks in your PC drives with your Atari
  see: http://www.nleaudio.com/css/products/floppy.htm

Subject: 10.5) How do I transfer files using a null modem cable?

This section by Russ Gilbert.

Q: How do I connect two computers using a null modem cable?

A: You need a term program and RS-232 ports on both computers. The RS-232 ports need to be connected together using a 'null modem cable'.

For up to 4800 baud, no flow control lines need be connected. Just cross the transmit and receive lines and join the grounds together. Transmit is pin #2, receive is pin #3 and ground is pin #7 on the 25 pin port. 25 pin #2 goes to Atari #4 (XMT to RCV), 25 pin #3 goes to #3 on Atari (RCV to XMT) and #5 of 850 goes to #7 of 25 pin (GND to GND).
The right hand pin on the 'long' side of a female 'D' connector is #1. There are 13 holes on this 'long' side, 12 holes on the 'short' side. The numbers go to the left 1 to 13 then #14 is under #1 and left again so that #25 is under #13.

Most term programs allow a null connection, without a carrier detect. Notably, '850 Express!' does not. I have only used 'Procomm 2.4.3' (the last shareware version of Procomm) on the PC and BobTerm on the Atari, but other term programs may work.

To check your null modem connection, start both PC and Atari term programs, set baud to 2400 or 4800 on both computers. No parity, 8 data bits, 1 stop bit on the PC. Be sure to use the correct COM port on the PC. Go to 'terminal' mode and you should now be able to type on either computer and see it on the other screen. To accomplish a file transfer, use Y-modem probably from BobTerm, rather than X-modem. X-modem will often append bytes to a file transfer, an undesirable event. There is also a very nice Z-modem receive program for the Atari, called ATAR-Z-MODEM by Larry Black for the Atari.

A convenient way to make a null modem cable, up to about 30 feet long, is to use two female DB25 connectors (Radio Shack) some three or more conductor cable. Using the two DB25 female connectors allows unplugging your modems and plugging in the null modem cable into the two modem cables. This also avoids the confusion of variations in the computer ports. Most computers connect into the modem end via a standard RS-232 DB25 connection. With this both ends 25 pin cable, you would cross pins 2 and 3 and connect the #7s together to make a null modem cable.

The SIO port on the Atari cannot be used directly. An 850, P:R: Connection, MIO, Black Box or similar device that provides an RS-232 port must be used.

Following are pin assignments for a DB25 pin RS-232-C port.

1. Protective Ground
2. Transmit Data
3. Receive Data
4. RTS (Request to Send)
5. CTS (Clear to Send)
6. DCD (Data carrier Detect)
7. RXD (Receive Data)
8. TXD (Transmit Data)
9. GND (Ground)
10. DCD (Data carrier Detect)
11. DSR (Data Set Ready)
12. RTS (Request to Send)
13. DTR (Data Terminal Ready)
14. DTR (Data Terminal Ready)
15. RXD (Receive Data)
16. TXD (Transmit Data)
17. CTS (Clear to Send)
18. GND (Ground)
19. RTS (Request to Send)
20. DTR (Data Terminal Ready)
For higher speed connections, above 4800 or 9600, you need the flow control lines and Atari term software that has flow control built in. You also need an MIO or Black Box, which uses the PBI (parallel bus). A high speed cable would need not only XMT, RCV, and GND, but also flow control lines. I suggest a commercial null modem from computer store to ensure correct lines. A null modem is a small adapter with the correct lines already crossed. I don't know how to correctly connect the CTS, RTS, DTR, DSR, CRX lines for a high speed null modem. With a null modem, you just plug it into the 25 pin connectors of the two modem cables you might already have connected to your Atari and PC or Mac. You may need a straight thru 25 pin gender changer also.

Following is in this FAQ elsewhere, but I summarize here: (Figure out or look for pin numbers on the ports.) Note that these are pin assignments, and NOT null modem connections with the XMT, RCV crossed and GND straight thru.

Atari 8-bit PC AT 25 PC AT 9 pin
-------------------------------------
1. DTR 20 4*
2. CRX 8 1*
3. XMT 2 3
4. RCV 3 2*
5. GND 7 5
6. DSR 6 6
7. RTS 4 7
8. CTS 5 8
9. No connect? shield RI
   22 RI

Note: * above indicates the difference between an AT 9 pin and a Atari 8-bit 9 pin cable connector. eg. If you check continuity from pin 3 of 25 pin end and it goes to pin 4 of nine pin end, you have an Atari serial cable. If pin 3 of 25 pin goes to pin 2 of 9 pin end, you have a PC serial cable.
(updated 3/1/99)
(DTE = Data Terminal Equipment, i.e., your computer.
DCE = Data Communications Equipment, i.e., your modem.)
Subject: 10.6) How can my PC utilize my Atari disk drive?

==> 1050-2-PC, by Nick Kennedy

1050-2-PC is a device used to allow the PC to communicate directly with an Atari disk drive. It requires hardware which is very similar to the SIO2PC but configured differently. It allows direct sector I/O with the Atari drive and can be used to create disk images which will emulate copy protection schemes when run on SIO2PC.

More 1050-2-PC information: http://pages.suddenlink.net/wa5bdu/1050.txt
SIO2PC home page: http://pages.suddenlink.net/wa5bdu/sio2pc.htm

==> APE ProSystem, by Steve Tucker

The APE ProSystem goes beyond Steve Tucker’s Atari Peripheral Emulator (APE). The ProSystem has two components:

- The program PROSYS.EXE is used to create the protected and unprotected disk images which are then used by APE.

- The ProSystem hardware is a cable designed to allow direct connection of a stock 1050 disk drive directly to a PC’s serial port for use by the PROSYS.EXE software.

http://www.atarimax.com/

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Subject: 10.7) What about interoperating with the Apple Macintosh?

Mark L. Simonson keeps a nice set of web pages which he calls "Mac/Atari Fusion: Atari 8-bit Resources for Mac Users." Please visit:

http://www2.bitstream.net/~marksim/atarimac/

Mark Grebe is the author of two modern solutions for Mac OS X:
- Atari800MacX - Atari 8bit Computer Emulator
- Sio2OSX - Atari 8Bit Peripheral Emulator
http://www.atarimax.com/

The FC5025 USB 5.25" floppy controller by Device Side Data plugs into a USB port and enables a Mac to read data from an external 5.25" floppy drive. Included software supports reading Atari 810 disks.
Subject: 10.8) Are there 8-bit Atari tools for the Commodore Amiga?

'551conv', freeware by Achim Hartel:
Converts a real Atari-800-disk, .xfd-image or .atr-image into a real
Atari-800-disk, .xfd-image, .atr-image or extracts the files of the
disk (-image). All 4 formats of the XF551-station supported: Single,
Medium, Double, Quad. Version 1.03.

Subject: 11.1) What is the history of Atari's 8-bit computers platform?

Information presented here has been collected by MC from public sources, such
as magazine and newspaper articles, press releases, corporate annual reports,
and SEC filings. I have no special access to inside information.

Have to credit Kr0tki for finding sales figures in Polish periodicals:
http://www.atariage.com/forums/topic/183619-total-number-of- a8-units-sold-
worldwide/page__st__75__p__2311754#entry2311754

For a broader Atari history may I suggest: http://mcurrent.name/atarihistory/

1977
Summer: Atari engineers Steve Mayer, Ron Milner, and Joe Decuir, veteran
designers of the Atari VCS, began work on a next-generation home video game
This project became known as "Oz" inside Atari.

Fall?: The video game technology already under development at Atari as the
"Oz" project would now form the basis for the development of a personal
computer system. The newly-redefined project became known as "Colleen" inside
Atari. The overall engineering plans for "Colleen" were conceived by:
Steve Mayer, Joe Decuir, and Jay Miner

December: "Several other new personal computers, in the PET/TRS-80 price range,
are coming soon...Atari (another video game manufacturer), and a European and
Japenese [sic] company are also expected to enter the competition."
(Micro #2 Dec77 p18; reprinted from "Northwest Computer Club News" Oct77)

1978
January: "Other manufacturers are also looking at TV games as the way to enter
the home-computing market. Atari is said to be working on a programmable unit
featuring color graphics; it will use either custom chips or a 6502 micro."
(ROM v1n7 Jan78 p60)
Spring?: The "Colleen" computer project evolved into two specific computer models:
- "Colleen" - the full machine - would be released as the Atari 800.
- "Candy" - a reduced-feature version - would be released as the Atari 400.
- One or more pre-production Atari 400 units would carry the additional designation: Model No. C7000
  See: http://mcurrent.name/atariads/intro400.htm

Summer?: Atari pre-announced that the Atari computer would debut at the January 1979 Consumer Electronics Show.

September: Atari VCS game programmers David Crane, Larry Kaplan, and Alan Miller were assigned to create an Operating System and BASIC for the Atari computer, after Jay Miner, manager of both custom chip and OS software development for the computer, had determined that both the existing work-in-progress OS and the work-in-progress port of Microsoft BASIC could not meet the January 1979 CES deadline.

October 6: Freeing Crane/Kaplan/Miller to focus on developing the core OS, Atari contracted with Shepardson Microsystems, Inc. (SMI, headed by Bob Shepardson) to create both a version of BASIC and a File Management System (FMS) for the upcoming Atari personal computers. The contract called for delivery by April 6, 1979. Atari planned to take an early, 8K Microsoft BASIC to the CES (in Las Vegas) in January, 1979, and then switch BASICs later.

December: SMI delivered working versions of BASIC and a disk FMS to Atari.

1979
January: Atari (Consumer) introduced the Atari 800 and Atari 400 Personal Computer Systems at the Winter CES in Las Vegas. The 800 would ship with 8K RAM (user-expandable in 8K or 16K increments to 48K) and retail for US$1,000; the 400 would come standard with 8K RAM and retail for US$500. The computers were scheduled to ship in limited quantities in August 1979, with full availability later in the fall. Also introduced: the 410 program recorder, 810 disk drive, and 820 printer. Software previewed: Atari BASIC. Software titles announced: Basketball, Chess, Stock Market (game? never shipped), and "Computer Aided Instruction in over 20 subject areas, including Math, English, History, Literature, Economics, Psychology, Auto Mechanics and many others" (cassette courseware under development by Dorsett Educational Systems for Atari). Coverage of the introduction of the Atari 400/800 from Creative Computing magazine: http://mcurrent.name/atari1979/

"Atari, by introducing its line of personal computers, is the first major consumer electronics manufacturer to demonstrate a commitment to the three paramount needs of both the consumer and retailer: Effective hardware, effective software and effective peripheral components." -- Michael Shea, Atari (Consumer) marketing vice president, quoted in Merchandising magazine


April: Crane/Kaplan/Miller finished their work on the Operating System for the Atari 400/800 computers.

Spring?: Peter N. Rosenthal joined Atari (Consumer) as Director of Marketing, Personal Computer Systems.

May 11-13: At the 4th West Coast Computer Faire in San Francisco Atari again showed the Atari 400/800 computer systems, which were expected to ship within months.

June: At the Summer CES in Chicago Atari again showed the Atari 400/800 computers, which were expected to ship within weeks. The retail price for the 400 system would be US$550 (up from US$500). The 410, 810, and 820 were again shown as well. Accessories introduced: 8K RAM Memory Module, 16K RAM Memory Module. ROM cartridges introduced: Educational System Master Cartridge, BASIC (Atari BASIC), Assembler Debug (would ship as: Assembler Editor), Basketball, Life (would ship as: Video Easel), Super Breakout, Music Composer, Super Bug (never shipped), Computer Chess. Educational System (later dubbed “Talk & Teach”) cassettes introduced: U.S. History, U.S. Government, Supervisory Skills, World History, Basic Sociology, Counseling Procedures, Principles of Accounting, Physics, Great Classics, Business Communications, Basic Psychology, Effective Writing, Auto Mechanics (never shipped), Principles of Economics, Spelling, Basic Electricity, Basic Algebra. Other cassettes introduced: Guide to Basic Programming (would ship as: An Invitation to Programming 1: Fundamentals of BASIC Programming), BASIC Game Programs (never shipped). Diskettes introduced: Blank Diskettes (would ship as: 5 Diskettes), Disk File Manager (would ship as: Master Diskette).

August: Atari received FCC Type I approval for the 400/800 computers, and also the 410 program recorder). The Atari 400/800 were the only personal computers to ever comply with this stringent requirement against any RF interference, before the FCC subsequently relaxed the rules.

August:
"The first official small shipment of the 400/800 was on August 29th 1979. These were hand-built pilot run units to Sears that needed to be in stock by Sept. 1 so they could be placed in the big fall catalog. The units were placed in the Sears warehouse and then immediately returned to Atari after the "in stock" requirement had been met." --Jerry Jessop

September 4: The New York Times reported on p. D7, "Atari Inc., the maker of
home video games, will introduce two new personal computer systems in the fall. The inaugural ad campaign, created by Doyle Dane Bernbach, will break in October in 12 national publications. TV commercials will also be aired in Los Angeles in November and December.

September: In what was likely the first 3rd-party print ad for Atari computer products, Computer Components ("of Orange County"; Westminster, CA) ran a two-page ad on pp. 32-33 of issue #16, September 1979, of MICRO: The 6502 Journal. Page 32 was devoted entirely to the complete Atari personal computers product line as then expected. See: http://mcurrent.name/micro_16_sep_1979_p32.pdf

October: "Atari's production lines were stalled for about a week in October due to yield problems at one of its chip suppliers, Synertek. The low yields at the semiconductor manufacturer resulted in significantly reduced delivery of the MPU to Atari, resulting in about a 3-week delay in getting the computers into the marketplace." Electronic News, December 10, 1979, p. 83.

November: "The first "real" consumer units were shipped in Nov. of '79 and were 400s to Sears followed very shortly by 800s." --Jerry Jessop

November: Conrad Jutson joined Atari (Consumer) as Vice President-Sales & Marketing for Personal Computers.


December: "Atari is funneling large quantities of its 400 and 800 personal computers and software to Sears, Roebuck, while retail computer stores have been faced with late hardware deliveries and received very little, if any, software. Sears is offering the Atari 400, priced at $549.99, through its catalog, and is spot-marketing the machine in its retail stores throughout California and the Chicago area. In addition, the firm is selling the Atari 800, priced at $999.99, in its California stores, but not through the catalog, a Sears spokesman said." Electronic News, December 10, 1979, p. 83.

1980
January: At the Winter CES in Las Vegas Atari introduced the 825 printer, 830 modem, and 850 interface. Software titles introduced: 3-D Tic-Tac-Toe, Star Raiders, Personal Finance (possibly eventually shipped as: Personal Financial Management System). Also, list prices for the 400 and 800 packages increased to US$630 and US$1,080 (up from US$550 and US$1,000).

January?: Atari shipped 3-D Tic-Tac-Toe and Star Raiders

Winter: Atari shipped the 810 disk drive (with DOS I) and the 820 printer (US$449.95).

March?: Atari shipped Music Composer.

April?: Atari shipped the Assembler Editor.

June 15: At the Summer CES in Chicago Atari introduced the: 815 dual disk drive with DOS 2.0D (never shipped), 822 printer, and CX70 Light Pen. Atari also introduced 34 new software packages, including: TeleLink 1, the Atari Accountant series (by Arthur Young & Co.)--General Accounting System; Accounts Receivable System; Inventory Control Program, the Investment Analysis series (by Control Data)--Bond Analysis; Stock Analysis; Stock Charting; Mortgage & Loan Analysis, Conversational French, Conversational German, Conversational Spanish, Space Invaders (SoftSide Aug80). More: Mailing List, Energy Czar, Calculator, Touch Typing, Graph It. Previewed: Missile Command

Summer: Atari modified the 800 computer package. The computer would now ship with 16K RAM (up from 8K); the 410 program recorder and Educational System Master Cartridge were removed from the package; the Atari BASIC Reference Manual was added to the package. The retail price remained US$1,080.

Summer: Atari shipped the 825 printer (US$999.95), 830 modem, and 850 interface (US$219.95).

September: Peter Rosenthal remained director of marketing for Atari computers.

October 21: Roger H. Badertscher was named president of the newly established Computer Division at Atari. He was previously vice president and general manager of the microprocessor division of Signetics, an electronics semiconductor manufacturer.

October: Visicorp introduced the Atari version of VisiCalc.

Fall: Atari shipped the 822 printer (US$449.95).

Atari reportedly lost $10 million on sales of computer equipment of $13 million in 1980 (InfoWorld 9/14/1981)

Atari had sold 35,000 400/800 computers through 1980. (source?)
1981

January 8-11: At the Winter CES in Las Vegas Atari announced that the list price for the 400 computer package with 8K RAM installed was reduced to US$499.95 (previously: US$630), and that the list price for the 16K RAM version of the 400 package would be US$630. Also introduced: Asteroids, Astrology (ultimately released via APX), Atari Word Processor, An Invitation to Programming 2, An Invitation to Programming 3, Missile Command, Personal Financial Management System, Personal Fitness Program (ultimately released via APX), PILOT, SCRAM (A Nuclear Reactor Simulation), Conversational Italian

Winter: Atari released DOS II version 2.0S.

February 25: The source code to Atari BASIC, the FMS component of Atari DOS 2.0S (DOS.SYS), and the Atari Assembler Editor were purchased from Shepardson Microsystems, Inc. (SMI) by Optimized Systems Software (OSS), headed by former SMI employees Bill Wilkinson and Mike Peters.

Spring: First issue of The Atari Connection, the glossy magazine published by the Atari Computer Division in support of the 400/800.

Spring: Keith Schaefer joined Atari (Computer division) as National Sales Manager.

April 3-5: Atari Software Acquisition Program (ASAP) staff attended the 6th West Coast Computer Faire in San Francisco, offering a grand prize of US$25,000 in cash and US$75,000 in Atari products to runners-up for Atari computer software authors. In order to qualify for the awards, programs would have to be accepted and sold through the soon-to-be-launched Atari Program Exchange.

April 3-5: Also at the West Coast Computer Faire, Optimized Systems Software (OSS) introduced BASIC A+, CP/A (would ship as: OS/A+), and EASMD (enhanced, disk-based versions of Atari BASIC, Atari DOS 2.0S and Atari Assembler Editor, respectively).

May 4-7: At the National Computer Conference in Chicago, Atari announced that the 8K Atari 400 was being discontinued and that the price on the 16K version was being reduced to US$399 (was US$630); also, the 400 would no longer be sold with the Atari BASIC cartridge and the Atari BASIC: A Self-Teaching Guide book. Other price reductions: CX852 8K RAM module now US$49.95 (was US$124.95), CX853 16K RAM module now US$99.95 (was US$199.95), 820 printer now US$299.95 (was US$449.95). Also introduced: Dow Jones Investment Evaluator, Atari Microsoft BASIC, Macro Assembler and Program-Text Editor
May: Atari launched the Atari Program Exchange (APX), a user-written software distribution unit within the Atari Computer Division. The APX concept had been the brain-child of Dale Yocam, and APX was guided by Fred Thorlin since its inception in February 1981. See http://www.atariarchives.org/APX/

Summer: Through their first Catalog, APX introduced: Newspaper Route Management Program, The Computerized Card File, Text Formatter (FORMS), Lemonade, Mugwump, Avalanche, Outlaw/Howitzer, Preschool Games, Roman Checkers, Space Trek, Castle, Wizard's Gold, Sleazy Adventure, Alien Egg, Chinese Puzzle, Sultan's Palace, Anthill, Centurion, Tact Trek, Comedy Diskette, Graphics/Sound Demonstration, FIG FORTH (this version never shipped), Sound Editor, BASIC Program Compressor (MASHER), BASIC Cross-Reference Utility (XREF), BASIC Renumber Utility (RENUM), Disk Fixer (FIX), Variable Changer, Character Set Editor, Extended WSFN, Supersort. APX also introduced several hardware products: DE-9S with DE51218 Shell (controller plug), 5-pin DIN connector, 13-pin I/O plug, 13-pin I/O socket, DA-15P with DA110963-2 Shell (850 printer plug), DE-9P with DE110963-1 Shell (850 serial plug), 2716 EPROM cartridge

Summer?: Atari created the Atari Institute for Educational Action Research, which began awarding major grants of Atari home computer products, cash stipends, and/or consulting services to selected individuals and non-profit institutions or organizations interested in developing new educational uses for computers in schools, community programs, or in the home. Founded and directed by Dr. Ted M. Kahn, Ph.D. More than US$250,000 would be awarded in the program's first year.

Summer: By mid-1981 Atari had sold over 50,000 400/800 computers to date. (InfoWorld 9/14/1981)


August 26: Date of the internal Atari document "Z800 Product Specification, Revision 1" reflecting Operating System work for the SWEET16 project to create a new series of computers to replace the 400/800. See: http://www.atarimuseum.com/computers/8BITS/1200xl/1200xl.html


September 10-12: Maplin Electronic Supplies exhibited the Atari 400/800 at the Personal Computer World Show at the Cunard Hotel, Hammersmith, London.

September: Peter Rosenthal was director of business planning and development at Atari (Home Computer Division).

Fall: APX Catalog introduced: Data Management System, Financial Asset Management System, Decision Maker, Banner Generator, Personal Fitness Program,
October: Atari 810 disk drives began shipping with the Data Separator Board. The enhancement "improves the drive's ability to distinguish between data pulses and clock pulses on the disk. This is necessary in part because of the variations in the characteristics of different diskettes. The data separator lowers the chance of a misread from the disk." (Antic Oct.82)

November: The Atari 400/800 would now all ship with the GTIA chip rather than CTIA as in earlier machines, increasing the palette of simultaneously displayable colors to 256 and adding 3 new graphics modes. (Antic Oct.82)

November: The Atari 400/800 began shipping with OS ROM version B, improving peripheral I/O control routines. (Antic Oct.82)

November: Atari 810 disk drives began shipping with ROM C and with DOS II version 2.0S (replacing the original Atari DOS I). "ROM C causes diskettes to be formatted with an improved sector layout which is more efficient than that used by earlier 810 control ROM's." (Antic Oct.82)

December 30: Atari said that it would cut the retail price for the 800 home computer (with 16K RAM) to US$899 from US$1,080. Other prices were increased: The Entertainer to US$110 and The Educator to US$166.

Atari claimed to have sold 300,000 400/800 computers in 1981. (InfoWord 6/14/82 p.57)

1982
January 6: Atari announced the publication, Atari Special Editions, a catalog of more than 400 products for the Atari computers from 117 vendors.

January 7-10: At the Winter CES in Las Vegas Atari introduced Pac-Man ($44.95), Centipede ($44.95), The Bookkeeper, and The Home Filing Manager. Space Invaders, previously released on cassette, was now re-released on cartridge. The APX title, Caverns of Mars would be the first APX title to be transferred into Atari's standard product line ($39.95 disk). Following the 400 packaging theme introduced in 1981, the 800, 810, and 410 would now ship in silver/full color packaging. Previewed at the show: the Atari Supergame System (would ship as the 5200).

January 16: At the first Atari Star Awards banquet, held at San Francisco's
Maxwell's Plum restaurant in Ghiradelli Square, the Atari Software Acquisition Program (ASAP) awarded the Star Award Grand Prize and US$25,000 to Fernando Herrera for his APX title, My First Alphabet. Star Award of Merit winners: Ronald Marcuse & Lynn Marcuse, Sheldon Leemon, Greg Christensen


Winter: Ted Richards' name first appeared as editor of The Atari Connection magazine.

March: Atari began producing 810 disk drives using the revised "Analog" (later, "810M") design, including new Analog Board, new Power Supply board, and new 10 pin flat cable connecting the two. The 3 components were also offered together as the CB101128 "Grass Valley Analog Board Set" for "Pre-Analog" 810 drives.

March 19-21: Percom introduced the RFD40-S1, the first 3rd party disk drive for the Atari, at the 7th West Coast Computer Faire in San Francisco.

Spring: APX Catalog introduced: Family Budget, Diskette Mailing List, Isopleth Map-Making Package, RPN Calculator Simulator, Advanced Musicsystem, Sketchpad, Cubbyholes, Musical Computer--The Music Tutor, Starware, Wordmaker, Block Buster, Atari Pascal Language System, Extended fig-FORTH Rev. 2, GTIA Demonstration Diskette, Instedit (Microsoft BASIC version), Keypad Controller, Speed-O-Disk. APX also introduced the book, De Re Atari (APX-90008 / Atari#CO60070), written by staff in the Atari Software Development Support Group: Chris Crawford wrote Sections 1-6 and Appendices A & B; Lane Winner wrote Section 10 and Appendix D with assistance from Jim Cox; Amy Chen wrote Appendix C; Jim Dunion wrote Sections 8-9; Kathleen Pitta wrote Appendix E; Box Fraser wrote Section 7; Gus Makreas prepared the Glossary.


June 6-9: At the Summer CES in Chicago Atari introduced Atari Speed Reading (US$74.95), Music Tutor I (title never shipped. MC's speculation: this would have been an Atari-branded re-release of the APX title, Musical Computer-The Music Tutor), Juggles' House (by The Learning Co.), Juggles' Rainbow (by The
Learning Co.), TeleLink II (US$79.95), and the Communicator II kit (new 835 modem + Telelink II) (US$279.95). The APX title, My First Alphabet would be re-released as part of Atari’s standard product line. Atari also twice announced new retail prices for the 400 computer: first US$349 (CC Oct82 p180), then US$299 (Merch Jul82 p43) (previously, US$399). Keith Schaefer was vice-president of sales for Atari’s Home Computer division.

June 8: Atari announced the 5200 Home Entertainment System. Later dubbed the SuperSystem, the cartridge-based 5200 would be marketed alongside the ultra-popular Atari VCS (soon to be known as the 2600). While the 5200 required unique game cartridges and controllers, the internal hardware and operating system were nearly identical to that of the 400/800 computers. Suggested retail price: US$299.95.

June: Roger Badertscher resigned from his position as president of Atari’s Home Computer Division.

Summer: APX Catalog introduced: Bowler’s Database Rev. 2, Data Base/Report System, Family Vehicle Expense, Recipe Search ’n Save, Calculator, Astrology, Blackjack Tutor Rev. 1.1, Going to the Dogs, Algicalc, Elementary Biology (by MECC), Frogmaster, Instructional Computing Demonstration (by MECC), Metric and Problem Solving (by MECC), Music I--Terms & Notation (by MECC), Polycalc, Three R Math System, Block ‘Em Rev. 2, Castle Rev. 1.1, Checker King, Galahad and the Holy Grail, Jax-O, Jukebox #1, The Midas Touch, Pushover, Rabbotz, Salmon Run, Seven Card Stud, BLIS Rev. 1.1, Cosmatic Atari Development Package, Insomnia (A Sound Editor) Rev. 1.1, Instedit Rev. 1.1, Microsoft BASIC Cross-Reference Utility, Player Generator, Utility Diskette II

Summer: First year of Atari Computer Camps, held at 3 locations: The University of San Diego (CA), The Asheville School (Asheville, NC), and East Stroudsburg State College (PA). (Camp was cancelled at the fourth announced site of Lakeland College in Sheboygan WI.) The camps were managed for Atari by Specialty Camps, Inc. Curriculum developed by Robert A. Kahn at Atari. Program overseen by Linda Gordon, Atari vice president for special projects.

July 26: InfoWorld estimated between 250,000 and 300,000 Atari 400/800 computers had been sold to date.

August: Atari announced the establishment in New York City of a new research laboratory (“Atari NY Lab”) dedicated to the exploration of microprocessor-based products in electronic publishing and transactional services for home computers. The Atari NY Lab would be headed by Steve Mayer, now senior vice president of engineering at Atari (previously: vice president of research and product development). The lab would also function as a focus for joint research projects with other subsidiaries of Warner Communications Inc.

August 24: John C. Cavalier was named president of Atari’s Home Computer Division. His most recent job was vice president and general manager of
American Can Company's Dixie and Dixie/Marathon unit, makers of consumer paper products.

September: The recently-established Atari NY Lab was spun off from Atari to form a new subsidiary of Warner Communications called WCI Labs Inc. Atari NY Lab head Steve Mayer, who had been Atari senior vice president of engineering, departed Atari to serve as executive vice-president for strategic planning for Warner Communications, as well as president of WCI Labs.

September 29: Date of the internal Atari document, "Sweet-16 Product Specification". As of this document, the Sweet-16 project had evolved into two specific computer model designs, a 16K RAM version tentatively named "1200" and a 64K RAM version tentatively named "1200X" (earlier: a 16K "600" and a 64K "1200"), with both models now sharing the same case design. However, also as of this document, plans called for manufacture of only the 64K version. The project would soon lead to the release of the 1200XL.

http://www.atarimuseum.com/computers/8BITS/1200xl/1200xl.htm l

October: Atari shipped the 5200 SuperSystem.


Fall: The suggested retail price for the Atari 800 was US$679 with 48K RAM standard (previously: US$899/16K). The Atari 400 retail price was US$299 (previously, $349).

November: Atari began producing new 810 disk drives with the "center flip door" drive mechanism by Tandon, instead of the "push button, sliding door" mechanism by MPI used in the original design. (Antic May 83) Technical documentation would refer to the new design as the "810T".

December/January: First issue of Page 6 magazine, the U.K.'s first Atari computer magazine. Published by Les Ellingham.

December: Atari shipped Galaxian, Defender, and VisiCalc (by VisiCorp) in time for the holiday shopping season.

December 13: Atari introduced the 1200XL home computer at a press conference at the Plaza Hotel in New York City. "We believe that the Atari 1200XL will set the standard for a new generation in home computing and, once again, positions Atari on the leading edge of electronic technology and creative computing," Atari chairman Ray Kassar said. The list price for the 1200XL would be "well under $1,000." The 1200XL resulted from the Sweet-16/
"Elizabeth"/"Liz" project inside Atari. Peripherals introduced: the 1010 program recorder (US$99), 1020 printer/plotter (US$299), and 1025 printer (US$549). Keith Schaefer was vp of sales and John Cavalier was president of Atari's Home Computer Division.

Atari sold 400,000 of its 400 and 800 computers in 1982, according to The Yankee Group, a Boston-based computer consulting firm, accounting for 17 percent of all home computer sales.

1983
January 1: The retail price for the Atari 800 (with 48K RAM, without Atari BASIC) was reduced from US$679 to US$499. The retail price for the Atari 400 was reduced from US$299 to US$199.

January 6-9: At the Winter CES in Las Vegas Atari showed the 1200XL (and announced the retail price of $899), 1010, 1020, and 1025, introduced revised versions of the Programmer and Entertainer kits, introduced Qix, E.T. Phone Home!, Dig Dug, Donkey Kong, Family Finances (enhanced combination of the two APX titles, Family Cash Flow and Family Budget), Timewise, and AtariWriter, showed the recently-released Galaxian and Defender, and also announced the upcoming AtariMusic I and the first title in the Disney Educational Series, Mickey in the Great Outdoors. Caverns of Mars would be re-released on cartridge (previously: disk). The APX title, Eastern Front (1941) would be re-released in the main Atari product line (on cartridge). The CX22 Trak-Ball was introduced, marketed for the 2600 but also compatible with the 400/800/1200XL.

January 15: At the 2nd Atari Star Awards banquet, held at San Francisco's St. Francis Hotel, Atari awarded the Star Award Grand Prize and US$25,000 to David Buehler for his APX title, Typo Attack. Star Special Award of Merit winners: Douglas Crockford, Harry Koons & Art Prag, Lee Actor.

Keith Schaefer had been promoted to senior vice-president of sales for Atari's Home Computer Division.

January: Atari began production of the 1200XL (made in the USA).

Winter 82/83: First issue of I/O, later known as Input/Output, the magazine of the Atari Home Computer Club (Atari International (U.K.)).

February: Atari announced the Atari distribution of Visicalc by Visicorp.

Winter: APX Catalog introduced: FOG Index, Real Estate Cash Flow Analysis, Text Analyst Rev. 2, Astrology Rev. 1.1, Earth Science (by MECC), Easygrader Rev. 1.1, Geography (by MECC), I'm Different!, The Magic Melody Box, The Market Place (by MECC), Monkey Up a Tree, Music II--Rhythm & Pitch (by MECC), Music III--Scales & Chords (by MECC), Prefixes (by MECC), Typo Attack, Air-Raid!, Game Show, Gridiron Glory, Melt-Down, Phobos, Pushky, Quarxon, Rabbolz
Winter: Atari shipped the AtariWriter cartridge. AtariWriter was programmed by William V. Robinson (author of DataSoft's Text Wizard) with Mark Rieley for DataSoft, for product manager Gary Furr at Atari.

Winter/Spring: "Computers: Expressway to Tomorrow" was an Atari-produced assembly program for junior and senior high schools in the U.S., offering both entertainment and computer education using films, slides, music, and a live host to explore the role of computers in society. (MC's note: I remember that this came to my school!)

March: Atari shipped the 1200XL, suggested retail price US$899.

March 18-20: At the 8th Annual West Coast Computer Faire in San Francisco, Atari announced the 1050 disk drive, and Atari Logo (developed by Logo Computer Systems, Inc. (LCSI) for Atari).


April: Atari announced that Michael Moone would no longer serve as president of the Consumer Electronics Division, as the division would be consolidated with the Home Computer Division.

April/May: Production of the 1200XL shifted from the USA to Taiwan.

May: Production of Atari 400/800 computers and 810 disk drives ended.

May: The retail price for the Atari 400 was reduced from US$199 to US$99.

June 1: Atari consolidated the businesses of the Home Computer Division with the Consumer Electronics (home video games) Division. There would now be three Divisions for both home computers and home video games:
  - Atari Products Company (development & marketing, John Cavalier, president)
  - Atari Sales and Distribution Company (Donald Kingsborough, president)
  - Atari Manufacturing Company (Paul Malloy, president)

June: Atari introduced the 600XL and 800XL home computers at the Summer CES in Chicago. Retail prices would be $199/600XL and $299/800XL. The 400/800/1200XL would be discontinued. (The 1400XL and 1450XLD computers were also introduced, but these never made it into production.) Peripherals introduced: 1050 disk drive, 1027 printer, 1030 modem, CX75 Light Pen + AtariGraphics, CX77 Touch Tablet + AtariArtist, CX42 Remote Control Wireless Joysticks, CX80 Trak-Ball, CX60 Ultimate Super Joystick (eventually shipped as...
the CX24), AtariLab Starter Set With Temperature Module, AtariLab Light Module (AtariLab developed by Dickinson College). Software introduced by Atari: DOS 3, Logo, Microsoft BASIC II, Pole Position, Ms. Pac-Man, Donkey Kong Junior, Pengo, Robotron: 2084, Joust, Football, Tennis, Paint, AtariMusic I, AtariMusic II. Battlezone was announced. (Also introduced or announced but never shipped: the 1060 CP/M Add-On Module, the 1090 XL Expansion System, Superman III, Soccer, Tempest, Xevious, Peter Pan’s Daring Journey or Peter Pan’s Daring Escape (Disney; later renamed: Captain Hook’s Revenge), The Mysteries of Wonderland (Disney), Star Trux, and the AtariLab Modules: Timekeeper, Lie Detector, Reaction Time, Heartbeat, Biofeedback, Mechanics)

The 600XL had been known as "Surely" and the 800XL had been known as "Surely Plus" inside Atari.

June 11-Sept 10: Atari co-sponsored the Punta Cana Club Med/Atari Computer vacation getaway on the island of Hispaniola in the Dominican Republic.

June 27: Atari opened their first Atari Center, an educational computing concept, at The Oaks Shopping Center in Cupertino, CA. Atari Centers were operated by the Picodyne Corporation (Dean Brown, president) with Atari providing funding and advertising. Alan O’Neill was the contract manager of Atari Centers. Sara Armstrong, director of the Terra Nuova Montessori School in Hayward CA, would be director of the Cupertino Atari Center.

Month?: Atari (Home Computer) vice president, product and business planning (strategic planning) Peter Rosenthal departed the company.

Summer: APX Catalog introduced: Home Inventory, Home Loan Analysis, Strategic Financial Ratio Analysis, Drawit, Piano Tuner, Video Kaleidoscope, Circuit Lab, Morsecode Master, Punctuation Put-on, Three R Math Home System, Wordgo, The Bean Machine, Bootleg, Can’t Quit, Dandy, Ennumereight, Smasher. APX also introduced the 48K RAM Expansion Kit (for the 400 computer, 8K or 16K versions); $110, or $130 installed at Atari Regional Repair Centers.


July 2: The second Atari Center opened at the corner of Fifth Ave. and 48th St. in Manhattan. Educator Seth Greenberg would be manager of the Manhattan Atari Center.

July 7: Warner Communications announced that Atari chairman Ray Kassar had resigned, to be replaced by James J. Morgan. Morgan was previously executive vice president of Philip Morris USA, handling the company’s US$4.3 billion cigarette operations. Until Morgan’s arrival, Emanuel Gerard would serve as interim chairman and CEO.
July: Production of the Atari 1200XL computer ended.

August: Atari Chairman-to-be James Morgan instituted another major management reorganization at Atari. Atari Sales and Distribution Company and Atari Manufacturing Company were both dissolved, their functions to be merged into the Atari Products Company division (home computers and home video game systems), with 5 divisions of its own:
- Atari Products Company (no division head)
  - Management (marketing) (John Cavalier, president)
  - Sales (Donald Kingsborough, president)
  - Manufacturing (Paul Malloy, president)
  - Engineering (John Farrand, president)
  - International (Anton Bruehl, president)
The presidents of all Atari Products Co. divisions would report directly to Morgan.

Sept83-June84: The "Catch On to Computers" program, a joint effort between Atari and General Foods' Post Cereals, offered Atari computers, equipment, and educational software to schools for collecting Post cereal proof-of-purchase points over the 1983-1984 school year.

September: Ted Kahn stepped down as executive director of the Atari Institute for Educational Action Research. More than US$1 million worth of computers, software, and cash stipends had been awarded to over 100 nonprofit organizations since the program's founding in 1981.

September: Atari International (U.K.) announced The Loan Raider.

September: The Atari 800 (with 48K RAM, without Atari BASIC) would now retail for US$165 while supplies lasted.

September 23: The two Atari Center locations both closed at the end of the 90-day trial period for the program.


Fall: Atari begin shipping the 1050 disk drive with DOS 3 (replacing DOS 2.0S).

Fall: The Atari 600XL/800XL both shipped, retail price US$199/$299.

Fall: Atari shipped the Communicator II package, containing the 835 modem.

October 7: John Cavalier departed from his position as president of the
Management (marketing) division of the Atari Products Company.

October: Atari launched Atari Learning Systems, a new division dedicated to product development, sales, and support for K-12 educators in the U.S. Directed by Linda Gordon.

October: Atari France launched the "L'Atarien" magazine, issue 0 (pilot ?), the "magazine of the Atari Club". In its first issues, the magazine was mostly centered on the 2600 VCS and 400/800 computers, but the focus quickly shifted to the XL computers in the next issues. Officially the magazine was issued by "Rive Ouest - Cato Johnson France" on behalf of "PECF Atari France" (Issue #0, Page 3). "PECF" was the nickname of the company "Productions et Editions Cinematographiques Francaises", a company 100% owned by Warner Communications.

October-December: "Catch on to Computers" computer literacy training programs for children, adults, and teachers, sponsored by Atari and General Mills' Post Cereals, ran in 10 cities across the U.S.

November: Atari announced that because of production snags in Hong Kong, it would be able to fill only 60 per cent of its Christmas orders for the 600XL/800XL. Atari also said that the 1400XL and 1450XLD would not ship until 1984.

November: Atari opened the Atari Adventure center in St. Louis, MO. The concept combined a traditional video game arcade with a hands-on public computer classroom/lab featuring Atari XL computers, along with a new technology display area.

"Atari sold roughly 250,000 of its 800 series computers last year"
- Time magazine, July 16, 1984

1984
January 1: Atari increased U.S. dealer prices for the Atari 600XL and 800XL by US$40 each, to US$180 and US$280, respectively.

January 7-10: At the Winter CES in Las Vegas Atari introduced: the 1064 Memory Module (for the 600XL), The Atari Translator, Moon Patrol, Jungle Hunt, Millipede, Sky Writer, SynFile+, SynCalc, SynTrend, The Legacy (shipped as Final Legacy), Player Maker, Screen Maker. The APX title, Typo Attack would be re-released on cartridge as part of Atari’s standard product line.
(Atari confirmed that the unshipped 1400XL computer was canceled. Atari CEO James Morgan said the unshipped Atari 1450XLD was "exhibited only as a demonstration of the company’s intent to market a high-end computer in 1984, although the specifics of such a product are currently under review."
--Creative Computing May 1984.)

(Software introduced by Atari but never shipped: Atari Pascal 2.0, Atari Super PILOT, Captain Hook's Revenge (Disney), Berserk, Pop'R Spell, Mario Bros. (a completely rewritten Mario Bros. was ultimately released in
1989), AtariLab Modules: Robotics, Nuclear Radiation)

January 14: At San Francisco’s St. Francis Hotel, Atari awarded the third annual Atari Star Award and US$25,000 to Mark Reid for his APX title, Getaway!. Other Finalists: James Burton, R. Stanley Kistler, Gregor Novak. Fred Simon was Atari senior vice-president of computer hardware and software marketing.

January 23: Atari chairman and CEO James Morgan announced another management reorganization at Atari. John Farrand was promoted to president of Atari, and would also now serve as president and COO of the Atari Products Company (home computers, home video games, and now coin-operated arcade games).

Winter: APX Catalog introduced: Equestrian, Mastermatch, Atspeller for AtariWriter, Bellum, Burgers!, Chambers of Zorp, Character Fun, Dragon Quest or A Twist in the Tail, Numberland Nightwatch, Raid on Graviton, Rush Hour, Weakon, National Flags, Dog Daze Deluxe

February: Atari 5200 production ended.

March: Fred Thorlin, director of APX since its 1982 inception, left Atari.

March 22-25: At the 9th West Coast Computer Faire in San Francisco Atari’s exhibit included the APX title, Equestrian. (ROM #6) APX also introduced what turned out to be their last release, Bumpomov’s Dogs, see: http://graychang.megabyet.net/cnc/bumpomov/broderbund_letter.shtml

Spring: I/O Issue Five turned out to be the final issue of Input/Output, the magazine of the Atari Home Computer Club (Atari International (U.K.)).

April: Atari shut down the APX operation. Software rights were returned to the original authors.

May 8: In an elaborate press event, Atari and Lucasfilm introduced Ballblazer and Rescue on Fractalus!, developed by Lucasfilm Games, to be shipped by Atari on cartridge for the 400/800 computers and the 5200 SuperSystem. (The Atari computer versions were finally shipped on disk by Epyx (USA) and Activision (UK) in 1985. The 5200 versions were finally released by Atari Corp. in 1986.)

May 21: Atari disclosed that the 5200 was no longer in production. More than 1 million 5200s had been sold to date. (Washington Post, May 22, 1984, C3)

June 3-6: Atari motto at the Summer CES in Chicago: "June 3, 1984--The Day The Future Began.” Atari announced that it would introduce a new high-end computer, reportedly for under $1000, in time for the Christmas buying season. The computer would be an extension of the XL line, very similar to the long-awaited 1450XLD; it would have 64K RAM, modem, speech synthesis chip, and a
built-in, double-sided, dual density disk drive that stores 352K. (never shipped.) The previously-announced 1090 XL Expansion System was expected to be released along with the new computer (never shipped). Atari introduced: Proofreader (for AtariWriter), Track & Field, Crystal Castles. Atari also introduced The Last Starfighter, which was ultimately re-worked and shipped as Star Raiders II in 1986. (Also introduced by Atari but never shipped: MindLink hardware device, Jr. Pac-Man, Hobgoblin, This Is Ground Control, Through the Starbridge, Find It!, Elevator Action, Yaacov Agam's Interactive Painting, The ABC of CPR: First Aid, Wheeler-Dealer, Simulated Computer, Telly Turtle, Word Tutor, Letter Tutor, Gremlins, Pole Position II)

June: Atari France announced the SECAM model of the 800XL. (The SECAM 600XL was also announced, but this never made it into production.) List prices:
600XL PAL: 2200 FRF ; 600XL SECAM: 2500 FRF ; 800XL PAL: 3200 FRF ;
800XL SECAM: 3500 FRF ; 1010: 890 FRF ; 1050: 3690 FRF ; 1020: 2590 FRF;
1027: 3490 FRF ; Atari Touch Tablet: 890 FRF

Month?: Exidy released the Max-A-Flex coin-operated arcade conversion system, along with four games for the system, all developed by First Star Software: Astro Chase, Boulder Dash, Bristles, Flip and Flop. The Exidy Max-A-Flex utilized an embedded Atari 600XL system. See:
http://www.myatari.co.uk/issues/jan2003/maxaflex.htm

July 1-August 25: Third and final year of Atari Computer Camps. Camps were held at two locations: "Camp Atari-Poconos" (East Stroudsburg State College) in East Stroudsburg PA, and "Camp Atari-New England" (Stoneleigh-Burnham School) in Greenfield MA. Patricia Tubbs was Project Manager at Atari.

July 2: In a deal consummated in New York City at 5:30 a.m. Monday morning, July 2, effective Saturday June 30, the assets of the Atari home computer and home video game businesses were sold by Warner Communications to Tramel Technology Ltd., which had been formed on May 17, 1984 by its chairman and CEO Jack Tramiel (pronounced truh-MELL), the founder and former president of Commodore International. The transaction included the rights to the "Atari" name and "Fuji" logo, with Warner Communications retaining exclusive license to use the Atari name and trademark in coin-operated arcade environments. Tramiel also gained the intellectual property rights to all existing Atari arcade games, with Warner Communications retaining exclusive license to those properties in coin-operated arcade environments.

Tramel Technology adopted the new name, Atari Corporation. Jack Tramiel would continue as chairman and CEO, and (son) Sam Tramiel would serve as president.

July: The new Atari Corp. halted all manufacturing, and dismissed most of its inherited Silicon Valley workforce, roughly 1,000 people.

Upon a review of the existing product lines and inventories, it was determined to resume production of the 800XL computer. The 600XL was discontinued, and
further work on prototype new XL computer models was halted. Atari Connection magazine was shut down.

July 13: Warner Communications announced the sale of 78% of its WCI Labs subsidiary (internal co-developer of the Atari XL computers) to WCI Labs' management. As a result of the transaction, which was made effective retroactive to June 1, 1984, a new privately held company, the Take One Company, was formed, with Steven T. Mayer as chairman and chief executive. Warner Communications initially retained 22% ownership of Take One.

August: Atari engineers completed the prototype "800XLF" motherboard design, to be used in new-production 800XL computers. The new 800XL machines would include the new FREDDIE memory management chip (previously developed at Atari, Inc.), the new Revision C of Atari BASIC, and a reinstated chrominance video signal on the Monitor port (missing on the 1200XL/600XL/800XL produced by Atari, Inc.). The new 800XL machines would be produced in PAL and (for the first time, France-specific) SECAM versions, but not the NTSC version due to ample existing supply of NTSC 800XL machines.

August: Atari reduced the retail price for the 800XL from US$250 to US$179.

November 13: Atari held a press conference at company headquarters in Sunnyvale, CA in which they outlined their basic marketing strategy for 1985. The U.S. price for the 800XL was reduced from US$179 to US$119.

December 6: It was reported that Atari would make an immediate 23 per cent reduction to DM 499 (US$160) in the price of its 800XL home computer in West Germany and similar cuts in the UK and Italy. Atari estimated the company's share of the West German home computer market at 8%, compared with 2% in 1983. In the UK, the 800XL price cut was from 169 to 129 pounds.

December: Atari France announced the new prices of the XL computers range:
600XL PAL: 1599 FRF ; 800XL PAL: 2199 FRF ; 800XL SECAM: 2499 FRF;
1010: 449 FRF ; 1050: 2699 FRF ; 1020: 899 FRF ; 1027: 3399 FRF;
Atari Touch Tablet: 649 FRF

December: Atari France resumed L'Atarien magazine with issue #5. (It had been on hold since issue #4, June 1984.)

December: Atari engineers completed the prototype "900XLF" motherboard design, to be used in the forthcoming 65XE computer.

"The 800XL has sold almost 500,000 units through 1984" --Atari's Sigmund Hartmann, Atari Explorer magazine, Summer 1985, p. 33.

"By the end of 1984, the Atari 800XL will have sold more than 600,000 units since its introduction more than a year ago, according to Kenneth Lim of Dataquest, a market research firm in San Jose." InfoWorld January 7/14, 1985
1985
January 5-8: Atari introduced the 65XE and 130XE home computers at the Winter CES in Las Vegas. (The 65XEP and 65XEM computers were announced, but these never made it into production.) The 800XL would be discontinued. XE peripherals introduced: the XMM801 and XDM121 printers and the XM301 modem. XE Software introduced: AtariWriter Plus, Silent Butler, Song Painter (later renamed Music Painter), The Learning Phone (PLATO). (Also introduced but never shipped: the XTM201 and XTC201 printers, the XC1411 and XM128 monitors, and the XF521 disk drive. XE Software: Infinity (integrated word processor/spreadsheet/database/telecomm software, developed for Atari by Matrix Software / Vincent Garafolo), Shopkeeper, Atari Tutorial). Epyx introduced Ballblazer and Rescue on Fractalus for the Atari 8-bit computers, both announced but not shipped by the old Atari, Inc.

Winter: Atari shipped the The Learning Phone cartridge, designed at Atari by Vincent Wu. Atari access software for the PLATO Service Network (Control Data Corporation) had been in development at Atari since 1981.

February: First issue of Atari Explorer magazine, the glossy published by Atari (U.S.) Corp. in support of the XE and ST computers. Headed by Neil Harris.

February: The new "L'Atarien" magazine was now issued by "Pressimages" on behalf of "PECF Atari France" (Issue #6, Page 3).

February: Retail prices from Atari France: 800XL SECAM: 1700 FRF ; 1050: 2600 FRF ; 1027: 2600 FRF

March 5: At the San Leandro Computer Club Atari announced that they had "postponed plans to produce an 8-bit portable computer, due to lack of interest." Also, "plans for an XEM 8-bit music computer have been postponed indefinitely due to problems with finalizing the AMY sound chip." (The AMY chip had been developed at Atari, Inc. Atari Corp. now owned the technology, but had not retained the original design team. Thus, the new plan to integrate AMY into the XE system, as the announced 65XEM computer, turned out to be prohibitively expensive. Atari ultimately sold the AMY chip and technologies to a Milwaukee based audio design house called Sight & Sound. See: http://www.atarimuseum.com/computers/8bits/xe/xe_protos/65xe_m.html ) John Skruch was introduced as software product manager for the 8-bit XE line. (CN, Apr85, p. 19)

April: Atari shipped the 130XE, retail price US$149.95. (The 65XE was temporarily held out of the U.S. market due to ample supply of the 800XL.)

April: Atari France announced the availability of the Atari 1029 printer. The price was not announced.
April/May: Atari began shipping the 1050 disk drive with DOS 2.5 (replacing
DOS 3).

May: First issue of the U.K.'s Atari User magazine, published by Database
Publications.

June: At the Summer CES in Chicago Atari introduced Planetarium (prototypes
sometimes called Home Astronomer). (Atari also introduced VIP Professional
and GEM Desktop for the XE, but these never shipped.) DataSoft re-introduced
3 titles for the XE previously shipped by Atari: Pole Position, Pac-Man, and
Dig Dug.

June: Atari France retail price for the 130XE SECAM: 1990 FRF

Fall: Atari shipped the disk-based AtariWriter Plus. Designed and
programmed from scratch by William Robinson (the core word processor),
Ron Rosen (Mail Merge module), and R. Stanley Kistler (Proofreader module) for
Micro Fantasy, for Atari. Manual by Jeffrey D. Bass. Package included a
version for 48K/64K Atari computers as well as a version supporting the 128K
RAM of the 130XE.

Fall: Atari shipped the XM301 modem.

November 15: Atari announced the creation of an electronic entertainment
division, to be headed by Michael V. Katz, formerly head of Epyx.

November: At the fall COMDEX in Las Vegas Atari again showed the XMM801,
The Silent Butler, and Atari Planetarium, each to ship by Christmas.

Atari's 8-bit user base in the UK has now reached 400,000...close to 100,000
of the [discontinued 800XL] are believed to have been sold during the run up
to Christmas alone. (Atari User Feb 1986 p.9)

1986
January 9: At the Winter CES in Las Vegas Atari introduced Star Raiders II
for the XE, and also announced (but did not show) the XC11 program recorder.
A redesigned version of the 2600 (unofficially, "2600 Jr."); previously
designed by Atari, Inc.) was introduced.

February: Cover date of Issue #10, the final issue of L'Atarien magazine from
Atari France.

February: Atari France retail prices: 130XE SECAM: 1490 FRF ; 1010: 490 FRF ;
1050: 1490 FRF ; 1029: 1490 FRF

March: Database Exhibitions staged the first Atari User Show at the Novotel
March: At the Hannover Fair, West Germany, Atari introduced a working prototype of what would ultimately ship as the XEP80 interface, and they also described a new DOS, which was later named ADOS, and which ultimately shipped as DOS XE. (Atari also introduced plans for a 3.5" disk drive (the XF351) but this never shipped.)

Spring: Atari shipped the 65XE, retail price US$99.95.

April 28-May 1: Atari introduced a working prototype of what would ultimately ship as the SX212 modem at the Spring COMDEX (Computer Dealer's Exhibition) in Atlanta. Atari also announced that the 80 Column Card would be out "late this summer." (Atari also reiterated plans for a 3.5" disk drive (the XF351) but this never shipped.)

June 1: Atari announced that David H. Ahl was the new editor of Atari Explorer magazine.

June 1-4: Atari introduced the XEP80 interface at the Summer CES in Chicago. Also featured: Atari Planetarium, Star Raiders II, and the XMM801.

Summer: Atari shipped the XC12 in place of the XC11.

Summer: Bob Gleadow, previously of Commodore, became the new general manager of Atari UK. Max Bambridge, the outgoing head of Atari UK, was transferred to the Far East to oversee Atari manufacturing. (Atari User May 1988)


German Atari chairman Alwin Stumpf reported at CeBit 1987 in Hannover that Atari was surprised to sell 92,000 Atari XL computers in West Germany in 1986. (Happy Computer - 2. Atari XL/XE Sonderheft, p. 3, as quoted/translated by Andreas Koch)

1987
January 8: Atari previewed the XE game system at the Winter CES in Las Vegas.

February: Atari introduced the XE video game system at the American International TOY FAIR in New York.

March 4-7: Atari announced that they would release an XE-styled replacement for the 800XL at CeBIT '87 in Hanover, West Germany. This machine would soon be known as the 800XE.

June: "Flying High" was Atari's motto at the Summer CES in Chicago. Atari introduced the XF551 and ADOS (renamed DOS XE when shipped), AtariWriter 80, and SX Express!. Atari introduced the two pack-in games for the XE game
system, Bug Hunt (proto names had been Troubleshooter or Blast 'Em) and Flight Simulator II. Atari announced that they would be re-releasing many of their own 400/800/XL/XE cartridge titles for the XE, including Battlezone, Donkey Kong, Donkey Kong Jr., and the former disk title, Star Raiders II. Atari also announced many new Atari XE cartridge titles, including Crossbow, Hardball!, Fight Night, One-On-One Basketball, Archon, Ballblazer, Rescue on Fractalus, Lode Runner, Blue Max, David's Midnight Magic, Gato, and Barnyard Blaster.

Summer: Atari shipped the XDM121 printer.

September: Atari shipped the XEP80 interface and the SX212 modem. (The SX Express! disk software package for use with the SX212 would be sold separately, later.)

Fall: Atari shipped the XE game system in late September, and it reached most dealer shelves by mid-October, retail price US$150. Package included: Missile Command and Atari BASIC on ROM, keyboard, Joystick, Light Gun, Bug Hunt cartridge and Flight Simulator II cartridge.

December 31: From the Atari Annual Report: "In Czechoslovakia, the German Democratic Republic, and Poland the Atari 800XE and 65XE computers have gained brand dominance and are among the most popular systems being sold in these countries."

Atari sold 100,000 XE Game Systems in the U.S. at Christmas and did not meet demand (Antic magazine, May 1988, p. 39)

Atari "claims more than 2 million XE game systems sold in 1987."

1988

January: Optimized Systems Software (OSS) was merged into ICD.


April: Atari shipped the XF551 disk drive (with DOS 2.5).

May: Sam Tramiel became CEO of Atari (replacing father Jack Tramiel). Sam Tramiel would also continue as president. Jack Tramiel remained chairman.

June: Atari promoted the XE game system at the Summer CES in Chicago, under their "Winning Package" theme.
Summer: Atari shipped the new XE game cartridge, Gato.

Fall: Atari opened an office of the Entertainment Electronics Division in Chicago, headed by Larry Siegel, vice president of software development. Mike Katz, based in Sunnyvale, remained president of the Entertainment Electronics Division.

Fall?: Atari shipped the new XE game cartridge, Necromancer.

October 1, 1988 through September 30, 1989: "Atari Advantage" promotion program by Atari (U.S.) for the 2600, 7800, and XE. Collect 5 cartridges for a free Atari T-shirt; 15 cartridges for a free cartridge; or 25 cartridges for a 7800 for $25 or for an XE system or XE disk drive for $50, and "enter an essay writing contest to win an expense-paid 7-day/6-night trip for you and a guest to California. Visit some of California's top tourist attractions including a day at Atari headquarters (near San Francisco) to see how video games are designed."

November: Final issue of the U.K.'s Atari User magazine. The name would be sold to rival U.K. magazine publisher Page 6.

November: Atari (U.S.) announced the availability of the XG-1 Light Gun/ Bug Hunt package. (The package never did ship in the U.S. The loose XES2001 XG-1 Light Gun without Bug Hunt did ship in the U.S. in 1989.)

November/December: Atari (U.S.) offered a $50 consumer rebate on the purchase of the XE game system.

December 31: From the Atari Annual Report: "Our XE line of 8-bit computer systems is extremely popular throughout Eastern Europe, and most recently, has begun to appear on retail shelves in the Soviet Union."

Atari sold 500,000 Atari 800XL units in West Germany in 1988. (Bajtek 2/1989, p.7; thanks Kr0tki)

1989

January: Atari shipped DOS XE, and also began shipping the XF551 disk drive with DOS XE (replacing DOS 2.5).

January: Atari shipped 6 new XE game cartridges: Ace of Aces, Desert Falcon, Mario Bros., Crystal Castles, Thunderfox, Into the Eagle's Nest


February: Mike Katz departed from Atari as president of the Entertainment Electronics division.

February: Atari shipped 3 new XE game cartridges: Crime Buster, Dark Chambers,
Choplifter

Spring: Atari shipped 5 new XE game cartridges: Food Fight, Karateka, Crossbow, Airball, Summer Games

May/June: Premier issue of Atarian magazine, "the official magazine of the Atarian Video Game Club sponsored by Atari (U.S.) Corp." Published by Atari Explorer Publications, David H. Ahl, Publisher/Editor.


Summer: Atari shipped AtariWriter 80, programmed by William Robinson and Ron Rosen for Micro Fantasy. The package included Proofreader (programmed by R. Stanley Kistler) and Mail Merge modules, and required the XEP80 interface. Like AtariWriter Plus, the package included a version for 48K/64K Atari computers as well as a version supporting the 128K RAM of the 130XE.

October: Third and final issue of Atarian magazine.

December: Final issue of ANALOG Computing magazine

December 31: From the Atari Annual Report: "sales of games products such as the 2600 and 7800 game systems and the range of older XE 8 bit computers decreased by 35% to $101.6 million, or 24% of total net sales for the year ended December 31, 1989, from $155.5 million, or 34%, of total net sales in 1988." From the Atari 10-K: "The Company's traditional video game offerings include the 2600 VCS, the 7800 ProSystem, and the XE Game System."

1990
March 15: Atari Explorer Publications was shut down, and Atari Explorer magazine went on hiatus.

May?: At the Atari shareholders meeting, Atari stated that last year, 250,000 XE computers were sold. In Poland, the XE sold 70,000 units, making it the most popular computer in Poland. (Atari Interface, June/July 1990, p. 6)

June/July: Final issue of Antic, The Atari Resource magazine. Antic would continue as a section of the publisher's STart magazine.

1991
Jan/Feb: Return of Atari Explorer magazine, now headed by John Jainschigg and published in-house at Atari.

March/April: LDW had imported about 250-270 thousand Atari 8-bit computers into Poland to date (since 1985)...Currently about 20% of the global production of 8-bit Atari computers is sent to Poland (Moje Atari 4/1991, pp. 8-9; thanks KrOtki)
April/May: Final issue of STart magazine (which had incorporated Antic magazine).

May: "Atari Canada's General Manager Geoff Earle announces a new trade up program for owners of Atari 8-bit computers to a 520STFM for $250. The 8-bit computer line is admitted to be discontinued." (AtariUser Jan'92, p. 20)

May 14: At the Atari shareholders meeting, Atari stated that the XE was still in production, being sold in South America, Eastern Europe and the Middle East. (Atari Interface magazine, June 1991, p. 10)

November 23-24: Chicago Computerfest by Atari / Lake County Atari Computer Enthusiasts (LCACE), Ramada Hotel O'Hare, Rosemont, Illinois. Atari (U.S.) brought substantially all of their remaining inventory of 8-bit computer products for clearance sales.


December 28: From the Atari 10-K SEC filing: "Atari's XE series computers are targeted for the price conscious markets. The 65XE and 130XE have 64k and 128k of internal RAM, and generally retail for less than $100 and $150, respectively. Both are supported by a variety of peripheral equipment and a variety of software titles including entertainment software. This computer line retains compatibility with the Company's previous generation 8-bit computer systems, i.e., the 400 and 800XL computers."

1992
Atari announced that support for all 8-bit products was discontinued as of the beginning of this year, according to Atari Classics magazine. (Dec. 1992, p.4)

June 2: At the Atari stockholders meeting, Atari stated that the XE line of computers was still being made. Though not available in the U.S. market, XE systems were being made for sale in Mexico, South America, Eastern Europe and Germany. (Atari Interface magazine, Fall 1992, p. 19)


December 31: For the first time, the XE was not mentioned in Atari's Annual Report to Shareholders.

1993
Jan/Feb: Final issue of Atari Explorer magazine.

November?: Rights to ICD (including OSS) products for the 8-bit Atari were purchased by Fine Tooned Engineering (FTe / Mike Hohman)
1994
January 1: From the Atari Annual Report: "The Company also has some inventory of its older 16-bit computer products and 8-bit game products, namely ST and TT series of computers, 2600 and 7800 video games systems and XE computer and Portfolio products. As a result of these inventories being technologically obsolete and noncompetitive, the Company has written off these inventories. The Company is expecting minimal sales from these products in the future."

1996
July 30: Atari Corp. merged with JT Storage, Inc. into a new company, JTS Acquisition Corp. The merged company immediately adopted the new name, JTS Corp. The prior business of Atari would now be conducted through the Atari Division of JTS; however "the Atari Division was not expected to represent a significant portion of JTS business," JTS said.

1997
July: Final issue of Atari Classics magazine.

1998
February 23: JTS sold substantially all of the assets of its Atari Division, consisting primarily of the Atari intellectual property rights and license agreements, to HIAC XI Corp., a wholly-owned subsidiary of Hasbro Interactive (itself a unit of toy company Hasbro, Inc.), for US$5 million. HIAC XI was then renamed Atari Interactive, Inc.

Fall: Final issue of Page 6 Publishing's New Atari User magazine.

2001
January 29: Infogrames Entertainment announced completion of its acquisition of Hasbro Interactive from Hasbro, renaming the subsidiary Infogrames Interactive, Inc. Atari Interactive was included in the transaction.

2003
May 7: Infogrames Entertainment folded its Infogrames Interactive (the former Hasbro Interactive) subsidiary into its Atari Interactive subsidiary.

2009
May 29: The name of Infogrames Entertainment was changed to Atari.

TODAY: The Atari copyrights/trademarks/patents associated with the 400/800/XL/XE 8-bit Atari computer line are owned by Atari Interactive, Inc., a subsidiary of Atari, SA of Lyon, France. http://corporate.atari.com/

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End of atari-8-bit/faq
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