

ADAM CP/M 3

A CP/M 3.0 System for the Coleco ADAM



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Author of the CP/M 3 BIOS for the Coleco ADAM. A CP/M 3 port for the machine had been discussed and attempted since 1984. None of those efforts produced a working system. This one did.

The work ran from 2022 to the present, four years of research and development. The Z80, 6801, x86 and 68000 series assembly language was self taught, starting at the age of 13.

In 1987 he went to a technical college, where he learned COBOL on the TI-990 mainframe, along with C, Pascal and Forth. In 1989 he entered the US Army, working on the Bradley Cavalry Fighting Vehicle's computer systems, its gyroscopic fire-control solution and its thermal imaging. After the Gulf War he moved into communications and the DAS-3 computer systems, went to college ROTC, and returned to the US Army.

The Machine

The ADAM was not a willing host. Its master 6801 owns a window of shared RAM at the top of memory and scans it continuously for the process control block and the device control blocks. That window cannot be moved and cannot be used for anything else. The same constraint applies to the bank-switch port. Expansion RAM is reached through a 32K window into a 64K page, so the upper and lower halves of a page are never visible at once, and switching to the high half evicts the common RAM the BIOS itself lives in. Every transfer into that half has to be staged from low memory and the original contents restored afterward. The BIOS was written around those limits rather than against them.

The System

ADAM CP/M 3 is a non-banked CP/M 3.0 system written for the Coleco ADAM. It keeps the ADAM's own block size, 1024 bytes, but the layout under it is new. CP/M 2.2 on the ADAM kept the system on fixed tracks and blocks. This BIOS and its system files live in the directory like any other file, and the directory format itself is new. It is not a converted Digital Research system and it does not target hardware the ADAM does not have.

- 80-column color console on the F18A, with per-cell color and a software cursor. The original 9928 cannot do this. It tops out at 40 columns in two colors and 32 in multi-color.
- Real-time clock from the Dallas DS12C887, year-2000 compliant, read at each date and time call.
- RAM disk on drive M:, sized to the expansion card or set by hand, up to 1MB, with an automatic setting that takes the card size.
- Hard drive on H:, up to 20MB, with the allocation vector sized for a removable drive later.
- Disks at 160K, 320K, 360K, 720K and 1440K. Data packs at 256K.
- Media geometry read from a stamp in the boot block, so each disk logs in at its own size.
- Removable-media change detection on disks and data packs.

- File date and time stamps.
- Screen colors stored in the BIOS and changeable from a settings program, saved back to the system file.
- A resident command processor held in expansion RAM, so a warm boot does not depend on the disk in drive A:.

Memory Map

The BIOS loads at \$D100. The BDOS calls a mirror of the jump table at \$DC00.

Address	Bytes	Use
\$D100-\$E985		BIOS image
\$D100	99	Jump table, 33 entries
\$DC00-\$DC62	99	Jump table mirror, rebuilt at boot
\$E986-\$ED85	1024	Data buffer
\$ED86-\$F185	1024	Directory buffer
\$F186 / \$F196	16	Buffer control blocks
\$F1A6-\$F2A5	256	Work variables
\$F2A6-\$F3A5	256	Scratch SCB page
\$F3A6-\$F525	384	Allocation vectors, drives A-D
\$F526-\$FA25	1280	High-half save / RAM-disk staging
\$FA26-\$FA6D	72	Live disk parameter blocks
\$FA6E-\$FA7D	16	RAM-disk checksum placeholder
\$FA7E-\$FABD	64	RAM-disk allocation vector
\$FABE-\$FBBB	256	Checksum vectors, drives A-D
\$FBBE-\$FCFD	320	Hard drive allocation vector
\$FCFE-\$FD0F	18	Hard drive disk parameter block
\$FD10-\$FD4F	64	Bank-flip stack
\$FD50-\$FDFF		EOS scratch, reserved
\$FEC0-\$FFEA		AdamNet PCB and DCBs, reserved

Jump Table

Thirty-three entries, three bytes each, at \$D100. The mirror the BDOS calls is at \$DC00.

Entry	Address	Mirror	Function
0	\$D100	\$DC00	Cold start
1	\$D103	\$DC03	Warm boot
2	\$D106	\$DC06	Console input status
3	\$D109	\$DC09	Console input
4	\$D10C	\$DC0C	Console output
5	\$D10F	\$DC0F	Printer output
6	\$D112	\$DC12	Auxiliary output
7	\$D115	\$DC15	Auxiliary input
8	\$D118	\$DC18	Home disk
9	\$D11B	\$DC1B	Select disk
10	\$D11E	\$DC1E	Set track
11	\$D121	\$DC21	Set sector
12	\$D124	\$DC24	Set DMA address
13	\$D127	\$DC27	Read
14	\$D12A	\$DC2A	Write

Entry	Address	Mirror	Function
15	\$D12D	\$DC2D	Printer status
16	\$D130	\$DC30	Sector translate
17	\$D133	\$DC33	Console output status
18	\$D136	\$DC36	AUX input status
19	\$D139	\$DC39	AUX output status
20	\$D13C	\$DC3C	Character device table
21	\$D13F	\$DC3F	Initialize device
22	\$D142	\$DC42	Drive table
23	\$D145	\$DC45	Multi-sector count
24	\$D148	\$DC48	Flush
25	\$D14B	\$DC4B	Memory move
26	\$D14E	\$DC4E	Get/set clock
27	\$D151	\$DC51	Select memory bank
28	\$D154	\$DC54	Set DMA bank
29	\$D157	\$DC57	Inter-bank move setup
30	\$D15A	\$DC5A	User function
31	\$D15D	\$DC5D	Reserved
32	\$D160	\$DC60	Reserved

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