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altair 8800 clone computer table of contents

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Altair 8800 Clone Computer Table of Contents

- Introduction
- The Original Altair 8800: A Milestone in Microcomputing
- Why Clone Computers Became a Trend
- Altair 8800 Clone Computers: An Overview
- Popular Altair 8800 Clone Models
- Technical Specifications and Hardware Components
- Building Your Own Altair 8800 Clone
- Software, Operating Systems, and Programming Languages
- Community Resources and Where to Find Support
- Conclusion

Introduction

\\nThe Altair 8800, released in 1975, is widely regarded as the spark that ignited the personal computer revolution. Its iconic front panel, with rows of toggle switches and LEDs, captured the imagination of hobbyists and engineers worldwide. Over the decades, a wave of enthusiasts and companies created **Altair 8800 clone computers**—devices that emulated or extended the original design. This article explores the history, technical details, and community around these clones, providing a comprehensive **altair 8800 clone computer table of contents** for anyone interested in retro computing or homebrew hardware projects.\\n

The Original Altair 8800: A Milestone in Microcomputing

\\nThe Altair 8800 was designed by Ed Roberts of MITS (Micro Instrumentation and Telemetry Systems) and launched through a groundbreaking advertisement in *Popular Electronics*. The article promised a kit that could be assembled by hobbyists, and the response was overwhelming—over 100,000 orders in the first month. The machine ran on the Intel 8080 processor, a 4 MHz 8 bit CPU that was a marvel at the time. Its architecture included 256 bytes of onboard RAM, expandable to 64 KB, and a front panel that allowed users to input binary data directly via switches.\\n

\\nThe Altair"s significance extends beyond its hardware. It demonstrated that a single, affordable computer could be built by non professionals, laying the foundation for the software industry. Early programs such as *Altair BASIC* and the *Microsoft BASIC* interpreter, both written in assembly language, made the machine accessible to programmers. The Altair also inspired the first generation of software companies, including Microsoft and Intel, and set the stage for future personal computers like the Apple II and the IBM PC.\\n

Why Clone Computers Became a Trend

\\nIn the late 1970s and early 1980s, the Altair's design was both a technical marvel and a commercial opportunity. As the market for microcomputers grew, so did the demand for cheaper, more reliable, and more feature rich versions of the original hardware. Companies and hobbyists began producing **Altair 8800 clone computers** that offered improvements such as:\\n

- Higher clock speeds and more efficient CPU implementations
- Increased memory capacity and faster storage options
- Enhanced input/output (I/O) interfaces, including serial and parallel ports
- Improved power supplies and chassis designs for better durability
- Software compatibility with existing Altair programs and new operating systems

\\nClones also served educational purposes, allowing students and engineers to study computer architecture without the cost of a commercial product. The open source ethos of the early computing community encouraged the sharing of schematics, firmware, and assembly code, making it easier for anyone to build a clone from scratch or purchase a pre assembled kit.\\n

Altair 8800 Clone Computers: An Overview

\\nWhile the original Altair was a single, iconic machine, the clone market blossomed into a diverse ecosystem. Each clone offered its own set of features and design philosophies. Some aimed for strict hardware compatibility, while others introduced modern enhancements such as:\\n

- Microcontroller based control boards that replaced the original front panel
- Integrated floppy disk drives and hard disk controllers
- Built in sound and graphics capabilities
- Compatibility with contemporary operating systems like CP/M, MS DOS, and even Linux

\\nThe result is a rich tapestry of machines that range from faithful reproductions to creative reinterpretations. For hobbyists, this diversity offers a playground for experimentation, learning, and community collaboration.\\n

Popular Altair 8800 Clone Models

1. The Raspberry Pi 8 bit Retro Kit

\\nWhile not a direct hardware clone, this kit uses a Raspberry Pi Zero to emulate the 8080 CPU, providing a modern platform for running Altair software. The kit includes a custom front panel, a 2 inch LCD, and an optional 3.5 inch floppy drive. Its low power consumption and compact size make it an attractive choice for portable retro computing projects.\\n

2. The MicroMite 8080

\\nMicroMite 8080 is a low cost, breadboard friendly clone that uses an 8080A CPU and a 16 bit memory bus. It comes with a pre wired front panel and an optional 1.44 MB floppy controller. The board is designed for educational use, with extensive documentation and a modular layout that allows students to swap components easily.\\n

3. The Altair 8800E

\\nThe Altair 8800E is a faithful recreation of the original machine, built with 8080 microprocessors, 256 bytes of RAM, and a 2 inch monochrome display. It includes a full front panel, a 1.2 MB 5¼ inch floppy drive, and a 5 V power supply. The design is aimed at collectors and enthusiasts who want an authentic Altair experience.\\n

4. The PC 8800

\\nA modern twist on the Altair, the PC 8800 incorporates an 8080 clone CPU, 512 KB of RAM, and a 2 inch color LCD. It features a built in keyboard, a 3.5 inch floppy drive, and a USB interface for connecting modern peripherals. The PC 8800 also includes a pre loaded CP/M operating system, making it ready to run classic software out of the box.\\n

5. The Homebrew 8080 Kit

\\nFor those who enjoy the challenge of building from scratch, the Homebrew 8080 Kit provides all the components needed to assemble a complete Altair clone. The kit includes the 8080 CPU, a 1 bit memory bus, a power supply, and a custom front panel. Detailed schematics and a step by step guide make it accessible to both novices and experienced hobbyists.\\n

Technical Specifications and Hardware Components

CPU and Clock Speed

\\nAll Altair 8800 clones are built around the Intel 8080 or compatible CPU. The original Altair ran at 4 MHz, but many clones boost this to 6–8 MHz using modern clock generators. Some clones also support the 8085, a later variant with integrated I/O, simplifying the design.\\n

Memory

\\nThe original Altair featured 256 bytes of RAM, expandable to 64 KB. Modern clones often start with 64 KB of RAM, with optional expansion slots that can accommodate additional memory or specialized modules such as video or sound cards. Some high end clones provide up to 512 KB or even 1 MB of RAM, enabling the use of more advanced operating systems.\\n

Storage Options

- Floppy Drives: Most clones come with a 5¼ inch floppy drive (1.2 /MB) or a 3.5 inch drive (720 /KB). The drive controller is typically a 6502 based interface that emulates the original Altair''s 5¼ inch controller.
- Hard Disk Controllers: Some higher end clones include a small 1.44 MB hard disk controller, often based on the WD1772 or similar controller.
- SD Card Slots: In modern clones, an SD card slot provides a convenient and high speed storage solution, often used to store ROM images, operating systems, and software libraries.

Input/Output Interfaces

- Serial Ports: RS 232 or USB to serial adapters allow communication with modern terminals or other computers.
- Parallel Ports: For connecting printers or other legacy devices.
- Keyboard and Display: Many clones include a built in keyboard and a monochrome or color LCD. Some models offer a full 80×25 character display via a composite video output.

Power Supply

\\nThe original Altair used a 5 V DC power supply. Modern clones often provide a 12 V to 5 V regulated power supply, making it easier to power the system from a standard AC adapter. Some kits include an optional battery backup for preserving settings during power loss.\\n

Building Your Own Altair 8800 Clone

\\nBuilding a clone is a rewarding project that teaches the fundamentals of computer architecture. Below is a high level overview of the steps involved. For detailed schematics and BOM lists, consult the manufacturer’s documentation or community forums.\\n

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