AccessionIndex: TCD-SCSS-T.20250918.004
Accession Date: 18-Sep-2025
Accession By: Dr.Brian Coghlan
Object name: Intel 8086 microprocessor and associated chips
Vintage: 1978
Synopsis: Intel's very successful early 16-bit microprocessor.

Description:
The Intel 8086 and 8088 and their 8087 and 8089 coprocessors …

The 80186 and 80188 were simply more integrated versions of the 8086 and 8088, with built-in clock generator, interrupt controller, timers, wait state generator, DMA channels, and external chip select lines, although a few new instructions were introduced that were included in succeeding generations.

The 80286 was the 2nd generation, introduced in 1982, the first of the Intel 16-bit CPUs with memory management and separate 24-bit address and 16-bit data busses. It was chosen as the CPU for the IBM PC/AT introduced in 1984, and then widely used in most PC/AT compatible computers of that generation.

Chips from Advanced Micro Devices (AMD) included here were designed to be compatible principally with the Intel 8080 but also with a number of microprocessors. However, they were widely used with the 8086 before Intel became a second-source with *82xx* part numbers, so they have been included here with the other *82xx* chips.

Intel's 1st generation 8086, 8087, 8088, 8089, 80186, 80188, 80188 and 2nd generation 80286 chips proved to be the precursors to the multiple generations of what became known as the highly successful *80x86* or *x86* series of microprocessors (see elsewhere in this catalog). The series maintained backwards compatible complex instruction set (CISC) architectures over those multiple generations spanning decades.

There were and are many demonstration/development boards or systems for the 8086. In this Collection these are represented by a *Retroshield* designed by Erturk Kocalar, which uses an Arduino host to emulate the original 8086 external environment, such that it can execute original 8086 software, see elsewhere in this catalog.

Many thanks to Brian Coghlan for donating these items.

The homepage for this catalog is at: https://www.scss.tcd.ie/SCSSTreasuresCatalog/
Click *'Accession Index'* (1st column listed) for related folder, or *'About'* for further guidance.
Some of the items below may be more properly part of other categories of this catalog,
but are listed here for convenience.

Accession Index	Object with Identification
TCD-SCSS-T.20250918.004	Intel 8086 microprocessor and associated chips. Intel's very successful early 16-bit microprocessor. 1978.
TCD-SCSS-T.20250918.004.01	1 x Intel 8086 microprocessor. 1978.
TCD-SCSS-T.20250918.004.02	2 x Intel 8088 microprocessor. 1979.
TCD-SCSS-T.20250918.004.03	1 x Intel 8087 floating-point coprocessor. 1980.
TCD-SCSS-T.20250918.004.04	3 x Intel 8089 I/O coprocessor. 1979.
TCD-SCSS-T.20250918.004.05	2 x Intel 8207-2 dual-port DRAM controller. 1983.
TCD-SCSS-T.20250918.004.05	4 x Intel 8212 8-bit I/O interface. 1978.
TCD-SCSS-T.20250918.004.06	6 x Intel 8218 bus controller. 1977.
TCD-SCSS-T.20250918.004.07	2 x Intel 8237 direct memory access (DMA) controller. 1978.
TCD-SCSS-T.20250918.004.08	1 x NatSemi INS8250N-8 UART.
TCD-SCSS-T.20250918.004.09	1 x NatSemi DP8251N serial interface.
TCD-SCSS-T.20250918.004.10	1 x Mitsubishi M5L8251AP-5 serial interface.
TCD-SCSS-T.20250918.004.11	1 x NEC D8251AC serial interface.
TCD-SCSS-T.20250918.004.12	1 x Intel 8253 programmable interval timer. 1978.
TCD-SCSS-T.20250918.004.13	1 x Intel 8255 programmable peripheral interface. 1978.
TCD-SCSS-T.20250918.004.14	1 x Intel 82C55 programmable peripheral interface. 1985.
TCD-SCSS-T.20250918.004.15	1 x Intel 8257 direct memory access (DMA) controller. 1978.
TCD-SCSS-T.20250918.004.16	1 x Intel 8259 programmable interrupt controller. 1978.
TCD-SCSS-T.20250918.004.17	4 x Intel 8275 programmable CRT controller. 1976.
TCD-SCSS-T.20250918.004.18	3 x Intel 8282 8-bit latch.
TCD-SCSS-T.20250918.004.19	24 x Intel 8286 octal bus transceiver.
TCD-SCSS-T.20250918.004.20	1 x Intel 8284 clock generator. 1978.
TCD-SCSS-T.20250918.004.21	2 x Intel 8288 bus controller.
TCD-SCSS-T.20250918.004.22	1 x Intel 8289 bus arbiter.
TCD-SCSS-T.20250918.004.23	1 x Intel 8291 GPIB talker/listener 1978
TCD-SCSS-T.20250918.004.24	1 x Intel 8292 GPIB bus controller. 1978.
TCD-SCSS-T.20250918.004.25	5 x Intel 8293-10 GPIB bus transceiver. 1980.
TCD-SCSS-T.20250918.004.26	1 x AMD Am9511DC floating-point coprocessor. 1978.
TCD-SCSS-T.20250918.004.27	1 x AMD Am9513DC system timing controller. 1978.
TCD-SCSS-T.20250918.004.28	2 x AMD Am9517PC direct memory access (DMA) controller. 1978.
TCD-SCSS-T.20250918.004.29	2 x AMD Am9519DC programmable interrupt controller. 1978.
TCD-SCSS-T.20250918.004.30	1 x AMD Am9519APC programmable interrupt controller. 1978.
TCD-SCSS-T.20251216.001	Arduino shield for Intel 8086. A board that enables execution of software by the 8086, S/N: ???, 2025.
TCD-SCSS-X.20250916.001	Dr.Brian Coghlan's Collection of Early Microprocessors. An extensive and nearly complete set of unused 1970s microprocessor chips, most accompanied with documentation, some with demonstration boards. 1971.

References:

1. Wikipedia, *Intel 8086*, see:
   https://en.wikipedia.org/wiki/Intel_8086
   Last browsed to on 18-Sep-2025.

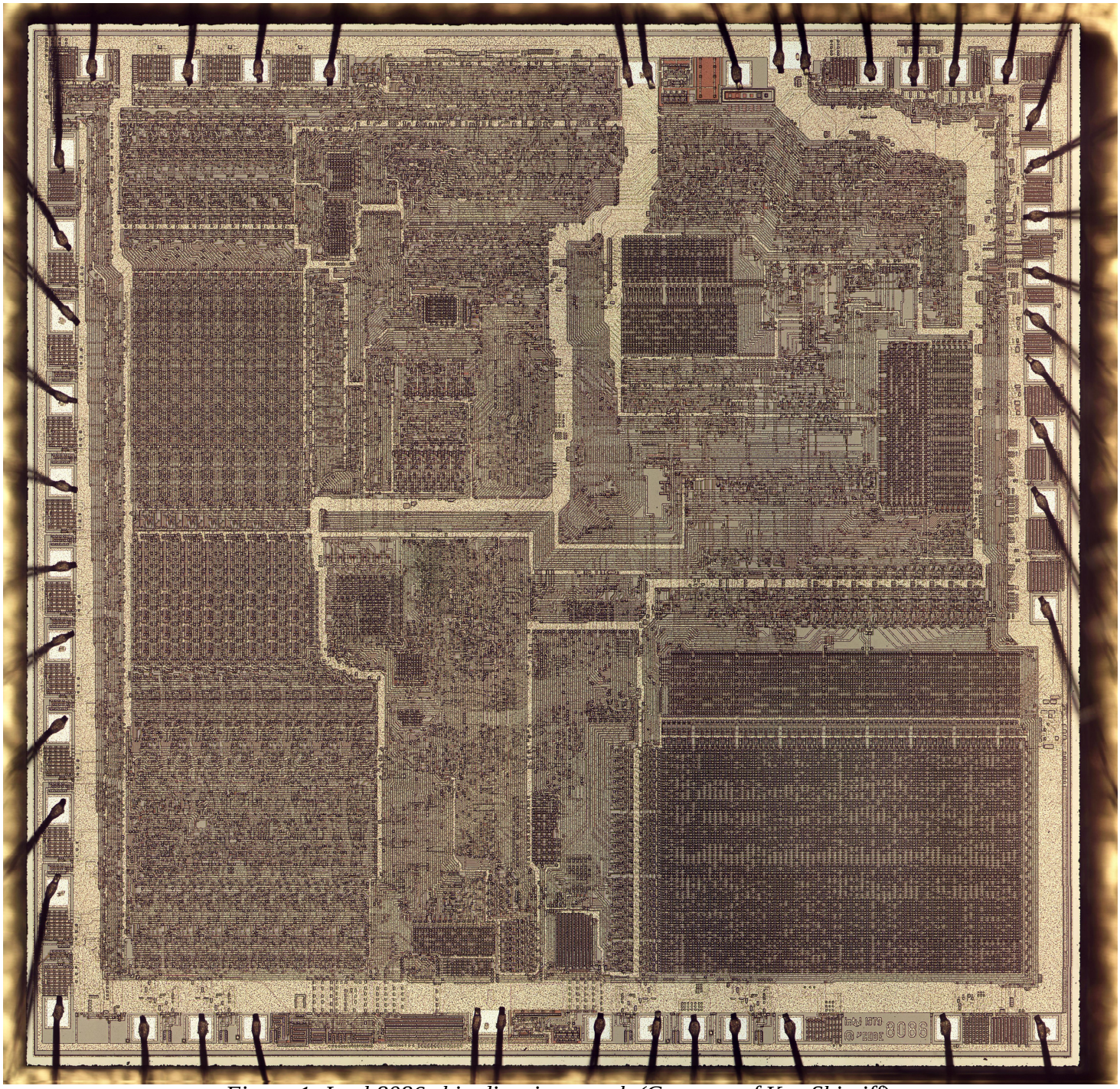

Figure 1: Intel 8086 chip die micrograph (Courtesy of Ken Shirriff).

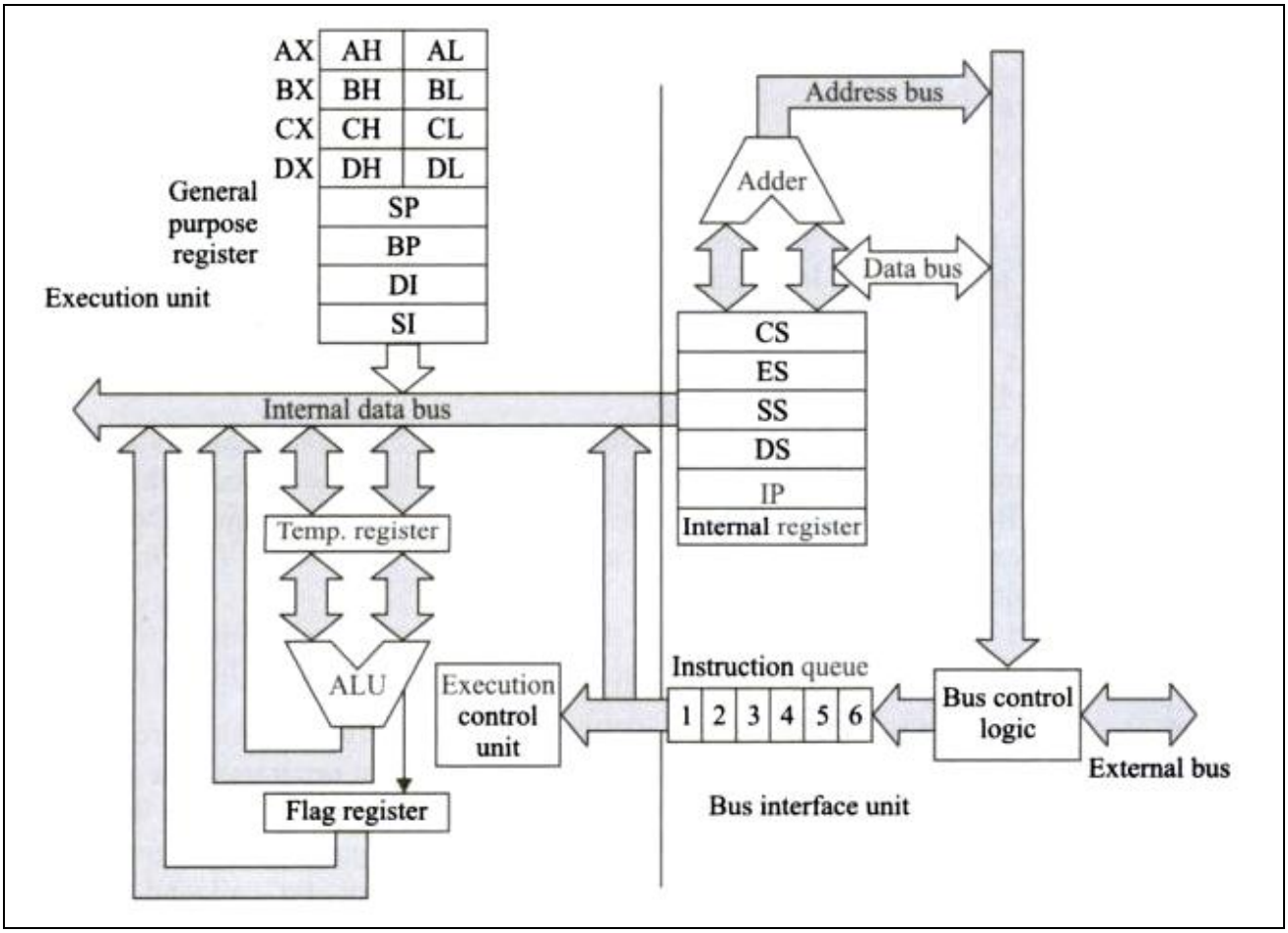

Figure 2: Intel 8086 architecture (from Wikipedia).

Intel 8086 registers

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 (bit position)			
Main registers			
	AH	AL	**AX** (accumulator)
	CH	CL	**CX** (counter)
	DH	DL	**DX** (extended acc)
0000	BH	BL	**BX** (base)
Index registers			
0000	SP		**S**tack **P**ointer
0000	BP		**B**ase **P**ointer
0000	SI		**S**ource **I**ndex
0000	DI		**D**estination **I**ndex
Program counter			
0000	IP		Instruction **P**ointer
Segment registers			
ES		0000	**E**xtra **S**egment
CS		0000	**C**ode **S**egment
SS		0000	**S**tack **S**egment
DS		0000	**D**ata **S**egment
Status register			
	- - - - O D I T S Z - A - P - C		Flags

Figure 3: Intel 8086 registers (from Wikipedia).