

AccessionIndex: TCD-SCSS-T.20160121.001

Accession Date: 21-Jan-2016

Accession By: Peter Canavan

Object name: Zilog Z80 SDK Development Kit

Vintage: c.1978

Synopsis: Programmers development kit for the Zilog Z80. S/N: ???.

Description:

Federico Faggin and Ralph Ungermann worked at Intel on the i4004 and i8080 CPUs, then left in 1974 to establish Zilog Inc. Masatoshi Shima, Intel's principal 4004/8080 circuit designer under Faggin, joined Zilog in 1975.

At the time of introduction in Jul-1976 the Zilog Z80 was the most powerful 8-bit CPU on the market, with 158 instruction types implemented by a synchronous nMOS state machine with a 16-bit memory address space and a separate 8-bit I/O address space. Masatoshi Shima was again the principal Z80 circuit designer. Faggin designed the instruction set to be binary compatible and a superset of the Intel i8080, so the Z80 could execute i8080 programs, including the CP/M operating system.

The improvements over the i8080 included bit manipulation, block move, block I/O, and byte search instructions, indexed addressing using IX and IY registers, more general vectored interrupts, a non-maskable interrupt (NMI), twin register files (like the 8008 predecessor, the Datapoint 2200), built-in DRAM refresh, non-multiplexed busses, simplified power, clock and I/O, and a special reset for in-circuit emulation. As a result it became very popular, e.g. it was used in the Sinclair ZX80, ZX81 and Spectrum, Tandy TRS-80, Nintendo GameBoy and Sega Master computers, and the first generation of programmable polyphonic music synthesizers.

The Z80 SDK Development Kit was introduced by S.D.Systems and Micro Design Concepts in 1978. It had a 2MHz Zilog Z80, 1kB of static RAM, a 6-digit 7-segment LED display, a hexadecimal keyboard plus 12 command keys, two 8-bit parallel ports, an on-board wire-wrap area, two optional simplified S-100 bus connectors (45-pin subset of the hundred S-100 signals), an EPROM programmer, a debug monitor (ZBUG), and storage write/read to/from an external cassette player interface using the Kansas City coding and Intel hexadecimal format. A built-in power supply (with a custom mains AC cable) provided +5V at 1A for normal operation, plus +25V at 30mA for programming of 2716 or 2758 EPROMs.

The Z80 SDK in this collection was used c.1980 for an assignment in a master's degree course unit run by Dr.John Mills at the University of Western Australia. The kit still has an AY-3-8910 sound-effects chip on it, which once played melodic gibberish courtesy of a Z80 Speech Synthesiser assembly language program written in pencil in an exercise book, and saved/re-loaded to/from an audio cassette recorder via the cassette interface (the printed program listing in this catalog dates from later). The SDK was powered up on 11-Jan-2016, for the first time in decades, and astonishingly still appears to work.

Many thanks to Peter Canavan, Network Manager, Broadcast Operations, Australian Broadcasting Commission (ABC), who donated these items from his personal collection.

Trivia1: Federico Faggin, Masatoshi Shima, Ted Hoff and Stanley Mazor designed the Intel 4004

Trivia2: Federico Faggin and Hal Feeney designed the Intel 8008

Trivia3: Masatoshi Shima designed the Intel 8080

Trivia4: Federico Faggin and Masatoshi Shima designed the Z80 and Z8000, the latter said to be the last CPU designed using a random logic methodology

The software and documentation is properly part of the Software and Literature categories of this catalog, but are listed here too for convenience.

Accession Index	Object with Identification
TCD-SCSS-T.20160121.001.001	Zilog Z80 SDK Development Kit. S/N:
TCD-SCSS-T.20160121.001.002	Zilog Z80 SDK Development Kit custom AC cable. S/N:
TCD-SCSS-V.20160121.001	Z80 Speech Synthesiser assembly code listing, Peter Canavan, Australian Broadcasting Commission, Sydney, Australia.
TCD-SCSS-V.20160121.002	Programming the Z80, Rodney Zaks, ISBN 0-89588-013-X, Sybex Inc, 2344 Sixth Street, Berkeley, California 94710, 1979.
TCD-SCSS-V.20160121.003	Microprocessor Interfacing Techniques, Rodney Zaks, second edition, ISBN 0-89588-003-2, Sybex Inc, 202 Milvia Street, Berkeley, California 94704, 1977.

References:

1. Wikipedia, *Zilog Z80*, see (last browsed to 27-Jan-2016):
https://en.wikipedia.org/wiki/Zilog_Z80
2. S.D.Systems and Micro Design Concepts, *Z80 Starter System*, see related folder in this catalog.

See the extensive set of documents in the related folder in this catalog.

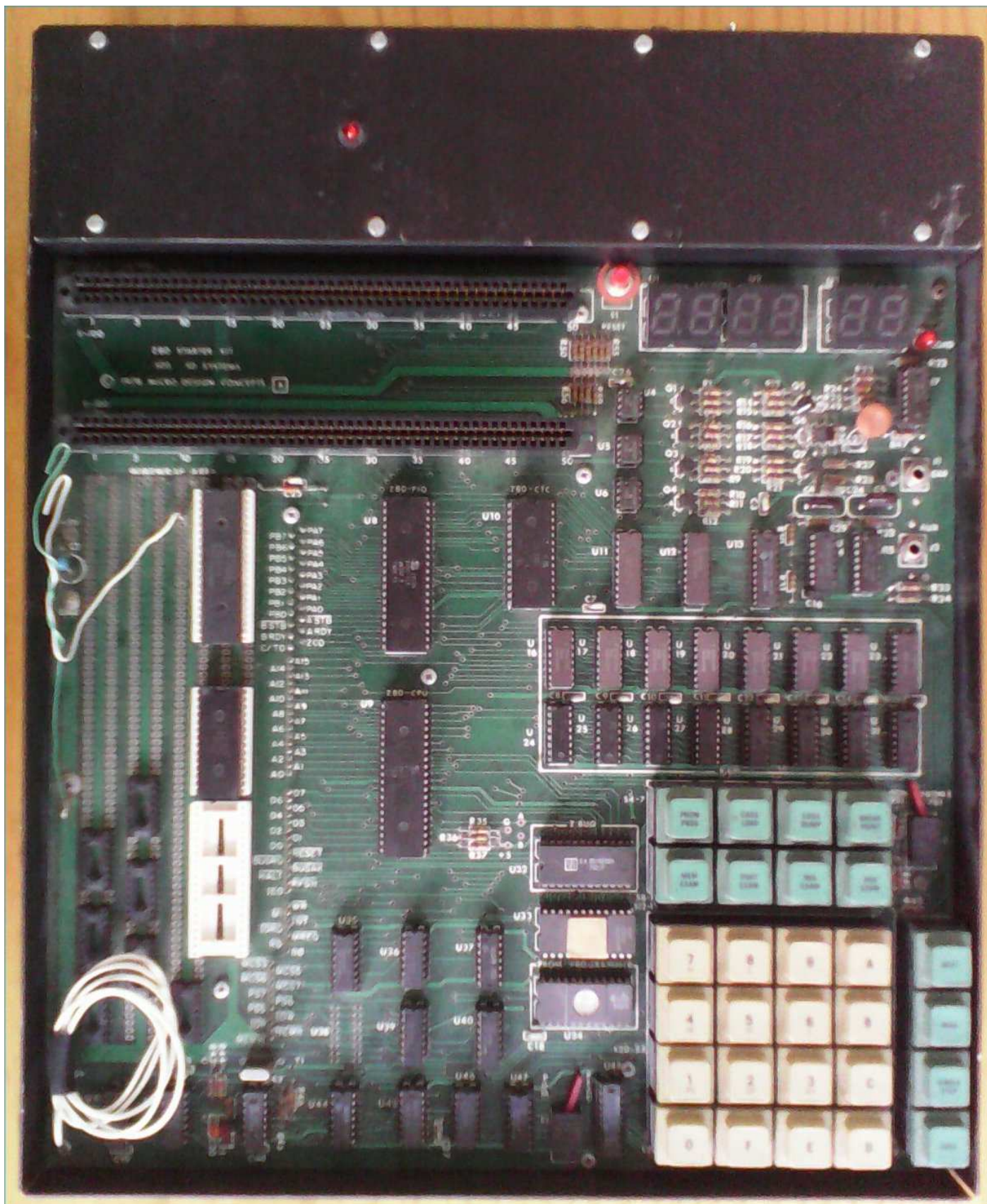


Figure 1: Zilog Z80 SDK Development Kit top view



Figure 2: Zilog Z80 SDK Development Kit rear view

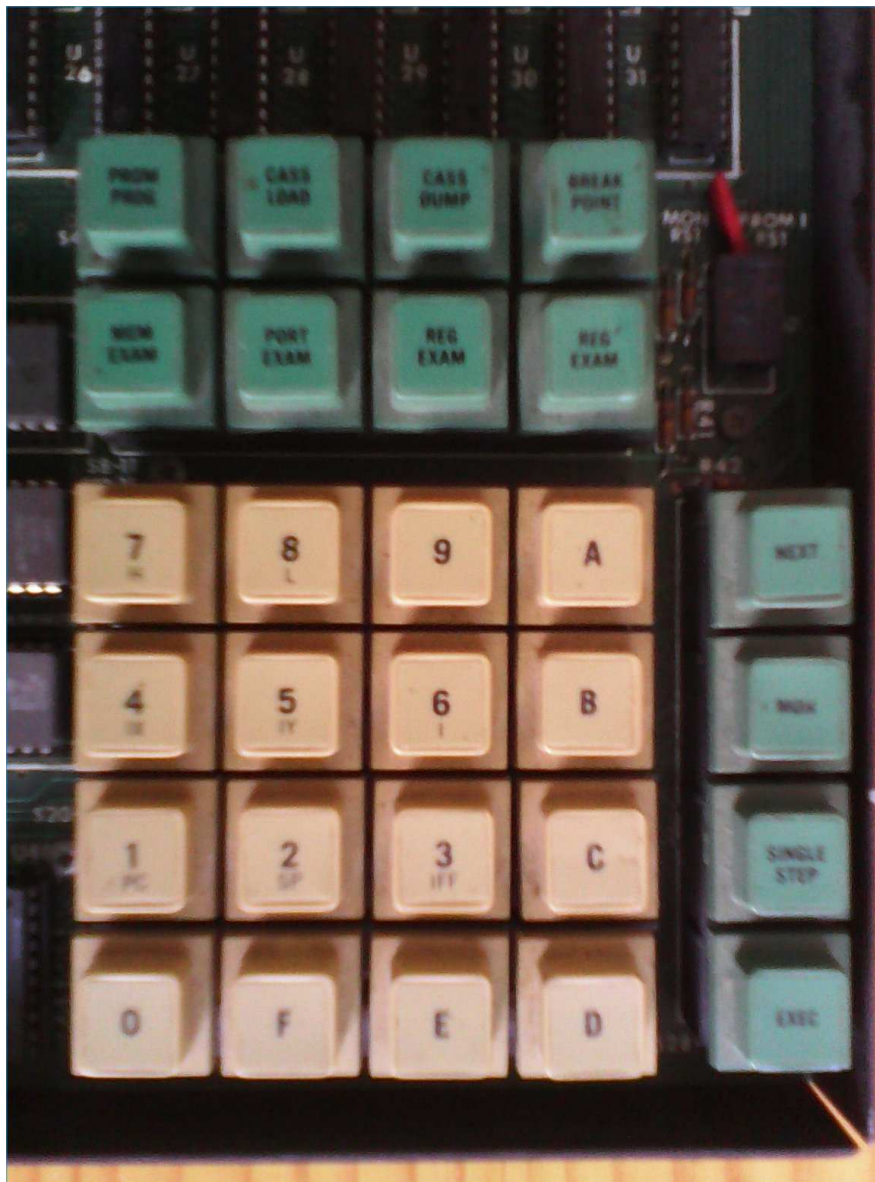


Figure 3: Zilog Z80 SDK Development Kit keyboard



Figure 4: Zilog Z80 SDK Development Kit keyboard top closeup

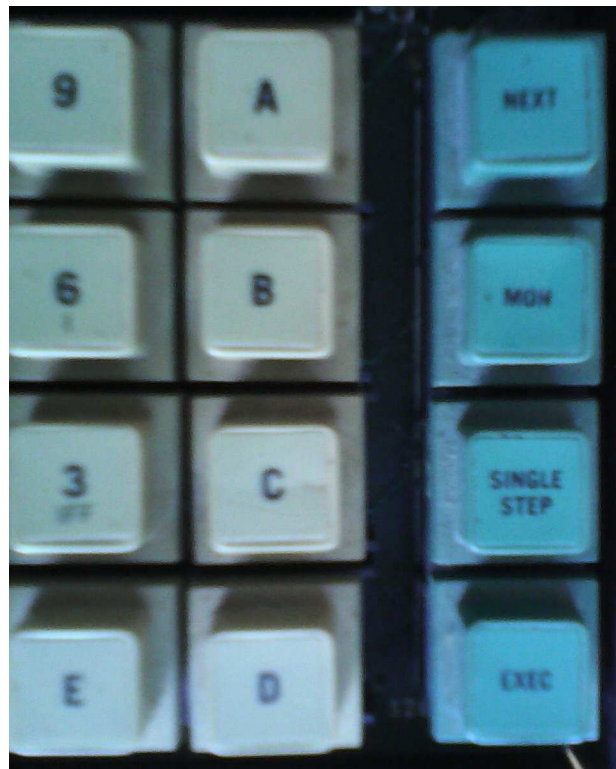


Figure 5: Zilog Z80 SDK Development Kit keyboard right closeup

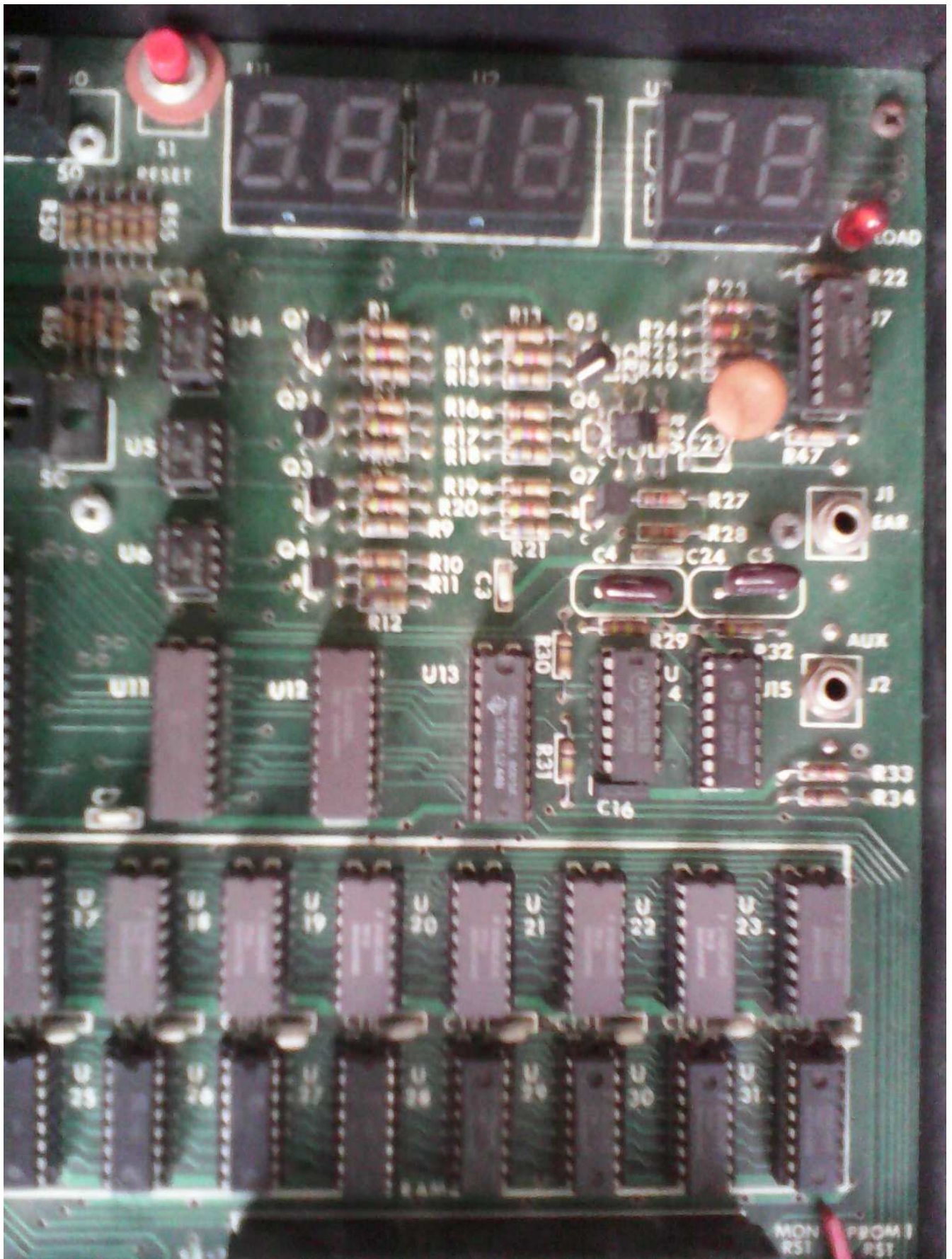


Figure 6: Zilog Z80 SDK Development Kit memory and hexadecimal display

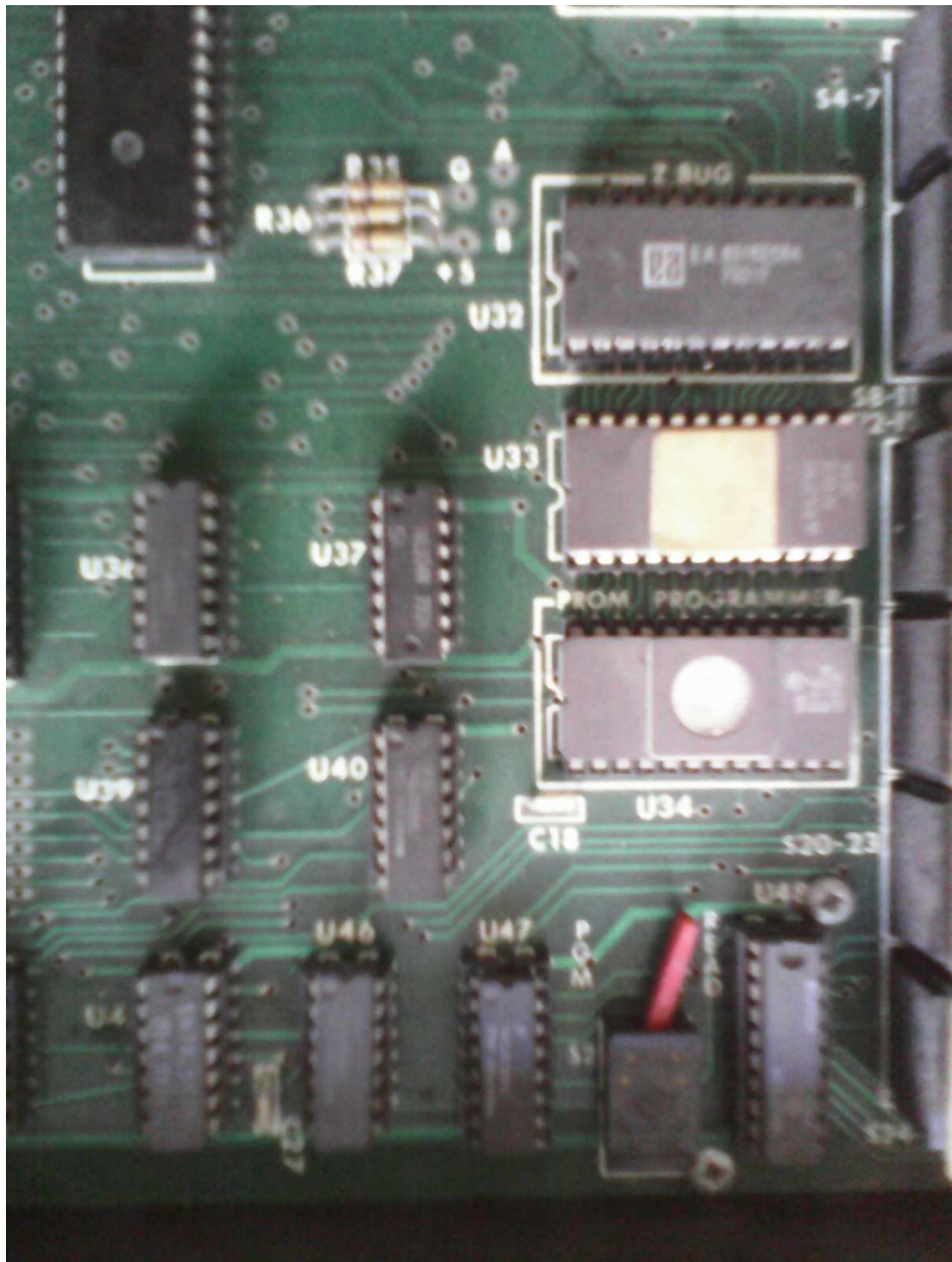


Figure 7: Zilog Z80 SDK Development Kit ZBUG ROM and EPROM programming socket

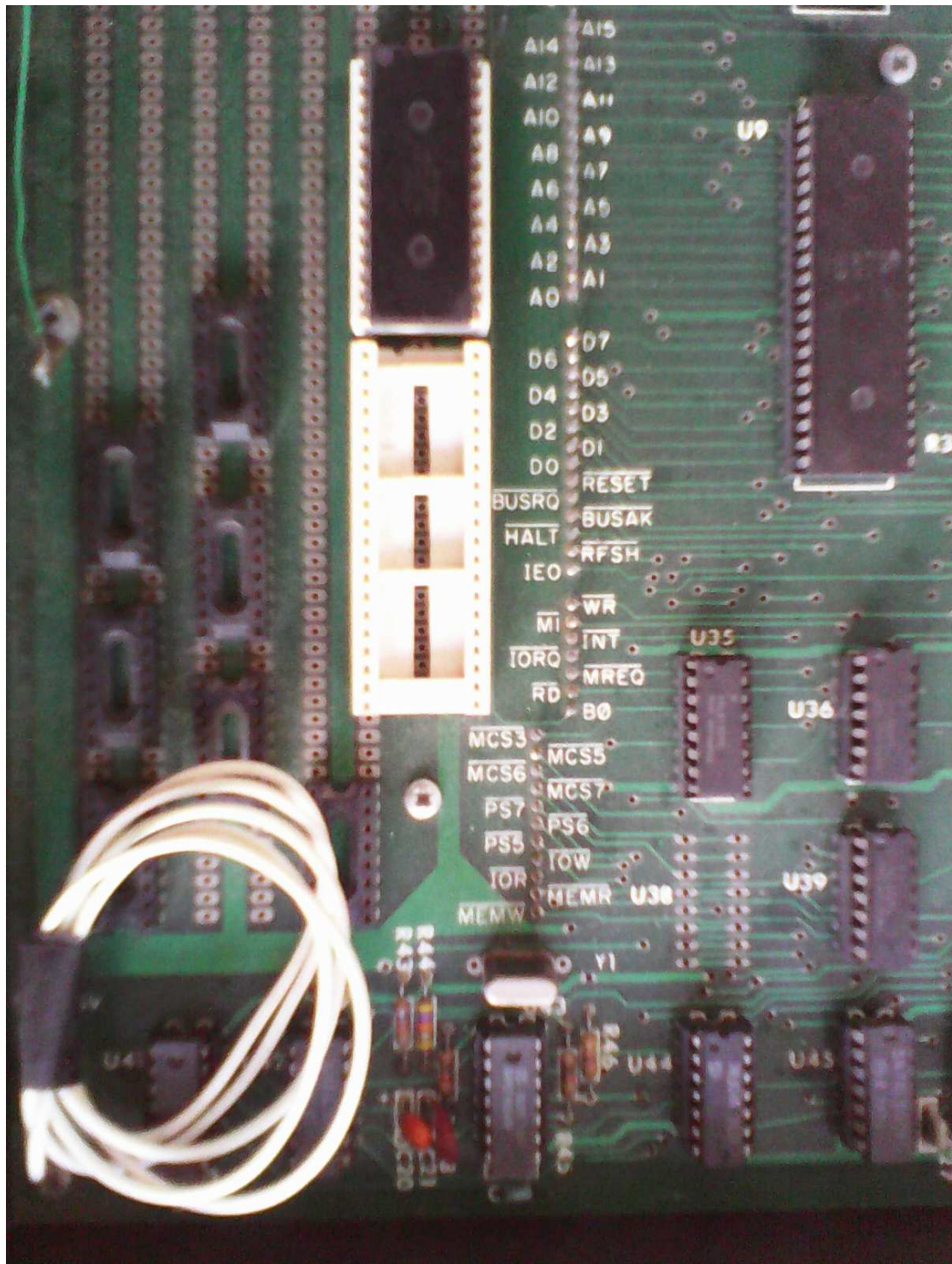


Figure 8: Zilog Z80 SDK Development Kit lower wire-wrap prototyping area

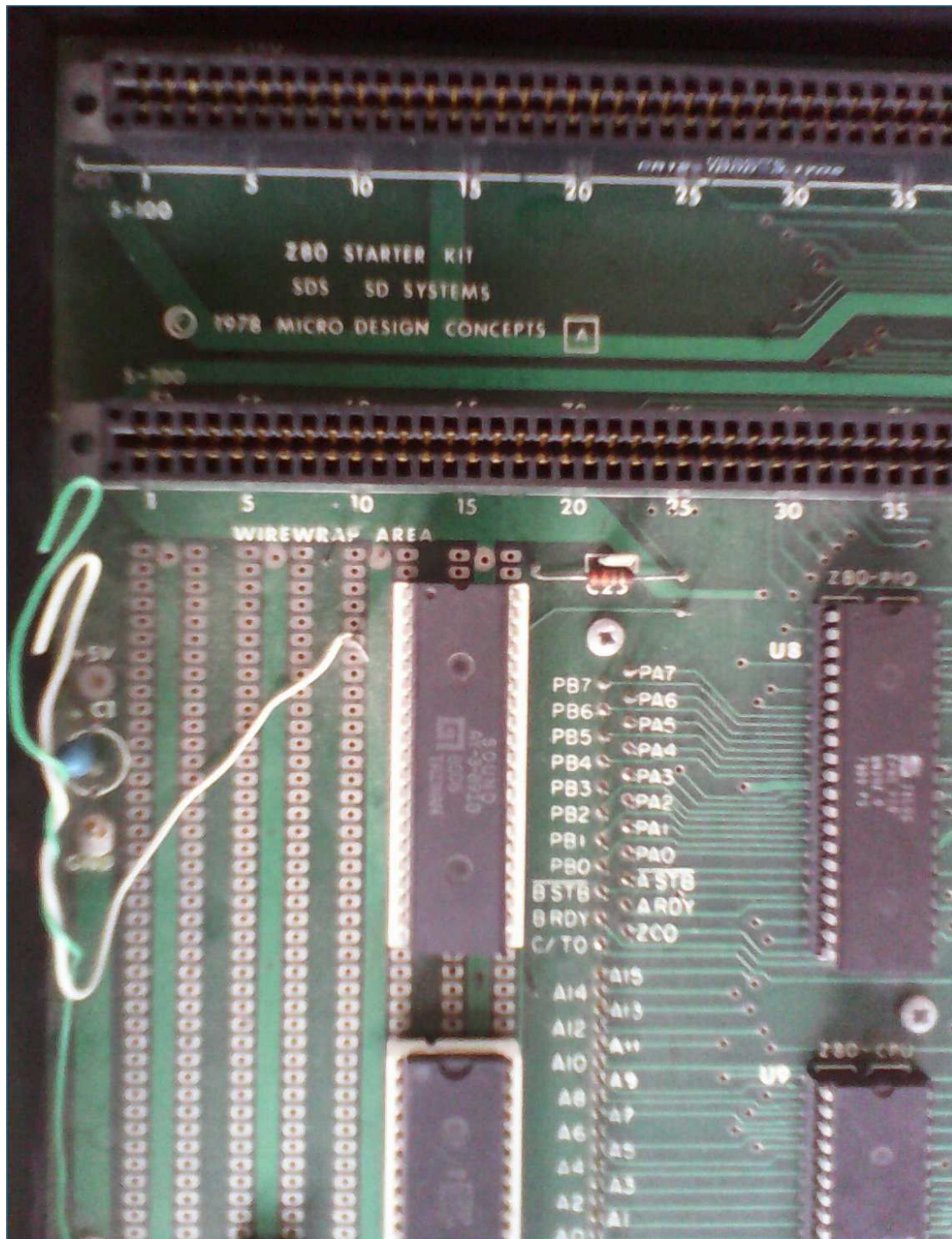


Figure 9: Zilog Z80 SDK Development Kit upper wire-wrap prototyping area
Also shown are S100 connectors and manufacturing label

“Z80 Starter Kit
SDS SD Systems
© 1978 Micro Design Concepts”