

The OMEN Kilo brings you this great CPU directly on your table! Simple design, but extendable in a modern way, the Kilo is the real powerful 8bit computer in a spirit of 80's.

You will love its assembler, designed by programmers for programmers.

OMEN Kilo



"6809 is the best 8-bit processor ever done"

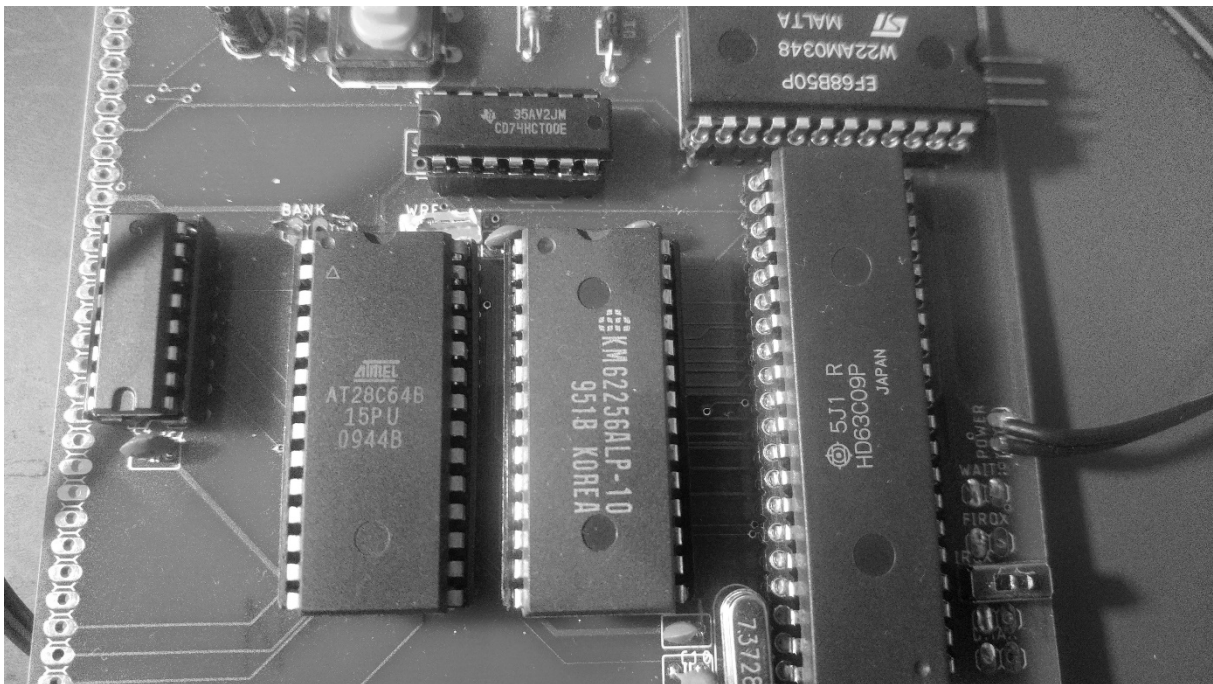
- Bill Gates, the Microsoft BASIC creator

Spirit of 80's

- Powerful processor Motorola 6809
- 128 kB RAM (expandable)
- Up to 64 kB EEPROM

OMEN Kilo / issue 1

Technical Documentation



INTRODUCTION

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The OMEN Kilo computer kit is a low-cost computer trainer, based on the MC6809 / HD6309 CPU. It has these features:

- MC6809 CPU working at 1.8432 MHz
- 32 kB RAM
- 8 kB EEPROM
- Serial port up to 115.200 Bd / MC6850 ACIA
- Application system bus



ASSEMBLY INSTRUCTIONS

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1. Solder sockets for the integrated circuits
2. Test all soldered connections
 - a. Test if all pins are well connected
 - b. Check if GND is not short connected to Vcc
 - c. Check if each IC has properly connected GND and Vcc
3. Solder all passive parts /capacitors, diode, resistors, push button, crystals/
4. Connect the power adapter and check
5. Insert the CPU into its socket /keep the proper orientation!/ and try to power it up. Check if oscillator lives /at CPU pin 34/
6. Insert the other ICs. Again: keep the proper orientation! Bad orientation can damage the IC!
7. Connect the serial pins TxD, RxD and GND /pinhead SERIAL/ to the TTL-to-USB converter
8. Start the serial terminal on your PC, select proper serial port and set the parameters to 115.200 Bd, 8 data bits, no parity, 1 stop bit.
9. Power your Kilo and check the terminal.

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MONITOR

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The main software for OMEN Kilo issue 2 is the Kilo Monitor version 2.0. Source codes are available on GitHub.

Basic commands are:

Daddr - Memory dump. Next line with ENTER, SPACE aborts dumping, BACKSPACE displays previous addresses.

Maddr - Modify memory byte by byte. Use ENTER, SPACE and BACKSPACE in the same way as in DUMP.

Gaddr - Go to program (JMP)

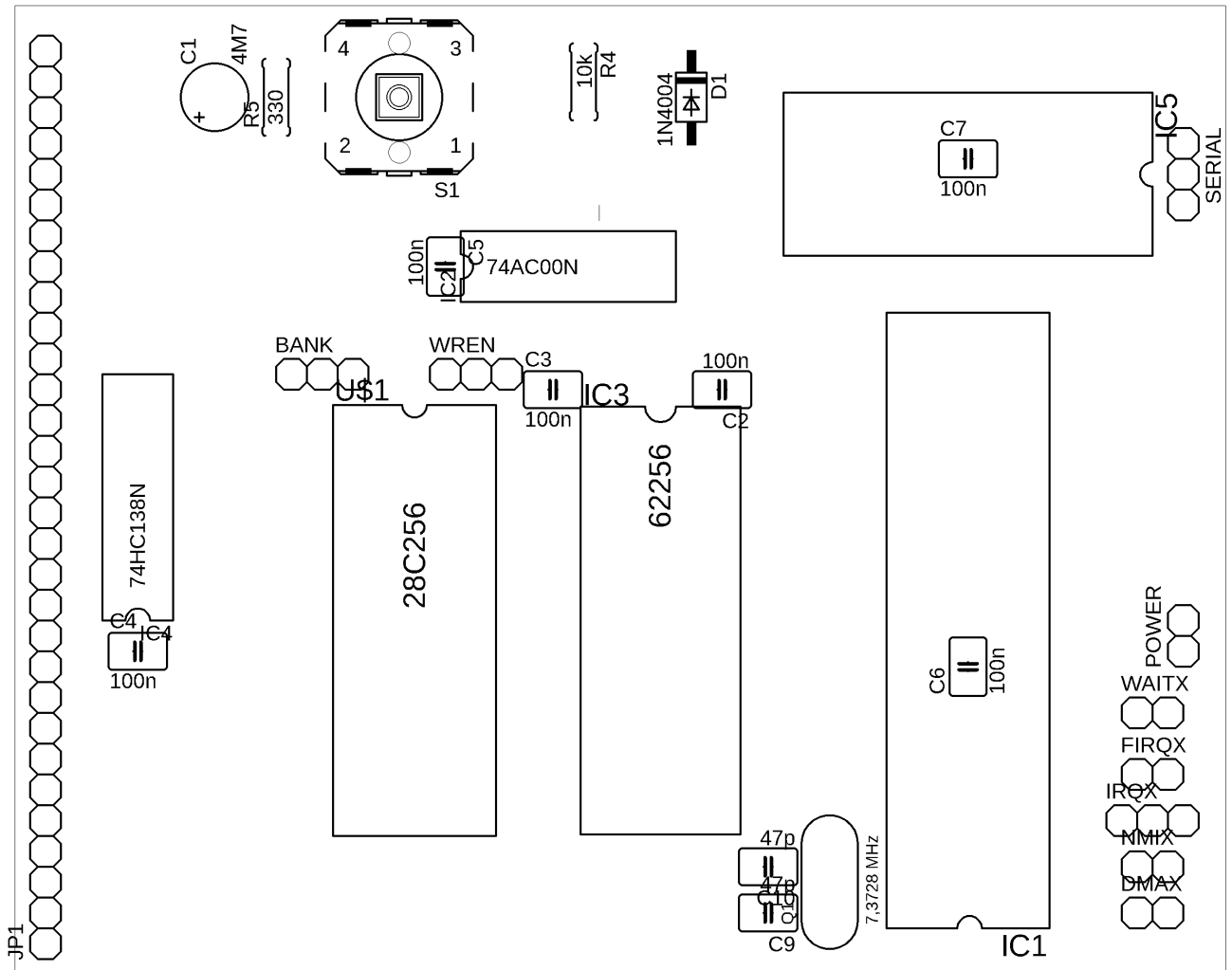
W from to - export memory as SREC

X from to - export memory as HEX

: - start HEX file to load. You can just send HEX file directly to the terminal to load data or program into the memory.

U - start a use module. Kilo EEPROM contains one preprogrammed module, the TINY BASIC interpreter. See source code to further information about the modular concept.

THE BOARD



Jumpers and pin headers

SERIAL: Serial port. Pins are RxD, TxD, GND from up to the bottom, RxD is near the edge.

WREN: PLEASE DO NOT USE, just solder the middle pin and the left pin /close to the BANK switch/ together. I am sorry.

BANK: EEPROM bank selector - only for AT28C256. Leave it open.

NMIX: NMI enabler. Close to disable non-maskable interrupts, open to leave it on the application bus. Connect the 10k resistor to make it "open-collector signal".

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IRQX: Interrupt enabler. Close to disable maskable interrupts, open to leave it on the application bus. Connect the 10k resistor to make it “open-collector signal”.

FIRQX: Fast Interrupt enabler. Close to disable maskable interrupts, open to leave it on the application bus. Connect the 10k resistor to make it “open-collector signal”.

WAITX, DMAX: Connect the 10k resistor or short wire, if you does not plan using these features.



SYSTEM APPLICATION CONNECTOR

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This connector is on the right edge of board. Pin 1 is on the upper side, next to the SYSTEM label.

Pins:

- 1 /WR
- 2 D0
- 3 D1
- 4 D2
- 5 D3
- 6 D4
- 7 D5
- 8 D6
- 9 D7
- 10 A0
- 11 A1
- 12 A2
- 13 /RD
- 14 IO1 --- 9000h - 93FFh
- 15 IO2 --- 8800h - 8BFFh
- 16 IO3 --- 9800h - 9BFFh
- 17 IO4 --- 8400h - 87FFh
- 18 IO5 --- 9400h - 97FFh
- 19 IO6 --- 8C00h - 8FFFh
- 20 IO7 --- 9C00h - 9FFFh
- 21 Vcc
- 22 GND
- 23 IRQ --- See the IRQX jumper
- 24 PHI2
- 25 /RESET
- 26 /WAIT --- See the WAITX jumper
- 27 /BUSRQ --- See the DMAX jumper
- 28 /BUSACK
- 29 /FIRQ --- See the FIRQX jumper

IOx signals are decoded by 74138

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PERIPHERAL IC ADDRESSES
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ACIA 68B50:

83FEh - Command Register

83FFh - Data Register



MEMORY MAP
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0000h - 7FFFh - System RAM 32k

8000h - BFFFh - I/O space

C000h - DFFFh - EEPROM 8k shadow

E000h - FFFFh - EEPROM 8k