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Acetronic aka Mini Chess ^[4]

Mini Chess, (SciSys Mini Chess) along with [Junior Chess](#) and [Graduate Chess](#), a series of portable [dedicated chess computers](#) manufactured and sold by [SciSys](#), first released in early 1981. The computers had a [Hitachi HD44801](#) 4-bit [CMOS microcontroller](#) with 2 kibi of 10-bit word [ROM](#), 128 10-bit words of pattern ROM supported by pattern generation instructions with table lookup capability, and **160 nibbles** or digits (80 [bytes](#)) of [RAM](#) ^[1], running at 400 KHz.

The programs were delivered by [Philidor Software](#), developed by [Mark Taylor](#) under guidance of [David Levy](#), who contributed the basic chess algorithm ^[2] including [promotions](#), [en passant](#), and [castling](#), and even managed [mate](#) with KR v K in some versions all in astonishing 160 nibbles of RAM. A piece of work that Mark Taylor is still rightly proud of today ^[3].

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160 Nibble Challenge

160 nibbles of RAM is a challenge. The HD44801 has an internal 4 word return [stack](#), so one may assume a maximum [search depth](#) of 4, but one has to be careful with external [interrupts](#), i. e. from keyboard or timer, since they cause an implicit call to an [interrupt handler](#), pushing the instruction pointer on the internal stack as well, with the possibility to cause an [stack overflow](#). One may better implement a simple [iterative search](#), called after [making a move](#) at the [root](#) within its [iterative deepening](#) framework.

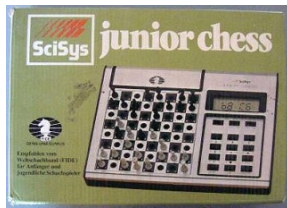
The board is apparently represented by an [incremental updated 8x8 array](#) of nibbles. The ply stack entry consists of [en passant](#)- and [castling rights](#), the [move](#) to [unmake](#), likely 3 nibbles [12-bit from-to encoding](#) also interpreted as state of a deterministic [move generator](#), and [alpha](#), while [beta](#) might be restored from alpha of the previous ply in [negamax](#) manner. Of course, with such a minimalistic design, [move ordering](#) is a big issue, and how to utilize the remaining nibbles in a most efficient manner, considering [MVV-LVA](#) and possibly maintaining a small [triangular PV-table](#) say for four plies.

Derivatives

Mini Chess was the basic model with [keypad](#) and [seven-segment LCD](#) to display move coordinates and small status messages, also sold in the UK under the marketing company name *Acetronic*.

Junior Chess

Junior Chess had almost the same



hardware and program than Mini Chess, but an integrated travel pegboard.

Junior Chess ^[5]

Graduate Chess



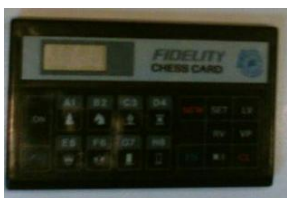
Like [Junior Chess](#), **Graduate Chess** was almost identical to Mini Chess, also with an integrated travel pegboard.

Graduate Chess ^[6]

CXG

The 4-bit program initiated [Eric White's](#) involvement in computer chess business and long time collaboration with Levy, when [Hong Kong](#) based manufacturer *White and Allcock*, forerunner of [Newcrest Technology](#) introduced the [CXG](#) brand in 1981 with [CXG Sensor Computachess](#) ^[7] ^[8]. It was further adapted for the more advanced **HMCS40** 4-bit singlechip processor ^[9].

Chess Cards



In the late 80 and early 90, the 4-Bit program appeared in low cost chess card computers by [CXG](#) ^[10] and [Fidelity Electronics](#) ^[11], at that time already acquired by [Hegener & Glaser](#).

Fidelity Chess Card ^[12]

See also

- [Junior](#)
- [Mini](#)
- [Move Generation with 256 bytes RAM or less?](#)
- [Novag Micro Chess](#)
- [Philidor Software](#)

External Links

- [Chess Computers - The UK Story](#) from [Chess Computer UK](#) by [Mike Watters](#)
- [Scisys and Novag : The Early Years](#) from [Chess Computer UK](#) by [Mike Watters](#)
- [Scisys/Saitek | Photo collection](#) by [Chewbanta](#)

Mini Chess

- [Mini Chess](#) from [Chess Computer UK](#) by [Mike Watters](#)
- [Mini Chess | My Chess Computers](#)
- [SciSys Mini Chess](#) from [Schachcomputer.info - Wiki](#) (German)

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Graduate Chess

- [Graduate Chess](#) from [Chess Computer UK](#) by [Mike Watters](#)
- [Acetronic Graduate Chess | My Chess Computers](#)

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- [Fidelity Chess Card Electronic Chess Computer](#) from [The Spacious Mind](#)
- [Ismenio's chess computer collection | Fidelity Chess Card 6115](#)
- [CXG Pocket Chess](#) from [Schachcomputer.info - Wiki](#) (German)
- [CXG Sphinx Chess Card](#) from [Schachcomputer.info - Wiki](#) (German)
- [Fidelity Chess Card](#) from [Schachcomputer.info - Wiki](#) (German)
- [Fidelity Chess Pal](#) from [Schachcomputer.info - Wiki](#) (German)
- [Fidelity Micro Chess Challenger](#) from [Schachcomputer.info - Wiki](#) (German)

References

1. ^ [HD44801_398306.PDF Datasheet Download --- IC-ON-LINE](#)
2. ^ [David Levy interview](#) from [Schachcomputer.info - Wiki](#)
3. ^ [Chess Computers - The UK Story](#) from [Chess Computer UK](#) by [Mike Watters](#)
4. ^ [Acetronic](#) from [Scisys/Saitek | Photo collection](#) by [Chewbanta](#)
5. ^ [Junior Chess](#) with [FIDE](#) recommendation for novice and junior chess players, [Scisys/Saitek | Photo collection](#) by [Chewbanta](#)
6. ^ [Graduate Chess](#) from [Scisys/Saitek | Photo collection](#) by [Chewbanta](#)
7. ^ [CXG Sensor Computachess](#) from [Schachcomputer.info Wiki](#)
8. ^ [CXG Pocket Chess](#) from [Schachcomputer.info Wiki](#)
9. ^ [HD614048_511862.PDF Datasheet Download --- IC-ON-LINE](#)
10. ^ [CXG Sphinx Chess Card](#) from [Schachcomputer.info - Wiki](#)
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