Dap Hartmann (1992)
Gallery of Dutch chess programmers
Interview with Johan de Koning

Johan de Koning: "There's a piece of Mephisto there, and there's a piece of Saitek." Johan points to circuit boards inhabited by chips, scattered here and there.

Johan de Koning: "You don't get that much useful information out of it, but it does tell you that these devices are sometimes messed about." That refers to the execution of the hardware. Extracting programmes from the ROMs appears to be a hopeless task, and it is impossible to pass judgement on possible messing around in them.

I am visiting TASC (The Advanced Software Company), Wil Sparreboom's Rotterdam firm where Johan de Koning works. It is a few days before Christmas, but there is no Christmas tree to be seen anywhere.


Dap Hartmann: "Perhaps you could decorate Wil Sparreboom", I suggest. The nice thing about that is that you can take it down a few weeks later. With this jocularity, I am assured that none of the ready-made Christmas presents will bear my name. Life is sometimes hard.

We take a seat in the far corner of the 'hobby room' behind the 'MicroOne' shop on the Wolphaertsbocht in Rotterdam. It looks like an ordinary computer shop, and it probably is. But still, the complete production of the so successful ChessMachine is housed here. All those beautiful plug-in cards are manufactured in the basement. And the programs are written in the hobby room. Everything under one roof. Except Ed Schröder, who works at home. Although Johan is present every day, he is anything but a 'wage slave'. Flexible working hours ('to avoid the traffic jams') and a commission-based contract make Johan feel like a king. There are computers everywhere - most of them not dismantled. PCs, commercial chess computers and Archimedes computers. After all, the famous RISC chip of the ChessMachine is the basic processor of the Archimedes. Thus, on that machine programs can be developed that are sent by a PC to the RISC processor on the plug-in card.

Johan de Koning is currently 27 years old, and the reigning Dutch champion of computer chess. I congratulate him on that, and present him with the challenge trophy in which the name of his programme, 'The King', has now been engraved. I hope that this trophy does not suffer the same fate as the memento of the last world championship in Vancouver. When not hidden under a microprocessor handbook, a volume of the Informator and three floppies, I believe it serves as a coaster.

It must be a nice place to work, because you can smoke there. In any case, that creates a good atmosphere for an interview. Every now and then, Sparreboom drops by to borrow a cigarette from Johan, to check that no big secrets are changing hands, and to answer the questions I've just put to Johan.

Johan de Koning: "On 1 April 1987 I started writing a chess programme. At that time I was a third year student of electrical engineering at Delft University of Technology. However, I got more and more motivated, and eventually quit more than a year later. I had already been involved in computer chess to some extent in 1982. A friend had taken me to the Dutch Championship in Wageningen. I thought that was I loved it and immediately became a member of the CSVN. Back home, I wrote a move generator. I did that on a homebrew computer that was described in the magazine Electuur. This 'Electuur Junior' was designed around a 6502 chip running at 1 MHz, and had a memory of 8Kb. I had made the clock frequency variable, because I also used the computer as a tone generator. I sometimes played along with the computer on my guitar and this way, I did not have to tune my guitar all the time. In the end, I could run the 6502 at 3.8 MHz."
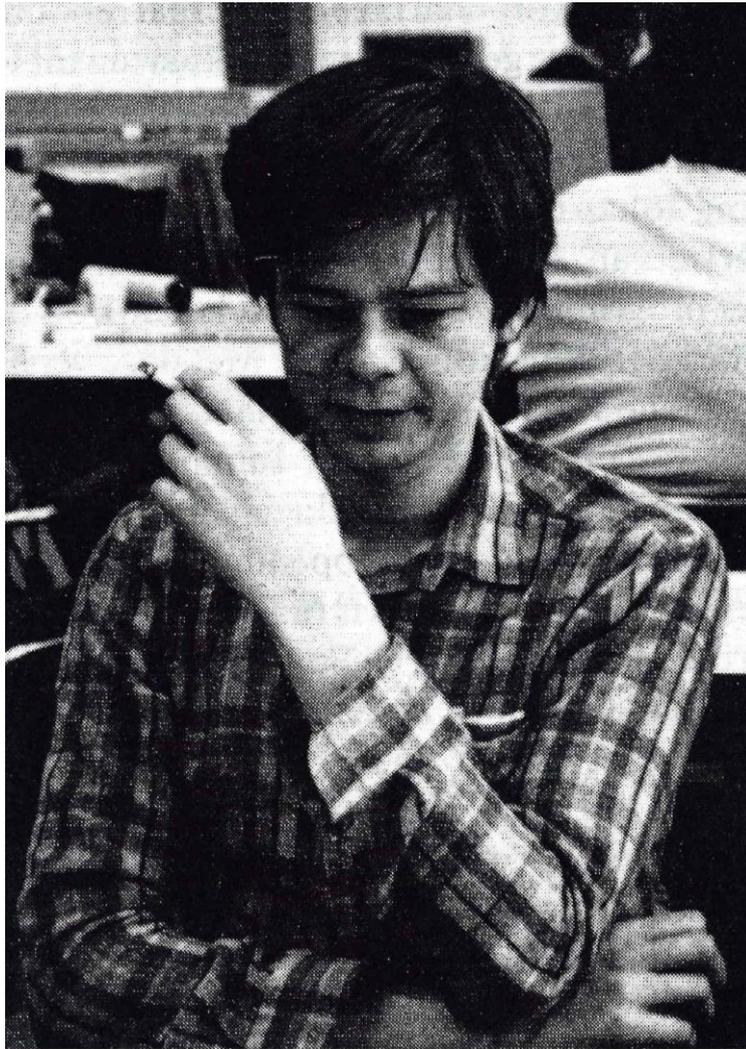
Johan de Koning during one of the many tournaments.
(photo: CSVN magazine 1992) (photo copyri*g*ht © by www.schaakcomputers.nl/) (600 dpi)

Perhaps that makes Johan the creator of the first turbo-kit. In 1986, he bought an Atari computer, and learned the language 'C'. So, after making all kinds of small programs, Johan started writing a chess program on 1 April 1987. It went quite fast, because after three weeks it was time for a new version. After nine weeks, there was already a fourth version, which lasted until after the 1987 Dutch Championship. The King debuted in that seventh Dutch Championship and scored 4 out of 7, which earned him a shared fourth place. The programme was brute-force, calculating about 350 positions per second.

Johan de Koning: "I was not dissatisfied with that shared fourth place (actually I was seventh), certainly because there was an error in the sorting of the moves. As a result, it sometimes happened that the best move was at the back instead of at the front. That makes a huge difference to the efficiency of alpha-beta pruning. I had also hardly played any test games, simply because I had no opponent for The King. Mostly I used test positions."

Johan de Koning: "After that tournament, the programme was reworked. I had devised a new data representation that should enable the new version (5) to reach 1000 positions per second. I am still using that same representation now. It was a good idea, but in version 5 I could not get beyond 350 positions per second. That was mainly because of the evaluation function. That took most of the time. Although the programme was not faster than the year before, the evaluation function was much better. At the NK (Dutch Championship Computer Chess) I scored 4 out of 7 again, and became fourth."

At the end of 1988, Johan stopped studying electrical engineering for good. But then the Ministry of Defence threatened to call him up for military service. He was recognised as a conscientious objector and enlisted in TASC. When you write such good programmes, it is clearly in the national interest. After Jan Louwman and Frans Morsch had recommended Johan, Sparreboom hired him in February 1989.


Johan de Koning: "I started all over again. This time on a completely different processor. After TASC had released the Final Cartridge and the Final ChessCard, they were looking for something new. The 6502 chip that was in the ChessCard was a bit old fashioned, and they wanted to investigate the possibility of using a new generation of processors, the so-called RISC processors. The idea behind the RISC philosophy is already contained in the acronym. Such a Reduced Instruction Set Computer has very few different instructions. Therefore, the design of the chip is relatively simple, and all instructions can be executed in the same short time (or 2 clock-cycles). To give an impression, the RISC processor we use, the 86C010 (also called AMR2), is built with only 25.000 transistors.

Compare that to an 80486, which consists of more than a million transistors! It is a true 32-bit processor, with a simple logical structure. In fact, all registers are identical. This makes programming much easier than the complex situation with segmented registers on Intel chips. Also, compilers can work much more optimally on this architecture. The Archimedes computer is equipped with an AMR2 processor, and it is on such a machine that I started developing the new version. I write most of my programmes in C. Compared to machine language, this is a small loss in performance, but it is much faster. The ChessMachine has a 16 MHz RISC processor and can execute approximately 12 million instructions per second (MIPS). A 33 MHz 80386, on the other hand, only achieves 4 MIPS."

Work on a new program resulted in a sixth version of The King, the first on ARM2. For the first, the program was selectively searching, and achieved a speed of about 650 positions per second. Evaluation still takes up most of the time.

Johan de Koning: "At a certain point, I rewrote the move generator from C to assembler. I did not do that for speed, because generating the moves only takes about 5% of the time. After rewriting, the routine became about 10% faster. 10% of 5% is only half a percent of the total. The main consideration was memory space: The routine took up much less space in machine language. I sometimes have to make compromises with space. Because I use quite an elaborate data structure, and need such a structure for each ply, that sets the maximum search depth. At the moment, the maximum search depth is 36 ply, which is sufficient in almost all cases."
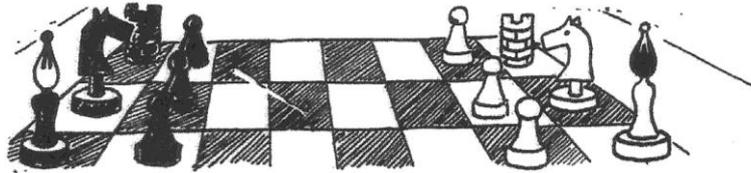
At the 9th NK, this version of The King came second. A clear progress was noticeable. Shortly afterwards, Sparreboom decided to equip the new generation of plug-in cards with the AMR2 RISC processor. It turned out to be a golden move. Early 1990, Johan started working on the seventh version of his program. This time the program was designed in such a way that it could also run on the ChessMachine. With it, The King managed to consolidate his second place in the 1990 NK. In the meantime, the number of examined positions per second is about 2000, and the opening book contains 55,000 moves. The search process is (after a number of plies brute-force) selective. Some variants are deepened, others cut off prematurely. The emphasis in the evaluation is on space and activity. Johan shows a picture of a position in which The King self-consciously refuses to accept an offered pawn, because it drastically limits the activity of the pieces.

Early 1991 a new era starts. Johan's contract with Sparreboom is changed when The King is made commercially available for the first time. Besides the program of Ed Schröder, the ChessMachine is now also available with the program The King. This is where the strength of the ChessMachine concept lies The plug-in card is a fully autonomous working computer. The software is loaded from DOS; nothing is stored in ROM. This way, ChessMachine always retains its value.

A new version of the program can easily be delivered on a floppy disk, and offered to the RISC computer. And several programs can be loaded (not simultaneously, of course). In the (standard) interface that takes care of the whole I/O, there is an option 'load program'. So, besides the Schröder programme, The King can now also be selected. It is not unthinkable that in the future completely different programs will be developed that can run on the RISC card. Perhaps even a Go programme. How do Ed's and Johan's programmes compare?

Johan de Koning: "The test games that I have played here show that they are not very different from each other. But you have to be very careful with that kind of statements. Besides, Ed seems to be working on a new version that scores 75% against the current one. It all changes so quickly, you can't make reliable statements about it".

Due to the absence of Ed Schröder, The King was obviously the favourite for the Dutch title last year. And The King, now version 8, became champion "of course".

Johan de Koning: "I have had a hard time with that. It is not pleasant to be the favourite, because something can always go wrong. You are supposed to win, so it can only be disappointing. When you see the incredibly fast systems that the participants in the NK use, it is sometimes frightening. A 33 MHz 80486 is about the least of it. I had to live up to an expectation. And I did, but not without a struggle, as you know."

Dutch champion, what more do you want? For now, the plan is to participate in all NKs and WCs. Other nice tournaments (like the Aegon Tournament) are good for publicity, and for an indication of the (human) playing strength of the programme. Such a plug-in card has its advantages. Not in the least because the speed of the PC into which the card is inserted is of no importance. After all, the processor on the card does the work. That is why a laptop is the obvious machine to travel with. Wil Sparreboom (now drinking a beer) talks about the emotions that were stirred up when the competition in Vancouver saw how they had lost.
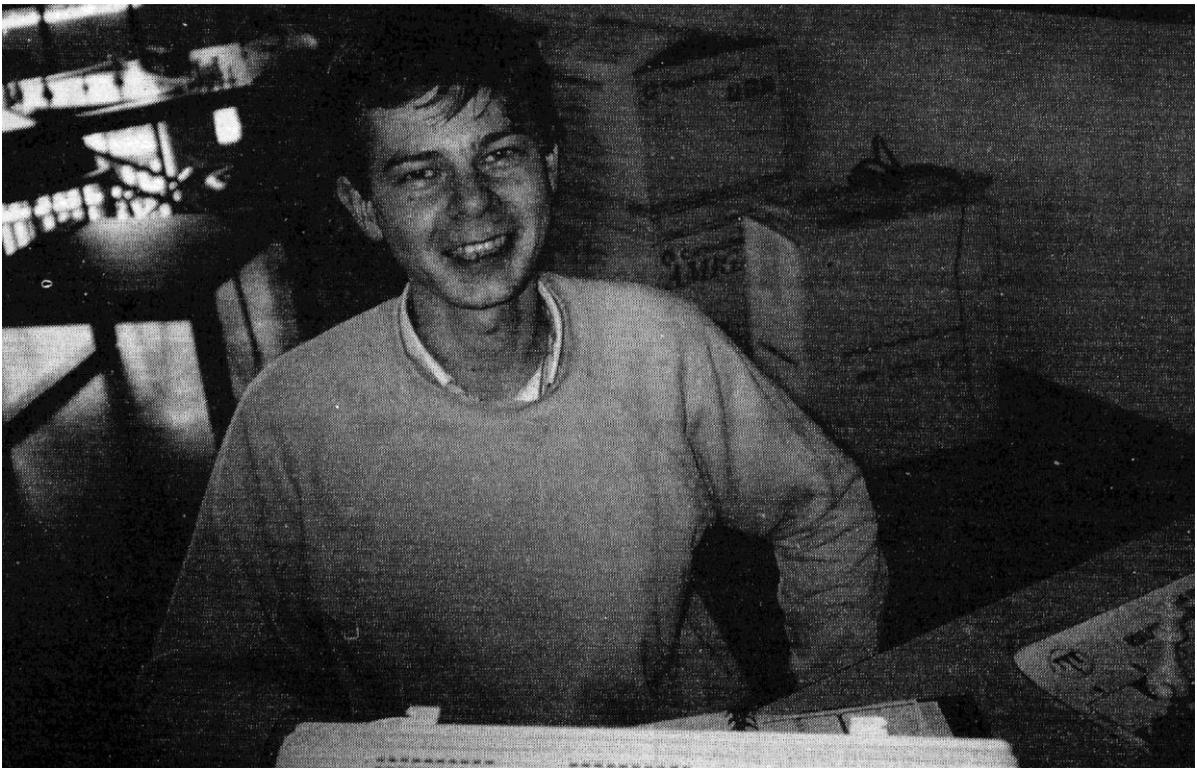

Johan de Koning during the computer chess world championship in Vancouver 1991. Johan, with his program "The King", managed to make a dangerous pawn sacrifice to win a chess game away from programmer Richard Lang (Mephisto X).
(photo: Jan Louwman) (photo copyright © by www.schaakcomputers.nl/) (600 dpi)

Wil Sparreboom: "At a certain moment, the battery of the portable computer was empty. Jan Louwman (computer chess pioneer and expert of the first hour) thought that something was wrong with the plug-in card. That card had only been ready a few hours before our departure to Vancouver. We had received the faster processor (30 MHz) at the very last moment, and had to work very hard to get it all working. The result was that a large number of temporary soldered connections had been made and the whole thing was held together with tape. When Jan Louwman removed the card from the machine, the scales fell from the eyes of some of the participants: had they lost THEM?"

Johan brings me back to the station; really, TASC is not easily accessible by public transport. The year is over, Johan is Dutch champion, Sparreboom has just informed him that a very lucrative international contract has been concluded, his Christmas present is waiting in the shop, and this afternoon there will be a social gathering, what more could you want?

Johan skilfully manoeuvres his Kadet through the busy traffic. After a fierce overtaking manoeuvre, he slams on the brake pedal. I don't know how far he looked ahead, but the bumper of the car in front of us is less than a ply. A witty witz about the successful cut-off of the car behind us escapes me again as a voluminous Santa Claus in a much too small car approaches us. It is almost Christmas. Finally, we reach the station safely. Could there be any truth in the Danish proverb: The closer you are to the King, the closer you are to the gallows?
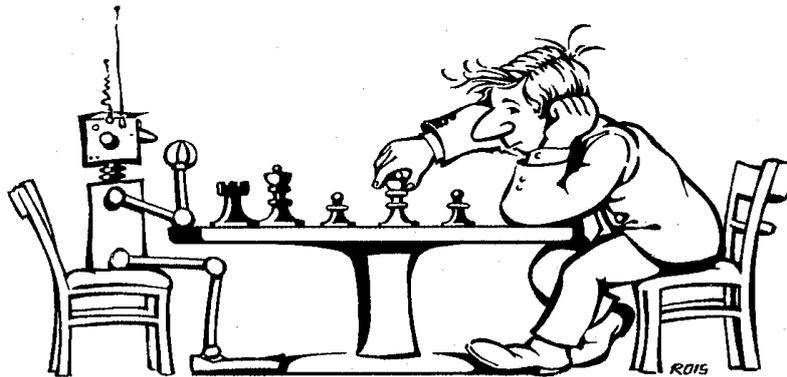
So far the article about Johan de Koning as chess programmer written by his colleague Dap Hartmann and first published in the magazine "Computerschaak" of the CSVN (Computer Chess Association Netherlands) in February 1992. Because the article is already 30 years old, I have added something to the text for clarification.

I know Johan de Koning from the Aegon tournaments of the past. I was lucky enough to be present there every year in The Hague. I had no personal contact with Johan there. For me, as a chess programmer, he was an authority that you could not just go and talk to during the tournament. In those days, as a layman you had some respect for chess programmers. During the CSVN programmers tournaments, I got to know Johan a little better. Johan turned out to be a very accessible person. He is still there today. This makes him one of the oldest participants still taking part in the CSVN tournaments every year.

Related items
https://www.chessprogramming.org/Johan_de_Koning

https://www.schach-computer.info/wiki/index.php?title=De_Koning,_Johan

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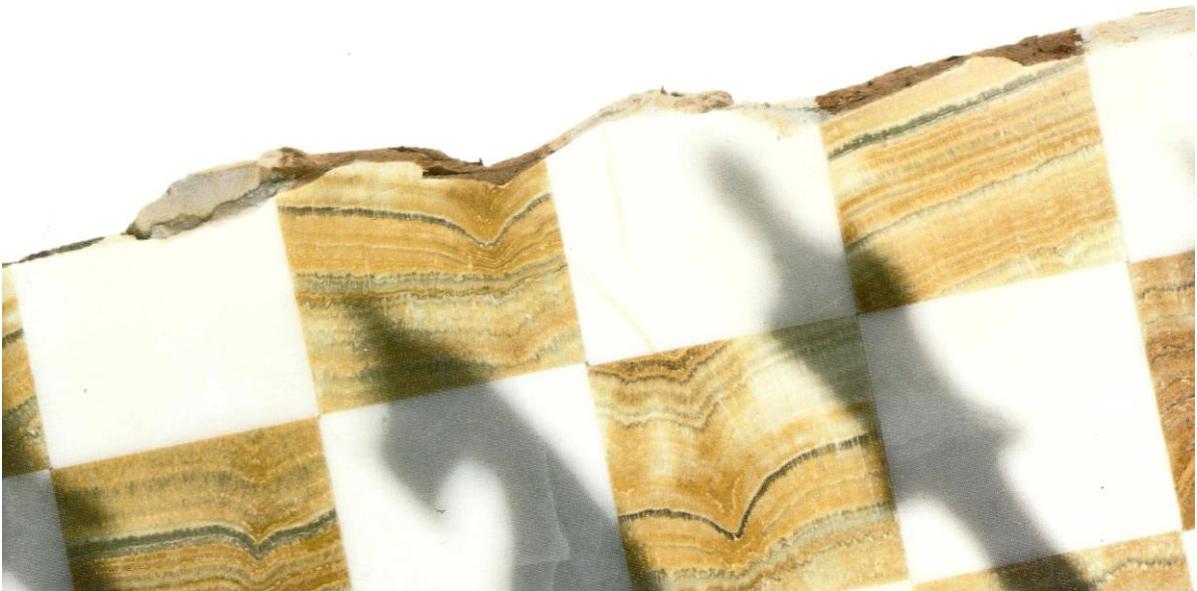
https://www.chessprogramming.org/TASC_R30

https://www.schaakcomputers.nl/hein_veldhuis/database/files/04-1989,%20Dap%20Hartmann,%20Interview%20with%20Ed%20Schroder%20(Dutch%20to%20English%20translation).pdf

https://www.chessprogramming.org/Dappet

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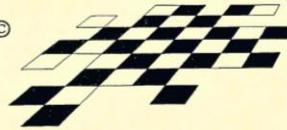
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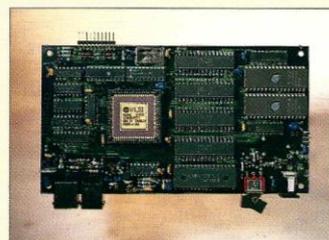
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Wir von TASC haben das Tasc ChessSystem R30 mit einem Ziel vor Augen entworfen: In jeder Hinsicht den besten Schachcomputer herzustellen. Seine Elektronik und die Verarbeitung des Holzes sind von hervorragender Qualität, seine Benutzerfreundlichkeit und seine Spielstärke außergewöhnlich.

Das Schachprogramm, mit dem der R30 arbeitet, ist die neuste Version von "The King". Dies ist das wohl stärkste Schachprogramm der Welt. Es katapultierte sich mit einer bisher unerreichten Punktzahl von 2402 auf den ersten Platz der SSDF Ratingliste (sogenannte "Schwedische Weltrangliste Schachcomputer"). Das ist die Wertung, die in der Regel erst von einem Internationalen Meister erreicht wird! Der R30 ist ein unschlagbarer Taktiker, und die Offensive ist seine große Stärke. Er spielt auf eine ansprechende und herausfordernde Art.

Das SmartBoard, das Schachbrett des R30, ist ein technisches Meisterstück. Es erkennt nicht nur die Position der Figuren, sondern auch, um welche Figur es sich handelt. Auf diese Weise kann das SmartBoard die Figuren "sehen"! Dennoch hat das SmartBoard die Größe eines herkömmlichen Schachbretts, und sein Design und sein Äußeres sind eine wahre Freude für das Auge.

Operator-Modul
Um das Schachbrett nicht zu einer sperrigen Box zu machen, ist das Herz des R30, der eigentliche Computer, zusammen mit dem LCD-Bildschirm und den Bedienungstasten in einem getrennten Modul untergebracht. Der Computer hat einen superschnellen RISC-Prozessor und einen gleichermaßen schnellen Speicher, die beide für eine hohe Spielstärke unerläßlich sind.

Der R30
- 32 bit 30 MHz Prozessor
- 24 MIPS
- Grafikdisplay
- 256K ROM
- insgesamt 640K RAM
- 512K 20 ns RAM
- 128K dauerhaftes RAM, batteriegepuffert

Das SmartBoard
- Elektronisches Schachbrett
- Größe 41 x 41 cm, Felder 4,5 x 4,5 cm
- nur 23 mm hoch
- 81 LEDs, vier je Feld
- volle Figurenerkennung
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The Tasc ChessSystem R30 has a SSDF playing strength of 2402 which is comparable to the title of an International Master.