International Players Chess News (1986)
A History of Chess Computers

1976 ~ 1978
Since their inception in 1976, commercial chess playing machines have consistently improved in playing strength, reliability, appearance, ease of operation and price. The main point of discussion in this article will be the price to rating strength ratio of machines on the market. The latest crop of these machines offers one entering the Expert class, two of solid class "A" strength, with two others bordering on low class "A". Curiously, the rating of a computer is not as stable as one might expect. It fluctuates more so than the average human due to two factors:
1) whether the opponent is basically a strategic or tactical player (and other more subtle "playing style" considerations),
2) how used the opponent is to playing against computers and more specifically, against the computer at hand.

The human who has been playing regularly against different machines can probably count on a new machine playing about 100 points below its "real'' rating against him. And after playing a lot of games specifically against the new machine he can possibly substract 50 points, once he gets to know it. It's no wonder the top computer out now, the Novag **Super Constellation** (officially rated 2018), which regularly beats experts, only seems to a computer vet to be in the 1900's. Granted it is a strong expert at speed chess. In order to understand where chess computers currently stand, however, one must have a sense of the history of the development of chess microcomputers.

Fidelity Chess Challenger 1
(foto: Tom Luif)

The first chess computers appeared in the late 1970s. These included the Fidelity **Chess Challenger 1** and Fidelity **Chess Challenger 3**, as well as Applied Concepts **Boris** (a small wooden model). The mere fact that these toys could "think" was a novelty which caught on quickly with the general public. However, with ratings of below 1000 these early computers were less than challenging and therefore of little interest to the tournament player.

When manufacturers claimed various rating strengths for these machines, i.e. beginner, intermediate and expert levels, they were demonstrating ignorance of the meaning of 'expert" rather than any attempt to deceive the chess playing world. In fact, the most primitive of these machines would not capture en passant, castle or promote properly. One machine, now classic, had the alphanumeric system backwards, with letters for the ranks and numbers for the files. Nonetheless, these primitive patzer machines, which sold for under $400, were a good beginning for what has become an exciting and challenging application of computer technology to the high logic of chess. Most of the available machines were manufactured by Fidelity and Applied Concepts.

Two companies, Tryom with the **Electronic Chess** and DataCash Systems/Staid with the **CompuChess** (started up solely for the purpose of making chess computers (although Tryom also produced a backgammon model); however, they could not keep pace and quickly dropped out of competition when Fidelity came out with their **Chess Challenger 10** which ranked over the 1000 rating.

DataCash Systems/Staid with the CompuChess
(foto: Tom Luif)

1979
In 1979, prices dropped to the $100 range. Machines such as the Fidelity **Chess Challenger 7** and Applied Concepts **Boris Diplomat** were released with no real strength improvement. The next playing strength sophisticasion came with the Fidelity **Voice Chess Challenger**. The rating went up about the same as the price (200 points). Gimmicks such as the voice, or machines with little, snide messages running across a screen, were meant to uplift an otherwise unchallenging game. These "innovations' were a questionable use of the added memory space, which could have been devoted to a more challenging level of play or at the very least an improvement on move entry technique. Moves still had to be entered on an external keyboard, leaving much room for error and "illegal" moves. Additionally, it was still possible to enter the moves correctly on the keyboard yet position pieces incorrectly on the playing board.

1980

In 1980, Fidelity came out with the first sensory touch board, the **Sensory Chess Challenger 8**. Now moves could be entered directly on the board by pressing the piece to be moved first on its starting square and then on its destination square. The board, however, required a concentrated, firm pressure on a precise point; nevertheless, this technology was far superior to the external keyboard method of entering coordinates, eliminating the possibilities of keying errors or move errors discussed above. Additionally, it went a long way toward eliminating "illegalities" in moves. The price dropped back to the $100 range, while playing strength advanced to slightly over 1200.

The novelty of having a machine that simply "made legal moves" wore off quickly, and designers now began developing strategy on a higher level, incorporating time controls and enhancing combinational considerations by the machines. These "toys" were good gift giving items for beginners, But even non-tournament players found themselves straining for a good game by giving these computers several hours per move (?!). Most players were still disappointed with the weak responses.

Applied Concepts/Chafitz Boris/Sargon 2.5
(foto: Tom Luif)

The Spracklens, top programmers of the time, began concentrating on serious program advancement with their Applied Concepts/Chafitz **Boris/Sargon 2.5** program. Chafitz marketed **Boris/Sargon 2.5** as the first serious 'tournament players' computer in the form of the then conventional key-punch system, calling it the **Modular Game System**. The system could be up-dated with additional insertable modules. Chafitz also marketed a fancier version of its system (a state-of-the-art program in updatable format) called the **Auto-Response Board**. This beautiful wooden board, still available, incorporated magnetic reed relay switches below each square.
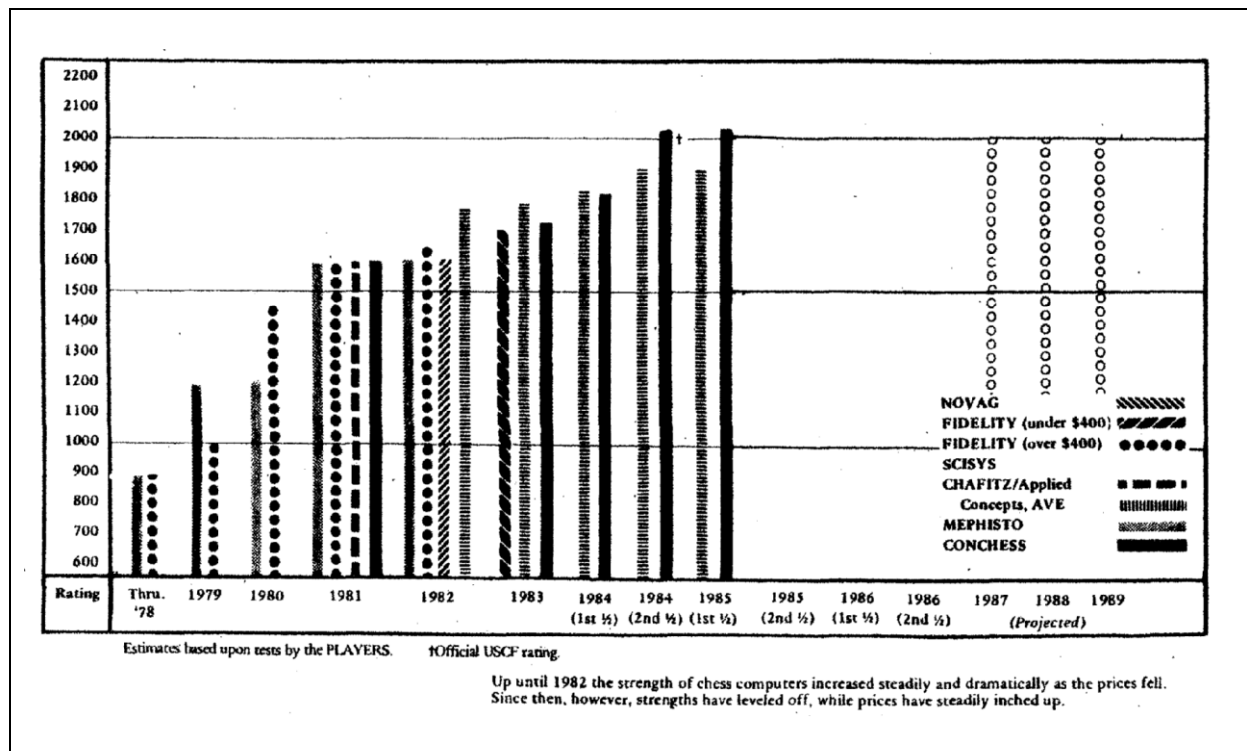
There were magnets in each piece, which responded to the magnets at the squares. Of all the machines of its time, the Auto-Response most simulated play with a human, sinds all that was required was to move the piece (no pressing squares) and the magnets recorded the moves. At $800, the machine was by far the most costly of its time. As a 1400-1500 rating, both machines played Class C chess. A less powerful program, the **Sargon 2.0** was made available for Apple Computer owners. The 2.0 was a less challenging opponent, both because is was an inherently weaker program and because is was software intended for a general computer rather than a dedicated system.

1981

Fidelity started the year with their **Voice Sensory Challenger** in an attempt to compete with thc top of the line machines. The machine, which integrated voice and sensory technology and included a built-in chess clock, was contained in a plastic casing surrounded by a wooden framed. The price ranged between $300 and $400. However, even with the additional features, tournament players still preferred the Chafitz's **Modular Game System** for playing strength and updatability. 1981 proved to be a year of many changes for computer chess.

Chafitz discontinued marketing and distributing their two chess computers.

Thus, the two manufacturers, Applied Concepts (Modular Game System), and AVE Micro Systems (**Auto-Response Board**) started marketing the machines on their own. However, in the confusion of the break-up, the top programmers, the Spracklens, ended up working for the largest manufacturer, Fidelity. It is important to note that, at least for marketing to tournament players, the programmer is the most important element, even for some multi-million dollar companies. Today's battle is really between which individual programmer will refine and enhance his program to the best possible playing strength and variety.

Estimates based upon tests by the PLAYERS.   †Official USCF rating.

Up until 1982 the strength of chess computers increased steadily and dramatically as the prices fell. Since then, however, strengths have leveled off, while prices have steadily inched up.

Fidelity's main sales were of lower-end products until Dan and Kathy Spracklen joined their team. They brought improvements in programming which virtually assured Fidelity's top position. Applied Concepts was also improving the quality of the product, with the **Morphy Edition master chess**, which was a few points stronger because of middlegame improvements. **Morphy Edition master chess** increased the strength of the **Boris/Sargon 2.5** to an approximate playing level of high 1500. **Morphy Edition master chess** was available for about $100 as a program up-date, which was a pleasant boost for owners of the **Modular Game System**. Additionally, they changed the name from **Modular Game System** (**MGS**) to the **Great Game Machine** (**GGM**).

Also in 1981 another pioneer programmer was busy working for Novag. This slick company made its first strong appearance in America in 1981 with David Kittinger's "My Chess" program. Introduced in their Novag **Savant** machine, a hi-tech, touch sensitive LCD board with a rating of approximately 1500 and a retail price of $625, the program ranked close to the top but was relatively inaccessible because of price.

Novag Savant
(foto: Tom Luif)

The same was true of Novag's **Robot Adversary**, which was an elegant machine priced at approximately $1500 (about $1.00 per rating point). Both of these machines were ahead of their time cosmetically, winning the prestigious New Product Award. However, the price/skill ratio was less appealing.

Novag also introduced a weaker, smaller "My Chess" program (only 4K) in a hand-held machine called **Micro Chess**. Priced as $140 with a rating of approximately 1000, this was the only significant hand-held chess computer of its time. Kittinger had just moved from Alaska to Los Angeles to continue his programming while making use of additional input from strong masters. The Hong Kong based SciSys also made an appearance in December of 1981 with their **Chess Champion Mark V**. Programmer David Levy's best effort won the 1981 'World Micro Championship, Commercial Section. To wrap up this significant, year - all the companies top-of-the-line programs were nose to nose at a high Class C, nearly 1600. This included Fidelity's last quarter advancement after the addition of the Spracklen team. During those few months, Fidelity added approxiamtely 200 points to its best machine to meet the competition with their **Champion Sensory Chess Challenger** program.

The final 1981 retail price standings, with all machines rating at approximately a high "C" level, were: Fidelity **Champion Sensory Chess Challenger** $375; Applied Concepts **Great Game Machine** (**MGS/GGM**) with **Morphy Edition master chess** $350; SciSys **Chess Champion Mark V** $398; Novag **Savant** $625.

At this point, all the machines were straining to become a solid Class B strength. However, although all manufactuers are now familiar with actual ratings, most of them were claiming "unofficial" ratings of 1700-1799. Things had gotten to the point where if any manufacturer claimed thereal strength of their machine, which would have realistically been under 1600, themachine would have appeared to be weaker than any of the competition and therefore unmarketable.

1982

1982 saw Fidelity take the lead in sales of chess microcomputers to tournament players. Novag was busy working on improving their programs. Applied Concepts introduced an opening module (the **Gruenfeld**, priced at $100) and an endgame module (**Capablanca**, $160) which only managed to take the strength of the entire system, priced as $600 to a low Class B rating of 1600. SciSys updated the **Chess Champion Mark V** to their (**Philidor**) **Chess Champion MK VI** program, which proved not to be significantly better than their original. Prices dropped to an all-time low as rating strength stabilized.

It should be noted here that all rating estimates are based on tournament time controls of 40 moves in 2 hours. This distinction will become more important as we discuss later the newest machines whose. 'blitz' ratings may exceed their tournament rating by as much as 200 points. Fidelity's 1982 introduction of the **Chess Challenger 9** was designed to "blow away the market" at an introductory list price of $165. Later the list increased to $195 as the coat of electronica in all areas increased. Prices have continued to increase with each new generation of strong machines.

Even so, the **Chess Challenger 9** was a strong and affordable machine, with the same brains as the **Champion Sensory Chess Challenger** but as half the price. It was 1982's best buy based on dollar to performance ratio. The **Chess Challenger 9**, however, did not have either a wooden frame or a build-in clock.

Fidelity Champion Sensory Chess Challenger

Fidelity did finally decide to add the modularity (not to be confused with the **Modular Game Systems**) concept to the **Chess Challenger 9**. The **MGS** was designed to accept program updates (brains), while Fidelity's could only be defined as modular, accepting raw information (opening cartridges, etc.) but not updatable. This means that to significantly improve playing strength the whole machine had to be sent to the factory for the guts to be replaced. Now it was possible to purchase a strong program (about 1600) at a low price or pay up to the list price of $600 for the Applied Concepts system, rated at 1600+.

The Conchess line of computers made an appearance with three inexpensive models, all with the same program. rated at approximately 1600. There were three levels of size (**Escorter**/ **Ambassador**/**Monarch**) and craftsmanship, ranging in price from $250 to $400. Early in 1982, Fidelity also came our with the **Elite Sensory Champion**, a machine for those who wanted the best available program. The machine was basically an advanced version of the **Champion Sensory Chess Challenger** program, running at 3.6 Mhz. The stronger **Elite Sensory Champion** program and faster clock speed put the playing strength at high Class B (almost 200 points stronger than the **Chess Challenger 9**).

The limited edition of 500 pieces has long since sold out at a list price of $1000. Later in 1982 Fidelity produced the **Prestige Challenger**, the same basic program but in a much nicer housing (similar to the **Auto Response Board** previously discussed), with an internal chess clock and a price rag of $1295. So, 1982 offered the tournament chess player three good choices: **Chess Challenger 9**, a low priced machine with decent strength; Conchess, with a nice casing and decent strength, and **Prestige Challenger**, a top-of-the-line machine combining beauty and brains.


The very original first Prestige Challenger with flat display! First owner: Dutch chess computer pioneer Jan Louwman, and second owner Rob van Son (Photo by Rob van Son)

1983

In early 1983, the main choices remained **Chess Challenger 9** and **Prestige Challenger**. But for spice, the German firm Mephisto came on the American scene, offering a machine which fell somewhere between the **Chess Challenger 9** and **Prestige Challenger** in both price and strength. The **Mephisto II**, a hand-held model, list for $350 and had a solid B rating of 1700. A beautiful cabinet for the machine, with out additional "brains", sold separately for $550. Other manufacturers appeared to be doing nothing. Is was becoming obvious that updatability did not have much meaning, with regard to the strength of any individual machine. It had more to do with the future of the particular company, their programmers and their updating ambitions than any real potential of the machine.

Suddenly in the Fall of 1983, after a long quiet period, Novag unveiled their new **Constellation** (2 Mhz), and also announced plans for their **Super Constellation** (first 3,6 MHz and later 4 MHz), which would make its appearance in 1984.
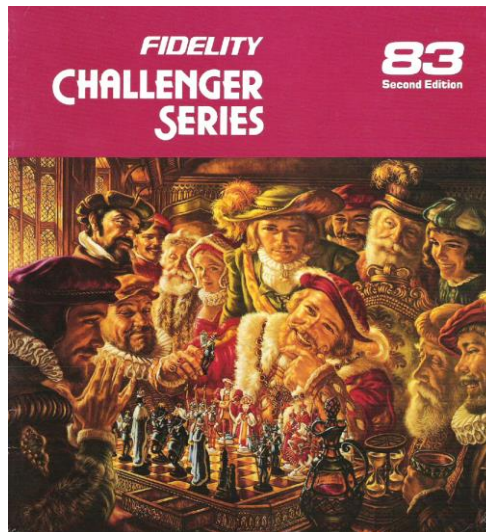
Fidelity brochure from late 1983

At a list price of $199.95 and solid "B" strength, the **Constellation** put the Fidelity **Chess Challenger 9** and the Mephisto out of contention. Also, Kittinger had spent all his time working on developing program modifications which allow the machine to play an especially strong game on its first level with up to a five second response time. Another especially welcome improvement was Novag's sensor board, which is far more sensitive than the competitor's pressure sensitive boards. Entering moves on the **Constellation**, thus, falls somewhere in between the hard press of the sensory games and the ease of the Auto-Response.

Additionally, by eliminating the response lights on each square which are typical of pressuresensitive boards and replacing them with prompt-lights on the proper coordinates, Novag succeeded in eliminating one of the more distracting features of its predecessors. Concurrently, in late 1983, Fidelity brought the cost of the larger wooden sets down with the **Elite A/S** (Elite Auto-Sensory); similar to the **Prestige Challenger** in operation and playing strength at one-third the price - $450. This was the lowest price ever on full size sets. So, at the end of 1983 the two top programs offered at good prices were; in the inexpensive version, the Novag **Constellation**, rated around 1700 and listed for $200, and in the expensive range, the Fidelity **Elite A/S**, approaching 1800 and priced at $450.

1984
Early in 1984, Fidelity discontinued the 1983 **Elite A/S** model and put their Budapest program into the **Elite A/S** casing, calling it the **Elite A/S World Champion**. This was a well-deserved title, since Fidelity had just won the 2nd World Micro-Computer Chess Championship in Budapest, Hungary, a few months earlier (late '83). The Budapest program brought the machine solidly over 1800. Customers with older **Prestige Challenger** machines or the **Elite A/S** could send the machines to the factory for $150 up-date, and first time buyers paid $600 list. Immediately after the **Elite World Champion** came out at Class A strength in mid-1984, Novag stepped up their Constallation program to run twice as fast (from 2,0 to 3,6 Mhz), bringing its strength up to Class A also.

For an additional $50.00, everyone opted for the Novag **Constellation 3.6** ('Connie 3.6' $250) and the slower verson is now discontinued Programmer Kittinger's emphasis has always been on speed, and now not only were the heuristics designed to play exceptionally well at fast speeds but the chip speed was running faster. The speed chess level was almost 2000 strength (based on human opponent spending as much time, moving as quickly as the machine), while the tournament level strength was low Class A (1800+).

All these statistics were taken at the time the machines appeared and continued to hold up in tournament competition throughout the world, against humans and against other chess micros. Of course the manufacturers still get a litlle excited about their own products. For instance, both the **Constallation 3.6** and Fidelity **Elite A/S** (**Budapest**) claim to be rated over 2000 by their manifacturers. Well, perhaps the **Constallation 3.6** is close at speed chess, but at 40/2 both had just entered Class A. Even so it seems now that rating claims are overstated much less to than years before.

Late - 1984
At the end of the first half of '84 the **3.6** was heralded as being the best priced machine for the playing strength, just as the **Chess Challenger 9** was in '82. The **Elite A/S** (**Budapest**) was the other tournament player's choice for those opting for a more beautiful casing. It was becoming clear that Novag and Fidelity were the two to watch. Fidelity produced two attempts to compete with Novag.
1) The **Chess Challenger 12**, and **Elite A/S** downgraded both in strength (close to 1800) and cosmetic appeal (half size with imitation metallic look and wooden border rather than full wood surface). The price was brought down to the Novag **Constellation 3.6's** $250. However, the **Constellation 3.6** stil remained king in that price range.
2) The Fidelity **Elegance**, also in the 12's size, but much more handsome, retaining the **Elite's** full-wood look, was quite an improvement both in appearance and play. The pieces, however, lacked a touch of class, It's program was an **Elite A/S** update, running at the same speed (3.6 Mhz) but with better programming. The **Elegance** program just tied for first in the Fourth Micro Chess Championships in Glascow, Scotland, August '84 and appears to be close to 1900 strength.

Fidelity Elegance (foto: Tom Luif)

Just as the **Elegance** was coming out, Novag relased their long-awaited **Super Constellation**. The list price was expected to be $600.00, but Novag surprised us with in incredible low list price of $399.95 ($600.00 with printer and clock). The other surprise which Novag had kept well secret was the fact that the machine is now user programmable. The biggest surprise, however, came late November when the USCF officially acclaimed the Super to be expert strength. After 40 games of humans (average rating 1982) playing against 10 production off-the-shelf models, the computer garnished 22 points. This 55% score under tournament conditions netted in official rating of 2018.

Super Constellation vs Constellation 3.6

Some of the main differences between Novag's **Constellation 3.6** and **Super Constellation** are:

1) 16 levels for the Super (7 lower levels so one can win occasion), while only 8 for the **3.6** (and no training levels). Tournament players like this feature since they can teach wife/husband or kids to play the game and, after not to long, they will start winning and be encouraged to move up the latter. The **Constellation 3.6**. for instance, would start off on its lowest, instant response level by beating even intermediate players a hundred games in a row. After such a string of losses, the average person becomes disenchanted and feels like he'll never be able to play the game competently. We suggest that if you get such a machine, plan on losing - against is every time, use it as a tutor. Then trounce your human opponents. The advantige of the Super, of course, is that you start monitoring your progres by seeing a ratio of wins as you go up the "easy" levels. Also if you set a goal of, say reaching expert strenght, you can progress in smaller increments and have the machine stil keep you interested even when you reach your goal. And you'll always have the lowest levels to beat up om if you even find yourself disenchanted with progress. For anyone rated below 1600 the choice between the 3.6 and the Super would be easier if the Super were presently priced at $600.00. However, with the current cost being so closc the two main factors appear to be

a) Can one handle losing every time against the 3.6 with no out, until improvment finally shows through and

b) is your goal to have a good, strong partner (if you don't mind losing) or a tutor that can help you set your goal at expert/master class rather than class 'B'.

2) The Super is compatible with the Novag printer, while the 3.6 is not. If you find that you have played a particularly brilliant or instructive game, you may print out the game in crisp figurine notation with diagrams at instructive points. The printer may also be used to verify positions in the computer's brain or keep track of which opening variations one has programmed in.

3) The Super accepts a clock for a more even match. Masters may spot time odds of five minutes to three for an even struggle (the machine has been nick-named "blitz monster" after winning games against IMs in blitz matches). Weaker players may give themselves the time advantage. The clock may also be used singly for tournament chess, or to play speed chess with friends.

4) The rating difference between the two machines is close to 200 points. Opening play is much more varied with over 21,000 moves versus 3000. This should result in a better middlegame starting point. The program has been written in a 56K format as opposed to 16K. This allowed the programmer much room for advanced strategie heuristics. Now its positional insight is more equal to its proverbial tactics. It will even sacrifice on positional grounds. The endgame play is also much more enhanced. It will force a mate with bishop and knight versus king, a feat no other computer can perform and many experts find difficult!

5) The internal clock speed is only 0,4 megahertz faster (3.6 Mhz versus 4.0 Mhz). This is much less significant than the drastic program advancements as it very rarely allows it to see even an extra ply (½ move) further. The fact that the machine plays a strong expert, close to master speed-chess game has more to do with the promming.

6) The Super can be unplugged and the game still continued three months later, due to its long-term CMOS memory. Thus, if you wind up in a losing position and "accidentally" knock all the pieces over or trip over the cord ... well, the machine is still ready and willing to continue.

7) If asked, the Super will display its depth of search at that moment. It also automatically announces up to mate-in-four. If you are playing along when unexpectedly on comes the mate-in-four signal, you know already that it is time to hit the "take-back" key (followed, perhaps, by the "hint" key).

Novag Constellation 3.6

8) Both solve mates and problems with amazing swiftness. Often, the Super will solve the problem in seconds, faster than some Grandmasters!

9) With the Super, one can in effect aid the programmer by adding opening lines that you, specifically, have a more difficult time against and need practice playing, either as White or Black. You can also program in how often you would like to see each line appear. Now if you find that you need to get a few fast wins in against the computer, just put in a couple. You could have it open 1. g4 every time and after your 1 ... e5, have it play 2. f3 50% of the time and 2. f4 the rest of the time. After mating it a number of times on h4 and proving it is not invinceable, you can erase those moves from memory and do some serious programming. The moves do not just stay in memory for a limited time. Rather, they become an integral part of the machine's permanent opening memory repertoire (although, of course, you can erase and reprogram this repertoire).

Entering the moves into the computer's bram is easy. It does not involve laborious keying-in. Just play the garne naturally and each move you play is automatically ingrained into its brain, as long as you are in programming mode. You can create your own monster - the variations you dread playing will keep coming back in future games to haunt you. You may find after drilling yourself through many games that certain variations you used to have a difficult time playing against you now find easy to play. At that time you may steer the machine much deeper down the line to a fork where you feel that the branch the machine usually opts for poses fewer problems than one it plays less frequently (or perhaps the friend you're trying to beat plays the less frequent line). At that fork you can change the ratio of response - have it play the move it usually opts for only 1 in 10 times, and the other move, 9 out of 10 times. If you ever find that you master the line altogether then you may delete that line leaving space for others. The deletion flexibility is especially important if you are close to the programmable moves, which is 2400 half moves. This programmable feature is only of optimum use to stronger players who are objective enough to recognize their own weaknesses. Weaker players who purchase the Super and hope to get to master strength can utilize this feature more fully as they go up the ladder.

Elite A/S dilemma

Now the more costly **Elite A/S** (Budapest) only had beauty to show for itself as it was ranked third behind the **Super Constellation** and the **Elegance**. It was more closely grouped with the **Constellation 3.6** and the **Chess Challenger 12** in playing strength. A good number of people found that the never expected to beat the **Super Constellation** or the **Elegance**, or had any realistic aspirations of doing so, They did not like the flimsy pieces on the **Elegance**, the plastic of the **Super Constellation** and liked the size of neither. For them, the **Elite A/S Budapest** was fine.

The main real advantage to getting the strongest program for someone at that level is that although he or the never plans on getting to the point of bearing the machine regularly on its higher levels, as least the machine will be providing a better game on fast response levels. In addition to receiving a more challenging game without having to wait, also the stronger the machine, the less likely the chance of outgrowing it.

Fidelity Elite A/S Challenger
Study by K.K. Behting, 1908
White plays and draws! Artificial Stupidity?

Naturally, if one is using the machine as a tutor, one inclined to take the advice of a stronger program with less of a grain of salt than a lesser program. The machines are so strong now, however, that most people can start to make compromises between top strength and top looks. Still some players wanted the beauty and a program ranking closer with the top models.

Shortly after Novag released their **Super Constellation**, Fidelity released a third version of the **Elite A/S**. The program is exactly that of the **Elegance's**, However, is runs 0.4 megahertz faster (3.6 versus 4.0 Mhz), resulting in only perhaps a 10 rating-point gain. This program at 4.0 Mhz is 50 to 100 points stronger than the older **Elite A/S Budapest**, putting it close to 1900. So the dilemma was solved with the **Elite A/S 4.0** ranking solidly in the top two. The cost went up only $50 ($650 list), a healthy price/strength raise.

With a list price close to the **Super's**, the comparison is easy-expensive, handsome cosmetics (beauty) versus costly electronics/programming (skill).

Elegance vs Elite A/S 4.0
With a difference of $250 in price, the Elite/Elegance comparison is a little muddled.
1) Playing strength is approximately equal, both as solid class
2) Playing surface of Elite 4.0 is almost tournament size, with beautiful wooden pieces, making for much more comfortable, natural playing.
3) Both machines have a modest number of built-in opening moves (several thousand) intended to be supplemented with any of Fidelity's opening cartridges, such as the **CB9** ($78 list) with 8,160 moves or the **CB16** ($120 list), with 16,100 moves. (The **Chess Challenger 9**, incidentally, will only accept these two). The newer Fidelity models (such as the older **Prestige Challenger**, all three **Elite A/S's**, the **Sensory 12** and **Elegance**) will all accept these two general opening cartridges and the more specialized ones.

Also offered is the **5-volume ECO (Encyclopedia of Chess Openings) set** (each volume, $120 list) or the even more specialized **Queen's Gambit Tarrasch** module ($120 list).
4) Unlike the **Elegance**, the **Elite 4.0** has a built-in displayed chess clock. Besides the obvious telling of time, one can see a number of insights the machine is trying to relay.

Fidelity Elegance Chess Challenger

For instance, it will display its assessment of the position in + or - fractions of points (+ 0.5 means it feels it is up the equivalent of half a pawn as a positional/material equation. It does, occasionally, display minus scores - this is to make the human opponent feel better). The clock will also display which ECO opening module should be popped in next, in the event that a line should cross over to a different ECO volume (a rare occasion, and only useful if one owns the ECO cartridge set, $600 list).
5) The **Elite 4.0** has a long-term memory (as the **Super Constellation**),whereas the **Elegance** is only short term.
6) The one advantage of the Elegance is that is has no voice. But rest assured, the voice on the **Elite A/S** can be turned off. Actually, the voice may have a positive influence in stimulating the interest of a youngster to tackle the game.

Opening enhancement

All rating estimates given so far have been based on the machines performance without utilizing any opening enhancements. The following comparison of these enhancements is primarily between Fidelity's complete set of **ECO** cartridges and Novag's programmable opening book and how they relate to the two primary aims of the opening 'book" of a chess computer:

1) to play these automatic moves quicker and
2) to create more difficult middlegame opposition.

We as Players feel that, in general, the opening is the least important phase of the game. One of the primary reasons for increasing one's depth of rote knowledge of an opening repertoire is that is simply allows one to budget extra time to more signifiant middlegame and endgame considerations. The set of **ECO** cartridges for the Fidelity machine override the much smaller, built-in lines and increase the average depth of many lines to over 10 moves, setting the machine in motion for a decent middlegame.

The set is especially good for beginners as they can see if the moves they are making are respectable enough to be considered a main line (the cartridges contain only the main **ECO** lines). However, the entire set probably increases the overal strength of the machine by only 25 points. Additionally, while **ECO** may assess a line as being slightly better for White, equal, etc. these assessments do not have the same meaning for every player. "Good" and "Bad" positions are relative terms.

More important than speeding up the opening with a vast collection of opening moves to reach relatively even positions is to have the moves continue into the middlegame with significant effect. Thus, the **ECO** set for Fidelity is less effective than Novag's programmable opening (more appropriately titled programmable middlegame) feature, since the Novag approach may be used to specifically affect only the middlegames in which the user needs practice. This approach has great significance for the serious student.

Imagine that every game played resulted in a middlegame where you found yourself having to struggle, not just any randomly selected middlegame, but specificalty the ones that occur in your opening repertoire. Every player finds that there are lines within his or her repertoire that cause more difficulty than others. One lessen to be learned with a programmable middlegame is how to steer the opponent away from these more difficult lines when thev are encountered in tournament play.

If this is not possible, using the computer the player is able to learn how to counter and/or handle these difficult middlegame positions through regular practice. Let us continue this example in greater detail. Imagine, if you will, the average master playing against an expert. If the expert is playing an opening where the middlegame plays itself (e.g, a thematic kingside attack) and the master bas been steered into his least favorite line, suddenly the expert is playing at least 100-200 points stronger than his usual play.

Similarly, if a 2200 rated player was playing the 2000 rated **Super Constellation** and programmed in to enter only middlegames he despised playing, then the strength of the computer goes up in like manner. Of course, the next player with his own repertoire who sits down to play the machine will find its strength back to the original, because the machine is only stronger specifically against the person who programmed it.

With the **Super Constellation** this is achieved by first changing the ratio of rcsponse of the 21,000 moves it comes with. Undoubtedly some of the machine's lines will provide you with difficult middlegames to play against with either color, After you select the cream of the crop, the most difficult lines the machine has against you, specifically (probably a total of several hundred or more, depending en how varied your opening repertoire is), then you add other lines of your choice which are designed to pose you with difficulties. This process of aiding the enemy works like an inoculation. Thus, curiously enough, the 2400 programmable half moves of the **Super Constellation** are more significant than the tens of thousands of **ECO** moves contained in the Fidelity cartridges on both of the opening qualities discussed earlier: 1) the game generally goes deeper into the middlegame, gaining time for later analysis and 2) the middlegame opposition is tougher.

To conclude: The Fidelity **ECO** system is good for the intermediate player to help widen his or her opening repertoire. For the, beginner or intermediate player who purchases the **Super Constellation**, the assumption is that the student will learn from the built-in book lines and from a library of actual books. The student has probably set his sights On reaching expert or master rating and will find the machine with its own book challenging to that point. When he reaches his goal (or perhaps even at Class A) the owner can then take the time to boost the machine's strength with the programmable option (also by that time there will probably be slight up-date on the overall strength of the machine).

Early 1985
The latest development in chess computers for 1985 is Fidelity's **Chess Challenger 12** running at 5 Mhz. The older **Chess Challenger 12** ran at 3.25 Mhz, but both machines use the same program, the Budapest. The increased speed of the **Chess Chalenger 12** does not make it stronger than the **Elite 4.0** which has the Glasgow program, a one year further advanced program. In other words, the increased program strength of the **Elite 4.0** outweighs the greater clock speed of the **Challenger 12**. The new **Chess Chalenger 12** increased $100 in price over its predecessor, from a list of $250 to the current list of $350. The rating strength increased approximately 50 points. Another new computer has arrived on the market, the **Turbo Star** from **Scisys**. Our computer experts are now testing this machine to evaluate its overall strength.

Late 1985
Until Fall, the **Super Constellation** was the strongest machine commercially available and should continue to offer the best price/performance ratio in the 2000 rating range into 1986. The latest models coming off the line have an even lower defect ratio than the initial models, which were already less than 5%. A larger version of the **Super Constellation** is in the works, called **The Constellation Expert** - expect a November delivery.

With an extra larger program than the **Super Constellation** (64K vs. 56K) The **Constellation Expert** will also feature substantial programming refinements. This should put in about 75 points higher than the **Super Constellation**, which has an official rating of 2018.

Moreover, The **Constellation Expert** will be a full sized beautifully finished auto-sensory machine. But with a price-tag of $700, **The Constellation Expert** may have trouble meeting the sales of the popular **Super Constellation**, with its healthy price/performance ratio. Fidelity's **Elite A/S 4.0** remained a good buy as a beauty/brains model until the arrival of Novag's **Constellation Expert**. Mephisto is back with two upscale programs, the **"S"** and **Blitz,** and five different choices for casings.

Their top-of-the-line model is the **Munich S**, a beautiful wood cabinet filted with costly electronica. The name "Munich" describes the 17" x 17" casing. The "**S**" stands for the expensive advanced program expected this Fall/Winter. Presenty, the Munich board is only available with the **Blitz** program. Although the "**S**" program is much larger than the **Blitz** with its 64K (and should break the 2000 harder), it is slower and hence better only at strategy. The **Blitz** is better at fast response, tactics, and especially problem solving. Better positional play should still put the **Munich S** as least 50 points ahead of **Blitz**.

AVE Micro Systems recently released their **Sargon 4.0** program. This program should not be confused with the **Elite 4.0** or **Prestige 4.0** program, although the casing looks very much like that of the Prestige (without the clock). The playing strength is now Class "A" (although claims over 2000 are made), a healthy class ahead of **Sargon 2.5** or **Sargon 3.0**. The main reason for the jump into Class "A" is that the original programmers for the **Sargon 2.5**, the Spracklens, chipped back in to aid AVE Micro Systems. The rating is still a notch below Fidelity's **Elite 4.0** program due both to the sophistication of Fidelity's program and its clock speed of 4 Mhz. However, with a program only slightly stronger than Fidelity's new model costing 1/10th the price, few players will pay the premium for what is perhaps the most beautiful chess computer casing ever produced.

The dramatic development in late '85 is in the public arena - not in increascd playing strength (non tournament players, who constitute the biggest market, can count on loting every game against present top models and certainly don't need anything stronger) but in improved price/strength ratio in the lower range, Fidelity's new **Excellence** model would have been top-of-the-line only a few years ago, doubtless carrying an expensive price-tag (the original plastic Elite listed for $1000). But the **Excellence** cost only about $100 with a perfectly decent playing strength of about 1800.

Chess computer manufacturers have a long history of overrating their machines. The only computer officially expert rated is the **Super Constellation** as 2018, yet Novag continue's to claim a strength of over 2200. Such boasting is unnecessary since as its real strength it offers the best price/performance ratio for stronger players. Fidelity is guilty of the same exaggerations in the lower-end range with the Excellence, boasting a strenght about 200 points too high. Imagine trying to have an 1800-rated program running on inexpensive electronic components - the result could be even more quality problems than Fidelity's expensive machines now experience. And it is not reasonable to expect the **Excellence's** program which is only half the size of the **Elite's**, to be as strong as that machine's. It runs 25% slower than the **Elite's** and contains only 60% of the opening moves. Also, the machine is not modular, and is incapable of accepting a large opening repertoire, or update.

The 3 Mhz clock speed is misleading since the program runs a cheaper processor yielding an even slower comparative speed. One advantage, however, of this procescor is the increased battery life: now the machine will play 100 to 200 hours on a set of four batteries.

Fidelity has plans to submit the **Excellence** to the USCF for an official rating, the second entrant to take this bold test after the **Super Constellation**. The hope is that the machine will come out with a rating over 1800, but that even if it fails significanrly short of that goal - say, low class "B", It will still be by far the best buy for the dollar in the $100 price range, two other models are all below class "B".

The next models up, the **Chess Challenger 12** and **Constellation 3.6** both list for $250 and are at best only slightly stronger. Some impatient customers may still opt for the Novag **Constellation 3.6** since it plays a much stronger speed chess game. Relatively speaking, the Fidelity **Excellence** is poor on fast response levels and needs 5 to 10 minutes per move for its strength to flourish. Other customers may opt for the handsome walnut-framed **Chess Challenger 12** for cosmetic reasons, as the **Excellence** looks a hit like a home-made model kit.

Even the plastic **Constellation** series look very handsome, with a robust casing in which one can see the work of a highpowered team of designers. And the cost is not that much more - less than $100 difference after discounts (The **Excellence** lists for $225, plus $12.95 for the adaptor).

Stil, all in all, we feel the **Excellence** is the best buy for the dollar in the lower price range and will help anyone rated class "C" or below improve quickly. Ones one reaches class "B" or "A" the machine becomes more a sparring partner, useful for keeping the player on his toes. In order to make full use of a chess computer as a tutor er self-improvement tool, its playing strength should be at least one solid class ahead of the player's so that he can respect its advice and can plan on frequently losing and learning.

But even the non-tournament player, who can anticipate not winning on tournament time settings, will find the faster response levels easy enough to show him a win on occasion. So it makes a great gift even for the total novice (unlike the regular **Constellation**, which Novag should probably have built in training levels as they did with the Super since its number 1 level of 0-to-5 seconds response is not much worst than the slow response levels; on all levels the person en the street can count on losing).

Customers who cannot contend with the **Excellence's** quality control have two options that were top-of-the-line models in their time, and which have been reduced substantially because they are used **Great Game Machines** with all three cartridges (over 1600 strength) $99.95 (including adaptor); or regular Constellations, rebuilt $175, used $125, with used adaptors, $9.95.

Stronger players (class "B" and above) and lower-rated players ambitious to reach an Expert rating (the aspiring junior, for instance) will find their best buy in the **Super Connie**. Experts regularly use it to keep in form - even a few Masters have bought the machine, finding it sufficient to provide a real challenge, and enough of a sting to keep their interest. Masters can utilize the programmable opening book to steer themselves into middle-games that are part of their repertoire, but pose paricular difficulties.

To summarize, our recommendations for good choices in late 1985 are as follows: Fidelity **Excellence** - fine for the less ambitious player and as a gift for the casual player (e.g. most people.) Novag **Super Constellation** - appropriate for the serious tournament player looking to improve. And with its lower training levels, even an ambitious beginner has the whole spectrum ahead of him.

Mephisto **Blitz** - ideal for the problem solvist. Fidelity **Elite A/S** - for the person who appreciates beauty and brains. You could, patience notwithstanding (= onverminderd - ongeacht), wait for the **Constellation Expert**.

The matter of ratings
It should be noted that Novag is the only company to have their computer officially rated by the USCF computer rating agency. Most companies won't risk permitting their products to be officially rated because of the possible bad press if theirs does poorly, The Chess Federation allows any production or experimental models to play in regular rated human tournaments (eg. U.S. Opens). However, since they cannot monitor the legitimacy of "on-market" models, all computer entrants are considered experimental. Therefore many are supped - up to their max. One supped - up program (faring very well as such) has been made to run very powerfully in tournamcnts is has competed in, the Sargon III. Commercial models are much less impressive.

Software vs dedicated machines
Substantially stronger than the Sargon II, the III is the best software (diskette) program out. However, since the program was designed for the casual player already owning a home computer, the manufacturer cannot economically staff a team of programmers to approach the strength of state-of-the-art dedicated models. The weaker programming in conjunction with the limitations of home computers (previously discussed) in for instance a standard Apple computer (running at 1.2 Mhz) will play a slower, weaker game.

Still, one can achieve a 1600 level game. The diskette is a good buy, but there is still some charm lost from having to key in moves, watch the board on a screen and then move the pieces on a real board. Playing against a dedicated machine that actually "thinks" is quite different. Many people owning a home computer will ask for a chess diskette simply because they already own a computer. What they mean to ask is - What will give me a good game of chess?

Familiarity breeds contempt
Some computer owners have tent their machines in for an update (eg. up-grade to a Budapest program) and were disappointed to find that the improvement was very slight, so slight for some that the machine actually seemed weaker. This may have been due to the human having improved against the first edition and improving in the couple months it takes to get it back. However, chances are that the player was comparing his cumulative win/loss ratio on the older version (where he may have had many more initial losses) to his current record against the update. Incidentally, the Glasgow program is a more significant upgrade.

Although the top program out, the Super, boasts an official rating of expert, a number of the stronger, seasoned chess computer vets on gut feeling estimate after a solid month with the machine, even its strength to be slightly under 2000, high 1900's (without utilizing the programmable opening book).

These prosusually underate chess computers by far more thans 25 to 50 rating points. Maybe they need more time to attempt uncorking any quirks they may discover. These hard cores know exactly how to play against computers. The human player has a distinct advantage – he learns how to play against the machine, even subconsciously picking up on its weaknesses. Two human opponents playing regularly against each other will attempt different late-opening/middle game lines and after the orther sees that he is losing, he adjusts and unleashes a different middlegame strategy.

So, the ultimate goal is to produce a machine varied enough, good enough that you never catch on to his tricks; you can never learn to beat it automatically. Lacking that, a machine that learns to play against you. Well the Super has achieved the goal on both counts to some compromising degree. Opponents will find that they are actually improving, not just uncovering weaknesses in the machine. With the earlier, weaker models, once you discovered certain failings (entire books elaborate on these deficiencies), you could beat it at will.

Players would go through all kinds of contortions trying to make the machine's game better, such as opening up files one usually wouldn't, playing unsound sacrifices, or just playing an inferior game. With the Super's advanced middle game and endgame positional understanding, its weaknesses are much more subtle (a master's are even more subtle) and hardly as predictable.

To most people the machine is unbeatable (excluding training levels of course). But for the expert or master, as they try different lines and find ways of outwitting it, i.e. learn the machine, it won't quite learn back. However, with the owner's assistance the computer can, in a sense, learn how to improve on its play and "learn" to beat its master. No long does familiarity with a computer necessarily breed comtempt. The computers now are so good that even after becoming intimately familiar with their style, their playing strength remains about the same.

Source: 11-1986, International Players Chess News: A History (Recap) of Chess Computers. (Slightly edited by Hein Veldhuis.)

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Last Updated on January 16, 2010