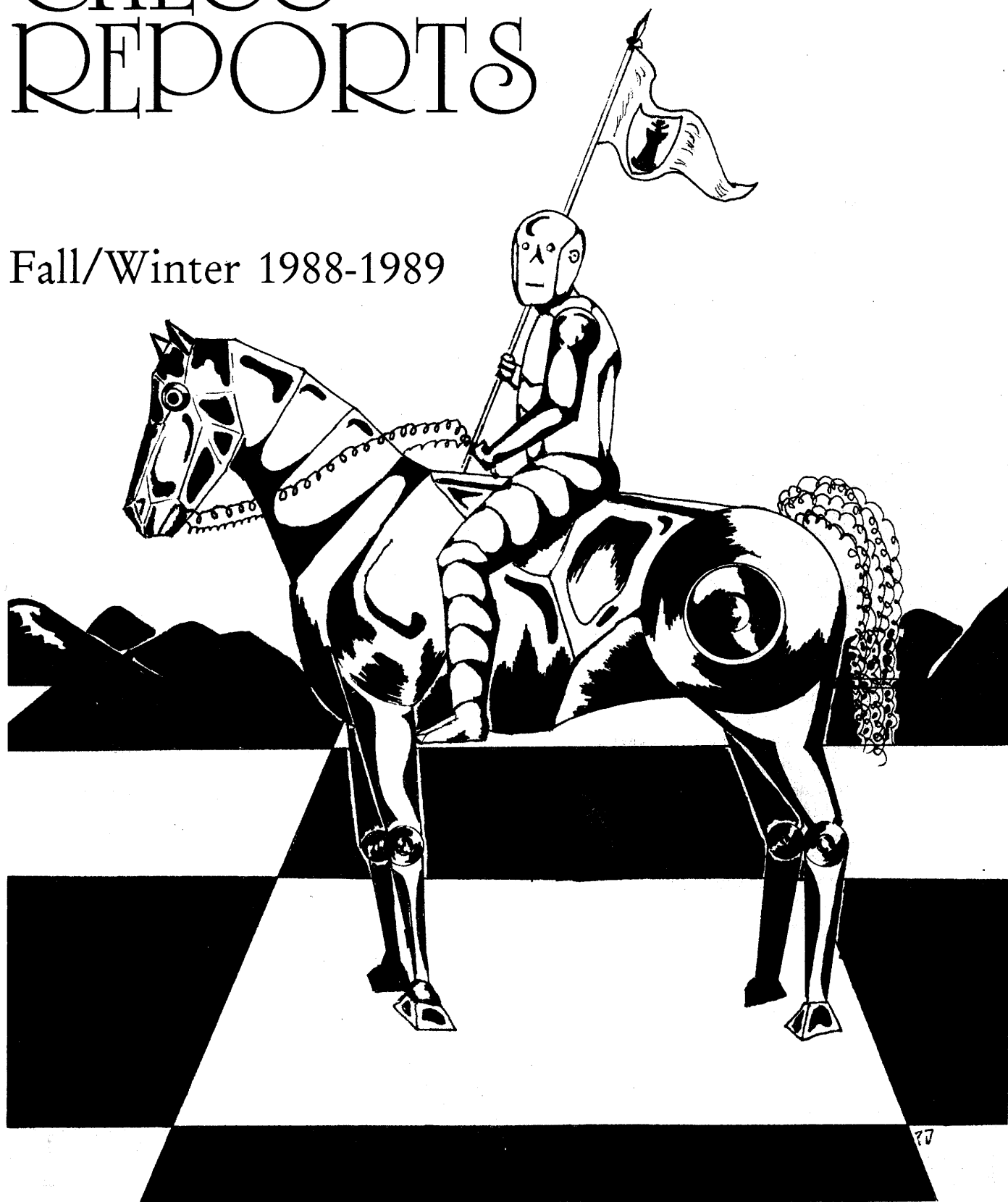


COMPUTER CHESS REPORTS

Fall/Winter 1988-1989



ADDENDUM

by Larry Kaufman

The ten games on pages 16 and 17 between Mephisto Mondial 68000 XL and Fidelity Mach III were played at the two minute per move tournament level by Mike Fay. Openings were pre-selected to avoid prepared lines, with each machine playing one white and one black in each line. It may be interesting to compare how the two models handle the same opening. Mephisto Mondial won the match 7-3, yet lost 8-2 when openings were not pre-selected, apparently because the Mach III opening book was designed to defeat the Mondial.

On page 26, the designer 2100 display should be listed as 6 MHz, not 5. Book size is 28,000, not 16,000. On page 27, the Academy is wrongly listed as lacking the ability to claim draws and to resign. The Europa does have mate solving, set-up and tutorial levels, and is battery operable.

The listing of "Swedish Chess Federation" as a contributing editor should read "Swedish Computer Chess Association". There latest ratings (150 added for USCF equivalent) include: Mephisto MM IV + Turbo Kit (16MHz) 2309, Meph. America 16-bit 2295, Fidelity Mach III 2240, Meph. Roma 32 bit 2235, Meph. Dallas 32 bit 2224, Meph. Roma 16 bit 2181, Meph. Dallas 16 bit 2177, Fidelity Mach II LA 2133, Meph. Mega IV 2112, Meph. Academy 2100, Meph. MM IV 2098, Novag Super Forte (5MHz) 2023, Fidelity Par Excellence 2022, Saitek Stratos 2008, Meph. Europa 1872, etc... The Mephisto and Fidelity 32-bit models are not yet on the list, but after 20 games (a 6.5 to 13.5 loss to the MM IV + Turbo) the Fidelity Mach IV stands at a surprisingly low 2182, while after 72 games in Sweden, England, and U.S. (all at 40/2) the Mephisto Almeria 32-bit stands at 2338 on this same scale, primarily due to a 24.5 to 10.5 victory over the Mach III.

The above Mephisto Academy rating is very disappointing, but after 27 games here and in England at 40/2 with the selective search depth set for 4 instead of the default (3), it rates at an impressive 2252 on this scale. The default of 3 is probably ideal for faster games like 30 seconds or 1 minute per move, but appears to be inferior for tournament level play. The reason is that 4 ply of selectivity allows the Academy to complete the key odd(seventh) ply often. I have had excellent results for this model at all levels, and considering strength, features and board (auto-sensory wood) I deem it the best model now available under \$500.

Novag plans to release Super Expert B and Super Forte B by May featuring a new selective search program, several times faster than the current program on most problems. The standard version will remain at 6 MHz at prices close to the old Supers, with more expensive higher speed models also likely. At 8 MHz, the new program rates at 2271 after 16 "reversal" games at 30 seconds, which would put it above all but the \$1000+ models. As the new program was received just days ago and is quite different from the version tested more extensively for this publication, it is too soon to say whether it will be stronger than the Fidelity Mach III and the Meph. Academy, it's main rivals under \$500.

The Mephisto "Supermondial II", a slightly upgraded Mega IV at 4 MHz, is doing amazingly well in my tests. At 30 seconds "reversal", it defeated the 16-bit Mondial 68000 XL by 9-7. While the SM II would probably not defeat the Mondial XL at other time limits, it certainly looks like a great value in those countries where the Mondial 68000 is not sold.

Fidelity had announced plans to add a form of learning to the Mach III program to create the "Elite Avant Garde 2265" this summer, fulfilling a prophecy made in this CCR (page 13). It will not learn in any generalized sense, but will attempt to avoid repeating the same loss interminably. The Mach III was recently rated 2036 in France after 52 games vs. humans at 40/2. If French ratings are 200 below USCF as they claim, this agrees closely with the CCR rating of 2221.

The Novag Mentor 16 will employ a similar selective search to the new Novag Super B models. Because of its' tiny RAM (256 bytes) it is not likely to play as well as the VIP, but it will surely be the strongest tabletop model with display for under \$100. My best guess would be 1800 level, but I have very little information to go by so far.

The article on page 46 should have appeared immediately before the one on page 53, as both involve Pierre Nolot's problem set.

New chips are now available for the two Mephisto Almerias (32 and 16 bit) to brighten the lights and to cure the occasional "vector error" seen on the first units sold. Owners may return modules for a free upgrade to the current version.

Hello Again

by Steven A. Schwartz

Welcome to our Sixth Annual and for those of you who signed on to receive this publication way back when, thank you for your patience. As usual, the putting together of this magazine has been an up-hill struggle, for the flow of information with respect to computerized chess computers never ends, but if one is to get out a magazine dedicated to writing about these events, it has to stop somewhere. Consequently, you are *now* the proud owner of the 1989 Computer Chess Reports.

When the current project began back in December of 1987, we all had visions of grandeur. This 1989 magazine was going to be 500 pages long. It was going to be printed upon parchment dating back to the age of Sodom and Gomorrah. It was going to include articles written by the then President Reagan and the Ayatollah Khomeini. And, naturally, its circulation was going to rival that of Time Magazine. The ONLY problem was that nobody here really thought that a cover price of \$1,200 was going to sell a heck of a lot of Annals. So, back to reality. A 60 page magazine, newspaper print, and a reasonably good circulation but no Time, for sure.

However, as you pass through the pages to come, please note that International Master Larry Kaufman was, *by far*, a better choice for Editor than the two other choices listed above. All kidding aside, Larry's dedication to this project is beyond reproach. In a field so cluttered with paranoia and skepticism, no person is more trusted and relied upon by the chess computer manufacturers for his advice and recommendations. In fact, it is quite likely that, if you decide to purchase a chess computer within the next several years, some part of its program has been positively affected by his input.

Also deserving of praise are Tony Franco, who spent many hours at our computers formatting and setting up the layout, and Paul DeStefano who took over from Tony and displayed a glorious hidden talent. His art work is liberally scattered throughout this publication, and now maybe he will finally get some sleep; we perfectionists are pretty hard on ourselves. The many others who deserve credit are posted on Page 2; we thank you all!

We are constantly looking for ways to improve the Reports, and my personal favorite would be to have you, the readers, write articles for us about your experiences with chess computers. Frankly, we cannot afford to pay for your services, but what we get paid for doing this magazine is not much different. This is *truly* a labor of love. We invite you to join our collective orgy.

You will notice that the 1989 Computer Chess Reports is totally neutral when it comes to recommending which computer to buy, but there is no hiding the fact that when you finally decide which computer to buy, you should select the best place to buy it. If having worked at Institutional Computer Development Corporation (I.C.D. Corp.) for 10 years disqualifies me on the grounds of partiality, then stop reading now and go onto the rest of this magazine, but if you are still with me, I.C.D. happens to be the best place if I do say so myself- just ask me, or, better yet, speak with anyone who has ever dealt with our company. I.C.D. Corp. (Your Move Computers) 2951 Merrick Road, Bellmore, NY 11710 and 21 Walt Whitman Road, Huntington Station, NY 11746. Toll-Free 1-800-645-4710 (1-516-221-3000 in N.Y.) The preceeding was the last commercial message you will see in the 1989 Reports... Sing Hallelujah!!!

O.K., I got that off my chest. If you are adverse to seeing *any* kind advertising in Computer Chess Reports, just cut out the paragraph above. Please note that doing so will, of course, destroy the cover not to mention my feelings.

Those of you who have been following the progress of Computer Chess Reports over the past six years are intimately familiar with my articles entitled, "Pity the Poor Chess Computer Buyer." In those articles I attempted to leave no stone unturned as they pertained to this field, but this year I have been relegated to one page. This is tantamount to giving someone a quarter and telling him to call all his friends. What is nice, however, is that the industry is cleaning up its own act. The machines seem to be better made, the companies are more supportive, and there are not many of us left who can still beat the little critters. What a joy it is to listen to the same customer who used to call and complain about how weak his computer was, now calling to say he can never beat it. Frankly, I love it.

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COMPUTER CHESS REPORTS

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ACM 19th North
American Computer
Chess Championship

by Larry Kaufman

This year's event, in Orlando, Florida, was undoubtedly the strongest computer chess tournament in history, with the defending champion Deep Thought (successor version of "Chip Test"), the four super machines which tied for first in the last World computer champ., namely Cray Blitz, HiTech, Sun Phoenix, and Bebe, and the top 3 commercial manufacturers all present. These eight machines are all thought to be of master strength, while Deep Thought and HiTech sport senior master ratings. It was widely thought that while the micros have performed well against humans, they would have little chance against the much faster, more expensive super computers & custom designed chess machines, since the faster machine might be expected to search deeper than the micros in all lines. Even though the micros ran on much faster hardware than commercial machines do, the "giant 5" outsearched the micros by anywhere from 5-1 to 100-1 in nodes per second.

Despite this enormous handicap, in 9 games between the top 3 micros and the "giant 5", the micros won 5-4!! Although Deep Thought won as expected (3 1/2-1/2), the Fidelity 68030 took second on tie break, having drawn Deep Thought and defeated Cray Blitz, HiTech, and tail-ender Waycool (with 512 processors!!) An incredible result, especially in view of the drubbing (20-13) which the same Fidelity model suffered just a month earlier in the World Micro at the hands of the Mephisto 68020, which took third in the ACM. Mephisto defeated Sun Phoenix, a multi-processor title contender from Canada, drew with Cray Blitz, and lost to Deep Thought, and defeated newcomer A.I. Chess running on a 386 based machine. Mephisto achieved winning positions against both Cray and DT, but their incredible search depth allowed them to escape. Cray Blitz took fourth on tie break at 2 1/2, while HiTech, fresh from its 3 1/2-1/2 victory over GM Arnold Denker, only managed fifth with a 2-2 score here, having lost to both Deep Thought (decisively) and Fidelity. HiTech had a favorable bishop endgame against Fidelity, and saw a way to win Fidelity's bishop for some pawns, only to find that the pawns were unstoppable. Sun Phoenix and Bebe, a dedicated super chess machine by Tony Scherzer which often finishes second in major computer chess tourneys, took the next two places at 2-2. Novag was eighth at 1 1/2,

having defeated Bebe nicely. This was a real achievement, as the Novag unit was running only mildly faster (9 MHz) than affordable commercial versions, while Mephisto and Fidelity were running at 5 or more times the speed of their 68000 commercial models. Ninth at 1 1/2 went to BP, an amateur PC program on a 386 which claims a 2300 performance rating after 17 games in human events. David Levy's Cyrus 68k, which took such a beating in the 1986 and 1987 World Micros, did so again here, finishing tenth at 1 1/2. A. I. Chess took 11th at 1 (draws with Novag and BP), though an operator-caused time forfeit probably cost it half a point against Mephisto. Finally, WayCool, despite its 512 processors, each 32 bit with 512k ram for hash tables, scored only a half point (vs. Cyrus). WayCool claims to achieve a 170-1 speed gain for its 512 processors, so clearly something is terribly wrong with the program, although it is described as "state of the art". With this hardware, it should be expected to be faster than all but DT, HiTech, and Cray Blitz. If the program were of the standard of the Mephisto or Fidelity 32 bit programs, this machine should be Grandmaster level, but in fact it appears to play only around 2100 level.

All three commercial participants can be pleased, Fidelity with its fabulous result, Mephisto with a fine showing and with the proof that its decisive victory in the World Micro was over a very powerful opponent, and Novag with its 8 bit program upsetting the mighty Bebe. As to how we can explain the plus score of the micros over the giants, akin to David vs. Goliath, I can say that the selective search of Mephisto and Novag and the inclusion of checks in quiescence by all three apparently offset most of the speed advantage of the giants (except DT), and the superior chess knowledge of the Micros over all but HiTech played a big role. If only someone could combine the search and chess knowledge of the micros with the speed of DT, perhaps even Kasparov might have a worthy computer opponent. There was talk that Ken Thompson of Belle and Tony Scherzer of Bebe plan to collaborate on a new machine expected to search 2-3 million nodes per second, with enormous hash tables to search 12 plies full width. Will it have the chess knowledge needed to defeat grandmasters? We shall see. Neither Bebe nor Belle excelled in this area, but perhaps master advice will be sought this time.

A History of the C.R.A.

by Larry Kaufman

The Computer Rating Agency (C.R.A.) was formed by the United States Chess Federation for the purpose of rating commercial chess computers against human opposition, so that U.S.C.F. members would not have to rely on exaggerated claims by manufacturers. Such claims continue to this day, but are banned from "Chess Life" and ignored by all but the naive. Although there are still problems, I support the C.R.A. and its goals. However, a C.R.A. rating should not be looked upon as the word of God.

The first C.R.A. test, of the Novag Super Constellation in 1984, was a success for all concerned. Novag hoped for an Expert rating, and got one--2018, after a private 40 game test. First a ten game set was played against players of widely disparate ratings to determine the mean level of opposition in the final test. Although these ten games were not rated, the final rating would have been the same anyway, as the performance rating in the preliminaries and final were virtually identical. The only flaw was that since the test was private and not rated for the humans, it is likely that their incentive (small cash awards per win) was less than in a serious, rated tournament.

The next pair of tests, in early 1986, was rocked by controversy. One test, by Fidelity, was of a program later sold as the Par Excellence and Avant Garde 2100, and now sold in the Phantom and Designer 2100. Fidelity first played 10 games against opponents near 2100, Fidelity's estimated rating, but only scored 3 points for a rating around 1950. Then, 40 games were played against players over a wide range averaging 1929. A score of 29-11 worked out to a rating of exactly 2100 by the method chosen. Not only were the ten preliminary games excluded from the rating calculation, but no mention of them appeared in "Chess Life" until my letter about this was printed a year later. Furthermore, two games which Fidelity would have lost were ordered replayed on the grounds that they were repeats of prior losses. Of course, since Fidelity had failed to provide for much variety in the Par's opening book, they should have had to suffer the consequences of this. Finally, drawn positions were played out interminably late at night to provoke players to take suicidal action rather than stay up all night for a few dollars. In view of all this, it is clear that the true strength of the Par is well below 2100; probably just slightly over 2000. This opinion is supported by foreign results--the offi-

cial British and French ratings equate to USCF 1980 and 2053 respectively after correcting for the higher rating levels in the U.S. Also, owners I have talked to generally rate the Par at 1900-2000 or so.

At about the same time as the Par test, the Mephisto Amsterdam, a far more expensive model, also underwent a C.R.A. test. It had already earned an established U.S.C.F. rating after 24 games of 2229, but as this was not supervised by the C.R.A. it could not be advertised in "Chess Life". In the C.R.A. preliminaries, a 5-4 (plus 3 draws) score against a 2144 field produced a 2178 rating. The finals confirmed the accuracy of this number. Unfortunately, a site was chosen which closed early, forcing adjournments in about a quarter of the games. This greatly favored the humans, especially in comparison to the Fidelity test. With 4 games to go plus several adjourned games, Mephisto withdrew, citing unequal conditions vis-a-vis Fidelity. This is unfortunate, as a master rating was still possible and a high expert rating nearly certain. The TD later estimated the rating, based on the likely outcome of the adjourned games, to be 2176.

In view of these troubles, some changes were made. The head of the C.R.A., David Welsh, resigned and Frank Camaratta took over. The private format of the first 3 tests was replaced by a new policy of awarding C.R.A. ratings only in major USCF rated events. The first such test was at the 1986 U.S. Open, where Fidelity played 96 games with their new 68000 program, which later evolved into the Mach II. Although Fidelity estimated a 2200 rating before the event, the actual rating earned was only around 2050 (2066 counting "feedback" points), and so was rejected as below the Par's 2100 rating. As the new 16-bit program was thought to be stronger than the 8-bit Par, this shows that the Par would not rate much if any above 2000 in a major tournament.

The next test was at the 1987 U.S. Open. Fidelity again tried a version of the Mach II, but withdrew after 24 of the required 48 games with a rating of around 1940. Fidelity later blamed this on a bug (wrong sign), which I believe in view of the large drop from the prior test and an awful blunder I witnessed. The bug was apparently not present in any commercial model of the Mach II. Fidelity blames their failure to detect the bug on insufficient testing--only 20 games.

In November '87 no less than three tests were held at the American Open. Fidelity earned a 2188 rating for a 68020 20 MHz model with 512k RAM, but despite promises this model was never released. Instead, the same program was offered at one-third the speed as the "Mach II L.A.". While USCF did not allow Fidelity to advertise the rating with this model, customers in many foreign nations were swindled by dis-

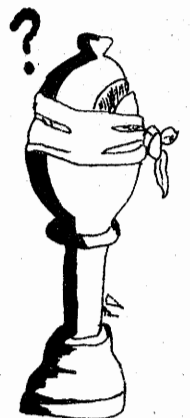
tributors claiming falsely that the Mach II L.A. had the 2188 rating. Mephisto earned a 2154 rating for the "Mondial 68000 XL", a mild disappointment as the Mondial is actually somewhat stronger than the Mephisto Amsterdam, based on computer vs. computer tests. Novag withdrew after 30 games when a new selective search program gave a rating of about 2012, but then began a new test with the program now offered in the "Super Expert 6MHz" and "Super Forte 6MHz". After 18 games it stood around 2300, but after the required other 30 were played at the Continental Open this dropped to 2164, still the highest C.R.A. rating for a commercial model.

This brings us to the 1988 World Open C.R.A. tests. Mephisto chose to rate their top 8 bit program (the new 16 and 32 bit "Almeria" program was not ready), the Mega IV, running with an 18 MHz bit-slice "Turbo-kit". It earned a 2209 rating in the main event against a 2194 field and defeated two players over 2300. Although this was a master rating, results in European human tournaments have been closer to the U.S.C.F. 2300 mark for the very similar MM4 Turbo. In accordance with a new policy, it also played 48 games in the U.S. Action Chess Championship and earned a 2361 rating there against a 2235 field, defeating no less than three International Masters! Action chess (game/30 minutes) is now U.S.C.F. rated, but the C.R.A. only awards ratings at 2 minutes per move or slower, so the 2361 rating is called an "Action chess performance rating", not a C.R.A. rating, although the C.R.A. supervised the test. Fidelity refused to enter the Action event, perhaps because fast chess is not their forte. Also, operator time was a concern--the Mega IV Turbo set its clock for 25 minutes, allowing 5 minutes for operation, and still narrowly escaped a time forfeit at least once.

Fidelity entered two models in the main (30 in 90) event. The "Mach III Master" earned a 2265 rating against a 2177 field, an impressive result for a sub-\$500 model. The same program with different opening book modules, but running 2.3-2.4 times as fast on a 20 MHz 68020 with 512k RAM earned a 2325 rating against a 2195 field, and will be called the "Mach IV Master". A splendid rating, but as the suggested price is about \$1,500 for a small plastic unit it is of interest to very few people. Both models won two games from opponents in the 2300s. In a subsequent British rating test of the Mach III, a USCF equivalent rating of only about 2140 was earned in 33 games, showing the enormous chance factor in these tests.

Since the switch to tournament format, the C.R.A. has been free of scandals and has worked well. The refusal of about one third of players to play computers has created some pairing problems for direc-

tors, but so far suitable opponents have always been found. The two round a day format of most tournaments inflates all the ratings somewhat (computers don't get tired), as shown by the fact that the three rejected ratings were all in 1 round a day events, while the accepted ones were all in two per day tests. It's safe to say that no manufacturer will agree to a U.S. Open test again for this reason. The most serious problem is that the standard deviation for a 48 game test is about 40 points; all C.R.A. ratings should carry a +/-40 warning, and there is even a 5% chance of an 80 point error. So even if one program outrates another by a hundred points, one cannot be too certain as to which one is stronger. The more tests a company enters, the more likely they are to get lucky on one. For this reason I believe it is advisable to consider other evidence, such as computer-computer testing, before making a purchase. Also, the cost of a test (several thousand dollars) makes it impractical to rate more than a handful of the many models on the market. Yet another problem is that a tournament test tells only how a model performs against unfamiliar opponents; that's why most buyers are apt to feel their machine is over-rated. "Familiarity breeds contempt". To conclude, C.R.A. ratings are very useful guides, but take them with a grain of salt.



BLINDFOLD CHES

World Microcomputer Chess Championship--1988

by Larry Kaufman

For the fifth straight year, Mephisto won the World Microcomputer Chess Championship, held this time in Almeria, Spain. Unlike last year, when Mephisto faced only token opposition from CXG, this year they had to contend with Fidelity, fresh from its successful CRA tests. There were three divisions and seven prize categories, but in all seven Mephisto took first ahead of Fidelity. All told, there were no less than 39 games between Mephisto and Fidelity, and Mephisto won by a decisive 24-15 margin. This was particularly remarkable because in all but 6 of these games Fidelity had the advantage of a newer, faster processor--the 68030 vs. Mephisto's 68020. Against outsiders both Fidelity and Mephisto were ruthless, Fidelity scoring 10-1 and Mephisto 11-0! In view of this, Mephisto's success can not be blamed on any weakness or flaw in Fidelity's program; both companies seem to have made great strides this year.

The top section was the "manufacturer's" section, which only Mephisto and Fidelity contested. Both used their latest program running at an estimated 30-33 MHz in four separate machines, with huge RAM for hash tables, although one of Fidelity's machines was exempt from inspection as an "unlimited" entry and could have been a multiprocessor. David Levy quotes Fidelity's Ron Nelson as saying it had "lots of microprocessors", yet its score of 3 out of 8 was no better than the average of the three Fidelity single processor entries. The Fidelity units (at least the 3 inspected ones) used a 68030 chip, which is thought to be perhaps 20% faster at equal MHz than the 68020 used by Mephisto. Mephisto won 19-13 in this section, and thus won the team prize, the world championship, the unlimited prize, the single processor top prize, and the Absolute World Championship.

In the "software" section, Richard Lang entered the same unit as Mephisto used in the top group, and won all six games to sweep this 7 unit round robin. Fidelity also used the same unit as in the top, and took second at 4 1/2-1 1/2. Third was a 19MHz bit-slice Conchess Plymate at 3 1/2-2 1/2, while a bit slice upgrade of the Mega IV (similar to the one CRA rated 2209) took fourth at 3-4. As these four are all really dedicated chess machines, the "software" designation seems to have no discernible meaning. The other three programs were European ones intended only for use as software for personal computers. "Pandix" won the PC and amateur championships at

2 1/2, while "Chat" at 1 and "Dappet" at 1/2 completed the roster.

The "commercial" section was under separate auspices, the "European Chess Union" rather than the ICCA. The definition of "commercial" was rather loose, with none of the three entrants being machines currently available except by special order and then only at prices of \$2,000-\$4,000. Still, it was fair in that a 20 MHz limit was adhered to by all three. Fidelity entered the same model that is CRA rated 2325, the Mach 4 (20 MHz 68020). Mephisto ran their new program, now known as "Mephisto Almeria", at that same speed. The same bit slice 19 MHz Conchess Plymate (same program as Mephisto's old MM2) as played in the software section was the third commercial entrant. A sextuple round robin ensued. Mephisto won with 10-2, Fidelity second at 7 1/2 - 4 1/2, and the bit slice Plymate got only a half point (from Fidelity) out of its 12 games. Considering that the bit slice plymate is thought to be over 2100 USCF in strength, this shows just how powerful both the Mephisto and Fidelity 68020 machines must be. If one were to rate this "commercial" event, using 2100 for the Plymate, the Fidelity 68020 would come out over 2550 and the Mephisto nearly 2700! Clearly, this is not realistic; either the sample is too small or machine vs. machine rating differences must be scaled down, as I've often claimed.

As to the games themselves, Fidelity often attacked Mephisto on the king's side, and in general was fairly competitive in the middle game. Fidelity was awarded a "best game" prize for one win. Surprisingly, much of Mephisto's victory margin is credited to the endgame. Since Fidelity is known to excel in this arena, this is a real tribute to the endgame of Mephisto-Almeria. Probably the hash tables deserve much of the credit. Also, Mephisto's handling of closed positions seems to have been extraordinarily good for a computer. As for the openings, to avoid repeat games Fidelity used 4 different opening modules in the non-commercial sections, while Mephisto reprogrammed the book between rounds when necessary to avoid a repeat loss. Thus, there was adequate variety. Some openings were fairly conventional, such as queen's gambits, but others were eccentric - Fidelity opened some games with 1a3, and once this was answered by 1...c6. This tended to make the event a test of the programs rather than the opening books, as it should be. David Levy has proposed that in the future no machine playing white may repeat its first move against the same opponent in a later round, even if that means being forced to open irregularly in late rounds.

Although this is called a "microcomputer" tournament, I have the feeling that very few computers of any sort are stronger than the winner of this event;

perhaps only "Deep Thought" and HiTech. As for the affordable 68000 versions of the Mephisto and Fidelity programs, they will soon be battling for the top spot in the real "commercial championship"; namely the Swedish computer vs. computer rating list, which has the blessing of the ICCA.



European Rating Tests

by Larry Kaufman

Commercial chess computers have been participating in a great number of human tournaments in many countries recently, but only in a few European countries (and the U.S.) have organized rating tests of 30 or more games been held. It is interesting to compare results in various countries, but there is a problem. American ratings are known to be nearly a hundred points above F.I.D.E. ratings, while the rating systems of most European nations are either at or below F.I.D.E. levels on average. Since this article is being written for an American audience, I have added a hundred points to all European ratings, plus an added 100 for Holland, France, and Sweden, and 150 for West Germany, based on my impression of the levels in those countries. If these numbers are in error, at least the relative ratings remain the same. All results listed were at 40/2 or slower, I believe.

In Holland, three 30 game tests were held in July of '88. The Mephisto Mega IV (5 MHz) finished first at 2176, the CXG Commander (5 MHz) next at 2058, and the Saitek TurboKing (5 MHz) last at 2029. A 16 Mhz MM4 Turbo has performed at 2293 in 21 games in three tournaments, while Mephisto Dallas 68020 performed at 2208 and Forte B at 2133 in these same events (21 games each). These results agree fairly well with results from computer. vs. computer. testing in Sweden and elsewhere, except for Forte B.

In Great Britain, the Par Excellence earned a 1980 rating in 33 games in the British Open two years ago, while this year the Mach II c+ (the revised Los Angeles version) earned an impressive 2212 in a private but official B.C.F. 30 game test at 30/1. It is hard to reconcile this with the 2188 C.R.A. rating earned by a similar program running three times as fast, and results in individual tournaments in various nations have not been so favorable. On the other hand, the Mach III, which did so well in the U.S. (2265), got only about 2140 in its official B.C.F. test, 33 games at 30/1. This seems to prove that very large numbers of games are required to rate computers accurately against humans. In a British action chess event, the Mega IV (5 MHz) played 25 games and performed at an incredible 2471!! It scored 21 wins, one draw and 3 losses against a 2156 average field! This is considerably better than the USCF 2361 Action chess rating for that program running nearly four times as fast (18 MHz)!

In France two tests were held two years ago. The Forte (A) received a 2061 rating after 41 games, while the Par Excellence earned a 2053 after 46 games. In the latest French "Royan Open" the Novag Super Forte led all other computers with a 2254 performance, but 9 games is not enough to base a rating on. The other computer results were Mega IV 2209, Leonardo Maestro with Turbo kit 2164, and Mach II L.A. 2151. In other French tournaments, Mephisto Amsterdam earned 2295 in 18 games, while Mephisto Dallas 68020 received 2155 after 36 games, again showing the need for large samples, as the latter is much stronger than Mephisto Amsterdam (on a 68000). In a recent 52 game test, the Mach III earned a 2236 rating.

In Sweden the old Novag Super Constellation is rated 1994 after 61 games in various events, while "Conchess Plymate 5.5 MHz" has 2044 after 50. Other machines with between 20 and 30 games are Mephisto Amsterdam-2180, Conchess 4.0-2058, Forte B- 2037, and Turbostar 432-1993.

In Germany the Saitek Turbostar (4 MHz) has played over a hundred games in various tourneys and received a 2034 rating, while Mephisto Amsterdam stands at 2217 after 45 games. The following ratings are based on only 18 games each: Mephisto Roma 68020 - 2186, Novag Super Expert - 2098, Fidelity Mach II Los Angeles - 1978, CXG Sphinx - 1922, and Par Excellence and Avant Garde (combined) - 1799 (!).

Novag Forte B deserves special mention for its results in Greece (9-0 against a field ranging from about 1700 to 2000) and in the Soviet Union (!) where it scored an incredible 10 1/2 to 1/2 against a field averaging around 2075! To be fair, I must point out that it has also had some mediocre results, in Sweden and elsewhere. The Novag Expert also had some master level results in Denmark and Canada, while the Forte (A) has not done very well in human tournaments. As those two programs are quite similar and close in strength, this is probably just due to luck.

I wish to express my thanks to Gerald Murphy of England and to Goran Grotting of Sweden for much of the above data.

As for the United States, aside from the C.R.A. ratings the following approximate results have been obtained in tournaments by commercial machines, with the number of games in parenthesis: Mephisto Roma and Dallas 68000 (combined) - 2220 (25); Mephisto Amsterdam 2194 (72); Turbostar 440 - 2038 (40?). In the 1988 U.S. Open, two modified Novag Super Experts performed about 2135 in 24 games, including a win over America's #2 rated

junior (under 19) player, Vivek Rao, and a draw (nearly a win) over GM Arnold Denker. An experimental Leonardo Maestro C with Turbo kit turned in a disappointing 2097 performance for its 12 games. The Novag Forte B and 6 MHz Expert have both performed around the 2100 level in various events.

I cannot close without mentioning a small tournament in Alabama with a most unusual finish. The top three placers, in order, were: Novag Super Expert, Mephisto Roma 68000, and Dave Kittinger, Novag's programmer. In the final round, the Super Expert swindled its own programmer out of a win and first place in the tourney! Several experts and masters finished below them.



THE KING'S INDIAN DEFENSE

Dinosaur Chess Testing

Maurice A. Robinson, Ph.D.

A few years back, I played against an Expert rated some 400 points above me. I deliberately steered away from the popular lines and essayed openings like the Giuoco Piano or Four Knight's Game. My opponent immediately labeled my opening play "Dinosaur Chess." The term has stuck, even though at my current level of expertise I can regularly get beaten no matter whether I play the most current ECO line or "ride the dinosaur." So too, it seems, with testing chess computers.

The computers I have been testing are already passe, having been surpassed by faster and more powerful machines at a rapid pace. In fact, two new generations of powerful number-crunchers have reached the home market since I began testing the Mephisto Mondial 68000XL against the Par Excellence. But this essay reports on the test of those dinosaurs as well as philosophizes on the future of chess computer testing.

Basically, the same method of testing was implemented over this past year as had been utilized with my previous tests of the Par Excellence vs. the Novag Super Constellation and then the Par vs. the Novag Forte (A) (also dinosaurs in their time). Those test results may have been interesting, but were already a year out of date by the time they were published. I conclude that the publication of these results has more value for establishing a sound testing methodology rather than actually aiding the consumer, since the machines I report on are by publication date no longer on the market or greatly surpassed (except that the Par somehow continues to survive in its manifold and ubiquitous manifestations on the basis of its 2100 rating). (The Mondial is still marketed as the strongest model under \$300--Ed.)

My method is very simple: 20 games are played between the two machines at tournament time controls (40/2), with 10 different openings being used. Each computer plays a single opening once as White and once as Black (10 openings x 2 = the total of 20 games, reduced from last year's 40 game total due to time constraints). The result of these 20 games should be a sound enough basis for evaluation, but my methodology then requires a second round of 20 games, again utilizing the same 10 openings, but with a different twist.

The first series of 20 games requires each computer to be "walked" manually into the desired opening pattern, usually 4-6 moves deep, or a bit further if necessary for a particular variation. The absolute restriction in that first round of testing was that both computers must be allowed to begin play from that selected opening while still in their pre-programmed opening book.

Once the computers were released into direct competition, all tournament rules then applied, and a game was not terminated until there occurred either mate, computer-initiated resignation, or a draw (by stalemate, repetition, insufficient mating material, or the 50-move rule). In general, most games between computers at tournament level end in mate or resignation rather than a draw; quite the reverse of human players of the same rating level. (Draws between equal humans exceed wins only near or above IM level--Ed.)

In this first series, Mephisto Mondial easily outplayed the Par Excellence by a 62.5% total score of 12.5 to 7.5 -- not at all unexpected, since it was already clear that the Par has been outclassed even by other Fidelity machines. The 20 selected openings ranged from current lines into those "Dinosaur" openings, thus covering a wide range of possible consumer play, and preventing computers with especially sharp lines (in the Sicilian, for example) from running a free-style monopoly with their specialties, such as has been the case in most computer vs. computer tournaments.

According to Dr. Elo's calculations (2), the 12.5-7.5 performance places Mondial 89 points above the Par. At the maximum (allowing the Par's rating to be the CRA's 2100), this would suggest a 2189 for Mondial. However, in his previous articles, the present writer has suggested that 2100 rating to be anywhere from 20-40 points too high, which would thus suggest around 2149-2169 to be more reasonable for Mondial.

The second round of testing involved the same two computers and the same 10 openings, playing each opening as White and Black respectively. However, the significant difference in this round was that both computers were taken out of their opening book and walked manually into a middle game position following identical main lines from MCO 10 in each opening (not including footnote variations). Both computers were then placed on their own in a reasonable middle game position, with no opening book to assist them.

The results were not that different: Mondial again (as expected) beat Par Excellence, this time by a 14-6 score (two draws included). This 70% performance

by Mondial is equivalent to an Elo rating difference of 147 points over the Par, meaning (if Par = 2100) a rating of 2247 for Mondial; however, if the actual rating of the Par should be more like 40 points lower, the Mondial would actually rate in this portion 2207.

With these two suggested computer vs. computer ratings showing the Mondial at 2149 and 2207 respectively, I would split the difference and suggest that it should be considered to rate 2178, somewhat above its 2154 CRA rating.

I remain convinced that only computer vs. computer testing under strict methods such as those advocated above will reflect a truly fair and impartial estimate of the relative performance of computers. I am well aware that Larry Kaufman has maintained that certain types of computers, because of their algorithms, do better against humans than against other computers. I am also cognizant of the USCF blurb which stated, "you buy computers to play against yourself, not versus other computers." (not always the case--computer. vs. computer. is a spectator sport--ed.)

Nevertheless, when computer ads include game scores which show Masters being trounced by the advertiser's computer because of what is kindly termed a fingerfehler (slip of the fingers), I always keep in mind my dictum that "computers don't have fingers" and therefore do not lose games by blunder in the same manner as amateurs, experts, masters, and even grandmasters have been known to do.

Because of this human frailty factor, I still think that computer vs. computer testing under laboratory conditions is the only way to proceed. Yet, having tested three pairs of computers extensively over three years, I can also maintain that, because of the amount of time required for one person to conduct such tests under tournament time controls, and because the results obtained are only written up and published long after the initial receipt of the machines due to the length of testing, we end up with "fossil analysis" of machines which have become "dinosaur extinct" by the time of publication.

I would suggest a quicker method of computer vs. computer testing, but this would take a great deal of cooperation from the distributors or manufacturers. Allow 40 identical machines (two models, one from manufacturer "A" and one from manufacturer "B") to play against each other at a single event, each machine manned by a volunteer operator. Each game would be under 40/2 time controls, and the openings would be whatever wide range (over 10 openings) had been predetermined, with one machine playing White and one playing Black for each opening.

Twenty games would begin from within the computers' opening book; the other twenty would begin from the middlegame MCO positions. Such an event would thus parallel what I have done in the Mondial vs. Par testing, but instead of one person trying to do this in one's spare time over many months, it would all be accomplished in no more than 6-8 hours. Something to think about, and definitely a way to obtain valid computer-vs. computer tournament time results which do not apply to Tyrannosaurus Rex.

One other desideratum regarding the CRA tests: I would like to see a machine, once it has been CRA rated in open competition and awarded (as currently) a "Master's" rating, go against a series of Masters within a very close (10 to 20 point range) of that computer. Only after, say, 10 rounds versus such Masters should the computer actually be rated, and that based upon its performance both against the general competition and against the Masters. I suspect that the Masters will trounce even the best computers if they survive the middlegame without blundering. If so, the computers then might be perceived for the strengths they have where they have the strength, and not mislead the public into thinking they have a complete "Master-in-a-box" for all phases of the game. In reality, they have a Grandmaster in the openings, a Master in the middlegame and a low expert or class A player in the endgame (for dinosaur models adjust downward as necessary). (In recent CRA tests, unlike the Par's test, the computers have faced many players near their final rating--ed.)

As for me and my house, we will stick with our trusty Brontosaurus (Super Constellation) until Master-level prices become more affordable. For the class "a" player or below, those old dinosaurs still have a lot of fight left in them.

END

footnotes:

1. This also brings up a personal concern regarding the CRA's computer vs. human testing. I absolutely support the USCF's revised policy of testing the computers in actual events in order to determine CRA ratings. This will definitely provide a fair indication of how such machines will likely perform against humans under tournament conditions.

Yet in these tournaments, most humans either cooperate with their silicon opponent by playing those sharper current lines, or seek to throw the computer "out of book" by playing an early a3/...a6 or something similar, in the hope that the computer will flounder once it no longer has its book to rely upon. Neither method is necessarily the best if one is mere-

ly trying to make headway against machines that do not cheaply blunder away pawns or pieces.

Many experts have suggested that the best method might be simply to keep the game closed, until a solid breaking opportunity presents itself. Putting oneself out of book along with the machine generally leaves a greater weakness in one's own position, and staying within sharp lines usually results in a middlegame position in which the computer is electronically "comfortable" and in which the human might not survive.

But for ordinary play by the home consumer, one might question whether that buyer desires to remain exclusively with those sharp lines of play (if indeed one even is current with them), or whether one deliberately plans to play "non-book chess." These possibilities seem rather unlikely. Rather, the consumer will generally play various openings gleaned from MCO or those for which one has a personal affinity.

It would be a very interesting experiment were humans paired against computers in a 24-game, double round-robin tournament, being forced to play one game as White and one game as Black against each computer from a pre-determined opening list. My suspicion is that in each case the computers would do as well or even better than in the CRA tests against humans who might not be so familiar with either the "dinosaur" or other non-current lines. Of course, the human could still take the computer "out of book" on the seventh or eighth move instead of the first or second, but then the human is still the one more in uncharted territory, and one only handicaps oneself with a potential weak move in such cases.

2. Arpad E. Elo, "a Statistical System for the Rating of Chess Players," in Bozidar M. Kazic, ed., *The Chess Competitor's Handbook* (New York: Arco, 1980), pp. 77-90; Table 1: Rating Differences from Percent Scores, p. 82.

Summary of Dr. Robinson's ratings

Mephisto Mondial 68000XL -- 2178

Fidelity Par Excellence -- 2060

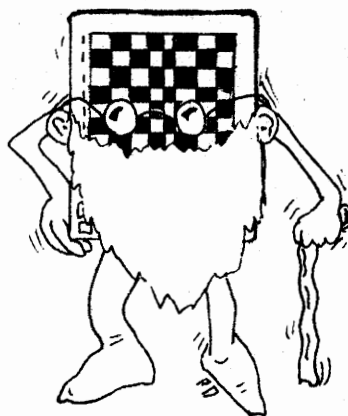
Novag Forte (A) -- 2051

Novag Super Constellation -- 1976

POSTSCRIPT by Larry Kaufman

These four ratings all look quite reasonable. All are quite close to my own estimates and fairly close to CRA ratings, including the excluded preliminaries in the case of the Par. So it seems that Dr. Robinson's method is quite sound.

CCR attempted to apply Dr. Robinson's method to rating a current model, the Fidelity Mach III. Mike Fay, another of our testers, applied the method used in the second half of Dr. Robinson's test, but due to time constraints played half the 20 games at 30/1 and half at 60/1 instead of all at 40/2. The Mondial beat the Mach III overall by 12-8, the victory margin being earned solely at the slower time limit. This implies a rating for the Mach III of only 2108, far below all other estimates and miles below the CRA 2265. Aside from chance, there are two explanations: 1. The Mach III opening book is superior to the Mondial's, so the omission of stage 1 of the test hurt it. 2. The Mach III is relatively better at 40/2, the Mondial at the faster time limits. Probably both factors are present. It is clear that the Mach III is far more than fifty points improved over the Par, so something is wrong here. In any case, the likely margin of error (standard deviation) for 20 games is 62 points, so luck may be the biggest factor of all in this test.



The Future of Commercial Chess Computers

by Larry Kaufman

In view of the rapid progress in recent years, it is of interest to speculate on what the next few years will bring. Will we continue to see rapid growth in strength, or will the emphasis turn to features and/or styling? There is no question that the manufacturers face a diminishing incentive to further strength improvement, as the latest models are already strong enough for all but a miniscule percentage of chess players. In fact, all of the manufacturers have indicated to me that the sale of master level computers is not in itself a profitable business, but is in reality a form of advertising for the low priced models which sell in huge quantities to non-tournament players. Many people buy a \$60 model of a certain company because they have heard that that company won such and such championship or sells a highly rated machine, not realizing that there is no connection between the two models. We tournament players thus benefit from the ignorance of the general public! The competition for titles and ratings should insure continued progress in our field, though perhaps at a diminishing rate.

Both software and hardware improvements have produced gains in playing strength in recent years and should continue to do so. Software gains are harder to predict, but one new idea that may filter down to commercial machines soon is "singular extension", a creation of the "Deep Thought" team at Carnegie Mellon U. The idea is to make the computer's search more like a human's by looking deeper in forcing lines. Of course this is also what selective search does; the difference is that selective search programs choose their extensions on the basis of chess knowledge, while singular extension lets the search itself choose which lines need to be extended. Whenever a move in the middle of some line appears to be clearly best, that line is extended by 1 ply. Which approach is superior remains to be seen, but it is already clear that singular extension is superior to conventional brute force. Since all of the latest micro programs already use some selectivity or extensions, there is the danger that singular extension may prove redundant for them. Another possible idea is to allow a program to learn from its mistakes. The technique is already known and has been implemented in a mainframe program, as in Deep Thought, but as it requires lots of memory it has not yet appeared in a commercial program. Also, the method only allows for avoiding repeat errors in identical positions, not merely similar ones. Another problem is that simply knowing that a certain move loses will not necessarily allow the computer to find

the correct move, so it might have to lose many games in a line before weeding out enough errors to find the saving move.

Greater gains are likely in the hardware area. The most likely candidates for the next generation of chess computers are the new "RISC" (Reduced Instruction Set Computing) chips. They only do simple operations but do them very quickly. Since chess has little need for more complex operations, RISC chips seem ideal. At the moment, cost is the principal obstacle, but within two years a commercial RISC chess computer seems plausible, though probably only at a stiff price. Another candidate is multi-processing. Fidelity has used a multi-processor in some tournaments, but seems to have abandoned plans to market one. The most exciting prospect is that of a dedicated chess chip, along the lines of "Deep Thought". Such a chip can run a hundred times as fast as those used in today's \$500 models, but it may be some years before such chips are economically viable for commercial chess computers. I wouldn't hold my breath, but it's something to look forward to in the coming years.

Aside from increased strength, what are other likely areas of progress? One is endgame data bases. Saitek already has a module of this type, but only for K+p vs. K and K+P vs. K+ blocking pawn. The idea is that such endgames can be played perfectly and almost instantly. As memory costs drop, more interesting endings may become practical for commercial machines, such as Q vs. R, Q vs. 2 minor pieces, 2 bishops vs. knight, and Q+P vs. Q, all of which have been done by "Belle". Another likely development is increased emphasis on instructional features; indeed, this trend is already visible in the new Mephisto line. Optional playing styles may soon become a standard feature. Another idea is to allow players to create "fairy" pieces by combining existing ones, such as a bishop + knight piece.

One final observation about playing strength. While many tournament players cannot beat the top models on even terms, they really want a machine that can defeat them on a fast level even though they take lots of time themselves. For this reason, it pays to buy a machine several hundred points above one's own level as the time handicap will even things up somewhat. If people take this advice, there will still be a good market for machines rated 2300 and higher. Also, much of the machine's strength is simply that it avoids blunders, so if you want a model that is truly your equal in quality of play, it must out-rate you by quite a bit. If you want it to teach you, it must be stronger still.

Annotated Games

by Larry Kaufman

U.S. Class Championship--Oct. 30, 1988

White: Mikhail Zlotnikov (Int'l Master)

Black: Deep Thought

1c4 e5 2Nc3 Bb4 3Qc2 (not in D.T.'s book) **Nc6 4e3 Nf6 5a3 Bc3 6Qc3 o-o 7b4 d6 8d3** (8Bb2 seems better) **d5** (no human would play ...d5 right after ...d6, but it works out well) **9cd5 Qd5!** (prevents a later b5) **10Bb2 a5 11Nf3 ab4 12ab4 Ra1 13Ba1 e4! 14Nd4 Bd7 15Be2** (loses a pawn, but white must develop) **ed3 16Bf3 Qd6 17Bc6 Bc6 18Nc6 bc6 19o-o Rd8 20Rd1 d2** (white has some, but insufficient, compensation for the pawn) **21f3 Ne8 22h3 h6 23Kf2 Nf6 24Qd4** (leads to an inferior, but perhaps tenable ending. Perhaps waiting was a better policy.) **Qd4 25Bd4 Nd5 26Rd2 Nb4 27Ke2 f5 28Rb2 Nd5 29Be5 h5 30Rc2** (obvious, but 30f4 gave better drawing chances) **Re8 31f4 g5! 32g3 Re6 33h4** (was waiting better?) **gh4 34gh4 Kf7 35Kf3 Rg6 36e4** (if white waits, he will suffer after ...K-e8-d7) **fe4 37Ke4 Ke8 38Ra2 Rg4 39Ra8** (loses a 2nd pawn. 39Rh2 still offered drawing hope.) **Kd7 40Rh8 Rh4 41Kf5 c5 42Ke4** (last chance was 42Kg5 Rh1 43Rh5 Rh5 44Kh5 c4 45f5 c3 46Kg6 c2 47Bb2 Nf4 48Kg7 Nd3 49Ba3 c1(q) 50Bc1 Nc1 51f6 Nd3 52f7 Nc5 53f8(n)! Kd6 with a likely win) **c6 43Rh7 Kc8 44Rf7 c4 45Rg7 c3 46Rg2 Rg4 47Rc2 h4 48Rh2 Kd8 49Kf5 c2 50Rh1 Ne3 51Ke6 Nd1** and white resigned. Although D.T. lacks much endgame knowledge, it is very formidable in complex endings like this one where its very deep search pays off well.

Final match game--N.Y. 1988

White: HiTech

Black: Grandmaster Arnold Denker

1e4 c5 2c3 (a favorite of many computers) **d5 3ed5 Qd5 4d4 Nf6 5Nf3 cd4** (premature, 5...e6 or Bg4 are usual) **6cd4 g6?** (6...Bg4) **7Nc3 Qd8** (Berliner suggests 7...Qa5) **8Bc4 Bg7 9Qa4!! Nbd7??** (if 9...Bd7 10Qb3 o-o 11Ne5 wins a pawn, so 9...Kf8 was the lesser evil) **10Bf7! Kf7 11Ng5 Ke8** (forced) **12Ne6 Qb6 13Qc4!** (very nice) **Nf8 14Ng7** (It's nice to see

a computer spurn the greedier 14Nc7) **Kd8 15o-o Bd7 16Re1 Qd6 17Bg5 Rc8 18Qf7 Rc6** (else 19Re7) **19Nb5 Qb4 20d5 Qb5 21dc6 Qg5 22cd7 N6d7 23Rac1** and black resigned.

U.S. Open--August 1988

White: Novag Super Expert (experimental)

Black: Vivek Rao (2491)

1e4 c5 2Nf3 d6 3d4 cd4 4Nd4 Nf6 5Nc3 g6 6Be3 Bg7 7f3 Nc6 8Qd2 o-o 9o-o-o Bd7 (usual are 9...d5 and 9...Nd4 10Bd4 Be6) **10g4 Ne5 11h4** (although taken out of book, Novag finds the correct plan) **Rc8 12h5 Qa5 13hg6 fg6 14Kb1 b5 15Ncb5 Qa6 16Qb4!?** (an odd looking move, but the natural 16Nc3 allows ...Nc4) **Rb8 17Be2 Kh8 18Qb3! Nf3??** (a faulty combination. 18...Rfc8 or 18...Qa5 give black some compensation for the pawn.) **19Nf3 Bb5 20Nh4 d5** (there's no defense) **21Ng6 Kg8 22Nf8 Rb7** (or 22...Bf8 23ed5 winning) **23Rd5! Nd5 24Qd5** and black resigned. One possible finish is 24...Kf8 25Qf5 Ke8 26Rh7 Be2 27Rg7 etc. A nice win from a junior star.

World Micro--Almeria, Spain Sept. 26, 1988

White: Fidelity "unlimited"

Black: Mephisto 68020

1e4 c6 2d4 d5 3ed5 cd5 4c4 Nf6 5Nc3 e6 6Nf3 Be7 7cd5 Nd5 8Bd3 Nb4 (this should be omitted) **9Be4 o-o 10o-o N(b8)c6 11Re1 Qd6?** (loses time) **12Nb5 Qd8 13Bf4 a6 14Nc7 Ra7 15d5 ed5 16Nd5 Nd5 17Qd5 Be6 18Qh5 g6 19Qh6** (the latest Fidelity machines love to attack the squares around the enemy king) **Qc8?** (loses, but even after better moves like ...Re8 or ...Ra8 I doubt that black can hold) **20 Be3!** (natural and good) **Ra8 21Bc6!** (The start of a piece winning combination, very pretty but only 6 plies deep, so even the commercial Mach III and some other micros can find it.) **Qc6 22Bd4 f6 23Re6** (best, but 23Ng5 also wins a piece, and is the line seen on a six ply search at move 21) **Qd7** (not 23...Qe6? 24Ng5 wins) **24Ng5 Bb4 25Bf6** and white soon won. Perhaps Fidelity's best game and Mephisto's worst. White's play was quite flawless.

World Micro--Commercial Section--Almeria Spain--Sept. 28, 1988

White: Mephisto 68020

Black: Fidelity 68020 "Mach 4"

1d4 d5 2Nf3 Nf6 3c4 c6 4Nc3 e6 5e3 Nbd7 6Bd3 dc4 7Bc4 b5 8Bd3 a6 9e4 c5 (the famous, wild Meran variation) **10e5** (10d5 is the less hairy choice) **cd4 11Nb5 Ne5** (11...Ng4 and 11...ab5 are also book) **12Ne5 ab5 13Bb5 Bd7 14Nd7 Qa5 15Bd2 Qb5 16Nf6** (16Nf8 is the main book line) **gf6 17a4** (A theoretical novelty, but I'm told that this was put in Mephisto's opening book in error. Luckily it turns out to be a good move. The new ECO gives 17Qe2 leading to equality) **Qb2** (17...Qd5 18o-o Rg8 is a safer alternative) **18o-o Bd6?** (Black should prevent 19Qf3 by 18...Qb7, with an unclear game) **19Qf3 Ke7 20Rfb1! Bh2?** (best is 20...Qd2 21Rb7 Ke8 22Qc6 Kf8 23Qd6 Kg8 24Qe7 Rf8 25Qf6 and white should win) **21Kh2 Qd2 22Rb7 Kd6 23Rd1 Qh6 24Kg1 Ra4** (obviously black's game is indefensible) **25Qc3! Rb8** (black should resign) **26Qc7 Kd5 27Rb8 Ke4 28Qc2 Kf4 29Qc1**, and Fidelity resigned. This game should make the Informant for its theoretical value. It seems that Mephisto did not make a single inaccuracy.

Sample Games

White Mondial 68000 XL
Black Fidelity Mach III
Opening Sicilian A

1e4 c5 2Nf3 e6 3d4 cd4 4Nd4 a6 5Nc3 Qc7 6f4 b5 7a3 Bb7 8Bd3 Nc6 9Nb3 d6 10o-o Nf6 Be7 12f5 o-o 13Qe2 Ne5 14fe6 fe6 15Nd4 Qd7 16h3 Rac8 17Rf2 Nc4 18Bc1 Bd8 19Na4 e5 20Nf5 Be4 21Be4 Ne4 22Qe4 ba4 23Qg4 Qa7 24Be3 Bb6 25Bb6 Nb6 26Raf1 Nd5 27Nd6 Rc2 28Qe6 Kh8 29Nf7 Kg8 30Qd5 Rf2 31Rf2 e4 32Qc4 a5 33Qd5 g6 34Ng5 Kh8 35Qe5 Kg8 36Ne4 Rf2 37Nf2 Qb6 38g4 Qc6 39Qa5 Qc1 40Kg2 Qc6 41Kh2 Qc2 42Qa8 Kg7 43Qa7 Kg8 44Qd4 Qc6 45Ne4 Qc7 46Kg2 Qc2 47Kg3 Qc7 48Kh4 h6 49Nf6 Kf7 50Qd7 Qd7 51Nd7 adjudicated 1-0

White Fidelity Mach III
Black Mondial 68000 XL
Opening English B

1c4 e5 2Nc3 Nf6 3Nf3 Nc6 4a3 d6 5d4 Bf5 6d5 Nb8 7Qb3 b6 8Bg5 Be7 9Bf6 Bf6 10e4 Bd7 11Be2 o-o 12o-o Bg5 13c5 Qf6 14cd6 cd6 15 Ng5 Qg5 16Nb5 Bb5 17Qb5 Rc8 18g3 h6 19Rad1 f5 20f4 ef4 21Rf4 fe4 22Bg4 Rd8 23Re1 Qg6 24Ree4 Kh8 25Kh1 Kg8 26 Be6 Kh8 27Bf7 Qe4 28Re4 adjudicated 1-0

White Mondial 68000 XL
Black Fidelity Mach III
Opening QGD Slav A

1d4 d5 2c4c6 3Nf3 Nf6 4Nc3 dc 5a4 Bf5 6e3 e6 7Bc4 Bb4 8o-o Nbd7 9Nh4 Bg4 10Qc2 g5 11Nf3 Bf3 12gf3 Qe7 13Bd2 Ra8 14a5 Rg8 15a6 b6 16Bd3 g4 17f4 h6 18Ne4 Bd2 19Nd2 c5 20Nb3 Qd6 21Bb5 cd4 22Nd4 Qc5 23Rfc1 Kf8 24Qe2 Qd6 25Rc6 Qb8 26Qc2 Qa8 27Rc1 Rg7 28Rc8 Rc8 29Qc8 Qc8 30Rc8 Ke7 31Nc6 Kd6 32Na7 g3 33hg3 Nc5 34Rc6 Kd5 35Nc8 adjudicated 1-0

White Mondial 68000 XL
Black Fidelity Mach III
Opening Ruy Lopez A

1e4 e5 2Nf3 Nc6 3Bb5 a6 4Ba4 Nf6 5o-o Be7 6Re1 b5 7Bb3 o-o 8h3 Bb7 9d3 d6 10c3 Qd7 11d4 Na5 12Bc2 Nc4 13Nbd2 Nd2 14Bd2 Qe6 15Bb3 Qd7 16Qc2 ed4 17cd4 c5 18dc5 dc5 19a3 c4 20Ba2 Rad8

21Ba5 Qd2 22Bb1 Qc2 23Bc2 Rd7 24e5 Nh5 25Bf5 Rd8 26Be4 Rd7 27e6 fe6 28Ne5 Rd5 26Be4 Rd7 27e6 fe6 28Ne5 Rd5 29Bd5 Bd5 30Bd2 Nf4 31Bf4 Rf4 32f3 Bc5 33Kh2 Rf5 34Re2 Bd2 35Rae1 c3 36bc3 Ba3 37g4 Rf4 38Kg3 g5 39Ra1 Bd6 40Kg2 Bb7 41Rf1 Kf8 42Re3 Ke7 43Rfe1 Be5 44Re5 Bf3 45Kg3 Rf6 46Rg5 Bc6 47Rg7 Rf7 48Rf7 Kf7 49Kf4 a5 50Kg5 a4 51Kh6 Bg2 52h4 Bh3 53Rg1 Kg8 54Rb1 Kf7 55g5 Bf5 56Rb5 Bd3 57Rb7 Kg8 58h5 Be4 59Rb4 Bc2 60 g6 adjudicated 1-0

White Fidelity Mach III
Black Mondial 68000 XL
Opening NimzoIndian B

1d4 Nf6 2c4 e6 3Nc3 Bb4 4Nf3 Ne4 5Qc2 f5 6g3 Nc6 7Bg2 o-o 8o-o Bc3 9bc3 d6 10Bb1 e5 11Ba3 Qe8 12Qd3 b6 13Nh4 ed4 14cd4 Bd7 15g4 Nf6 16gf5 Qh5 17Bd5 Nd5 18cd5 Qh4 19dc6 Bf5 20Qb3 Kh8 21Qg3 Qg3 22hg3 Bb1 23Rb1 Rae8 24Kf1 h6 25Rb3 a5 26f3 Kh7 27Kf2 Rf6 28Rb5 Ka6 29Bb2 d5 30Rb3 Rc6 31Rc3 Rc3 32Bc3 a4 33Bb4 h5 34e3 Kf5 35Bc3 Re6 36Ke2 Rg6 37Be1 c5 38a3 c4 39Kd2 Rf6 40Ke2 g5 41Kd2 g4 42f4 Ke4 43Ke2 Rh6 44Bb4 h4 45gh4 Rh4 46f5 g3 adjudicated 0-1

White Mondial 6800 XL
Black Fidelity Mach III
Opening English A

1c4 e5 2Nc3 Nf6 3Nf3 Nc6 4a3 d5 5cd5 Nd5 6d3 Be7 7Nd5 Qd5 8e4 Qa5 9Bd2 Qb6 10Bc3 Bf6 11Be2 o-o 12o-o Rd8 13Qc2 Be6 14Bd2 Rac8 15Rfc1 Bh3 16Qc3 Be7 17Bf1 f6 18Be2 Be6 19Be3 Nd4 20Bd4 ed4 21Qd2 Bd6 22b4 c6 23Rab1 Re8 24a4 Rc7 25b5 cb5 26Rb5 Rc1 27Qc1 Qa6 28Qc2 Ba3 29Rb1 Rc8 30Qd2 Qa4 31Rb7 Bd6 32Qb2 Rc3 33Qb5 Rc1 34Bf1 Ra1 35Qa4 Ra4 36g3 Kf8 37Kg2 Bg4 38Rb5 Bf3 39Kf3 Ra2 40Rd5 Bb4 41Be2 Bc3 42h4 Rb2 43Rd8 Ke7 44Ra8 Rb7 45Bf1 Kd6 46Bh3 a5 47Ra6 Kc5 48Bc8 Rc7 49Be6 Kb5 50Rd6 a4 51Bc4 Kc5 52Ra6 Kb4 53Kg4 Bb2 54f4 Rc5 55Ra7 h5 56Kf3 a3 57f5 Ra5 58Ra5 Ka5 59Ke2 Bc3 60Be6 Bb4 61Kf3 Be1 62Bf7 Kb4 63Ke2 Bg3 64Kd2 Bh4 65Kc2 a2 66Ba2 Bf2 67Kd2 h4 68Ke2 Bg3 69Kf3 Kc3 70Bc4 Kd2 71Kg4 Ke3 adjudicated 1/2-1/2

White Mondial 68000 XL
Black Fidelity Mach III
Opening NimzoIndian A

1d4 Nf6 2c4 e6 3Nc3 Bb4 4Nf3 Ne4 5Qc2 f5 6g3 Nc6 7Bg2 o-o 8o-o d5 9cd5 ed5 10a3 Be7 11Bf4 Be6 12e3

Bd6 13Ne5 Be5 14Be5 Ne5 15de5 Qe7 16Rac1 c6 17Ne2 Bd7 18f3 Ng5 19Qb3 b6 20Rfe1 Kh8 21Qd3 a5 22f4 Ne4 23Red1 Rfe8 24Qc2 a4 25Rd4 Nc5 26Re1 Rg8 27Rb4 b5 28Rd4 Rac8 29Nc3 Be6 30Qe2 Nb3 31Rdd1 b4 32ab4 Qb4 33Na2 Qa5 34Qc2 Rge8 35Qc3 Qb6 36Qb4 Qa7 37Nc3 Nc5 38Re2 Rb8 39Qd4 Qa5 40Ra1 Rb4 41Qd1 Reb8 42Rb1 Rb3 43Rc2 Qa7 44Qd4 R3b4 45Qd2 Qe7 46Rd1 Nb3 47Qe2 Qa7 48Na2 R4b6 49Kf2 Na5 50Nc1 Nc4 51Nd3 Rb3 52Ra1 Bd7 53Bf3 Be8 54h3 Bd7 55Bg2 Be6 56Bf3 h6 57Bg2 Kh7 58Bf3 g6 59Bg2 Bd7 60Bf3 R8b7 61Bg2 Be6 62Bf3 R7b5 63Bg2 Rb8 64Bf3 Bd7 65Bg2 R8b7 66Kf3 Be6 67Kf2 Bf7 68Bf3 Rb8 69Bg2 Bg8 70Bf3 R8b5 71h4 Bf7 72Ra2 R5b8 73Ra1 Be8 74Bg2 Bd7 75Bf3 R8b7 76Bg2 Be6 77Bf3 Rb8 78h5 gh5 79Bh5 Rg8 80Bf3 Qg7 81Rg1 Rb5 82Rc3 Rbb8 83Nc5 Rb2 84Rc2 Rc2 85Qc2 Qe7 86Ne6 Qe6 87Qa4 Nd2 88Bh1 Rg4 89Qc2 Ne4 90Be4 de4 91Rd1 c5 92Qa4 Rg7 93Rd6 Qf7 94Qd1 Qa2 95Rd2 Qe6 96Qh5 Rg6 97Qh4 Qf7 98Rc2 c4 99Qh1 Qd7 100Qc1 Qg7 101Qg1 Qg8 102Rc3 Rg7 103Rc1 c3 104Rc2 Rg6 105Re2 Qb3 106Qa1 Rb6 107Qa8 Qe6 108Qa3 Rc6 109Rc2 Qd7 110Qb3 Rc7 111Qb8 Rc8 112Qd6 Qd6 113ed6 Rd8 114Rc3 Rd6 115Ke1 Kg6 116Rc5 Rf6 adjudicated 1/2-1/2

White Fidelity Mach III
Black Mondial 68000 XL
Opening QGD Slav B

1d4 d5 2c4 c6 3Nf3 Nf6 4Nc3 dc 5a4 Bf5 6e3 e6 7Bc4 Bb4 8o-o Nbd7 o7 3 9Nh4 Bg4 10f3 Bh5 11Qb3 a5 12g3 Nb6 13Be2 Qd6 14Na2 o-o 15Nb4 ab4 16Bd2 c5 17Bd3 Nbd7 18g4 Bg6 19Ng6 hg6 20Rac1 b6 21Rc4 e5 22Rfc1 ed4 23ed4 Rfe8 24Bf1 Nd5 25dc5 bc5 26R4c2 27Bb5 Na4 28Bb4 cb4 29Ba4 Red8 30Bc6 Ra5 31Kh1 Ne5 32Be4 Qd4 33Rc7 Ra6 34Re7 Qd6 35Rb7 Qd2 38Rc8 Rad6 39Qa2 Rd8 40Rd8 Rd8 41 Qa1 Kg8 42Qc1 Qe2 43Qc7 Re8 44Rg2 Qe1 45Rg1 Qe3 46Qb7 Nd3 47Bc6 Re7 48Qa8 Kh7 49b3 Qd2 50Qb8 Re6 51Bb7 Nf2 52 Kg2 Ng4 53Kh3 Nf6 54Be4 Ne4 55fe4 Re4 56Qb5 Rh4 57Kh4 Qh2 58Kg4 Qg1 59Kf4 Qd4 60Kf3 Qc3 61Ke2 Qb3 62Qd3 Qd3 adjudicated 0-1

White Fidelity Mach III
Black Mondial 68000 XL
Opening Ruy Lopez B

1e4 e5 2Nf3 Nc6 3Bb5 a6 4Ba4 Nf6 5o-o Be7 6Re1 b5 7Bb3 o-o 8h3 Bb7 9d3 d6 10c3 Na5 11Bc2 c5 12a4 Nd7 13Bd2 Qc7 14Na3 Bc6 15ab5 ab5 16Qb1 b4 17cb4 cb4 18 Bb4 Rfb8 19Bc3 Nb3 20Ra2 Qa7

21Qd1 Qb7 22d4 ed4 23Nd4 Nd4 24Qd4 Nf6 25f3 h6 26Rea1 d5 27 e5 Nd7 28Qd3 Nf8 29Kh1 Bc5 30Bd4 Qe7 31Bc5 Qc5 32Qc3 Qc3 33bc3 Re8 34f4 Ne6 35Rf1 Re7 36Bf5 Rea7 37Rfa1 Nf4 38Kh2 Ne6 39Bb1 Rb8 40Nc2 Rc7 41Nb4 Bb7 42Ra3 d4 43cd4 Nd4 44Na6 Ba6 45Ra6 Nc6 46e6 fe6 47Ba2 Nd8 48Rd1 Rc2 49Rd7 Kh7 50Rd1 Kh8 51Rd7 e5 52Bd5 Rbc8 53Rg6 R2c7 54Rgg7 Rd7 55Rd7 Nc6 56 Be4 Nb4 57Rh7 Kg8 58Rh6 Rc4 59Bf5 Kf7 60g4 Nc6 61h4 Ne7 62Be6 Kg7 63Bc4 Kh6 64Kg3 Kg7 65h5 Kf6 66Kh4 e4 67g5 Kf5 68Bb5 e3 69Bd3 Ke5 70h6 Kd4 71Be2 Ng6 72Kh5 Nf4 73Kg4 Ke4 74h7 Ng6 75Kh5 Nf4 76Kh6 Ne2 77h8(Q) Nd4 78 Qe8 Kf3 79g6 e2 80Qe5 Nc2 81Qc3 Kf4 82Qc4 Ke3 83Qe6 Kd2 84g7 e1(Q) 85Qe1 adjudicated 1-0

White Fidelity Mach III
Black Mondial 68000 XL
Opening Sicilian B

1e4 c5 2Nf3 e6 3d4 cd 4Nd4 a6 5Nc3 Qc7 6f4 b5 7a3 Bb7 8Bd3 Nc6 9Nb3 d6 10o-o Nf6 11f5 Be7 12Be3 o-o 13Qe2 Ne5 14fe6 fe6 15Nd4 Qd7 16Nf3 Neg4 17Bd4 e5 18Bb6 Qc6 19Bf2 Nf2 20Qf2 Ng4 21Qg3 Qc5 22Kh1 Ne3 23Rfe1 Nc4 24b4 Qc8 25Nd5 Bd5 26ed5 Nb6 27Be4 Rf4 28Rad1 Nc4 29Ra1 Qd7 30c3 Raf8 31Bc2 Qc8 32Be4 R8f7 33Kg1 Qd7 34Kh1 g6 35Bc2 Qb7 36Be4 Qb6 37Bd3 Qc7 38Be4 Nb2 39Re3 Qc4 40Qe1 Na4 41g3 R4f6 42Nd2 Qc8 43Bg2 Rf8 44Ne4 R6f7 45Qe2 Nb6 46Qd1 Nc4 47Re2 Qg4 48a4 Bd8 49ab5 ab5 50Qd3 Bb6 51Rea2 Qd7 52Ra6 Qd8 53Bh3 Kh8 54Qe2 Qc7 55Be6 Rf3 56Ra8 Kg7 57Bg4 Re3 58Rf8 Re2 59Ng5 Kf8 60Ne6 Ke7 61Nc7 Re4 62Nb5 Rg4 63Ra8 Re4 64Rb8 Re1 65Kg2 Re2 66Kh1 Ne3 67Rb7 Kf6 68h4 Ke1 69Kh2 Nd5 70Nd6 Bg1 71Kg2 Nc3 72Rh7 Bd4 73Ne8 Kf5 74Rf7 Ke6 75Rg7 Ne4 76Kh3 Re3 77Nc7 Kf6 78Ne8 Kf5 79Rf7 Ke6 80Rf1 Ng3 81Nc7 Kd6 82Rf7 Nf5 83Kh2 Nh4 84Ne8 Kd5 85Rb7 e4 86b5 Rb3 87Rd7 Ke6 88Rd8 Ke7 89Rc8 e3 adjudicated 0-1



CHESS NUT

Games of the 8th World Micro

The following are select games played at the 8th World Micro Computer Chess Championship held in Almeria, Spain held on Sep tember 24th through Oc-
tober 1st 1988.

Commercial Group

Round 1

White Plymate

Black Fidelity

Time4 60 move / 60 minute

1.e4 c5 2.Nc3 Nc6 3.g3 g6 4.Bg2 Bg7 5.d3 d6 6.Nge2
e5 7.o-o Nge7 8.Bg5 f6 9.Be3 o-o 10.Qd2 Bd7 11.Bh6
Qa5 12.Bxg7 Kxg7 13.a4 Nd4 14.Rfd1 Qb4 15.Nxd4
cxd4 16.Nd5 Nxd5 17.exd5 Qxd5 18.Rxd2 Rac8 19.f4
g5 20.fxg5 fxg5 21.b3 Bg4 22.h3 Bf3 23.Rf1 Bxg2
24.Rxf8 Kxf8 25.Kxg2 Rc5 26.Kf3 Rxd5 27.Ke4 Rc5
28.Kf5 Kf7 29.Kxg5 e4+ 30.Kh6 e3 31.Re2 Rf5
32.Re1 d5 33.b4 b6 34.g4 Rf3 35.h4 Kg8 36.Kg5 Kg7
37.b5 Rf7 38.c3 dxc3 39.Rxe3 c2 40.Re1 d4 41.Rg1
Rf8 42.Rh1 h6+ 43.Kh5 Rc8 44.Rc1 Kf6 45.g5+
hgx5 46.hxg5+ Kf5 47.Rf1+ Ke5 48.Rc1 Kf4 49.a5
bxa5 50.Rf1+ Ke3 51.Rc1 Kxd3 52.g6 Kd2 53.Rf1
c1(Q) 54.Rxc1 Kxc1 0-1

Commercial Group

Round 1

White Mephisto

Black Plymate

Time4 60 move / 60 minute

1.b3 Nc6 2.Bb2 e5 3.e3 d5 4.Bb5 Qg5 5.Nf3 Qxg2
6.Rg1 Qh3 7.Bxc6+ bxc6 8.Bxe5 Bg4 9.Ng5 Bxd1
10.Nxh3 Bxc2 11.Nc3 Nf6 12.Bxf6 gxf6 13.Ne2 Bd3
14.Rc1 Bb6 15.Nef4 Bf5 16.Rxc6 Bd7 17.Rc1 Bxh3
18.Nxh3 Bxh2 19.Rg4 Kd7 20.Rc5 c6 21.Rg7 Bd6
22.Ra5 Ke8 23.Ra6 Bf8 24.Rg1 Kd7 25.Ke2 Bh6
26.Rc1 Rhc8 27.Ng1 Bg7 28.Nf3 Rc7 29.Nd4 Rac8
30.Nf5 Bf8 31.Rh1 h6 32.Nxh6 Ke6 33.f4 Bg7 34.Rh5
Bxh6 35.Rxh6 Rb8 36.Kd3 Rb6 37.Ra4 c5 38.Kc3
Rbc6 39.Ra5 Kf5 40.Kd3 Kg4 41.Rh8 Rd7 42.Ra8
Rcc7 43.Ke2 Kf5 44.Kf3 Kg6 45.Rg8+ Kh7 46.Rg4
Rc6 47.d3 Kh6 48.f5 d4 49.e4 Re7 50.Ra4 c4 51.bxc4
Rb6 52.Rg8 Rbb7 53.Ra6 Rb6 54.Rxb6 axb6 55.Rb8
Ra7 56.Rxb6 Ra3 57.Rxf6+ Kg7 58.e5 Rxd3+
59.Ke4 Ra3 60.Rd6 Rxa2 61.c5 Kf8 62.c6 Rc2 63.f6
Ke8 64.Kxd4 Rc1 65.Kd5 Rc2 66.e6 fxe6+ 67.Kxe6
Re2+ 68.Kd5 Rc2 69.Rd7 Rd2+ 70.Ke5 Re2+
71.Kd6 Re1 72.Rh7 Rd1+ 73.Kc5 Rd3 74.c7 Rc3+
75.Kd6 Rc1 76.Ke5 1-0

Commercial Group

Round 1

White Fidelity

Black Mephisto

Time4 60 move / 60 minute

1.e4 d6 2.d4 Nf6 3.Nc3 c6 4.Nf3 Bg4 5.Be2 e6 6.o-o
d5 7.Bg5 dxe4 8.Nxe4 Nbd7 9.Nxf6+ Nxf6 10.c3 Be7
11.Qb3 Qb6 12.Rfe1 o-o 13.Bf4 Nd5 14.Bd2 Bd6
15.g3 Qxb3 16.axb3 c5 17.Ra4 Bf5 18.Rea1 a6 19.c4
Nb6 20.Ra5 Nd7 21.Be3 Rfc8 22.Nh4 Be4 23.Bf3 Bxf3
24.Nxf3 cxd4 25.Nxd4 Be7 26.Rd1 Nf6 27.Bf4 Rd8
28.Raa1 Rac8 29.Nc2 Ne4 30.Be3 g6 31.f4 Bf6
32.Bd4 Bxd4+ 33.Nxd4 Rd6 34.Nf3 Rb6 35.Ra3 Nc5
o7 3 36.Kg2 Nxb3 37.Ne5 Nc5 38.Rd2 f6 39.Ng4 Kg7
40.Kf3 Rb4 41.Rc3 Kf7 42.Nh6+ Ke7 43.Ng4 Na4
44.Rcd3 Rc7 45.b3 Nc5 46.Rd8 Nxb3 47.Rd1 Rbxc4
48.Rh8 e5 49.fxe5 fxe5 50.Nxe5 Rc3+ 51.Kf4 Kf6
52.Rf8+ Kg7 53.Rdd8 Re7 54.Rg8+ Kf6 55.Rd6+
Re6 56.Rdd8 Rxe5 57.Rgf8+ Kg7 58.Kxe5 Rc2 59.h4
Re2+ 60.Kd6 b5 61.Rfe8 Rxe8 62.Rxe8 b4 63.Kd5
Nd2 64.Re2 Nf1 65.g4 g5 66.hxg5 Kg6 67.Re6+
Kxg5 68.Rxa6 Kxg4 69.Rb6 h5 70.Rxb4+ Kg3
71.Rb3+ Kg2 72.Rb2+ Kg3 73.Rb1 Kg2 74.Rb7 h4
75.Rg7+ Ng3 76.Ke5 h3 77.Kf4 h2 78.Rxg3+ Kf2
79.Rh3 Kg2 1/2- 1/2

Manufacturer's Group

Round 2

White Fidelity

Black Mephisto

1.e4 c6 2.d4 d5 3.exd5 cxd5 4.c4 Nf6 5.Nc3 e6 6.Nf3
Be7 7.cxd5 Nxd5 8.Bd3 Nb4 9.Be4 o-o 10.o-o N8c6
11.Re1 Qd6 12.Nb5 Qd8 13.Bf4 a6 14.Nc7 Ra7 15.d5
exd5 16.Nxd5 Nxd5 17.Qxd5 Be6 18.Qh5 g6 19.Qh6
Qc8 20.Be3 Ra8 21.Bxc6 Qxc6 22.Bd4 f6 23.Rxe6
Qd7 24.Ng5 Bb4 25.Bxf6 Rae8 26.Rxe8 Rxe8 27.Qh4
a5 28.a3 Bd2 29.Ne4 Qd3 30.Nxd2 Qxd2 31.Qc4+
Kf8 32.Bc3 Qd8 33.Rb1 b6 34.b4 a4 35.b5 Qd7
36.Qf4+ Qf7 37.Qd4 h5 38.Rb4 Rc8 1-0

Manufacturer's Group

Round 2

White Fidelity 2

Black Mephisto 1

1.e4 d6 2.d4 Nf6 3.Nc3 c6 4.Nf3 Bg4 5.h3 Bh5 6.Be2
e6 7.o-o d5 8.e5 Ne4 9.Be3 Nxc3 10.bxc3 Be7 11.Rb1
b5 12.Qd2 o-o 13.Rb2 Nd7 14.Bf4 h6 15.Rfb1 a6
16.Nh2 Bxe2 17.Qxe2 Nb6 18.Qg4 Kh8 19.Rb3 c5
20.Rd1 Qc7 21.Qe2 Rac8 22.Rc1 Nd7 23.Qe3 Qa5
24.a3 c4 25.Rbb1 Nb6 26.Qf3 Na4 27.Ra1 Qxc3
28.Qxc3 Nxc3 29.Re1 Na4 30.Ng4 Bd8 31.Bd2 c3

32.Be3 Be7 33.Ra2 Kg8 34.Nh2 Rc4 35.Rb1 Nb2
36.Rba1 Rfc8 37.Nf1 f6 0-1

Manufacturer's Group

Round 3

White Mephisto 1

Black Fidelity 3

1.Nf3 c5 2.c4 Nc6 3.d4 cxd4 4.Nxd4 e6 5.Nc3 Bb4
6.Ndb5 Nge7 7.e4 o-o 8.a3 Ba5 9.b4 a6 10.Nd6 Bc7
11.Be2 f5 12.Bg5 h6 13.Bf4 fxe4 14.Bg3 Nf5 15.Ncxe4
Nxg3 16.hxg3 b6 17.f3 a5 18.Rb1 axb4 19.axb4 Ra2
20.Nc3 Ra3 21.Ncb5 Bxd6 22.Nxd6 Ra2 23.b5 Na5
24.Qd4 Qc7 25.Rd1 Bb7 26.Qd3 Qc5 27.Qd4 Qxd4
28.Rxd4 Nb3 29.Rd1 Ba8 30.Rh4 Nc5 31.Rf4 Na4
32.Rd2 Rxd2 33.Kxd2 g5 34.Rxf8+ Kxf8 35.Bd1 Ke7
36.Nc8+ Kd8 37.Nd6 Ke7 38.Nc8+ Kd8 39.Nd6 1/2-
1/2

Commercial Group

Round 2

White Fidelity

Black Plymate

Time4 60 move / 120 minute

1.e4 c6 2.d4 d5 3.Nc3 dxe4 4.Nxe4 Nf6 5.Nxf6+ gxf6
6.c3 e5 7.Be3 Bd6 8.Bc4 Rg8 9.dxe5 fxe5 10.Qb3 Qf6
11.o-o-o Rxd2 12.Bxf7+ Qxf7 13.Qxf7+ Kxf7
14.Rxd6 Bg4 15.Rh6 Kg7 16.h3 Bf5 17.Nf3 Be4
18.Nh4 Rg5 19.Bxg5 Bxh1 20.Re6 Na6 21.Re7+ Kg8
22.Bf6 Be4 23.f3 Bd3 o7 3 24.Rg7+ Kf8 25.Rxb7 h5
26.Bxe5 1-0

Commercial Group

Round 2

White Mephisto

Black Fidelity

Time4 60 move / 60 minute

1.Nf3 d5 2.d4 Nf6 3.c4 c6 4.Nc3 dxc4 5.a4 Bf5 6.e3
e6 7.Bxc4 Bb4 8.o-o o-o 9.Qb3 Qe7 10.Bd2 c5
11.Rfe1 Bxc3 12.Bxc3 Ne4 13.Ne5 Rc8 14.f3 Nd6
15.dxc5 Rxc5 16.Bb4 Rxe5 17.Rad1 Qe8 18.Bxd6
Nc6 19.e4 Bg6 20.Bxe5 Nxe5 21.Bb5 Qf8 22.Qc3 f6
23.Qd4 a6 24.Be2 Rc8 25.Qb6 Qe7 26.Rd6 Bf7
27.Red1 g6 28.Rd8+ Rxd8 29.Rxd8+ Kg7 30.Rb8
Nd7 31.Rxb7 Nxb6 32.Rxe7 Nxa4 33.b3 Nc3 34.Bxa6
Kf8 35.Rc7 Na2 36.Bc4 f5 37.Kf2 fxe4 38.fxe4 Nb4
39.Ke3 h5 40.Kf4 Nc2 41.Ke5 Ne3 42.Be2 Nxg2
43.Kf6 Be8 44.Rc8 Nf4 45.Bb5 Kg8 46.Rxe8+ Kh7
47.Bf1 h4 48.Kg5 Nh5 49.Rxe6 Ng7 50.Re7 Hg8
51.Kxg6 1-0

Manufacturer's Group

Round 6

White Fidelity 4

Black Mephisto 3

1.a3 c5 2.Nf3 Nf6 3.b3 Nc6 4.Bb2 d5 5.e3 Bg4 6.Bb5
e6 7.h3 Bh5 8.g4 Bg6 9.Ne5 Rc8 10.c4 Bd6 11.Nxg6
hxg6 12.g5 Nh5 13.cxd5 exd5 14.Rg1 d4 15.exd4 o-
o 16.dxc5 Re8+ 17.Kf1 Bxc5 18.d4 Bxd4 19.Bxd4
Re4 20.Nc3 Rxd4 21.Qf3 Na5 22.Rb1 Rf4 23.Qe3
Rxc3 24.Qxc3 Qb6 25.Rg2 Qxb5+ 26.Kg1 Rf5
27.Qe3 Qd5 28.Re1 Nxb3 29.Rg4 Nd2 30.Rc1 Nf3+
31.Kg2 Nxg5+ 32.Kf1 Qh1+ 33.Rg1 Qxh3+
34.Qxh3 Nxh3 35.Rg2 Rf3 36.Ra1 N3f3 37.Rh2 g5
38.Ra2 Nf6 39.Rd2 g6 40.a4 Ra3 41.Rd8+ Kg7
42.Ke1 Rxa4 43.f3 Ra3 44.Rb8 g4 45.fxg4 Ra1+
46.Kf2 Nxg4+ 0-1

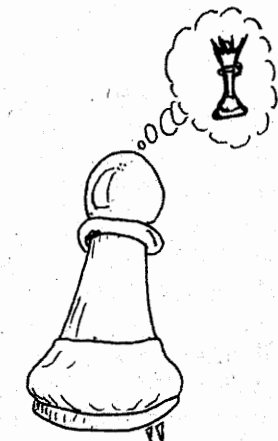
Manufacturer's Group

Round 6

White Mephisto 1

Black Fidelity 2

1. Nf3 d5 2.d4 Nf6 3.c4 e6 4.Bg5 Nbd7 5.e3 c6 6.a3
Be7 7.Bd3 Qa5+ 8.Nc3 dxc4 9.Bxc4 Nb6 10.Be2
Nbd5 11.Qb3 h6 12.Bxf6 Nxf6 13.o-o o-o 14.Rac1
Rd8 15.Ne5 Nd7 16.Nxd7 Bxd7 17.Ne4 b6 18.Bd3 c5
19.dxc5 bxc5 20.Qc3 Qxc3 21.Rxc3 Rab8 22.Nxc5
Rxb2 23.Nxd7 Rxd7 24.Rc8+ Bf8 25.Bc4 Rdd2 26.a4
Rbc2 27.g3 g5 28.Ba6 Rxc8 29.Bxc8 a5 30.Rc1 Bd6
31.Bb7 1/2-1/2



Rating the Commercial Chess Computers

by Larry Kaufman

A few years ago there was very little data on which to base a computer rating list, but now there is so much data that the problem is to choose the most meaningful results. Rating lists can be based on results vs. humans, comp. vs. comp. results free style, comp. vs. comp. results from fixed openings with each side as white in one game ("reversal testing"), or problem solving results. All four methods agree surprisingly well, but the differences are large enough to take seriously. Problem solving times are the least reliable, as the relative rankings depend very much on the choice of problems, but are useful for quick rating estimates (see article on this). Results vs. humans are vital for setting the overall level of a rating list, but not so useful for comparing different models, as test conditions vary greatly from country to country and even within each country. Also the role of chance in such tests is very large, even in 48 games. This was shown by the fact that the Fidelity Mach III performed about 70 points worse than the Mach II L.A. in very similar British tests (33 & 30 games resp.); yet the Mach III is substantially stronger than the L.A. by any other criterion. One would need over 1300 games in a rating test to insure + or - 15 point accuracy with 95% confidence. In general, human results agree closely with computer vs. computer results, except that in general newer, stronger models have not performed quite as well vs. humans as one might expect from their crushing scores against older models. I suspect that rigging openings to beat older models is a principal reason for this, although the growing familiarity of humans with computers is also a factor. Reversal testing removes the above bias towards new models, but it is open to the criticism that forcing a machine to play an unintended opening is a bit unfair, and one may argue that the opening book is part of the program and should not be circumvented in a rating test. On the other hand several models have programmable opening books or selectable openings, and most models offer the user the ability to input any opening he likes. Since a user is apt to learn the openings in a limited book after a while, he is likely to want to input his own choices or use the large, varied books offered with some models instead of the optimized tournament books. I continue to use both free style (no pre-selection of openings, but no repeat openings) and reversal testing, keeping separate ratings for each, as both are revealing.

By far the largest source of computer vs. computer results at 40/2 (free style) is the Swedish magazine "Ply". Over 12,500 games (!) have been played among 50+ models by the members of the Swedish Computer Chess Association (SSDF) over the last few years, with the resultant ratings published quarterly in Ply. The average level of the list is based on results of computers in human Swedish tournaments, but only computer vs. computer games by neutral volunteer testers are rated. Americans are advised to add 150 points to all ratings to convert to USCF scale. This seems fairly accurate except for Novag models, which have consistently performed about 60 points better than this in the U.S. on average. Those wishing to subscribe to "Ply" (in Swedish, but ratings, computer names, problems etc. are all understandable to Americans) or to the rating list only (8 per year) may write to Goran Grotting, Diabasvagen 3, 437 32, Lindome, Sweden. Membership in SSDF (with PLY subscription) costs 100 SEK by International postal order, or send a \$20 bill (no \$ checks). The rating list costs 110 SEK for 8 or a \$20 bill, and a membership plus the 4 in between lists would be 170 SEK or \$30 cash. I would add that I consider their work to be objective and honest, but subject to the bias inherent in free style testing. They (and CCR too) are careful to insure that a wide variety of opposing machines are played by each model rated, so that if a model is "booked" to beat a certain opposing model, it will only inflate its rating by a small amount, perhaps 10 points or so. Also, results give no indication of relative strength at faster levels than 40/2, although "Ply" does publish a blitz list occasionally. The SSDF ratings are also published with some delay in the ICCA Journal, the leading technical magazine on computer chess (in English). An annual subscription to this fine quarterly costs \$25. Send to ICCA c/o Dr. J. Schaeffer, Dept. of Computing Science, University of Alberta, Edmonton/Alberta T6G 2H1/Canada. U.S. check is okay.

While some programmers use reversal testing for their own development, not so much reversal data has been published. The testing by Dr. Maurice Robinson, 160 games now, seems to support the reversal method. His results imply a rating difference of about 200 rating points between Mondial 68000 XL and Super Constellation (the top and bottom models he tested) in reversal testing, while the "Ply" ratings suggest a free style difference of about 275. With the CRA gap only 136, even if we allow for the somewhat tougher test conditions of the Mondial (major tournament vs. private test) and the "Novag factor", it seems to me that the true gap is not likely to be much over 200, certainly not 275. It is quite possible that reversal testing does give accurate rating differences, while free style overrates the newer models. Unfortunately, with insufficient data to confirm this, I suggest that free style rating differences should

probably be reduced by 20% or so to correspond better with human ratings.

I would now like to thank a number of volunteer testers who contributed their results to CCR. Here are their new results:

Dr. Maurice Robinson, 40/2 reversal, Mondial XL beat Par Ex. by 26 1/2-13 1/2. Mike Fay, 40/2, Novag VIP beat Saitek Express 16K by 6-2. Mike Fay, 30/1, Mondial XL beat Par Excellence by 7-3, and Mondial XL beat Mephisto Amsterdam by 5 1/2 - 4 1/2. He reports this same 5 1/2-4 1/2 score between these two at 60/1, and a larger margin (6 1/2-3 1/2) for the Mondial at 60/15. He also reports that at 30/1 the Mach III beat the Mondial 8-2 free style, but the Mondial won 7-3 in reversal testing, adding that the Mach III book is very obviously targeted to beat the Mondial. At 60/1 reversal, they split 5-5. Max Harrell reports a 13-7 win at action chess for the Mephisto Roma 68000 over the new Saitek Maestro C program and some rather good results at 30/30 for the Maestro C against strong experimental programs. Yet at action chess the latest Novag experimental program beat Maestro C (each at 6 MHz) by 16 1/2 to 2 1/2, and the same Novag at 8 MHz beat the Mephisto Roma 68000 by 8-2 in action chess in Max's testing. At 60/1 the 8 MHz Novag split 5-5 with Mephisto Roma 68000 and the 6 MHz leads the Maestro C by 9 to 7. Steven Brann reports the following scores for three Mephisto 68000 models vs. the Par Excellence at various levels (combined) ranging from 15 sec. to 40/2: Mephisto Amsterdam won 9 1/2-5 1/2, Meph. Dallas won 13-4, Meph. Rome won 19 1/2-5 1/2. But he notes that if one takes only the games at 1 min/move or slower, the Dallas and Roma together beat the Par by an astonishing 16 1/2-1 1/2. This seems to confirm my claim last year that the Mephisto 68000s jump in strength on reaching the 1 min./move level. Mike Neeley reports that at action chess, the Super Expert 6 MHz beat the Mach III by 12-8, Super Expert 6 beat Turbostar 540+ by 6 1/2 to 1 1/2, and Mach III beat Forte (A) by 6-2. Harold Sanders reports that the Mephisto Almeria 16 bit beat the Novag Super Expert 6 MHz by 7 1/2 to 2 1/2 at 30/1, while the same Novag split 4 1/2-4 1/2 with the older Mephisto Dallas 68000 at 60/1 and 40/1. Finally, our British correspondent Gerald Murphy reports these results at 40/2: Mephisto Almeria 32 bit leads Mach III by 7-0, MM4 Turbo (16 MHz) leads Fidelity Mach IV (68020) by 6-3, Mephisto Roma 68020 leads Mach III by 12 1/2 to 6 1/2, Mega IV (5 Mhz) leads Mach III by 7 to 6, Mega IV (5 MHz) beat Mach II L.A. (c+) by 21- 14, and Mephisto Roma 68020 beat same Mach II by 22-9. Gerald's other results have been rated by "Ply", so I omit them. One point that stands out from all this is that Fidelity programs seem to have much difficulty against the 8 bit Mephisto programs (MM4, Mega IV) for some reason, perhaps

because the Fidelities were developed against the quite different 16 bit Mephistos.

To avoid duplicating the Swedish data, I concentrate my own testing at four levels: 60/1, 60/30, game/1 hour, game/30 (action chess). Recently I have come to prefer the latter two, now that they are available on most new models, because marathon games as sometimes occur between computers will still be over in a fixed time. Older models sometimes had poor time use algorithms for these fixed duration games, but the newer models all handle these time limits fairly well. I have played literally thousands of computer vs. computer games (sometimes 3 or 4 at a time) over the past 3 years, not only to establish their ratings for CCR but to learn how to improve the models. Many of my ideas have found their way into the latest commercial models, in particular the Mach III and the new Novags. One point that stands out to me is that seemingly small changes in the search or time use algorithm can have rather large effects on the ratings, while small changes in evaluation and added chess knowledge don't seem to mean very much to a good program. The point is that whichever model looks deeper at the critical moment is apt to win, confirming the famous axiom that "chess is 99% tactics". Still, a very large difference in chess knowledge will make a real difference in the ratings. In particular, understanding of pawn structure does seem to be rather important. This seems to be a dominant factor in the crushing results achieved by the Mephisto 68000's against all but the latest competing models.

In comparing my free style results with my reversal tests, I notice that while the correlation is generally quite high, there are some exceptions. The Mephisto MM4 does much better on the reversal method, presumably because its tiny opening book is a handicap in the free style tests. The Novag Super Expert does better free style, which makes sense with its very large book. The Mephisto 68000's also do a bit better free style, probably because their book, while not so varied or deep as some, tends to put the program into positions that suit it and do not suit other computers playing the other side. However, some of these openings, such as accepted gambits, may be rather risky against humans. Ideally, a computer should have separate books for play against computers or against humans, but none do.

The highlight of my testing was a 50 round tournament among six of the strongest commercial machines (including one Novag program not yet released). Each machine played ten games against each other model, six at game/30, four at game/1 hr. This helps guard against a model being optimized for a certain speed. I regret that four of the six were Mephisto models, but the Fidelity Mach IV 68020 was

not available and no other model available to me besides these six was deemed to be strong enough to have any chance at all in such a powerful field. Previous tourneys had shown that such strong machines as the Novag Super Expert and the Fidelity Mach II L.A. would simply be too outclassed by the new giants.

The winner, as expected, was Mephisto Almeria 32 bit at 33 1/2 - 16 1/2. Next was the Mega IV Turbo (18 MHz), CRA rated 2209 at 40/2, 2361 at action chess with 28 1/2 to 21 1/2. Close behind at 28 to 22 was the Mephisto Almeria 16 bit. Next, six points back at 22-28 was the Mephisto Mondial 68000XL, CRA rated 2154. Close behind at 21 1/2-28 1/2 was the Fidelity Mach III with its 2265 CRA rating, which suggests that while the Mach III may be stronger than the Mondial at 40/2 (about 45 points based on "Ply" ratings), there is no measurable difference at these faster speeds. Finally, the latest Novag experimental program running at 8 MHz scored a disappointing 16 1/2 - 33 1/2, in marked contrast to its fine results in Max Harrell's tests and in my own "reversal" testing. This discrepancy is puzzling, but in part suggests the vast superiority of the new Almeria to the Roma used in Max's testing. As to the breakdown between the two time limits in my tournament, in the 30 game action portion Almeria 32 bit scored 21, Mondial 16, Almeria 16 bit 15 1/2, Mega IV Turbo 14 1/2, Mach III 12 1/2, and Novag X 10 1/2. In the 20 game 1 hour per side portion, Mega IV Turbo won with 14, then both Almerias scored 12 1/2 each, the Mach III 9, and Novag X and Mondial each scored 6. This does not mean that Mega IV benefits more from added time than Almeria 32 bit, for example, but merely shows that different machines jump in strength at different time controls. Only the total scores give a fair picture. The Mephisto 16 and 32 bit programs all seem to jump in strength whenever an odd selective ply is reached, which corresponds to an even full width ply on the Amsterdam, Dallas, and Roma programs but to an odd full width ply on the Almerias. For the Almeria 32 bit, this means that strength increases sharply between blitz and action chess, at which point 3 ply Full width is nearly always completed, then gains relatively little with increasing time until we approach 40/2, at which point 5 ply searches become common and the strength jumps again. For the Almeria 16 bit, these times must be nearly doubled. Therefore, I recommend using the 16 bit at game/1 hour setting, as little extra strength will be gained unless one has the patience for 20 in 2 hours. For the non-Lang programs, odd/even effects are much less serious, the strength rising fairly steadily with time.

The CCR rating list is based on all games run by me and the other CCR testers at speeds of 30" to 1 min per move or 30' to 1 hour per side for the game.

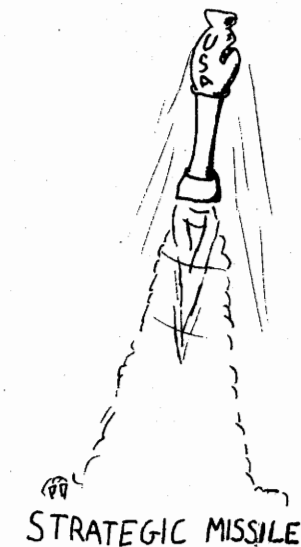
The action chess minimum speed corresponds to USCF policy for humans. The CCR rating (first column) is the weighted average of the free style and reversal ratings in the next two columns, with the free style games getting 60% of the weight since they include a variety of time limits. Free style games are played with whatever openings the computers play on their own, except no repeat openings are allowed. The reversal list is based solely on 30" per move games by me from 8 fixed openings. A 48 game minimum is required for each list unless marked by the letter "s" for small sample (30-47 games) or "vs" for very small sample (16-29 games). Entries marked "vs" are given only half the normal weight in determining the CCR rating. All rating differences are contracted by 25% to offset the tendency of computer-computer ratings (especially at the faster time limits) to spread farther apart than they would against humans. The average rating of the CRA rated models (including incomplete rating tests and unrated prelims) is set equal to the average on my list, so ratings should approximate likely results in serious 2 round a day U.S.C.F. events. Finally, for models offered at speeds different than those tested, adjustment is made by formula given in last year's CCR and rating enclosed in parens. Ratings estimated by relation to slightly different programs are marked by "e". Speed ratings are based on five minute, 10", and 15" a move free style games, and calculated similarly, except that the CRA action chess rating of Mega IV Turbo (2361) is the reference point rather than the 40/2 CRA ratings. This should approximate performance against humans at 10-30 minutes per side, but at blitz (5 min) experience shows that the computers would rate even higher. For those who set their computer on fast levels but take more time themselves, the relative ratings remain valid but the absolute numbers will of course be far lower. "Ply" ratings are listed as published + 150 to approximate U.S. levels, except where speed adjustment is required (by last CCR table). Some contraction, perhaps 20% towards 2150, is probably advisable with the Ply ratings as well, but I'll leave it to the reader to decide this. Any rating marked **** means either no data or too little to warrant publishing a rating. * denotes the 6301 chip, cheaper and less efficient than the usual 6502 used by all other machines listed except those running at 12 or more MHz. They use the 16 bit 68000 except for the 32 bit 68020 models and the bit-slice "Turbo" units. Names of machines not yet commercially available, but expected soon, are enclosed in parenthesis.

RATING LIST

Computer	MHz	CCR Rating	CCR Rating (free style)	CCR Rating (reversal)	Ply Rating	Speed
(Meph Academy Turbo)	18	(2356)	****	(2356)	****	(2369)
Meph Almeria 32 bit	12	2309	2317	2297	(2335)	2356
(Fid Mach IV 68020)	20	(2306)	(2281)	(2343)	(2321)	2385vs
Meph Mega IV Turbo	18	2304	2286	2332	(2336)	2361
Meph Almeria 16 bit	12	2282	2257	2320	2275	2241
Meph MM4 Turbo	16	2275e	2257e	2303e	2307	2332e
Meph Roma 32 bit	14	2246	2237	2260	2240	2320
Meph Dallas 32 bit	14	2232	2205	2273	2224	2356
Mephisto Academy	5	2223	****	2223	****	2236
Fid Mach III master	16	2221	2196	2258	2236	2268
(Novag X prototype)	8	2216	2188	2257s	****	2273s
Meph Mondial 68000	12	2187	2189	2184	(2190)	2240
Meph Dallas 16 bit	12	2178	2178	2178	2178	2232
Novag Expert Turbo	16	2178	2171	2189	2099	2300vs
Meph Roma 16 bit	12	2173	2181	2160	2186	2235
Mephisto Amsterdam	12	2165	2159	2174	2122	2230
Meph Mega IV	5	2151e	2135e	2175e	2116	2155e
Novag Super Expert						
and Super Forte	6	2137	2165	2094	(2046)	2185
Meph MM4	5	2134	2118	2158	2099	2138
Meph Supermondial II	4	2129e	2113e	2153e	****	2133e
Fid Mach II L.A.	12	2123	2131	2111	2132	2176
Fid Mach II (b)	12	2105	2085	2135	****	2184
Novag Super Expert						
pre-Los Angeles	5	2104	2104	2103	2012	2067s

Computer	MHz	CCR Rating	CCR (free style)	CCR (reversal)	Ply Rating	Speed Rating
Fid Excel 68000 (b)	12	2096	2104	2085	2050	2083
Meph Supermondial	4	2080	2083	2076	1991	2062s
CXG Sphinx Galaxy	4	****	****	****	2078	****
Novag Expert	6	2076	2070	2084	(2020)	2108
Saitek Maestro C	5.7	2067	2067	****	****	****
Super Exp. VSS mode	6	2066	2048s	2094s	****	****
Novag Expert	5	2065	2066	(2064)	(2000)	2093s
Novag Forte B	5	2055	2038	2081	2012	2067
Fid Par Ex, Designer						
2100, Elite 2100	5	2055	2063	2042	2022	2085
Saitek Simultano	5	(2052)	(2052)	****	****	****
Fid Mach II (a)	12	2051	2011vs	2081	2077	****
Fid Avant Garde	5	2046	2061	2023	2036	2088
Fid Design Disp 2100	6	2046	2008s	2102	(2042)	2081
Novag Expert	4	2035	2031	(2040)	1976	2111vs
Meph MM3 (Rebell)	5	2033	****	2033	2008	2107
Sait Turbostar 540 +	5.5	2029	2028	2031	****	2028s
Fid Excel 68000 (a)	12	2028	2011vs	2041	****	****
Novag Forte A	5	2025	2007	2052	1998	2108
Conchess Plymate	5.5	2025e	2025e	****	2001	****
Sait Turbostar 540	5	2023	2025	(2020)	****	(2017)s
Fid Excellence 4	4	2014	1998	2037	1988	2053
Sait Maestro A	5.7	****	****	****	2001	****
Saitek Maestro B	5.7	1995	2038	(1931)s	2009	(2038)
Novag Superconstel.	4	1995	2002	1985	1913	****
Meph MM2	3.7	1982s	1982s	****	1958	****
Radio Shack (Saitek)						
Chess Champ 2150	2.8	1980	2035s	1897s	****	1851vs

			(free style)	(reversal)	Rating	Rating
Fid Elegance (orig)	3.6	1970e	1970e	****	1960	****
Saitek TurboKing	5	1965	1998	1916s	(1994)	2023
Saitek Turbostar 440	4	1956	1932s	(1992)	****	(1993)s
Saitek Turbostar 432	4	****	****	****	1954	****
Fid Excel Display	3	1950	1950	1950	****	1961
Novag Quattro	4	1912s	****	1912s	1850	****
Mephisto Europa	*	1908vs	1908vs	****	1873	****
Conchess Glasgow	4	****	****	****	1902	****
Novag Primo & VIP	*	1901	1899	1905	1813	1925s
Novag Const. 3.6	3.6	****	****	****	1826	****
CXG Super Enter &						
Adv. Star Chess	*	1770vs	1770vs	****	1735	****
Saitek Turbo S 24k						
& Leonardo plain	*	****	****	****	1648	****
Saitek Express 16k	*	****	****	****	(1600)	****



	Designer 2000	Designer 2000 Display	Designer 2100	Designer 2100 Display
1) Microprocessor	65C02	65C02	65C02	65C02
2) MHz speed	3	3	5	5
3) Levels of play (#)	12	12	12	12
4) Memory size (ROM/RAM)	32k/8k	64k/8k	32k/8k	64k/8k
5) Board LED's (square / coord)	COORD. 16	COORD. 16	COORD. 16	COORD. 16
6) Display	NO	YES	NO	YES
7) Input system (keypad / sensory)	PRESSURE SENSORY	PRESSURE SENSORY	PRESSURE SENSORY	PRESSURE SENSORY
8) Opening book (#)	12,000	12,000	16,000	16,000
9) Cartridge upgradable (opening, ending, etc.)	NA	NA	NA	NA
10) Program upgradable	NA	NA	NA	NA
11) Take back (# moves)	256	256	256	256
12) Trace forward	YES	YES	YES	YES
13) Selectable openings	YES	NO	YES	NO
14) Resigns / claims draw	DRAW	DRAW	DRAW	DRAW
15) Give hints	YES	YES	YES	YES
16) Thinks on opponents time	YES	YES	YES	YES
17) Displays ply depth	NO	YES	NO	YES
18) Displays score	NO	YES	NO	YES
19) Displays time (elapsed, countdown, both)	NO	YES	NO	YES
20) Displays main line (# ply)	NO	YES	NO	YES
21) Announces mate (# moves)	YES	YES	YES	YES
22) Programmable time control	NO	NO	NO	NO
23) Auto play	NO	NO	NO	NO
24) Sound control	YES	YES	YES	YES
25) Mate solving	YES	YES	YES	YES
26) Programmable openings	NO	NO	NO	NO
27) Set up positions	YES	YES	YES	YES
28) Tutorial / beginner levels	YES	YES	YES	YES
29) Printer option	NA	NA	NA	NA
30) CMOS memory (# games)	NA	NA	NA	NA
31) Transformer	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL
32) Battery operable (#/size)	4/AA	4/AA	4/AA	4/AA
33) Maximum battery life	75	75	15	15
34) Board size (inches)	8 x 8	8x8	8x8	8x8
35) Overall size (inches)	12 x 12 x .9	12x12x.9	12x12x.9	12x12x.9
36) Square size (inches)	1"	1"	1"	1"
37) Piece size (inches)	2"	2"	2"	2"
38) Wood / plastic	PLASTIC	PLASTIC	PLASTIC	PLASTIC
39) PC interface	NO	NO	NO	NO
40) Randomizer control	NO	NO	NO	NO
41) Warranty	3 mo.	3 mo.	3 mo.	3 mo.

Phantom	Microchess	Super Forte 6.0	Super Expert 6.0	Europa	Academy
65C02	45C	65C02	65C02	6301	65C02
5	.6	6	6	8	.5
12	8	64	64	26	UNLIMITED
64k/8k	2k/64 byte	96k/8k	96k/8k	16k/256 bytes	48k/8k
COORD.		COORD.	SQUARE	COORD.	SQUARE
16	NA	16	64	16	64
YES	YES	YES	YES	NO	YES
		PRESSURE	MAGNETIC	PRESSURE	MAGNETIC
SENSORY	KEYPAD	SENSORY	SENSORY	SENSORY	SENSORY
16,000	NA	32,000	32,000	5,000 (?)	12,000 (?)
NA	NA	NA	NA	YES	YES
NA	NA	NA	NA	NO	NO
256	NA	YES	YES	10 PLY	ALL
YES	NA	YES	YES	?	?
NO	NA	YES	YES	NO	YES
DRAW	NA	BOTH	BOTH	NO	NO
YES	?	YES	YES	NO	YES
YES	NA	YES	YES	YES	YES
YES	NA	YES	YES	YES	YES
YES	NA	YES	YES	NO	YES
YES	NA	BOTH	BOTH	NO	YES
YES	NA	YES	YES	NO	YES
YES	NA	YES	YES	NO	YES
YES	?	10	10	?	YES (8)
NO	NA	YES	YES	?	NO
YES	?	YES	YES	?	YES
YES	NA	YES	YES	?	YES
NA	NA	YES	YES	?	NO
NA	YES (1)	YES (11)	YES (11)	YES	NO
REQUIRED	NA	OPTIONAL	REQUIRED	OPTIONAL	REQUIRED
NA	3/AAA	YES	NA	?	?
NA	?	15 hrs.	NA	?	?
10 x 10	?	9x9	12.5x12.5	7.5x7.5	10.5x10.5
22 x 19 x 4	?	14x10x1	19x16x2	11x9x.9	12.5x14.75x1.5
?	?	1 1/8"	1.5"	1"	1.5"
?	?	2"	3"	2"	2.5"
PLASTIC	PLASTIC	PLASTIC	WOOD	PLASTIC	WOOD
NA	NA	YES	YES	NO	NO
NO	NA	YES	YES	?	YES
3 mo.	3 mo.	3 mo.	3 mo.	3 mo.	3 mo.

	Mach III Master	Modular Almeria	Exclusive Almeria	Munich Almeria
1) Microprocessor	68000	68000	68000-68020	68000-68020
2) MHz speed	16	12	12	12
3) Levels of play (#)	33	88	88	88
4) Memory size (ROM/RAM)	64k/64k	128k/512k	128/512-1024	128/512-1024
5) Board LED's	SQUARE	SQUARE	SQUARE	SQUARE
(square/coord)	64	64	64	64
6) Display	YES	YES	YES	YES
7) Input system	PRESSURE	MAGNETIC	MAGNETIC	MAGNETIC
(keypad/sensory)	SENSORY	SENSORY	SENSORY	SENSORY
8) Opening book (#)	28,000	60,000	60,000	60,000
9) Cartridge upgradable	NO	NO	NO	NO
(opening, ending, etc.)				
10) Program upgradable	NO	YES	YES	YES
11) Take back (# moves)	256	ALL	ALL	ALL
12) Trace forward	YES	YES	YES	YES
13) Selectable opening	NO	NO	NO	NO
14) Resigns/ claims draw	YES	YES	YES	YES
15) Gives hints	YES	YES	YES	YES
16) Thinks on opponents time	YES	YES	YES	YES
17) Displays ply depth	YES	YES	YES	YES
18) Displays score	YES	YES	YES	YES
19) Displays time	YES	YES	YES	YES
(elapsed, countdown, both)	BOTH	BOTH	BOTH	BOTH
20) Displays main line (# ply)	YES	YES	YES	YES
21) Announces mate (# moves)	YES	YES	YES	YES
22) Programmable time controls	NO	YES	YES	YES
23) Auto play	NO	YES	YES	YES
24) Sound control	YES	YES	YES	YES
25) Mate solving (# moves)	8	16	16	16
26) Programmable openings	NO	YES	YES	YES
27) Set up positions	YES	YES	YES	YES
28) Tutorial / beginner levels	NO	YES	YES	YES
29) Printer option	NO	NO	NO	NO
30) CMOS memory (# games)	NO	50	50	50
31) Transformer	OPTIONAL	OPTIONAL	OPTIONAL	REQUIRED
32) Battery operable (#/size)	4 C	5 C	6 C	NA
33) Maximum battery life	?	?	?	NA
34) Board size (inches)	8X8	8x8	12x12	16x16
35) Overall size (inches)	11x10	14x12	16x16	20x20
36) Square size (inches)	1"	1"	1.5"	2"
37) Piece size (inches)	2"	2.5"	3"	4"
38) Wood / Plastic	PLASTIC	PLASTIC	WOOD	WOOD
39) PC Interface	NO	NO	NO	NO
40) Randomizer control	YES	YES	YES	YES
41) Warranty	3 mo.	3 mo.	3 mo.	3 mo.

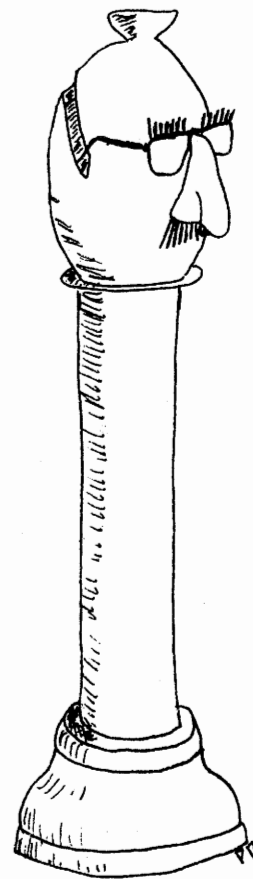
Mach IV	Mentor 16	Avante Garde 2265
68020	6301	68000
20	8	16
33	48	33
64k/512	16k/256 byte	64k/64k
SQUARE	COORD.	SQUARE
64	16	64
YES	YES (2)	YES
PRESSURE	PRESSURE	MAGNETIC
SENSORY	SENSORY	SENSORY
28K	8K	28K
NO	NO	NO
NO	NO	NO
ALL	8 PLY	265 PLY
YES	NO	YES
NO	NO	NO
YES	DRAW	YES
YES	YES	YES
YES	YES	YES
YES	YES	YES
YES	NO	YES
YES	YES	YES
YES	NO	YES
YES	YES	YES
NO	NO	NO
NO	YES	NO
YES	YES	YES
YES (8)	YES (5)	YES (8)
NO	NO	NO
YES	YES	YES
NO	YES	NO
NO	NO	YES
NO	YES	NO
OPTIONAL	OPTIONAL	REQUIRED
4 C	?	?
?	?	?
8x8	8x8	12x12
10x11	?	19x18
1"	1"	1.5"
2"	2"	3.5"
PLASTIC	PLASTIC	WOOD
NO	NO	NO
YES	NO	YES
3 mo.	3 mo.	3 mo.

Conchess and CXG

by Larry Kaufman

The only new offering by Conchess to my knowledge is the possibility of getting the "Conchess Plymate" program with a Turbo Kit to run at 19 MHz. The program is the same as in the now obsolete Mephisto MM2. Based on adjusting the "Ply" rating for the MHz gap, it should rate about 2130 USCF. In the World Micro, it lost 6-1 to Fidelity's 32 bit machine and 7-0 to Mephisto's, suggesting that even 2130 may be too high. As the likely cost is in the \$1500 range, we can safely dismiss it.

CXG decided to abandon plans to market David Levy's 68000 program, as it became clear that it was simply not strong enough. David says that the selective search he uses has great potential, but so far they have not been able to bring the frequency of oversights down to acceptable levels. So CXG has taken away Mephisto's number 3 programmer, Frans Morsch, and marketed his latest 8 bit program, at 4 MHz, as the "Sphinx Galaxy". Its Swedish rating implies a USCF rating of 2078, in close agreement with its official 30 game Dutch rating of 1858-2058 USCF. If it becomes available in the U.S. for under \$200, it would be the strongest model in that price range, but as Fidelity has U.S. distribution rights for CXG we will probably not see it here, as it would only undercut the Designer 2100. Based on my tests of its predecessor program, the Mephisto Super Mondial (not to be confused with the much stronger Mondial XL), I expect it will be especially strong around the 1 min./move level. Why it runs at only 4 MHz vs. the 5 to 6 used by most other 6502 models is a mystery to me. The search used I believe is rather like the Mephisto Europa, by the same programmer. In Britain, it should replace the Saitek Stratos as the strongest model under 150 pounds, and with its many levels and features it looks like good value for money to Europeans.



Fidelity

by Larry Kaufman

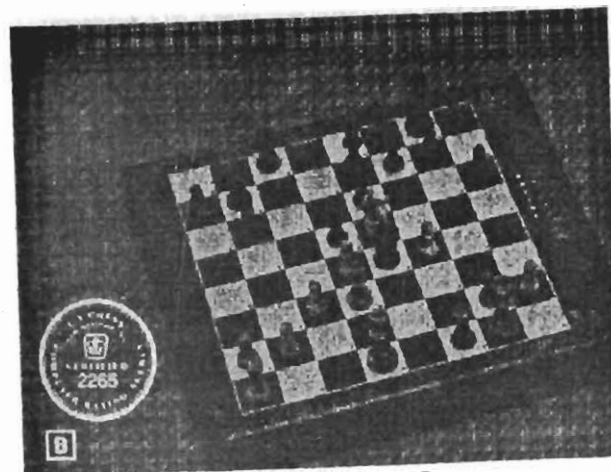
The big news here of course is the Mach III Master, with its 2265 C.R.A. rating. I am often asked "is this rating deserved"? In view of the widespread feeling that the Par Excellence did not deserve its 2100 rating, it is a legitimate concern. My reply is that the Mach III test was a much fairer one than the Par's. The Mach III, unlike the Par, faced many opponents near its final rating, no games were omitted from the calculation or voided as repeats this time, and the test was in a major tournament, not a private test like the Par's. On the other hand, the Mach III earned only about a 2040 rating in its 33 game British rating test (based on CRA rating formula), equal to about 2140 U.S.C.F. Pooling these two official rating tests gives us 2214 U.S.C.F., which I consider to be a fair rating. To explain the 125 point spread between the two tests, I would point out that the standard deviation in a 48 game test is about 40 points (50 points in 33 games), and there is a 5% chance of a deviation of twice these numbers. Also, when a company tries as many times as Fidelity has, sometimes luck goes its way; when it doesn't, the rating is rejected--Fidelity did this twice. The latest computer vs. computer testing from Sweden gives a rating of U.S. 2236, and the Mach III's performance on solving problems point to a rating of 2221. Thus, human, anti-computer, and problem data all fall close to their 2224 mean. My own testing at action chess and game 1/hr. gave a somewhat lower rating (2196) free style but a higher reversal rating at 30" (2258) which average very close to that 2224 figure. Of course, ratings assume that both sides play strict tournament conditions, and are valid only against unfamiliar opponents. Once you get to know a computer, its effective rating against you drops a hundred points or so.

How was this large gain in strength over older Fidelity models achieved? Let's review the history of the Mach II. The first model, the "A" version, was a disappointment. Its "Ply" rating is only 55 points above the Par Excellence (2077 vs. 2022), not much for a 68000 with 144k ram. The "B" version had much improved time allocation, worth perhaps 30 points. The Los Angeles ("C") version gained another 20 or so by a mild software speed-up, bigger and better opening book, and further improvement in time allocation. The C.R.A. rating of 2188 for this program running three times as fast on a 20 MHz 68020 suggests a rather low rating for the Mach II L.A., about 2075, but in view of good results elsewhere I consider 2125 to be about right. More impressive was the huge improvement in speed chess and fixed duration games from the B to the C, both of which had

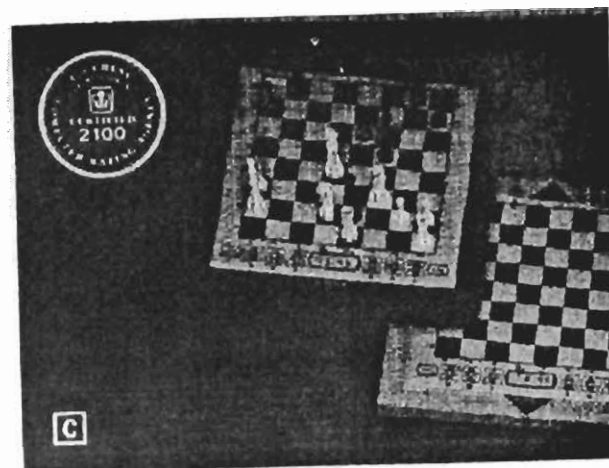
been rather weak in the B. A later version of the Mach II L.A., known as the "c +", was improved a bit more, to "Ply" 2132, by dropping a dubious shortcut in the check extension routine introduced in the "c" version. Despite all these improvements, the Mach II never quite caught up to the Mephisto Mondial in playing strength.

How do we account for the large increase in strength in the Mach III over the Mach II c +? To begin with, the increased Mhz, from 12 to 16, is worth about 30 points. Although the hash table size was halved, software improvement in this area seems to have offset this. Another 20 points was picked up by program speed gains. Next, Fidelity copied Novag by including many checking moves in the quiescence search, which had previously been only captures. This gives the Novag Supers and the Mach III greater tactical strength than their predecessors. Tactical problems show a huge decrease in solving time from the Mach II c + to the Mach III, with a 3 to 1 ratio being perhaps about average, although a few problems take much longer. Also, the evaluation function was rewritten and improved, particularly in the area of pawn structure. Passed pawns are heavily emphasized, and suicidal king-side pawn moves common in the Mach II are now gone. Play is now more purposeful, especially in terms of bringing pieces to bear on the opponent's king. Fidelity also adopted the Mephisto piece values as written up in last years CCR, thus curing the bad habit of the Mach II of giving up two minor pieces for rook and pawn without cause. Finally, the opening book was expanded and revised. Add it all up and a gain of around 100 (104 by "Ply" ratings) is understandable.

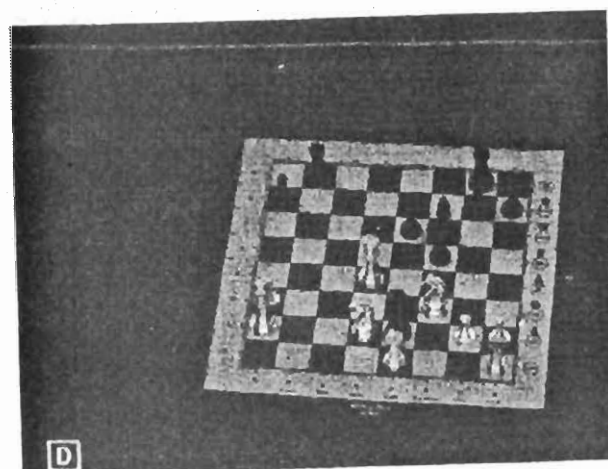
There is little doubt that the Mach III is at this writing the strongest model on the market under \$1000, at least at 40/2, although at 60/1 the Mondial has done better in my tests. Now that nearly every criticism I made of the Mach II last year has been remedied in the Mach III, it is difficult for me to find fault with it. Its playing style is more human-like than all previous Fidelity models, though some "computer moves" are still seen. It sometimes develops knights to rook 3 for no apparent reason. The opening book is varied, though not very current--for example in the Queen's Indian the fashionable Kasparov line, 4a3, takes it out of book. The endgame is quite good for a computer, second only to Mephisto Almeria in my opinion. Features are the same as the Mach II, except that the pieces will no longer stick to the board magnetically if the board is tilted, unlike the Mondial and Super Forte. The selectable rotating display is my favorite feature, and the problem mode is easy to use. The principal negative is that for nearly \$500, many players want a full size, autosensory board, like the Novag Super Expert, not a small plastic pressure board. Also, many owners I have talked to report



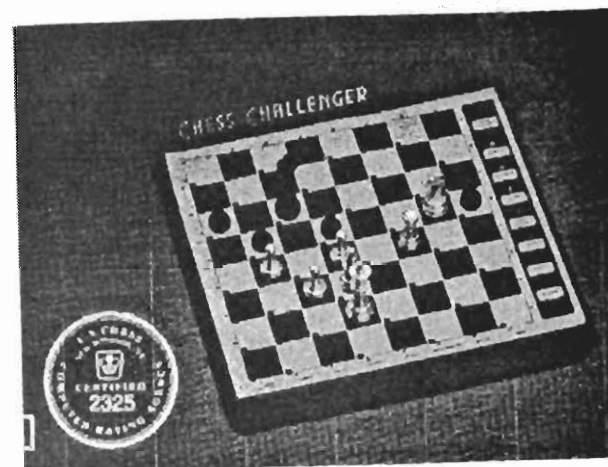
Avante Garde 2265



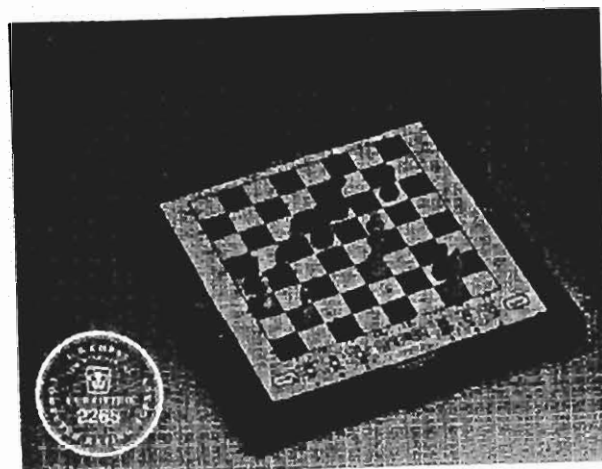
Display 2100



Designer 2100



Mach III - 2325



Mach III - 2265

some mechanical failure or problem, such as sound, lights on squares, or display not working properly. As the Super Expert (6MHz) and the Mach III are close in price, the prospective buyer must decide whether the extra playing strength of the Mach III compensates for the luxury and many extra features of the Novag model. Fidelity plans to offer the Mach III in the Elite autosensory board in the spring of '89 at a list price of \$999.

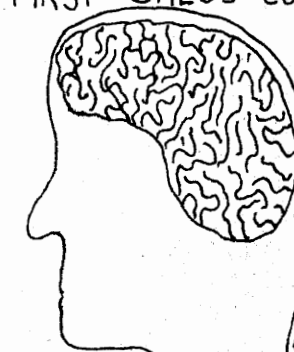
The Fidelity "Mach IV" 68020, C.R.A. rated 2325, has the same 20 MHz speed and 512K ram. as the model which was C.R.A. rated 2188 in Los Angeles in late '87 but never offered commercially. This confirms the great program improvement between the Mach II L.A. and the Mach III. The Mach IV is planned for sale in Feb. in the same plastic housing as the Mach III at a list price of around \$1500. An Elite version is also expected, but price and date are not yet announced. In my opinion it makes no sense to offer such expensive hardware in a cheap plastic board, so those interested in the Mach IV should wait for the Elite version. This should be comparable in strength to the Mephisto Almeria 32 bit, which has a stronger program in my opinion, and more RAM and ROM, but runs at a slower speed. The Mach IV program is the same as the Mach III, but the 68020 at 20 MHz runs about 2.3-2.4 times as fast. This should imply an 80-90 point gap, confirming that the Mach III is mildly overrated at 60 below the 68020.

In the under \$200 category, there has been no change at all in the program, a consequence of the inflated 2100 rating of the Par Excellence. Fidelity could easily upgrade the program, but has no incentive to do so, as only a massive upgrade would be likely to justify a new C.R.A. test for the 8-bit program. So Fidelity has merely redesigned the board and lowered the price to create the "Designer 2100". The "Designer 2100 Display" features the same program, running at 6 MHz instead of 5 (which should add 20 points to its strength). The book is a new, 28k, varied book replacing the Par's narrow book, with a display and all the features (and more) of the Mach III. As the book does not include all the Par openings, a new C.R.A. test should really be required, but the higher MHz and larger book shows a serious intent to improve the computer and the rating was allowed to stand. It would probably get a lower rating than the Par in a C.R.A. test due to its varied book (the Par only played those lines that suited it best), but an owner would consider the Par to be the weaker once he learned how to cope with its narrow repertoire. The inclusion of action chess and other fixed time levels is commendable, but they are unusable due to a serious bug that causes the computer to go into infinite think on these levels midway through the game. Fidelity intends to fix this bug in the next production run. Since no other company currently offers any

comparable model under \$200, the 2100 Display is a good value even if its true strength is only 2000-2050. Fidelity also offers the same models at 3 MHz instead of 5 or 6 as the "Designer 2000" and "Designer 2000 Display", but the modest savings don't offset the 75 point (estimated) reduction in playing strength. The Excel Display remains the outstanding value under \$100, with a likely playing strength in the low 1900s, varied openings, and depth, time, and score display, but it will soon be discontinued and there will no longer be any 6502 models from any company under \$100, unless one can find the Designer 2000 discounted to that level. The various cheaper Fidelity models are all too weak to warrant a review here, probably class D and worse. Some are actually CXG machines being marketed by Fidelity.

The Phantom, with the same program, book, and features as the Designer 2100 Display, is the only recent model which moves its own pieces. It is very interesting to watch, as the machine must move other pieces out of the way to let a knight or captured piece through, then return them. It even sets up its own pieces for a new game, albeit rather slowly. It was formerly sold by Milton Bradley, but with a much weaker program. It moves too slowly for fast chess, but for slower games it should be pleasant to play this way.

THE BLUEPRINT FOR THE
FIRST CHESS COMPUTER



Mephisto

by Larry Kaufman

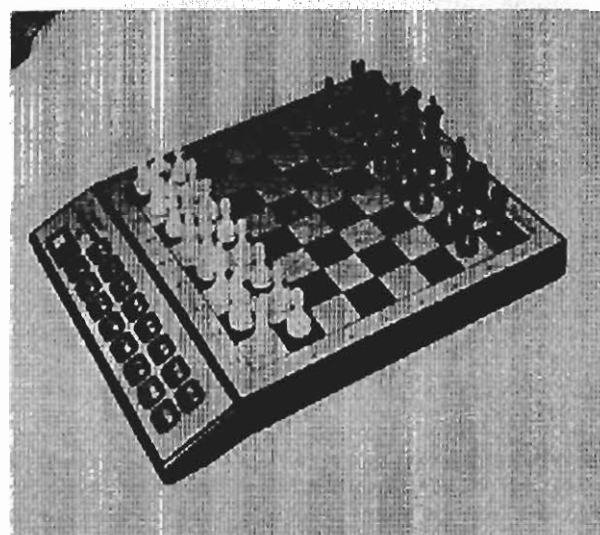
Since the 1985 debut of "Mephisto Amsterdam", Mephisto models have generally been acknowledged to be the strongest commercial chess computers, although the gap has narrowed each year as programmer Richard Lang has found it increasingly difficult to improve his program further. In particular, 1987's Mephisto Rome proved to be only a small improvement, around 15 points, over the previous year's Mephisto Dallas, and most of that gain appears to be due to weeding out poor openings from the book. With the competitors improving rapidly, it was clear that Mephisto would be overtaken in 1988 unless drastic action were taken. So Lang decided to write a whole new program designed to utilize at least 512k RAM for hash tables. This proved sufficient to retain the World Microcomputer Championship with a decisive victory over Fidelity, the nearest



Academy

competitor, in Almeria, Spain. There were 39 games between the two companies in all sections, with Mephisto winning 24-15, while Mephisto went 11-0 against all others. The commercial versions of "Mephisto Almeria" appear at this writing to be about 80 points improved over the comparable versions of Mephisto Rome, a very respectable gain for the hash tables. The benefits of the hash tables are similar to those achieved by Fidelity in the Mach II versus the Par Excellence, namely a moderate speed-up in the middle game, a large speed-up in endings, and enormous speed-ups in pawn endings. The program remains a selective search, but with a larger full width component than the pre-hash Mephistos, perhaps to best utilize the hash tables. The selective search has been shortened from 9 plies maximum to 8 to add an extra ply of full width, and in the endgame the full

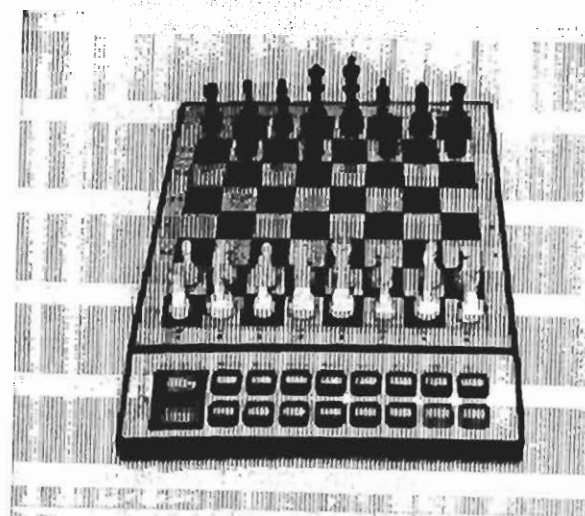
width component seems to be further enlarged. More chess knowledge, particularly pawn structure, has been added, and I have observed co-ordinated king side attacks not seen in previous models. The opening book has been expanded to 7,000 variations and offers much better variety than previous models, although the lines do not generally run as deep as in



Mondial

Novag and Fidelity models, in part because Mephisto generally plays less fashionable openings than do its rivals. It even opens 1b3 on occasion, and usually avoids the popular Indian and Sicilian defenses as black. Although its play appears more active than earlier models, Mephisto Almeria is primarily a positional player. It excels at tactics, but does not seem to go out of its way to provoke them (as Novag does). While other models may earn master ratings by provoking and punishing errors, only Mephisto Almeria can be said to play chess like a human master, generally. There is still a trace of the old passed pawn blindness, and a few other endgame foibles, but usually the endgame is superb, easily the best of all commercial models. The play in closed middlegames is also the best seen yet, though still well below human master level. The weakness of previous Lang models in defense of the king has been substantially cured. Problem solving ability is also much improved over the Roma, in both infinite and mate solve mode, but a few problems will take longer on the Almeria. At blitz the Almeria is also somewhat stronger than the Roma, 35 points by my testing. The gain is less than at slower chess because the hash tables are less useful at blitz—I would expect it would take about 30 seconds a move to make full use of 512k RAM in the 16 bit or 1024k in the 32 bit. In a recent New York blitz tournament the Almeria 16 bit won with about a 2400 performance, while the 32 bit won a blitz match with a 2241 player by 6 1/2-1 1/2. Fine results, but previous Mephistos and Novag's also had similar blitz results on occasion.

Mephisto Almeria features a 32 character (2 lines) dot matrix display, and selectable display option. It uses a menu-driven dialogue system which makes use of the manual unnecessary once you have mastered it. One nice new feature is that problems may be set up simply by setting up the full board, then moving each piece to the proper square or off the board as needed, without having to push buttons each time. Also, Mephisto now offers a permanent memory to retain the current and earlier games when unplugged as well as the programmable opening



Mega IV

book, features formerly offered only by Novag. A novel new feature is that the user may set a "contempt factor" based on his own strength; the Almeria will seek or avoid draws according to the value (in quarter pawns) input. One complaint is that the LED's on each square are not bright enough; it is easier to read the computer's move off the display than to find the lit LED. The problem seems to be only with U.S. machines (designed for 110 volts rather than the European 220), so perhaps a new adapter may correct it. As for hardware, ROM is now expanded to 128k, while RAM is 512k in the 16 bit, and 1024k (1 Megabyte) in the 32 bit, which helps compensate for a reduction in the 68020 MHz from 14 in the Roma to 12 in the Almeria. The 68000 version, although the same 12 MHz as the Roma, is actually 20% faster hardware (as also is the Mondial) due to the elimination of a "wait-state".

In the past, the 16 and 32 bit programs were slightly different, but this time the two Almeria programs appear to be identical. The only difference is speed, with a 12 MHz 68020 processor roughly equivalent to a 20 MHz 68000. The larger RAM for hash tables in the 32 bit further increases the speed a bit, so that on average the speed ratio is about 1.8 to 1, although I have observed ratios as low as 1.5 and as high as 4. This should translate to 60-65 rating points, al-

though at action chess (game/30) and at 40/2 the gap seems to be somewhat greater, at game/1 hr. or 1 min./move somewhat less. I attribute this to the program jumping in strength on the odd numbered plies, as the principal variation generally jumps two plies in length upon reaching a new odd ply. At 5 plies full width, fairly common at 40/2 for the 32 bit, the PV usually extends to 9 plies, a depth only reached at 40/2 previously by the Carnegie Mellon Univ. monsters Deep Thought and HiTech. Whether the added strength justifies the \$700 price gap depends on the strength of the purchaser, the intended use (for overnight analysis the difference would be minimal), and the buyer's finances.

The 16 bit is available in a choice of three autosensory boards, while the 32 bit is now offered only in the two wood autosensory boards. Personally, I recommend the "exclusive" board for most people as the best balance of luxury and economy. The price of the Exclusive 32-bit is nearly a thousand dollars less than last year's 32 bit Roma, despite the addition of the 1 Megabyte of RAM. Still, it remains too costly for the vast majority of chess player's. Both the 32 and 16 bit Almeria versions are also available as modules for existing autosensory boards, but since new hardware (the larger RAM and ROM) is needed the upgrade cost is much greater than for previous software-only upgrades; the cost is nearly as much as for a new machine, so owners might be better off buying a new unit and keeping or reselling the old one.

Another very strong Mephisto model, by another programmer (Ed Schroder), is the Mega IV. It has an improved version of the MM4 program, in the same housing as the Mondial. It was clearly the strongest 8 bit program in the world until a larger, upgraded version came out as the autosensory "Academy", although the new Novag program may challenge that claim. Unfortunately, as it runs at only 5 MHz and has a rather small opening book, the Mega IV is probably not as strong as the equally priced Mondial XL, a 16 bit machine, or the Novag Super Forte 6 MHz with its huge opening book. Consequently it has not been sold in the U.S., although it is a good buy in Europe as the Mondial is not sold there. The Mega IV Turbo is the same model boosted to a blinding 18 MHz by a bit-slice "Turbo-kit" made by Schaetzle + Bsteh. Unlike their early turbo-kits, these are now reliable and no longer overheat. This model earned a CRA rating of 2209 and an Action Chess CRA-supervised rating of 2361. Results in foreign human tournaments and computer vs. computer testing both show it to be stronger than the Mach III (CRA ratings notwithstanding) and all other models prior to Mephisto Almeria. In my own tests the Mega IV Turbo beat the Mach III by 5-3 at 40/2 and by much greater margins (nearly 3-1) at faster

levels, but as the price is comparable to the Almeria 16 bit, which has a much better, autosensory board and superior features, the Mega IV Turbo no longer looks like a good buy and will probably disappear without a single unit having been sold in the U.S. Really a shame, as it is amazingly strong, especially at fast time limits--at blitz it went 5 1/2 to 1/2 against International Masters at the World Open! At fast chess only the Almeria 32 bit may be stronger. If the "Academy" becomes available with a Turbo-kit at prices comparable to the 16 bit Almeria it may well be the better buy, but this is doubtful.

One point I would like to make about the Schroder programs so far (MM3, MM4, Mega4) is that in comparison to most programs they perform poorly on most tactical tests, and are often blind to rather obvious mating combinations. Yet, they regularly defeat full-width programs on comparable hardware by 2-1 margins or better, and also generally outperform them in human tournaments, though that is not so clear. I believe the explanation is that by selecting out apparently bad moves, they gain about one extra ply on average. As many combinations feature an apparently bad move, this results in "blindness" now and then, causing bad results on problems and some losing games, but the extra ply, move after move, saves and wins more games than the oversights lose. If you consistently saw one ply deeper than your opponents, wouldn't you expect to win? This is precisely how humans play chess--we risk missing moves occasionally in order to look deeply. So the Schroder programs generally play well, but if you like to attack the king and want a machine that resists such attacks well, look elsewhere. This also applies to all Mephisto models except the Almeria.

Two new Mephisto models received just before deadline are the Supermondial II and the Academy. Both employ Schroder 8 bit programs. The S.M. II appears to have a program very close to the MM4, but at 4 MHz and in a Mondial housing. As the Mega IV is somewhat stronger and otherwise identical the S.M. II seems redundant. The Academy is a new larger (48k) program in a small auto-sensory wood board, at 5 MHz. I suspect that most of the increased ROM is a larger opening book than in the Mega IV, a welcome addition. The program seems to be tactically very similar to the Mega IV except a bit slower, which I assume is due to added chess knowledge. One novel feature is the option of setting the depth of the program's selective search at anywhere from 0 to 9 plies; 3 is the default and presumably strongest setting, but perhaps the choice should be a function of the time limit and/or the opponent. Against an attacking player 2 might be a stronger value (to guard against sacs) while 4 might work best against a positional opponent. I haven't had time to test it yet except on problems, but I would expect a small

increase over the Mega IV, perhaps to 2150 or so. Whether it can wrest the title of "strongest auto-sensory model near \$500" from the Novag Super Expert 6 MHz remains to be seen. The Academy also comes with an advanced chess course (booklet and module). The SM II can also be bought with an intermediate course as the "College". Booklets in German; translation plans unknown.

The Mondial 68000 XL was reviewed in last year's CCR, and nothing is new except the price, just below \$300 at this writing. It is clearly the strongest model under \$300, and is probably stronger than the slightly more expensive Super Forte 6MHz, although the latter has it beat on features and sports a nominally higher CRA rating (2164 vs. 2154). The Mondial is perhaps a 2-1 favorite against the SF6 head to head at most time limits, so one may wonder why it failed to get a higher CRA rating. A big reason is the opening book--the Mondial's book is much shallower and not nearly so sharp as the SF book. Against computers this is no disadvantage, but against humans the more tactical the opening, the better the computer's chances. I feel that the Mondial program with a book like the Super Forte's would have earned a CRA master rating. As to whether the Mondial or the Fidelity Mach III is the better value, that depends mostly on the time limit it will be used at. At 40/2 the Mach III is some 40-50 points stronger based on the Swedish list as well as on total performance in rating tests to date (U.S. and England), which may well warrant the higher price of the Mach III, but at time limits like game/30 or 60/1 hr. my tests rate them very close, so the Mondial is clearly the better value at those speeds. Curiously, at blitz the Mach III is back on top by 30 points or so, suggesting that an odd/even ply effect is at work here. But for blitz, the machine for choice under \$500 is clearly the Novag Super Expert 6 MHz, both for its strength at blitz and because an autosensory board is a near must for blitz.

In the \$100 vicinity, Mephisto's entry, the Europa, is an enigma to me. Although it uses the same processor (8 MHz 6301) and ROM (16k) as the Novag VIP and Primo, its much smaller RAM (1/4 k vs. 2k in VIP) suggests a much weaker machine. Yet, from "Ply" ratings, problem solving, and my own computer-computer tests at 30" (4-4 vs. Fidelity, Excel Display, 3 1/2-4 1/2 vs. Primo), it seems clear that it plays around the 1900 level, astonishing for such meager RAM. It would have done even better in my tests except that it cannot detect draws by repetition due to the tiny memory and so allowed several such draws from superior positions. It is easily the strongest "single chip" chess computer ever marketed. The explanation in part is the power of selective search, the same factor that makes all Mephistos so strong. The surprise is that a good selective search can be done with minimal RAM. The

programmer is Franz Morsch, who also did the first Mephisto Supermondial and the CXG Sphinx Galaxy. The Europa seems to be the first model to be fairly competitive with Fidelity (Excellence, Designer 2000) in the \$100, class A, table top category. It lacks a display, but has most other standard features of good models, plus a tutor mode, and (with batteries) can retain the position when shut off. The board is slightly smaller than the Mondial XL. The opening book is large enough for a cheap model. The Europa can also be purchased with adapter and an elementary chess course (in English or German) as the "Chess School". The course may be aimed at novices, but the Europa, although it has novice levels, is strong enough for many tournament players. As always, I advise prospective buyers to get a model that out-rates them by at least 300 points, so players over 1600 should purchase a more expensive, stronger model.

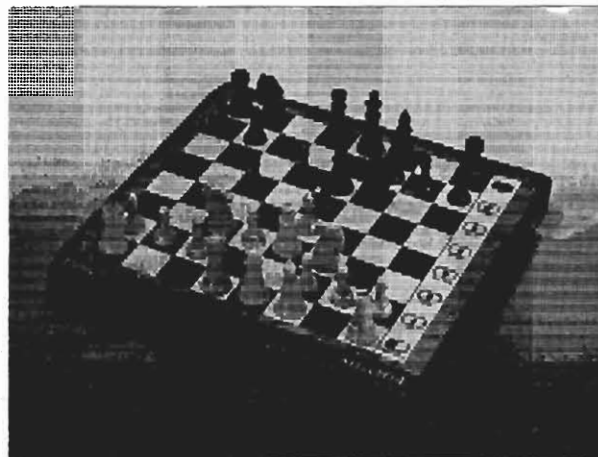


THE KING

Novag

by Larry Kaufman

Evaluating the playing strength of the Novag Super Expert and Super Forte 6 MHz (same program) is unusually difficult. On the one hand, the C.R.A. rating of 2164 confirms the general impression that Novag models do well in human tournaments. It led several other models with a fine showing in a recent French tournament, but did poorly in a Swedish one. Its predecessors Forte B and Expert 5 MHz generally performed around the 2100 level,

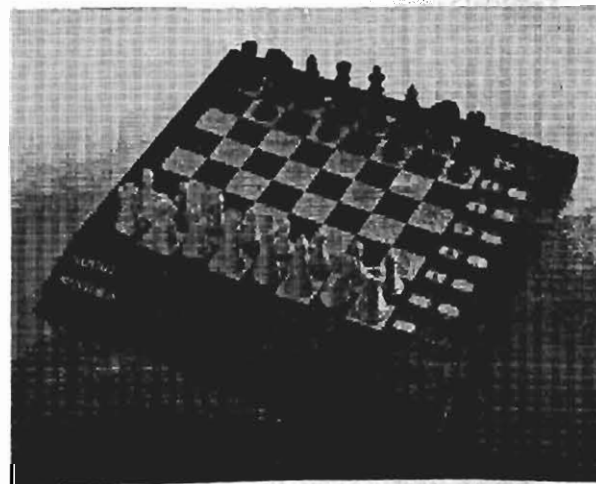


Allegro 4

and in some events much better, so the 2164 rating does not seem unreasonable considering the program improvement, larger book, and increased speed. Problem-solving tests also agree well with this figure. On the other hand, results of computer vs. computer tests have been rather disappointing at 40/2, at least in Sweden, although British results in such tests have been quite respectable. The "Ply" list places the Supers an astonishing 150 points below the Mephisto Mondial program (with both running at 5/6 the speed used in the U.S.), yet the Supers actually beat the Mondial by ten points in the C.R.A. tests. Some of this 160 point disparity may be chance, but most must be attributed either to the aggressive Novag style or the much deeper opening book, or both. Aggressive play is effective against people, who are apt to go astray in complications, but against computers it may help the opposing computer as easily as itself. Another possibility is that some of the "Ply" test games may have been played without setting the "tournament" level, which seems to make a real difference in the strength of all Novag models. Perhaps this may explain why "Ply" ratings for Novag models are nearly always lower than those of other testers, though another reason may be that most other testers use games at 2 or

even 1 minute levels as well as the 3 minute used exclusively by "Ply". At 1 min./move and faster levels the Supers perform only mildly worse than the Mondial in computer-computer tests, much better than at 40/2. So I conclude that while the Mondial is technically stronger, in actual practice the two models are about equally tough opponents for most people. If you like to input your own openings before playing, or if you play offbeat lines, then you will probably find the Mondial to be the tougher opponent, as the Novag advantage of deeper opening book will go to waste.

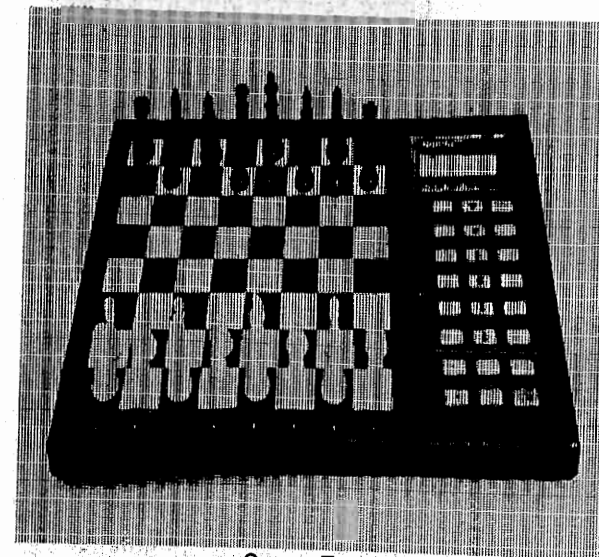
In terms of features, the Novag Supers are unequalled in their price range. A survey by the German "Computer Schach und Spiele" rated them as "best value for money" in the June '88 issue (note: the Mephisto Mondial 68000XL is not sold in Germany), and it is difficult to argue with this. The ability to retain games with the power off is a popular feature missing from most competitors' models, the programmable opening book is nice if you use it, the replay and analysis is helpful, and the choice of 64 levels, including programmable and separate white/black levels, is more than you'll ever need. PC interface is also available. The selective search program which did poorly in an earlier aborted C.R.A. test is available as an option (level 64). CCR testing shows this selective mode to be comparable to the standard mode at action chess or faster levels, but weaker at the 1 minute/move level. There is reason to believe that its failure was due to the endgame, and it may not be weaker than the normal program in the mid-game--this is not too clear.



Mentor 16

The Super Expert with its beautiful, autosensory wood board is clearly the best autosensory buy in its price range. The main rival is the Mephisto MM4 Exclusive, with a comparable strength program and fine board, but Novag gets the nod because its opening book is nine times larger and it has more features. The Super Forte faces tougher competition in the

pressure-board category, from the very strong and slightly cheaper Mondial and the even stronger but more expensive Mach III, but for those who will utilize its extra features it is also a superb value.



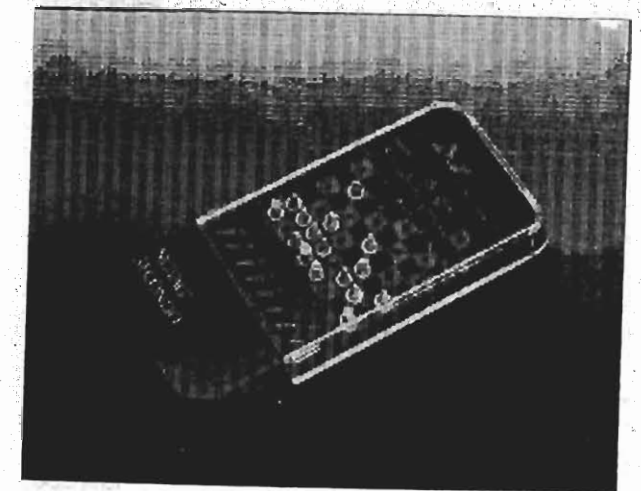
Super Forte

Another argument in Novag's favor is the splendid results for the Supers in fast play against humans. In blitz they seem to perform around the 2400 level, often decimating "weak" masters by huge margins. In a ten minute tourney in Spain the Super Forte won with 12 1/2 out of 13 against a field averaging 1823 (or 1923 USCF equivalent.), and also won an action chess event there with 5 out of 6 vs. a 2112 field (2212 USCF equivalent.).

Novag has been working on an upgrade of the supers. The opening book has been further expanded and revised to include theory through informant 45--I know because once again I did this book upgrade. As for the program, the endgame, Novag's weak point, has been improved somewhat, and more check extensions have been added, similar to those which seem to have worked so well in the Mach III. A time saving idea used by Mephisto has also been adopted, as well as one of my own. It's too early to give a rating for all this, but a 50 to 80 point gain seems likely, not counting any gain from a possible increase in MHz. Problem solving results are extraordinarily good. It certainly looks like the strongest 8 bit machine ever. At 8 MHz CCR testing puts it about equal with the Mach III at the intermediate levels, but what speed it will be sold at is not yet known, nor are name, price or release date. Novag may decide to make a further major change in the program before release if testing shows it to be worthwhile. I can't disclose details, but I will say that Novag is moving more and more towards selective search, like Mephisto.

Novag is also working on an upgrade of the V.I.P., the strongest inexpensive hand-held model on the market. The "Super V.I.P." will have a vastly larger book (a condensed version of the one in Super Expert) and some of the same program improvements planned for the Super Expert upgrade. It should rate in the high class A range. The "Suprimo", already out, has a program intermediate between the V.I.P. and Super V.I.P. in table top form. It should do well in Europe, but in the U.S. the price is too high for a 6301 based model, which cannot be expected to play at the level of the 6502 models, since the 6301 runs only at about the equivalent of a 2 MHz 6502. A cheaper 6301 model named the Mentor, with less ROM and RAM, is expected soon, and should fall somewhere near 1800 I expect. The Novag Alto is simply last year's Accord in a slimmer housing, a class C model. Even the Solo is being upgraded; it should fall in class E.

While Novag remains competitive in the top class thanks to its superior features and reasonable prices, it is increasingly clear that purely in terms of strength its 8 bit processor cannot keep pace indefinitely with 16 and 32 bit programs of Mephisto and Fidelity with their hash tables. Novag, it's time to go to 16 (or 32) bit!



Secondo

Saitek and Radio Shack

by Larry Kaufman

Until about two years ago Saitek (then called Sci-Sys) models were among the best values, but since that time U.S. prices have risen sharply while competing models have fallen in price. Moreover, although Saitek keeps improving their program, the gains have been less than those achieved by their competitors. Still, Saitek models are competitively priced in Europe and offer some features not found elsewhere, so a review is warranted.

Just as I indicated in my review last year, the program now sold (with slight differences) in the Turbo King, Stratos, Leonardo Maestro B and Analyst, has proven to be little if any improvement over the older TurboStar 540. The "Ply" rating for the 5.65 MHz models (Stratos & Maestro B) equates to USCF 2009, just a few points below the Par Excellence/Designer 2100. As the U.S. price for the Stratos is about double the Designer 2100 and above the much stronger Mondial XL and Super Forte 6 MHz, it is of no interest here, but I understand that in Britain the Stratos is priced near the Designer 2100 and well below the stronger models, so it may be a "best buy" there. The 5 MHz Turbo King should rate just under 2000 based on the speed difference from the Stratos. It earned an official Dutch rating of 1829 in 30 games, which I believe equates to 2029 USCF. These numbers contrast sharply with the Saitek claims of 2200 for the Stratos and 2150 for the Turbo King, neither of which has any basis in reality. If the Turbo King were the same price as the Designer 2100 I would give the Turbo King the nod, based on its more human like play, but this is not the case here. The Saitek programs do show a great deal of chess knowledge, and the endgame is much improved from the TurboStar, but they are prone to blunder and are blind to many mating threats. The problem is that they do not search as deeply as other models, spending much more time evaluating each node. At fast play they are rather weak, although at blitz the Turbo King is much improved from the TurboStar, which was hopeless. As for the Leonardo, until Saitek fulfills its promise of 16 bit modules it is unlikely to reach master level.

The principal U.S. distributor of Saitek models is Radio Shack. Their models have their own names and labels, but are made for them by Saitek. Until now none of the Radio Shack models were even strong enough to warrant a review, but now the "Chess Champion 2150" at \$179 will be promoted as

a strong unit. The program is an improved version of the Turbo King, but the processor runs at only 3 MHz (my own timings suggest 2.8 MHz). I had a great deal of trouble even finding out what MHz is claimed; its not in the literature. Perhaps Radio Shack is embarrassed at the slow speed. I feel that the program is quite good, and if it were running at 5 Mhz I would deem it best value under \$200, but as it is not as strong as the Fidelity Designer Display 2100 which runs at 6 Mhz. In my own tests at action chess and 30" level it performed surprisingly well in free style games (2035) but rather poorly in reversal testing (1918). This may mean that the program has been optimized for its own opening book, and plays unfamiliar poorly in untested positions. All in all I feel a rating of about 1975 is realistic, very good for the Mhz but not for the price. Clearly, the claimed 2150 rating is the biggest rating hype since the CXG "Advanced Star Chess" was billed as 2100. The 2150 claim might be valid at 8 Mhz (though I doubt it), but at 3 or less it is ridiculous. At blitz the "Champion" is very weak; in my tests even the program in the \$99 Novag VIP trounced it. The one new feature in the Champion is an LCD board display, which enables the user to verify the position without having to use the verify keys as on other models. If you make frequent errors when making the machines moves and are happy with high class A strength this model might suit you, but you can get more strength for the same money or equal strength for less with other models.

Saitek has just released the "Simultano", at 5 MHz with the "Champion's" LCD display and features, plus the ability to play 8 games at once (but how well??), and further program improvement. This new program is also offered as the "Maestro C" module for the Leonardo. Programmer Julio Kaplan claims 75 points improvement over the Turbo King, which I believe based on some good results vs. other computers by CCR tester Max Harrell and my own tests on the intermediate "Champion" program. Max found that it was quite weak at action chess (and blitz), but rather strong at the minute a move level. Still, this would not make it as strong as the comparably priced Mondial and Super Forte 6MHz. It has not done well in human competition so far. An 18 MHz bit-slice version performed at only 2097 in the U.S. Open, implying a rating around 1965 at 5 MHz, although there is some suspicion that the unit was faulty. In an Alabama tourney, the commercial speed version scored only two craws and a loss against class C opposition, a pathetic showing. But anything can happen in a few games, and I would prefer to go by the much larger sample of games vs. computers run by Max, which suggest a rating of mid-expert at 5 MHz and high expert at 8 if we discount the poor action chess results. An 8 MHz module may be offered for the Leonardo as the "Analyst". This would

make the new program competitive in Europe, but not in the U.S. It seems to be quite good in the endgame; it was able to recognize as won an endgame of two pawns vs. rook which all other models tested scored as a win for the wrong side (the rook). I would like to add that I admire the style of play of the recent Saitek programs, and feel that if a large speed-up can be achieved in a future 16 or 32 bit version, Saitek may join its three main rivals in having a master level model. Also, it should be pointed out that Saitek results seem more dependent on the specific time control selected than is normal, which I attribute to a very strong odd/even ply effect.

Saitek also plans two new luxury modular boards to replace the Leonardo, namely the "Galileo" and the "Renaissance". One new feature will be a board with very quick response time, important for blitz chess. A cheaper sensory board called the "Corona" is also imminent. The modules for all are expected to run the same program as the Simultano, but at higher MHz. I should also note that Saitek only guarantees MHz to + or - 10%, while the other companies (except Conchess) seem to stick to a 2% limit of error. This means that an "8 MHz" module from Saitek may run as slow as 7.2 MHz. I consider this to be misleading.

Chess Playing Software

by Larry Kaufman

Since my reviews in the last issue of Chessmaster 2000, Sargon III, and Psion, we have seen the release of upgrades named Chessmaster 2100 and Sargon IV. Unfortunately, I have only an IBM compatible, and neither of these two upgrades is available at this writing for the IBM, so I have no test results to report. I have found out a few things, so here is what I have learned.

There will be much confusion about Chessmaster 2100, as it is advertised as containing software developed by Fidelity, but this appears to be true only of some versions. Chessmaster 2000 used software by Novag's Dave Kittinger, and I expect this will also be true of the IBM and some other versions of CM 2100. The Apple version is likely to be a relative of the Par Excellence program, as both use the 6502 chip. On a standard Apple (1.2 MHz or so) it would run about a quarter the speed of the Par, which would reduce its strength by perhaps 160 points, to 1900 or a bit less. The Apple IIGS version appears to be grossly defective, as CCR tester Max Harrell reports it runs 7 times slower (!) than CM 2000, makes illegal moves, and loses to 1400 players. If you get stuck with one, try sending it back for a corrected version or refund. Any version of either CM 2100 or Sargon IV for a 68000 machine (Macintosh, Atari ST) is likely to contain a similar program to the Fidelity Mach II. If you have a standard 7-8 MHz model this should put it somewhere in the low Expert range. On a Mac II, high Expert level is likely.

As for new programs for the IBM family, A.I. Chess seems to be a good but grossly overpriced program. Despite its second from last finish on a 386 machine at the ACM tournament, the participants felt that it was not far from 2200 strength on the 386. Whether it can replace Psion as the strongest PC program remains to be seen, but at quadruple the price, who cares? Another new program, Zarkov, is much cheaper and should fall in the low Expert range on a 286 machine or mid class A on a standard PC or XT based on the programmer's own testing, which in this case I trust from my testing of an earlier version, for which my results agreed well with his. With several programs close in strength, features and ease of use may be the main selling points. One feature likely to appear is "learning", whereby the computer learns from its mistakes and tries to avoid repeating them. The technique is well known, but perhaps because of memory requirements has never been implemented in any commercial chess computer or software. Also, it only allows for avoiding er-

rors in an identical position, not in "similar" ones, so it is not much like human learning.

Two programs for the Atari ST have a "Ply" rating. Psion received a U.S. equivalent rating of 2083, and Chessmaster 2000 received 1841. As Psion Atari is virtually the Mephisto Amsterdam program running at 8 MHz instead of 12, 2083 actually seems conservative for it. As for the IBM family, my own testing of Sargon III on my 8 MHz AT (286 based) puts it at 1980 after 16 games at 1 min./move level, while Psion on same came out 2085 after 40 such games.

I would like to correct one error in last year's CCR. The English rating for "Sargon 4" mentioned then was for a dedicated model sold under that name in Europe, not for the software now being marketed under that name.

I also must mention that in Europe a program called "Deep Thought" is being marketed which bears absolutely no relation to the 2600 level monster from Carnegie Mellon with the same name.

As for the non-commercial "Rex" PC program by Don Dailey and myself, we work on it intermittently, and may market it when and if it surpasses other PC software in strength.

I should also mention briefly here the results of the U.S. Open Computer Chess Championship in Mobile, Alabama. Although this event was well contested in past years, this year there were only 4 entrants, perhaps because in the past machines were paired with others from the same company, resulting in titles being decided by forfeits and/or thrown games. Only Fidelity entered the dedicated category this year, and not surprisingly won all its six games. Chessmaster 2100 won the software section over Colossus IV and EGA Chess.

In conclusion, you can now expect to get low Expert level software from various sources if you own a 68000 or 286 based machine or Apple IIGS, and high Expert on a 68020 or 386 model, but on a standard PC, Apple, or Commodore one cannot expect more than mid class A. Also, don't assume that a program for machine X bears any relation to the same program for machine Y--they may share no more than the name.

The Big Guns

by Larry Kaufman

While "Computer Chess Reports" is primarily concerned with commercial chess computers, we also like to report on what's new with the one of a kind chess computers developed at universities or elsewhere. The most successful approach recently has been to design machines from the beginning for chess rather than to program mainframe computers for the task. Although "Cray Blitz" won the last (1986) World Computer Championship, running on a multi-million dollar Cray-XMP computer, it is widely regarded as weaker than HiTech and Deep Thought, two chess machines developed at Carnegie Mellon University by separate teams. These machines cost less than 1% of a Cray to build, and are much more available for tournaments as they use only relatively inexpensive computers plus special chess hardware. Both HiTech and Deep Thought are now rated as Senior Masters by the U.S.C.F., and are both improving rapidly, but here the similarity ends. They have been engaged in a rivalry to decide which will collect the \$10,000 Fredkin prize for the first performance rating over 2500 for 25 consecutive games. Deep Thought has won the race, achieving an estimated 2663 performance over its last 25 games and a current rating of about 2545.

HiTech is already well known. It is the creation of a team headed by Dr. Hans Berliner, former World Correspondence Chess Champion. It utilizes a separate processor for each of the 64 squares to generate the moves, and thus achieves a speed of about 80,000 nodes per second. By comparison, a typical \$300 chess computer does about 2,000, and a \$2,000 one around 5,000. HiTech is considered the most knowledgeable, sophisticated chess machine ever built. Its use of "pattern recognizers" attempts to emulate human thought, and its consistently high quality of play reflects this. Until recently, its search was basically full-width, with some extensions for piece recaptures. Curiously, several micro programmers report that such extensions failed to help their programs. Recently, HiTech has borrowed the "Singular Extension" idea from Deep Thought, and in its subsequent three events, with this addition, it has performed well above 2500 for 15 games, winning the Pennsylvania Championship outright (4 1/2 - 1/2), and defeating GM Arnold Denker (U.S. champion in the late forties, now rated around 2400) by 3 1/2 - 1/2 in a \$7,000 match for which he prepared for weeks. Its last published rating (2407) clearly does not reflect its current strength, in part because the Denker match was not USCF rated. It seems to be the best endgame program of all, having won some very nice

endings from very strong masters. It has also found some fine theoretical novelties in the opening.

By contrast, Deep Thought, descendant of last year's Chip Test, has a much less sophisticated method of evaluation and very little endgame knowledge so far. Why then is it rated 2545 after 42 games, and climbing rapidly? Very simply, it is now about ten times as fast as HiTech, doing 750,000 nodes per second, and is said to have a better implementation of Singular Extension. Together, this gives it a tactical ability that is simply awesome. In one tournament game it announced a mate in 15 moves in a middlegame, and in another, against a near 2400 player, it announced a middlegame mate in 19!! It regularly searches full width to a depth of ten plies, and with all its extensions it is almost impossible to defeat by tactics. This is all possible because of a specially designed VLSI chess chip which does four ply searches in less than a millisecond. Two such chips combined with a SUN computer comprise Deep Thought, and there are plans to increase the number of chips to 8 soon, with a hundred as a long term goal.

Deep Thought is the work of a team of Carnegie Mellon graduate students including Feng-hsiung Hsu, Thomas Anantharaman, Andreas Nowatzky, and Murray Campbell. It has had its evaluation tuned to "predict" as many GM moves as possible, but unlike HiTech it will never sacrifice or decline a pawn on other than tactical grounds. I contributed an opening book originally written for the program "Rex". In the 1988 U.S. Open it scored 8 1/2 including a win over perennial Grand Prix winner Igor Ivanov (2625), but it might have done even better except that the first three rounds were played with a bug that caused it to aim for self-mate! Although I beat Chip Test 2-0 in '87, I only managed 2 draws against the improved Deep Thought, before the addition of my book and the second processor. Both Chip Test and Deep Thought scored wins against junior star Vivek Rao (nearly 2500) back to back in the Fredkin masters tournament, with D.T. taking second place in the tourney. Curiously, Rao also lost to a Novag unit in the subsequent U.S. Open, although he had previously beaten HiTech several times. Then in the American Open D.T. scored 4 1/2-1/2 vs. experts, but lost to Joseph Bradford (2522). Next came a tie for second at 4-1 in the top section of the U.S. Class Championship with wins over 2 I.M.s (Bonin and Zlotnikov) and two other masters, and a loss to winner Volovitch (2492). A tie for 1st at 4 1/2-1/2 in the "Hall of Fame" tournament clinched the Fredkin prize. D.T. beat 3 experts and I.M. Calvin Blocker (its fourth IM victim), then drew with Igor Ivanov (2618) to share first with him. Despite Ivanov's desire to avenge his defeat at the U.S. Open, it was D.T. that should have won the game--the draw was blamed on a poor time

Not available with Fall 89

use algorithm that put D.T. in mild time pressure causing it to miss the win.

The most spectacular result in computer chess history came over Thanksgiving weekend, when Deep Thought shared 1st place with GM Tony Miles at 6 1/2-1 1/2 in the \$130,000 Software Toolworks Open in Los Angeles. It defeated two strong national masters, two FIDE masters (one, Alex Fishbein, USCF rated 2572), one International Master (J. Silman), and Grandmaster Bent Larsen (2580), formerly the second best player (after Bobby Fischer) outside the Soviet Union. It drew with 2600 rated IM Vince McCambridge, and lost only to 6 time U.S. Champion GM Walter Browne, who won by a fine exchange sacrifice. DT often got poor positions, but defended superbly. Most impressive to me was that it often won even endgames from strong masters, despite its lack of specific endgame knowledge (although it does have databases for perfect play in some simple endings, such as Q vs. R). In the 33 games played since the suicidal version was replaced during the U.S. Open, D.T. has scored 8 1/2-5 1/2 vs. players over 2400, and 18-1 vs. those below! In the 24 games played by the debugged two processor DT, it performed at USCF 2671. Of those opponents, 16 had FIDE ratings and DT performed at FIDE 2580 against them, consistent with the 2671 figure as USCF ratings are about a hundred points above FIDE. At 2580 FIDE DT would rank as the number 3 player in the U.S., behind just Seirawan and Gulko. The DT creators modestly admit to some luck, and point out that these results are all in two round a day events, where fatigue affects the human players much more than in one round a day tournaments. Still, there is little doubt that DT deserves to be invited to the next U.S. Championship.

It seems clear that as HiTech and D.T. add more knowledge and/or more processors, they will continue to gain in strength. It looks likely that an eight processor DT will reach candidate level in 1989, even allowing for opponents taking it more seriously now. There are rumors that Ken Thompson, creator of the former World Champion Belle, and Tony Scherzer, creator of past runner-up BeBe, plan a new machine to surpass the Carnegie Mellon creations. One way or another, it looks likely that some computer will be an even match (or better) for the human World Champion by 1995 or sooner. The only obstacle seems to be money, for large numbers of processors and/or huge amounts of RAM for hash tables (the memory needed for Ken Thompson's planned machine to reach optimum strength is said to cost around \$100,000). Also an opening book suitable for World Championship play must be developed, not a small task. In perhaps 20 years, it will be considered an achievement for any human to draw a game with the top computer. Whatever the big guns achieve, it is

likely that a commercial model will reach the same standard 5 - 10 years later.

I would like to thank Stuart Cracraft, operator of DT in some events, for much of the detailed information on DT and its results in all these events, and for game scores.

Computer Chess in 1988: The Year in Review

by Larry Kaufman

This has been a very exciting year for computer chess. Although there were no revolutionary ideas in the commercial models, the manufacturers made great strides by incorporating the best ideas of their rivals. As in 1987, the greatest gains can be found in the high price models. While there has been no change in the under \$100 market, the cost of each additional rating point has dropped sharply, as large RAM and ROM have been put to ever better use.

Mephisto made the most revolutionary change this year, writing a whole new 16 bit program with hash tables based on using 512k of RAM. The result was a massive increase in strength and a decisive victory in the World Micro Championships. While Fidelity was the first to use hash tables, Mephisto was the first to use them successfully in a commercial selective search program. Those who claimed that hash tables were not suited for selective search were decisively proven wrong.

Fidelity also made a great leap forward, as was shown by the C.R.A. tests at the World Open. They borrowed ideas from both Novag and Mephisto, added some of their own and used faster hardware to market the first master rated program under \$500. In the lower price realm there was no software improvement, but at least the features, opening book, and MHz of the Par Excellence were all upgraded to create the Designer 2100 Display. Although their defeat in the World Micro destroyed any hopes of being regarded as #1 in terms of strength, Fidelity is now the leader in strength under \$500, though Novag may soon challenge that. If Mephisto had not developed a new, hash table program I believe Fidelity would have won the Micro this year. Fidelity is handicapped in that their programmers, the Spracklens, devote only part time to the top end computers, while Mephisto's Richard Lang does nothing else, since the cheaper Mephistos are by other programmers. So the Spracklens have had to keep improving their old program rather than take the time to write a whole new one.

Novag has not released any new top end program since late 1987, but has made substantial progress experimentally and should soon release a much improved Super Expert/Forte. Whether it can challenge the Mach III depends on what MHz it can be offered at.

Saitek has added more chess knowledge to its models, particularly in the endgame, formerly a weak spot. The main emphasis, though, is on new features. Unfortunately, Saitek models are generally not too competitively priced in the U.S., but offer excellent values in Europe where Fidelity and Novag models seem to cost more than in the U.S.

CXG lured Mephisto's #3 programmer, Frans Morsch, away and has some new models out, but I understand that the better ones will not be sold in the U.S.

In the world of research computers, both HiTech and Deep Thought have achieved fabulous results and brought credit to Carnegie Mellon University. Even IMs and GMs are no longer safe against these monsters. It seems clear to me that predictions of a slowdown in computer chess progress have not materialized, and an electronic World Champion challenger by 1995 looks likely.



Evaluating the Tactical Strength of Chess Computers

by Larry Kaufman

Playing computers against each other or in human competition may be the best way to rate computers, but it takes a lot of time and the results are not reproducible. Chance plays a major role. So it would be very nice if one could evaluate computers by their problem solving time. If the problems are varied and well chosen one can get a reasonably good, reproducible measure of tactical strength. Tactics are by no means the sole determinant of chess strength, but they are the dominant component, especially for computers. If a computer had minimal knowledge of positional chess it would appear stronger on problems than in actual play, but with the possible exception of the Conchess programs it seems that stronger tactics have gone hand in hand with better strategy and increased chess knowledge. I have thus found that tactical ratings can correlate remarkably well with real playing strength.

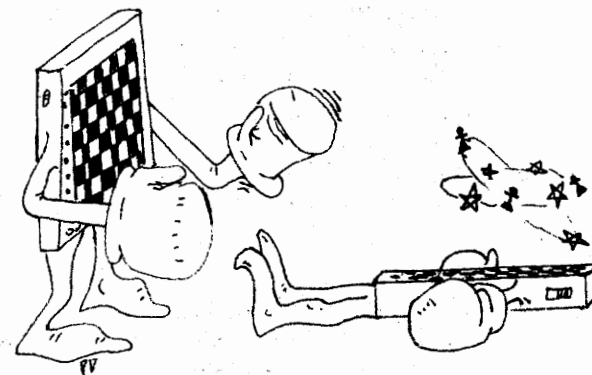
There are several sets of tactical problems which have been used on computers, but the set which seems to correlate best with playing strength is one which has been used for this purpose by Pierre Nolot in articles in the French magazine "Europe Echecs". I have selected 12 out of his 14 problems, including 3 mates, 3 endgames, and 6 combinations. I time all problems in infinite mode, whereas I believe Nolot uses Mate Solving mode on the mates, which is often a totally different program. I then obtain a score by the "Renard" method described by Nolot, and convert that to an estimated USCF rating by a simple linear equation. If you compare these problem solving ratings with C.R.A. ratings, you will surely be impressed as I was by the close fit. Here are the results:

Mephisto Almeria 68020 -- 2328; Fid. Mach IV 68020 -- 2315; Mephisto Almeria 68000 -- 2287; Meph. Roma 68020 -- 2266; Mach III Master -- 2221; Mega IV Turbo -- 2208; Novag Super Expert 6 MHz -- 2191; Meph. Roma 68000 -- 2171; Mondial XL 2161; Meph. Amsterdam -- 2151; Meph. MM4 -- 2139; Mach II L.A. (c+) -- 2136; Mach II b -- 2132; Forte B -- 2115; Meph. Academy -- 2114; Meph. Mega IV -- 2110; Saitek TurboStar 440 -- 2114; Fid. Avant Garde (Mobile Master) -- 2100; Novag Expert 4 MHz -- 2097; Fid. Excel 68000 (b) -- 2096; Par Ex. -- 2069. Only the TurboStar rating seems seriously out of line to me, and relates to its spectacular time on one difficult

problem, which I believe it solves by evaluation without "seeing" the outcome. A new experimental Novag program at 6 MHz scored 2266 on this test. The generally high figures for Novag are to be expected, as Novag is well known to excel in tactics. The rather low numbers (compared with comp-comp ratings) for some of the Schroder programs (Mega IV, Mega IV Turbo, Academy) are presumably due to the programs' policy of pruning out unpromising sacrifices, which only occasionally work in actual games but often work in problems.

One note of caution: some of the manufacturers (at least Novag and Fidelity) use this same test set to improve their programs, so their scores may be a bit higher than is warranted. Perhaps in the future I'll use an unpublished set of problems to avoid this problem. Pierre Nolot has recently switched to a new set of problems in Europe Echecs, saying the old set had become too easy, but the new set is very difficult and time-consuming and does not seem to correlate so well with playing strength.

Another problem set deserves mention, one compiled by Jens Baek Nielsen of Denmark, and published in the Austrian "Modul" magazine. It consists of 131 problems, of which only 22 are tactical. The majority are positional and endgame problems. The test is very good at identifying the strengths and weaknesses of the different programs, but not so accurate at rating them overall. In fact, it rates the Carnegie-Mellon machine "Deep Thought" (USCF 2545 est.) below the commercial Mach III! I feel that tactics are underweighted. The test confirms the widespread belief that Mephisto and Saitek excel in positional play, Novag in tactics, and Fidelity in the endgame, although the Mach III is also superb at tactics and the Mephisto Almeria in all 3 areas.



Selective vs. Full-Width Search--The Results

by Larry Kaufman

In the last issue we looked at various types of selectivity seen in commercial chess computers. Now it's time to compare the results of the best selective and full-width programs in actual play. For this I use the Swedish "Ply" ratings (adding 150 to convert to USCF levels). I consider a program to be selective if its search beyond the full-width depth generally includes moves other than captures and checks. By this definition all Fidelity and Conchess programs, and Novags prior to Forte B are full-width, while all Mephisto programs (except MM2 and predecessors) and Saiteks are selective. The newer Novags (Super Expert, Forte B and Primo/VIP) are selective for 1 ply only, and so will not be considered here, being intermediate between FW and selective.

To make a meaningful comparison we must compare programs employing similar hardware. This means same processor, MHz, and RAM and ROM size, or nearly so. Of course the programmers' skill and time spent on the programs are variables, but I think the top programmers are not so different in ability, nor are programs on comparable hardware apt to differ greatly in amount or quality of chess knowledge. The type of search is the dominant difference.

The top category for which comparable hardware models are rated is 68000 processor, 12 MHz, 64k ROM, 16k RAM. The top selective model, the Mephisto Mondial 68000xl, would rate 2190, while the top FW unit, the Fidelity Excel 68000, rates 2050, a spread of 140 points. The next category is 5 MHz 6502 programs with 32k ROM. The top selective, Mephisto Mega IV, rates 2116, while the top FW, Fidelity Avant Garde, rates 2036, an 80 point spread. Among 4 MHz 6502 models the top selective is the CXG Sphinx Galaxy at 2078, while the top FW is the Fid. Excellence 4 MHz at 1988, a 90 point gap. In the category of "single chip" models, the selective leader is the Mephisto Europa at 1873, while the FW champ is the CXG Super Enterprise at 1735, a 138 point gap.

Averaging the four margins of superiority for the selective machines gives us 112 points. So it certainly looks like well done selective search is typically worth a hundred or more points over full width, at least on a computer vs. computer basis. There is not yet enough data against humans to evaluate whether this holds true against them as well. My impression is that the selective programs margin of superiority is somewhat less against humans, because humans

tend to play for sacrifices that selective programs are likely to miss. So selective programs should incorporate special chess knowledge to minimize this danger, and should avoid openings likely to allow sacrificial attacks. That may be why the Mephisto programs usually defend with safe defenses like the Caro-Kann and Petroff rather than the double edged Sicilian. It is also possible to guard against "stock" sacrifices like Bxh7 check which are often overlooked by selective programs and may even be too deep for FW machines. If such precautions are taken, the selective programs may show the same superiority against humans as they show against computers.

Counting Plies

by Larry Kaufman

Now that almost all but the cheapest machines display depth of search, it is important for owners to learn how to count plies to benefit from this. A ply is defined as a move for one side, so a five move variation is ten plies deep. When your computer shows a depth of "6", for example, it is looking three moves deep for both sides. For most models, this is a minimum depth, which may be extended under some circumstances.

How can you tell whether your computer should see a certain combination in a given number of plies? If you own a Mephisto or Saitek model, that may be rather difficult, but it is easier with Fidelity and Novag computers. Let's assume that the combination wins at least 2 pawns, or one pawn without compensation, so that the computer's evaluation function is not a factor. The standard count then works like this: Getting out of check does not count as a ply, and captures at the end of the stated number of plies also do not count (subject to some large limit). Pawn promotion is treated as a capture. Once the stated number of plies is exhausted, the side to move must either try a capture or "stand pat", meaning to evaluate the position as it is. This accurately describes all of the following models: Novag Constellation and Quattro, Fidelity Par Excellence, Designer 2000 and 2100 Display, Excellence, Excellence 68000, Mach II (a, b, and c +), various Elite models except "Avant Garde Mobil Master". This also gives the maximum number of plies required for the following models: Novag Superconstellation, Expert, and Forte (a), Fidelity Mach III, Mach IV 68020, and Avant Garde Mobil Master. All of these models consider selected checks beyond the stated number of plies, and so may see a tactic in less than the standard number of plies. In addition, some of these models can recognize pins and/or double attacks, and do not allow the endangered side to "stand pat". All of this also applies to the Novag Forte B, Super Expert, and Super Forte, except that in some circumstances one extra ply may be needed to see an opportunity.

Let's look at some examples of ply counting. After the opening moves 1e4 e5 2Nf3 d6 3Bc4 h6? 4Nc3 Bg4? white wins a pawn by 5NxP, because if 5...BxQ? white mates by 6BxPch K-K2 7N-Q5. The standard count tells us that a computer should find 5NxP in 4 plies (not 5 because 6...K-K2 doesn't count, being an escape from check). Although there are three captures in the sequence, this doesn't matter because the combination doesn't end with a capture. I tried this position on several models, with the fol-

lowing results: Designer Display 2100 4 ply (6 seconds); Mach II L.A. 4 ply (15 seconds); Mach III 3 ply (3 seconds); Novag Super Expert 6 Mhz 3 ply (4 seconds). Note how the computers with checks included in the capture search (Mach III and Super Expert) see the combo a ply sooner than the others. For comparison, the Mephisto Mondial requires a 9 ply selective search, but still only takes 5 seconds. The Mephisto Almeria needs only an 8 ply selective search which takes just a split second.

Now let's consider the so-called "Noah's Ark" trap, as in the game A. Steiner-Capablanca, Budapest 1929. 1e4 e5 2Nf3 Nc6 3Bb5 a6 4Ba4 d6 5d4 b5 6Bb3 Nxd4 7Nxd4 exd4 8Qxd4? c5 9Qd5 Be6 10Qc6 Bd7 11Qd5 c4, and black wins the bishop for two pawns. How deep must one look on black's eighth move to see that 8...c5 wins material? It looks simple enough, but if we count it seems that seven plies are required. True, 10...Bd7 is an escape from check and so doesn't count, but even after 11...c4 the computer doesn't know the bishop is trapped. Only after 12 any is met by a decisive capture can the computer conclude that material is won by black. But wait, white can delay the loss further by 12Bg5 Qc8 (or 12...f6), adding two more plies for a total of 9. Now if we ask the computer to select a move for white on move eight, without using its opening library of course, we see that ten plies are needed to avoid the error, unless the machine happens to choose 8Bd5 on positional grounds. Moreover, this is true even with models like the Mach III that include checks and pins in the capture search, as they don't help here. A ten ply full width search, on a fast processor like the 16 MHz 68000 used in the Mach III, will generally require more than 24 hours to complete, although Carnegie Mellon's "Deep Thought" can do it in a few minutes.

This explains the apparent preoccupation of chess programmers with speed and with selective search ideas—even such elementary tactics as this one can be delayed beyond the computer's horizon quite often. Each added ply of search greatly decreases the frequency of such horizon blunders, and so it takes an enormous difference in chess knowledge to compensate for even one extra ply of search. Unfortunately, it generally takes a fivefold increase in processor speed (i.e. from 4 to 20 MHz for example) to add one ply, so the only hope for seeing tactics of more than seven plies depth in a commercial model (on current hardware) is selective search. At present I believe none can see through the Noah's Ark trap in any reasonable time; this illustrates why the "Deep Thought" inventors argue that computers are really weaker than similarly rated humans in both strategy and tactics, if we discount the many silly blunders made by the humans. This shows why one should buy a computer rated far above himself. An

equally rated computer will win its share of games from you, but generally on errors that you see and regret immediately. Only a machine rated far above you is likely to outplay you and beat you at your best. This is the way to learn and improve.

Humiliating Your Chess Computer

by Larry Kaufman

In 1980 it was not difficult for a master to successfully give queen odds to any commercial chess computer just by playing good chess, but recently the top models have been scoring well against masters in serious tournament games. Therefore it was surprising to me to receive some game scores from one George Morris in England in which he had defeated several recent top models at queen odds or more, mostly at tournament level! Mr. Morris is said to be what we would call a class A player, while all the models he trounced are of Expert strength or better. I verified the legitimacy of the games on my own machines. They all illustrate the same point-- machines will not decline a sacrifice unless they can see the mate or recapture of equal material. The only exception is Novag, which will decline sacs like the ones below on principle, as would a human in most cases.

The first game is Morris vs. Mephisto Roma 68000, 40/2, no white queen: 1d3 Nc6 2c3 Nf6 3Nd2 d5 4Ndf3 e5 5Bg5 Be7 6h4 o-o 7e3 h6 8Nh3 hgx5 9hgx5 Ne8 10o-o-o Bg4 11Be2 a5? (black should contest the h-file by g6, Kg7, and Rh8) 12Rh2 a4? 13Rdh1 a3? (still blind to the danger) 14Nf4 axb2 15Kb1 f5 16g6 Bh4 17Nf4 Rxa2? (here the older Mephisto Amsterdam finds the saving 17...Rf6!) 18Kxa2 Bxe2? (last chance for ...Rf6) 19Nf3 and white soon mates. The spite checks blinded the computer to the mate.

The second game is Morris vs. MM4, 40/2, remove white's queen and his queen's knight (!): 1d4 Nc6 2c3 d5 3Bf4 e6 4Nf3 Bd6 5g3 Bxf4 6gxf4 Nf6 7e3 e8g8 8Be2 b6 9h4 Bb7 10Ng5 Qd6 11o-o-o h6 12Rh2 hgx5? 13hgx5 Ne4?? (Rf-any still wins) 14Rdh1 f5 15g6 and mate next. Apparently the selective search misses 15g6. Pathetic, yet the very similar Mega 4 performed at 2471 USCF in a 25 game British action chess tournament!

The final game is Morris vs. Fidelity Mach II Los Angeles (c +), game/30, remove white's queen: 1d4 d5 2Nf3 Bf5 3c3 Nf6 4h4 e6 5Bf4 Bd6 6e3 Bxf4 7exf4 o-o 8Nbd2 Qd6 9g3 Ne4 10Nxe4 dxe4 11Ng5 h6 12Bh3 hgx5 13hgx5 Bxh3 14Rxh3 Nd7 15Kd2 Qb6 16b3 Qa6 17c4 c5 18a4 cxd4?? (moving the king's rook avoids all danger, but the machine is blind to the danger as the mate is beyond its horizon) 19Rah1 f5 20g6 Qa5 21Kd1 and white soon mates. Even the new Mach III loses similarly from the position after 18a4, except for inserting the moves 18...Qa5 19Ke2

before playing 19...cxd4??, but on level a7 (40/2) it does find a win.

The point of all this is that microcomputers still have weak spots tactically, as some "obvious" threats are beyond their horizon due to delaying moves. On the other hand, humans often overlook tactics which to a computer are obvious. Don't expect your computer to play like a human master just because it has a master rating; we have different strengths and weaknesses than do computers. Still, the gap is shrinking every year. The games also show that results of computers against humans are very dependent on the humans' style of play. Sound play is not always best against computers!

Postscript: I tried some of Mr. Morris's wins against the new Mephisto Almeria, and found that it handled the critical positions correctly, not falling for the mates.



IT WAS A DARK + STORMY KNIGHT...

Chess Computer Questions And Answers

by Paul DeStefano

Here's the ten most commonly asked questions about chess computers and their answers. Hopefully you can find the answers to a few of your own questions here, and you can save yourself a lot of time and confusion.

Q:What's the best computer I can buy?

A:This question really has no answer. I depends on exactly what you're looking for and what your price range is. If you're a novice, the best computer for you would not be the best computer for a master or someone who wants to solve chess problems.First, determine what you're looking for in a computer, and then start asking specific questions. There is no best. Some computers may be stronger than others while they may not have as many features. It's up to you to decide what you want in your new computer.

Q:This ad says that the Brand X Superchess runs at 12 megahertz on a 16 bit processor. Doesn't that mean it's at least twice as fast and strong as the Brand Z Megachess which runs at a mere 6 megahertz on a tiny 8 bit processor?

A:Not necessarily. If the programmer who created the 6 megahertz 8 bit program was very skilled, the program may overcome the slow hardware. It's really the program which determines the power of a machine more than the processor and clock speed. Of course, if you take the same program and run it at 6 megahertz and 12 megahertz, the 12 megahertz version will be stronger.

Q:I heard that the Brand W Chesswarrior computer is rated at 1989. What level is that rating for?

A:All chess machines which receive ratings are rated at the 40 move in two hour level, unless otherwise noted. Ratings should be adjusted down if you play them at faster speeds.

Q:I see that the Brand Q Chessbeast 2000 has an infinite level. What does that do?

A:Infinite levels are levels where the computer will think forever and not make a move. Since most of us don't have that much time to play a game, it's obvious that you can't play a game at that level. It's used for analysis purposes, where you would set up a position, leave the machine on for three or four hours or days, and force it to make the move which it has been studying for so long by pressing a "move now" button. You could also use the infinite levels to cheat at postal chess, which is a nasty and unethical thing to do, and we at Computer Chess Reports urge you to resist the temptation to do it.

Q:Should I buy a tabletop model chess computer, or software for my home computer?

A:Well, that's really up to you. The biggest difference between the two being obviously with a home computer program the game is all on screen and you can't physically touch the pieces. Home computer programs are also often less expensive than the stand alone models, usually under 50 dollars. Unfortunately, most home computer programs are much weaker than the stand-alone tabletop units. If you have a home computer, don't mind playing on a screen and you want to save money, the home computer disk sounds like it may be the choice for you.

Q: Is it true that if a buy a chess computer today, it will be obsolete within a year or so?

A: In a year or so, it's true that there may be stronger, faster and overall better machines than what is available today. That does not make the machine you own obsolete. If your computer does exactly what you want it to, and plays at just the right strength, then that machine is by no means obsolete for you. However, if you think you have a machine that's too slow and weak, or you've become bored with it for one reason or another, then it's probably time to invest in a new unit.

Q: I'm thinking of buying another chess computer. What do I do with my old Brand F Fossilchess 500?

A: Besides using old chess computers as very expensive paperweights and doorstops, many people like to keep them to play against the new computer to see just how much better the new one truly is. Some people like to collect computers. But if you really don't want it anymore, I suggest selling it. Just because you don't want it anymore doesn't mean it's not good for someone else, just as I mentioned in the previous question. You can take out a classified ad, sell it to the local chess club or a friend, or pass it on to your kids.

Q: Should I run my computer on batteries, or should I purchase an AC adapter?

A: Batteries should really only be used in hand held computers or when you plan on playing the computer when you cannot get to an outlet, such as when you are riding in a car or plane. AC adapters will end up saving you a small fortune in battery costs in the long run, and there is no chance of the computer going dead in the middle of a game, as it might with batteries.

Q: I saw an ad for the Brand R Twinkiechess, and it said it was pressure sensitive and had magnetic pieces. If it's pressure sensitive, why would it need magnetic pieces?

A: Magnetic pieces on pressure sensitive boards are simply to keep the pieces in place if the board is bumped or if you have the board on your lap while watching chess matches on TV.

Q: My girlfriend is sick of me playing my chess computer all the time and she says I have to stop playing it or she'll leave me. What should I do?

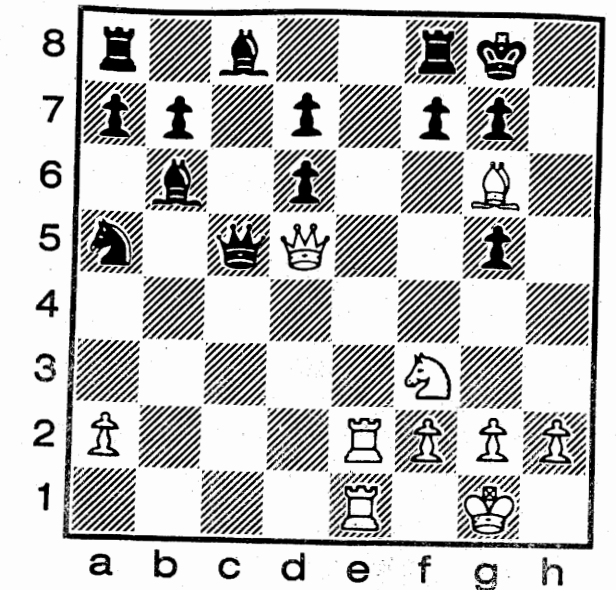
A: That depends. How strong a player is your girlfriend?

Using The Pierre Nolot Test Positions

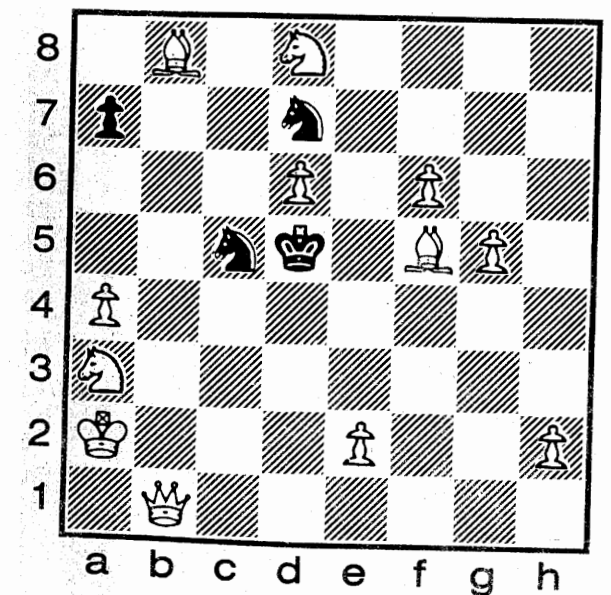
by Larry Kaufman

If you wish to use the Nolot problem set to rate your own computer, here is my procedure: Time each mate on infinite mode until a mate is announced, even if it's longer than the intended solution. Time the combinations and endgames until the right move is found, except that in the pawn endgames don't count it as solved unless the correct move continues to be displayed for an additional iteration to confirm that the computer will not change its mind, as sometimes happens with these endings. Any problem not solved in 24 hours is scored as 24 hours (this used to happen often, but is now rare). Omit Problem 9 (too many checks, not a realistic test) and endgame 7 (solution may be found by "chance", not by search). Convert each time to a score by the following formula: $S = \log(86401/(1+t))/\log(86401)$, where t is time in seconds and \log is base 10 log. Average the 12 values of S , then multiply this average by 1000. Finally, add 1,600. Bear in mind that since the lowest possible rating on this test is 1,600, it is not suitable for very weak machines, i.e. those that would be unable to solve several of the 12 problems in 24 hours. Also, if your score differs slightly from the one quoted above, remember that some models have a small randomizing factor built in that can cause times to vary on different trials, and also that some manufacturers make small program alterations from time to time without announcement. But if your computer's "rating" differs from the one quoted above by over 25 points, I would appreciate a note with your 12 times for further investigation. Also, don't be alarmed if a new, supposedly better model does worse (even much worse) than its predecessor on particular problems. Usually program changes help some positions and hurt others. Only if the total score is clearly worse is there cause for alarm. For example, some people complained because the Mach III took four times as long as the Mach II L.A. on Problem 7 (published also in last year's CCR). True, but the test overall shows the Mach III to be 85 points stronger, close to the 104 point spread in the "Ply" ratings. The explanation is that the check extensions in the Mach III enable it to solve many problems a ply faster than the Mach II, but when that doesn't happen the extensions merely burn up time. Similarly the Mephisto Almeria is much slower than the Roma on Combinations 5 and 7, but much faster on most of the other problems. In computer chess, rarely is anything "free"; to judge if a change is beneficial is often not an easy task.

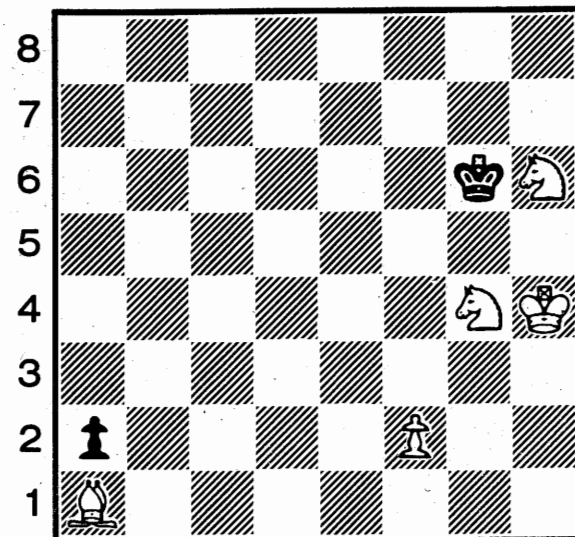
The following table includes both my own timings (all the mates, and all problems on the newer machines) and Mr. Nolot's. An "e" means the time is only approximate. "No" means the solution was not found in 24 hours. "****" means at least several hours, but I didn't wait the full 24 hours before quitting.



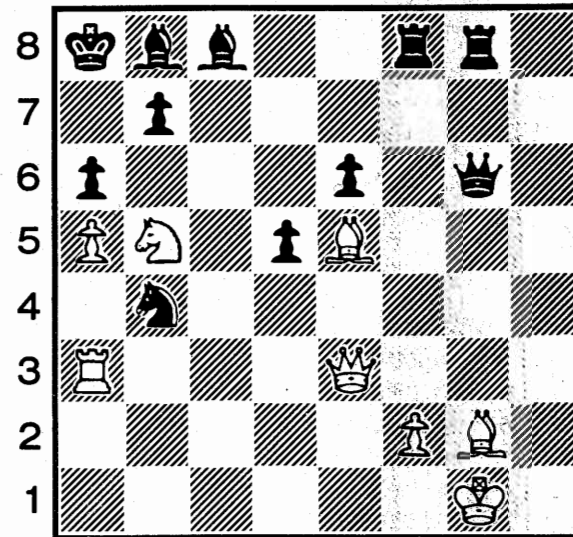
Problem 6 (Pb6) (Mate in 4)



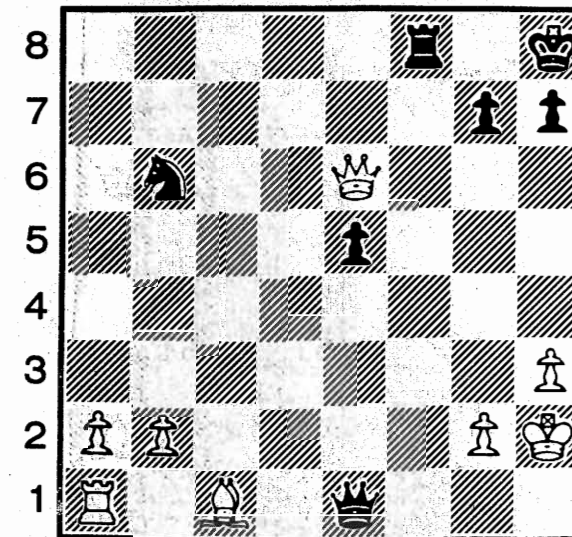
Problem 7 (Pb7) (Mate in 4)



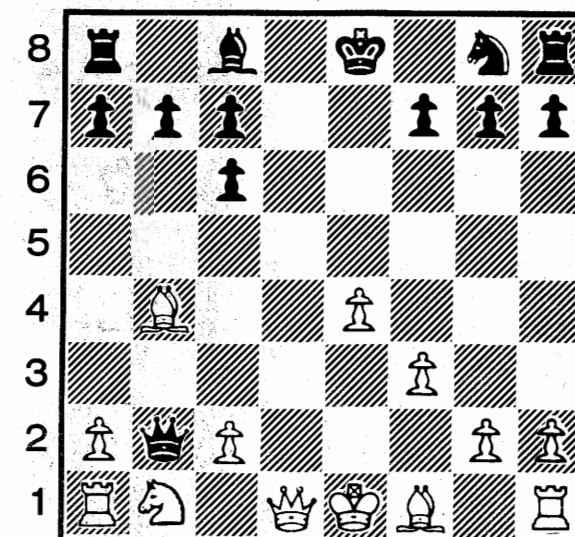
Problem 8 (Pb8) (Mate in 6)



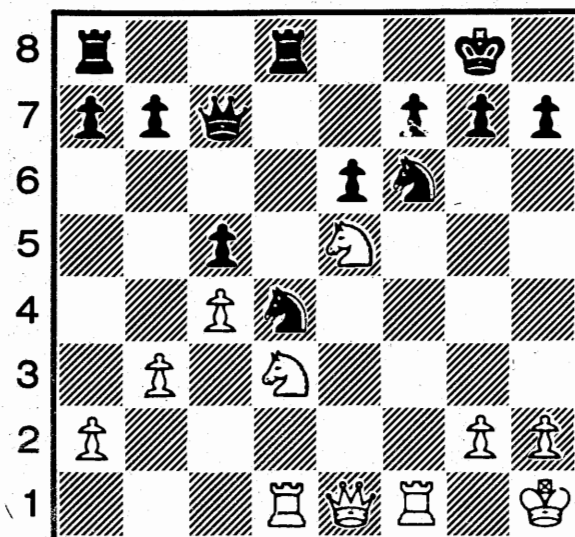
Problem 9 (Pb9) (Mate in 8)



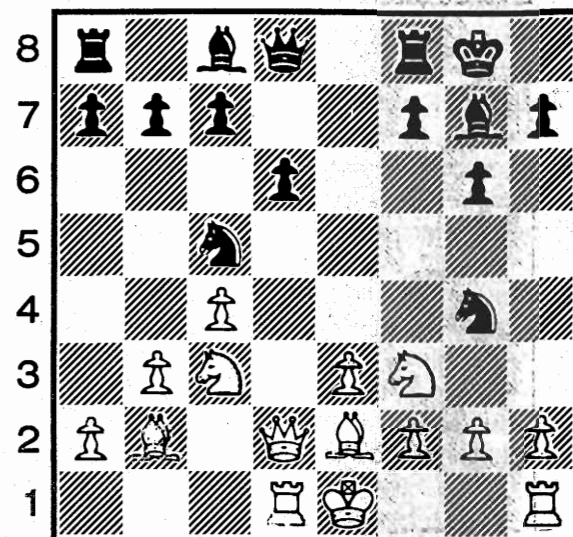
Combination 7 (Cb7)



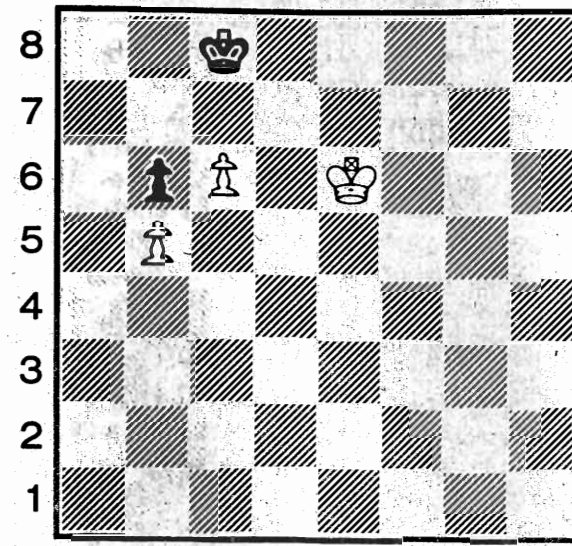
Combination 8 (Cb8)



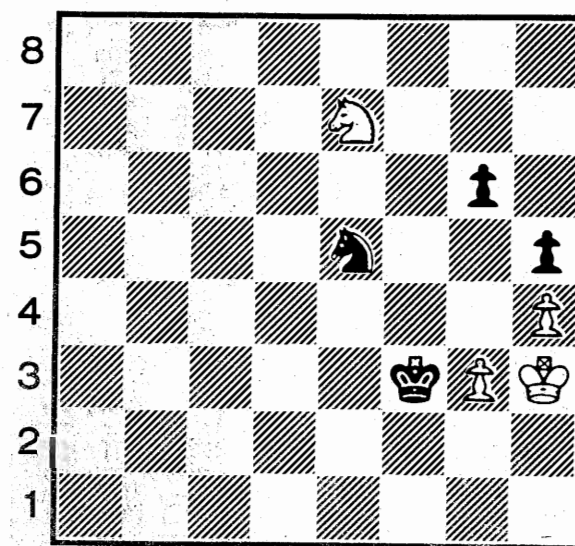
Combination 3 (Cb3)



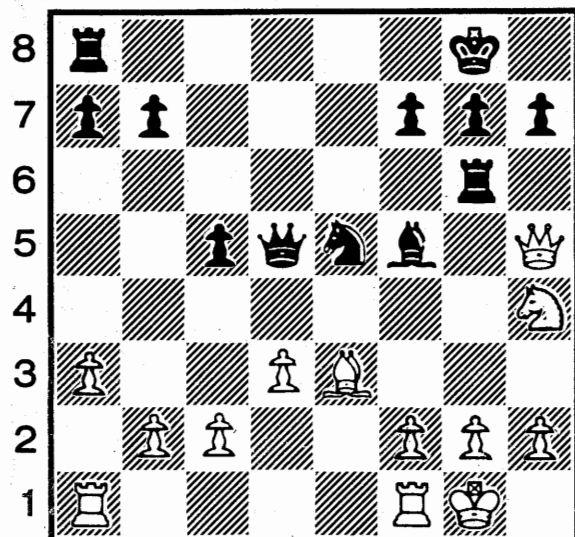
Combination 4 (Cb4)



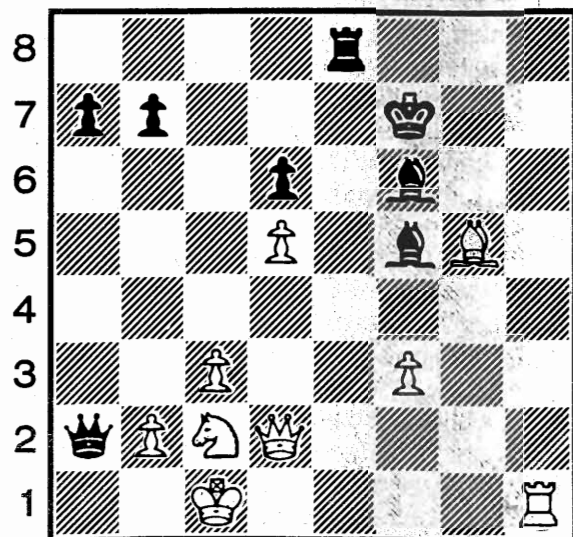
Endgame 4 (En4)



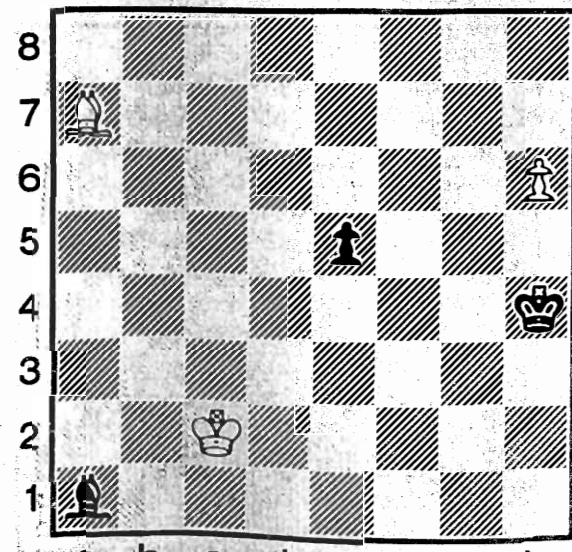
Endgame 5 (En5)



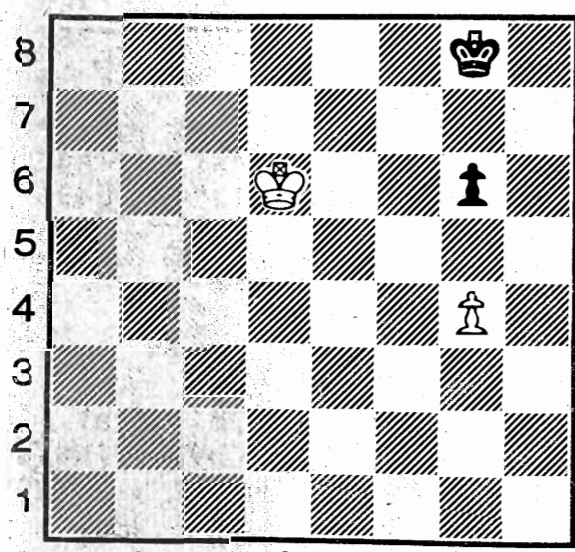
Combination 5 (Cb5)



Combination 6 (Cb6)



Endgame 6 (En6)



Endgame 7 (En7)

Time Results From The Pierre Nolot Test

by Larry Kaufman

Model	Pb6	Pb7	Pb8	Pb9	Cb3	Cb4	Cb5
M.Almeria 32 bit	20"	1'35"	1'3"	1'43"	0"	0"	3h30'e
F.Mach IV 68020	0"	6'43"	46'29"	1"	2"	2"	6'23"
M.Mega IV Turbo	7"	55"	2'50"	1h2'	1"	2"	2'48"
M.Almeria 16 bit	32"	2'48"	1'43"	6'38"	0"	2"	6h e
F.Mach III	1"	14'59"	2h57'	3"	3"	4"	16'16"
M.Mondial 68000	1'2"	4'19"	40'27"	6'50"	1"	7"	24'51"
N.Super Exp 6.0	1"	11"	2'56"	4'56"	18"	23"	3h30'e
M.Academy	7"	6'45"	13'19"	1'15"	4"	8"	3h30'
F.Mach II LA(c+)	8"	3'42"	1h16'	17"	23"	2'47"	1h48'
N.Forte B	9"	1'54"	45'46"	7'20"	17"	5'41"	4h20'
F.Par Excel.	14"	6'50"	1h49'	37"	24"	1'33"	1h42'
S.Turbostar 440	4"	3'41"	9h40'e	17'3"	1'5"	12"	35"

Model	Cb6	Cb7	Cb8	En4	En5	En6	En7
M.Almeria 32 bit	3"	52'8"	0"	5"	25"	3"	1"
F.Mach IV 68020	2"	1'4"	21"	6"	17"	36"	2"
M.Mega IV Turbo	16"	11'21"	20"	NO	2'26"	11'40"	NO
M.Almeria 16 bit	5"	1h38'	0"	10"	41"	5"	3"
F.Mach III	4"	2'22"	45"	10'15"	39"	1'27"	4"
M.Mondial 68000	4'58"	2h5'	1"	6'53"	2'5"	6'55"	1'27"
N.Super Exp 6.0	5"	15'35"	18"	***	3'5"	1'40"	***
M.Academy	1'1"	18'36"	2'29"	27'45"	11'37"	55'30"	NO
F.Mach II LA(c+)	54"	9'3"	1'3"	7'3"	2'11"	1'57"	5"
N.Forte B	8"	17'44"	23"	11h21'	3'25"	1'35"	NO
F.Par Excel.	46"	21'59"	1'17"	NO	5'44"	6'1"	14'30"
S.Turbostar 440	12"	1h43'	11"	NO	27'20"	6'8"	44'40"

ANSWERS:

Pb6: Qxf7 ck	Pb7: Bxa7	Pb8: f3	Pb9: Qa7 ck
Cb3: Rxf6	Cb4: ...Nxf2	Cb5: ...Rxg2	Cb6: ...Re2
Cb7: ...h6	Cb8: ...Qxb4	En4: c7	En5: ...Ng4
En6: Bd4	En7: g5		

Late News

by Larry Kaufman

The following items came to my attention just before press time. The rating list was adjusted for the latest results, so please forgive any small discrepancies between that list and other articles.

In British testing by neutral machine owners, Mephisto Almeria 32 bit leads the Fidelity Mach III by 14 1/2 to 4 1/2 at last word. This would seem to imply a Senior Master U.S.C.F. rating for the Almeria 32 bit. However, both of these models did badly in a recent 9 round Swedish human tournament, with performances in the low expert (U.S.C.F. equivalent) range. Perhaps too many of the Swedes now own chess computers and have learned their weaknesses. On the other hand, a Mephisto Almeria 32 bit, not necessarily at commercial speed, held two strong International Masters (with ratings equivalent to around U.S.C.F. 2500) to nearly even scores in 15 game blitz matches. In my own testing at 40/2, the Almeria 32 bit leads the Mega IV Turbo (18 MHz) by 2-1, and Mephisto Academy leads Mach III by 2 1/2-1/2.

The Mephisto Academy, with an 18 MHz Turbo Kit, recently scored a perfect 7-0 in an Austrian tournament, 40/2, against a field of players in or near the equivalent of the U.S.C.F. expert class. Technically the score was 6-1, but the loss was on time due to operator error in an overwhelming position. This result together with the splendid results I have obtained for the 5 MHz Academy make it likely that the Academy Turbo 18 MHz will be the strongest commercial chess computer on the market, when and if it becomes available. This has not been announced to date. Fidelity has announced plans to offer the Mach III Master in the slender "Designer" housing at a somewhat reduced list price this summer. The Mach IV 68020, though, would get too hot in that housing and so will be offered this Spring in the same plastic housing as the Mach III and predecessors have been sold in. The "Elite Avant Garde 2265" is expected this summer.

Novag has revised its Super Expert/Forte experimental program greatly since the version tested by CCR, and latest results at one minute level by one of our testers, Max Harrell, are very encouraging--7 1/2 to 1 1/2 vs. Saitek Maestro C, and 2-0 vs. Roma 68000. Just when Novag will stop work and release the new program remains unclear. I would expect the standard model to remain at 6 MHz, with a possible deluxe model at higher speed. The same selec-

tive search ideas are being implemented in the inexpensive "Mentor" and the hand-held "Super V.I.P.", but I don't yet have a model of either to test. Now that Fidelity no longer makes any strong (over 1500) machines to retail for under \$100, Novag will be in an excellent position to take over this market, especially if the Mentor achieves low class A strength as hoped. It may not be able to equal the Mephisto Europa in strength, but the Mentor unlike the Europa will have a display.

Regarding PC chess playing software, there are reports that the Commodore version of "Chess-Master 2100", as well as the Apple IIGS version, makes illegal moves. Also, I tested the new program "Zarkov" in 16 30" "reversal" games and obtained a rating of 1973 on my 8 MHz 286 based machine.



Computer Terms For The Chess Player

by Paul DeStefano

When one enters the market for a chess computer, they are often thrown into a world where various ads and salesmen will use words that seem like they're from another planet. The talk of hash tables, kilobytes and seven segment displays often leave the buyer in a cloud of confusion, when all you really want to know is what the machine can do and how well it does it. After reading through these terms, you should be able to understand what all of those chess-computer salespeople are talking about when you ask a simple question and they happily respond something about a new 32-bit dot matrix upgrade for a 16 megahertz autosensory housing with CMOS memory. Chess computer salespeople are a very excitable bunch, and they will answer in terms like that even when all you asked to know was the color of the board.

ADAPTER - a transformer which allows you to run a computer off of house current by plugging it in rather than using batteries.

AUTOSENSORY - the term used for any board that senses the position of the pieces by small magnetically activated reed switches and magnets in the bottoms of the pieces. Wooden boards are usually autosensory. This means that pieces are simply placed on the board, not pushed into it.

AUTOPLAY - a feature on certain machines which causes the machine to play itself, as both white and black, without any human input. This game can then be replayed for analysis.

BIT - the smallest unit of memory for a computer. Computers think in binary, which means computers only think with zeroes and ones or on and off signals. A bit is a single 0 or 1. A sixteen bit microprocessor can think in "words" of a series of sixteen 0s and 1s. Think what it would be like if you would have to talk in only very short words; communication would be slow and primitive. Therefore, the higher bit-capacity of a microprocessor allows for faster, more advanced and more efficient use of thinking time.

BIT SLICE or BIT SPLICE - a way in which the computer can understand longer strings of information than its processor would normally allow. This is a very new and expensive technology.

BYTE - a memory unit equal to a string of 8 bits.

C.M.O.S. - (Complimentary Metal Oxide Semi-conductor) a component which allows a machine to have a permanent memory. With C.M.O.S., a computer can be shut off and disconnected, and it would still remember the last position that the pieces were in. Computers with C.M.O.S. also often have the ability to save several games in memory at one time, and user programmable openings.

C.P.U. - (Central Processing Unit) the head processor of a computer.

DISPLAY - a screen on a computer which may show various information, such as time elapsed, what move it is, who's turn it is and on some computers it can show the algebraic notation of a move.

DOT MATRIX DISPLAY - a display system that uses a series of dots arranged to form letters. Dot matrix displays are easier to read and capable of displaying more than seven segment displays. Home computers use dot matrix displays to make letters on a monitor.

E.P.R.O.M. - (Erasable/Programmable Read Only Memory) a memory chip which can have its program changed for an inexpensive form of upgrading.

HARDWARE - the actual machinery that is needed to build a computer: lights, sound generators, buttons and electronic components.

HASH TABLES - the equivalent of a memorized book opening in the endgame or late middle game. The computer would have tables of various ending positions stored in RAM memory, which it can compare to the present game position to make rapid evaluations. They speed up end game play as well as make the computer substantially stronger.

HOUSING - the actual "house" that a computer lives in; the outer shell. The housings of chess computers are usually plastic or wood.

I.C. CHIP - (Integrated Circuit) a small black computer chip made mostly of silicon, resembling a black centipede with silver legs. They take the place of the hundreds of transistors and tubes that used to be in the first computers. If it weren't for I.C.s, your computer would be too heavy to even move.

INPUT - anything that the user tells to the computer is input. For example, when you tell a computer that you are moving a pawn from E2 to E4, the move must be entered as input by keyboard, pressure, magnetic sensors, or other entry.

K or KILOBYTE - a block of memory equal to 1024 bytes.

L.C.D. - (Liquid Crystal Display) a display system used on many computers for information read-outs, as well as most digital watches. L.C.D.s appear as black letters on a gray background.

L.E.D. - (Light Emitting Diode) an electronic component that glows when electricity passes through it. The red or green lights on many computers that tell you where the computer is moving are L.E.D.s.

MAINFRAME COMPUTER - an extremely large and powerful computer, usually owned by a university or company, not available for public purchase.

MEGAHERTZ - the speed at which a computer can think, often referred to as clock speed. Higher Megahertz ratings will allow a computer to think more thoughts in less time. Although one computer may think faster than another, that does not always mean that it is thinking better.

OUTPUT - any information that the computer tells the user. This can be a clock display or lights that show where the computer moves.

PRESSURE SENSITIVE - a board which requires the user to press down on the squares that a piece is being moved from and to.

PROCESSOR - the "brains" of the computer, which organizes the way it thinks.

PROGRAM - the series of orders that exists inside a computer. A computer can only think how it is told to think by a human programmer.

R.A.M. - (Random Access Memory) the memory that a computer will need to look into at varying times (randomly). This will include any random generators, such as for opening books, as well as hash tables.

R.O.M. - (Read Only Memory) the memory in a computer which does not change, no matter what the situation is; a knight will always move as a knight and other unchangeable rules.

SENSORY OVERLAY - a plastic sheet found in pressure sensitive boards which is a series of switches that allows the computer to feel where the user is pressing.

SEVEN SEGMENT DISPLAY - a L.E.D. or L.C.D. display which creates letters and numbers using different patterns of the same seven straight lines, which look like a square number eight when all of the lines are activated. This is the type of display that most digital watches use.

SOFTWARE - a computer program. Software is just information, not an actual physical item itself, although it must be stored on some storage material, like a computer disk, tape, or I.C. chip.

SURGE PROTECTOR - a device attached to an adapter to protect a sensitive piece of electronic equipment from becoming harmed by unpredictable changes in electrical current, like a lightning storm. These are highly recommended when using chess computers.

TOUCH SENSORY - the term to describe any board on which the user must press the piece gently into the board to tell the computer where it is moving from and to.

UPGRADE - improved hardware or software for a computer to make it perform better. Usually upgrades are in the form of stronger playing programs where the user would keep the same housing from an older program. With upgrades it is often like playing a new opponent on the same board.

