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Mid 1991 Review

by Larry Kaufman, I.M.

Since our last issue, there have been few tournaments involving computers, but there are several surprising happenings and some new models to report on. Among the big stories are the replacement of Fidelity's founder Sid Samole as president (see Fidelity review) and the bankruptcy of CXG, which manufactured "Travel Master" and other inexpensive models for Fidelity in China. Other news includes the poor showing of Saitek machines at the U.S. Open and the slightly disappointing results of the Fidelity Travel Master in the accompanying Action chess C.R.A. test (although TM still got a much better, Expert level, rating than any other pocket or under $100 model ever did or could).

The good news for consumers is that technology has shifted the strength/price equation in their favor. The Fidelity Mach IV with its 20 MHz 68020 processor and 2325 C.R.A. rating has become affordable in the Designer housing, while the Designer Mach III has gone on sale (to members of I.C.D.'s Preferred Buyer's Club) for under $200, an amazing bargain for a Master rated model (2265 by C.R.A., 2210 by CCR test, 2202 by "Ply" ratings). Mephisto has a new 8 bit model (Milano) that combines elegance and quality with a 2200+ program and a modest price tag. Novag models have also dropped somewhat in price, so the buyer has a rather attractive selection now. Even though competition is rather limited with only "Mephility" (as a certain wag calls Mephisto + Fidelity now that they are both owned by Hegener & Glaser) and Novag offering much of interest to strong players (we're still waiting for Saitek), the competition from pc software and "The ChessMachine" seems to be keeping them in line.

As for the pc software market, one new program worth mentioning is "Knight-Stalker" (known in Europe as "Fritz"). It is designed to work with "ChessBase", just as Zarkov works with "BookUp7". "Knight-Stalker" is essentially a pc version of the Fidelity Travel Master, by Franz Morsch. Like Travel Master it is a powerful tactician but rather deficient in chess knowledge, especially endgame knowledge (what, king + 1 minor piece can't beat a lone king? What's "square of the pawn"? etc.). Since the program is similar to Travel Master and about the same speed when run on a 386 sx 16 Mhz, it should be about the same (mid-Expert) strength on that hardware. If Morsch ever adds hash tables and basic endgame knowledge, it could be a holy terror on a 486. As for the other pc programs, MChess continues to come out with new versions, but the testing by "Ply" magazine has not verified any measurable improvement over earlier ones. Still, MChess remains king of the pc hill for now. The new "Alpha" program by Don Dailey, myself and Heuristic Software will not be out before the new year. The delays in implementing the features & graphics may give us time to complete the re-write ("Alpha 2") before its release. Can we challenge MChess?? We shall see.

As for tournament results, three machines played in the Swedish championships, with Lyon 32 bit (12 MHz) doing well (2409 USCF equivalent), while Diablo (2172) and especially MM5 (1953) disappointed (but only 12, 9, and 6 games were played respectively by these models). In a huge German tournament of 6 commercial models each playing 30 games with each other one, Fid. Designer 2265 (Mach III) won with 108 1/2 out of 150, followed by Meph Polgar at 98, MM4 at 83 1/2, Mach II at 76 1/2, Turbo King at 52, at the old Novag Super Constellation last at 31 1/2. The results agree quite well with the various rating lists. The Lyon 32 bit was then matched with the machines in shorter matches and defeated the two leaders by a total of 28 1/2 out of 40, the others by 44 1/2 out of 50. In another smaller such event, with 4 entrants and ten games per pairing, Mach III again won with 20 1/2 out of 30, Polgar again second at 17, Novag Super Forte C next at 16, and Fid. Designer 2100 last at 6 1/2, also in perfect rating order.

This fall we are expecting to see a very close cham-

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pionship match between the human and computer World champions -- in checkers! The program is widely regarded as better than all human players but the champ, and yet the gap between the top two human players is considered wide enough that the computer is the underdog! Perhaps we'll see the same thing in chess in a few years -- reaching Candidates' level (say 2650 FIDE) may be rather easy, but beating the Champ will take a much greater effort.

Readers are again reminded that they can call me toll-free with questions every Wednesday (10-3:30) at Fidelity. The number, outside Florida, is 1-800-634-4692. Due to the heavy volume of calls, we may add a second day. Fidelity/Mephisto are sufficiently confident in the superior price/performance of their models that they encourage me to provide objective answers to all questions, even if I sometimes have to recommend a competing model for certain people.

I would like to thank the folks at I.C.D. for publishing and subsidizing this magazine; Fidelity for financing the "hotline"; Heuristic Software for supporting my "CCR Problem Set" work; Gerald Murphy and Max Harrell for lots of hard-to-get information; and the Swedes who put out "Ply" and play so many thousands of test games for all their hard work!

Computers At The 1991 U.S. Open In Los Angeles

This year's Open featured two Saitek computers in the main event, a separate C.R.A. supervised Action Chess rating test for the Fidelity Travel Master, and two computers in the U.S. Open Blitz championship. Here is a summary of what happened.

The Travel Master test had four identical machines each play six different human opponents over a three day period, each opponent playing one game as black and then one as white. This produced 48 games against 24 opponents. Time limit was supposed to be game/30, but because the machines had no built in operator time the event was changed to game/35 so no games would be lost on time by the machines. All opponents were rated between 1900 and 2400, the average being 2172. All games were U.S.C.F. rated for both sides, and each game won by a human player won him $50, each draw $25. The resultant Action Chess rating of 2062, while below expectations, confirmed that the Travel Master is the first pocket chess game to deserve the USCF Expert rank. The score was 17 1/2 to 30 1/2, including 5 out of 20 against masters and a perfect 4-0 against players under 2000 (all over 1900). To insure fast and error-free operation, most of the games were operated by Senior Masters (Danny Edelman, Miles Ardaman, and myself). The Travel Master generally played well in the middle game, except in closed positions, but its tiny opening book lost it several games without a fight, and it threw away some drawn endings needlessly. One bug showed up when it promoted a pawn to a bishop, giving it away for nothing, rather than recapturing a piece elsewhere. Considering all these problems, I guess a 2062 rating is not too bad.

This was the second C.R.A. Action Chess test, the first being the World Open test three years ago of the Mega IV Turbo, a $1400 machine that earned a 2361 Action rating but only a 2209 40/2 C.R.A. rating. Probably the 2361 rating was too high because the players in that event had to play 11 rounds in two days, and were surely tired. In contrast, the Travel Master opponents were well rested, having only one round per day to play in the main event. Also, all the Travel Master opponents were volunteers, and it is likely that only players who do well at Action chess and/or feel that they know how to beat computers would volunteer. After reviewing all the evidence, I now feel that computers perform only slightly better at Action Chess than at 40/2, perhaps 50 points or so, since their own play suffers nearly as much as a person's. In fact there are many players who simply don't use anywhere near their full time allotment at 40/2, and against these players the computers will perform worse at Action chess than at 40/2. It seems to me that against strong Masters and Grandmasters the machines perform rather worse at 40/2 than at Action, since these players generally make rather full use of their time, but against amateurs this is less clear.

In the U.S. Open itself, Saitek entered the Renaissance board with a 10 MHz Maestro module using the latest version of the program that earned a 2045 C.R.A. rating in last year's Open running at 5 MHz. Due to the speed doubling, the program improvements, and the pre-event rating of around 2290, a high Expert performance was a reasonable expectation, but the result was an embarrassingly low 1930 result for the 5 1/2 - 6 1/2 score (all against Class A and low to mid Expert opposition). Saitek also entered the Kasparov Blitz, an "upgraded" version of the one that got a 1963 C.R.A. rating in last year's Open, but it performed this year at a humiliating level of around 1650 (!), scoring only 3 1/2 out of 11 (excluding a forfeit win). Two of its 3 wins were against unrateds, and the only rated player it defeated was rated 1637! It is very difficult for me to explain these two pathetic results, since both machines were well tested before and thought to be between 200 and 300 points stronger than the results actually achieved. This gap after 23 games is too large to be attributed to chance. There has been some rating deflation recently due to rules changes (i.e. dropping the last two digits of rating floors), and players are becoming more familiar each year with how to play against computers, but I doubt that these factors can account for more than a 20-30 point drop over the last year. Computers have generally fared poorly in U.S. Opens, presumably due to the leisurely 1 round a day format, but since we're making comparisons with the previous Open this can't explain the drop. Some of the errors made by the Saitek Blitz were not made when the same position was tried on last year's model, so perhaps the "upgrade" backfired, but it's hard to believe that a major weakening would have gone undetected until now. We'll need more data to solve this mystery.

In the U.S. Open Blitz Championship, W.B.C.A. rated, the Fidelity Mach IV (about to be released in the Designer housing at less than half the old price) tied for fourth place with a score of 11 out of 14, including a win and loss to

GM Michael Rohde and a 3-1 score against Senior Masters David Glicksman and Bob Rowley. Although we were given 3 minutes operator time to transfer moves to and from a standard board, we (I say "we" since I was operating) still lost one easily won game on time after perhaps 75 moves or so, and we lost another one to an Expert who merely duplicated a game he had seen the machine lose to GM Dzindzichasvili before the tourney. So GM Rohde was the only person to beat the Mach IV fair and square on the board. In a 10 game WBCA rated blitz match with GM Dzindzi (considered one of the best five blitz players in the U.S.) the Mach IV scored 2 points, the same as RexChess did against him last year. For the 24 games, the Mach IV performed at 2485 (based on WBCA ratings of opponents), although its actual WBCA rating will be only 2388 because it has to work its way up from its initial rating of 2325 (its C.R.A. rating). This result agrees well with my rule that blitz ratings for computers are usually about a class above their ratings at 40/2. Saitek entered its Renaissance with Maestro 10 MHz module in the blitz, but it scored only 7 1/2 out of the 14 for a high Expert performance rating. I believe it lost two or three games on time, so this is not too meaningful.

I hope that we will see other C.R.A. Action chess rating tests in the near future so that models can be compared and so that users can get a better idea of how computers play at the faster ratable levels, since that's probably how most people play their computers.

"Chess Machine" Review

The "Chess Machine", made by the Dutch firm TASC, is not a stand-alone chess computer or a pc program, but a hybrid. It is a "card" with a RISC processor ("ACORN" at 16 MHz) that inserts inside your personal computer (IBM pc or compatible running MSDOS) together with two chess programs that run on that processor. The RISC chip used seems to be roughly comparable to a 386 at 40 MHz or a 486sx at 20 MHz. So unless you own a 486 computer, you are getting better hardware than you presently own. Note that your own processor and memory are not used at all and so are irrelevant to the playing strength of CM, unlike the case of pc programs. One of the programs is a slightly upgraded version of "Gideon", which won the World Microcomputer championship in Vancouver this May (running nearly twice as fast, but so were some of the other competitors) and the Computer Olympiad this summer. The author is Ed Schroeder, who has had the best 8 bit chess programs for years (Mephisto Polgar, MM5, and now Milano). Now he is challenging Richard Lang for the honor of being regarded as the world's best chess programmer (difficult to measure when they use different hardware). The other program, "the King", by Johann de Konig, has placed near the top in these events and is regarded by some as the world's best microcomputer tactician, though its positional play does not seem to be up to the level of the Schroeder (or Lang) programs.

The card, both programs, and a year's worth of upgrades now sell for $475 with 128k RAM and for $725 with 512k. The sole difference is that the more expensive version has about 8 times as large hash tables. Since each doubling of a hash table is said to be worth about 8 rating points for most programs, the difference in strength should only be about 25 points, although my problem test showed a 43 point gap (for the Schroeder program) because two problems were solved a ply earlier with the larger RAM for reasons unknown.

At the time of the last CCR I had not yet received CM and had to rely on results obtained by running problems over the phone. I later confirmed the accuracy of those results. The version tested was 1.7, which was pre-Vancouver. I later tested 2.1 (a post-Vancouver version), which was said to implement "singular extension". As I expected, most problems took a bit longer, but a couple were dramatically faster. It seems to me from the problems that there is no measurable difference in strength between the versions. Results from the "Ply" testing in Sweden are running well above my problem rating, especially for the 2.1 version, and there is now little doubt that Chess Machine 512k version 2.1 is a bona fide (pun intended) Senior Master. As for the King, it scores just 9 points below the Schroeder program (version 2.1) on my problem set. It was generally a bit better tactically, but did poorly on a couple problems where evaluation was a factor. In my test games, at 10' the Schroeder program (1.7) beat the Mephisto Lyon 68020 12 MHz by 6-4, but the King lost to the same Mephisto unit by 2 1/2 to 7 1/2.

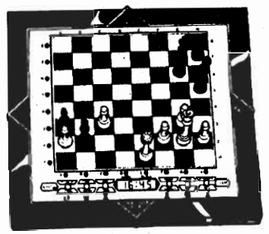
Now let's talk about features and ease of use. First of all, the two programs are identical in appearance and use, so no need to specify which program I'm talking about. The board and pieces are well drawn, and you can choose between a large board that fills the screen or a smaller one that leaves room for other information. All the standard features of good chess computers are offered, such as rotate board, take back, replay move or game, player-player mode, autoplay, clock, display of main line of analysis, hint, problem setup, mate solve mode, etc. You can choose any time setting you want, either x moves in y minutes, x seconds per move, or game in x minutes, or you may specify a fixed depth of search. Selectivity can be turned off and on, as can the opening book. Easy, beginner, and "aggressive" modes are also offered. A mouse is recommended but certainly not required. You can get moves printed and/or diagrams--I was pleased with the diagram printing. Games can be saved and loaded. One can also add to the opening book or create new ones. In sum, this is a well designed program, attractive, feature-rich, and (with a mouse) easy to use.

As for the play, one would have to spend at least $4000 to get this level of play in a dedicated unit now (Mephisto Vancouver 68020 20 MHz), and only MChess on a 486 can rival CM on a pc. It is likely that a dedicated version of CM will be offered sometime in 1992, probably by Mephisto and/or Fidelity. My principal complaint is that the endgame is not up to the level of Mephisto Lyon, although it is not bad for a computer. Perhaps this will be the area in which upgrades can show improvement.

Fidelity Review

The biggest news here is a change in management. Although Hegener & Glaser, which owns Mephisto, bought control of Fidelity a couple of years ago, they retained Sid Samole, Fidelity's founder and prior owner, as president, and Fidelity continued to act more or less as an independent company from Mephisto. As of this Sept. 1, Hegener & Glaser have replaced Mr. Samole with one of their own people, Dr. Alfred Prommer, as president. While it is too early to predict the ramifications of this change with much certainty, I believe that an increased emphasis on building for the long term is a likely prospect. This implies more emphasis on quality control even if it means slightly higher prices. Also, we can expect more sharing of programs between Mephisto and Fidelity, though the two companies are expected to retain their own identities for the foreseeable future.

As for new products, the big news here is that 32 bit computing will finally be affordable. Fidelity is taking the Mach IV program and hardware, with its 2325 C.R.A. rating, and putting it into the Designer housing. While the old Mach IV sold at discount for around $1300, the new "Designer Master 2325" *[shown on right]* will sell at discount for under $500, including adaptor and a nice carrying case. There is no change to the program, except for the minor Hash Table improvement that was added to the Mach III when it went into the Designer and Elite boards (worth 2 rating points according to my problem test). The new unit will have the same program as the Designer Master 2265, but with the 20 MHz 68020 processor and 512 k RAM that are found in the Mach IV and Elite Version 6. In terms of chess play, the only difference between the Designer 2325 and the Elite 6 will be the larger opening book in the Elite and the Elite's learning feature. As for the comparison between the Designer 2325 and the Designer 2265, the processor in the former unit is 2 1/4 times twice as fast (20 MHz 68020 = 36 MHz 68000 for this program, vs. 16 MHz), while the Hash tables are eight times larger, bringing the average speed ratio up to about 2.4 at tournament levels. This should imply a rating difference of about 90 points, just what both the "Ply" ratings and my problem test show. The C.R.A. difference of 60 is clearly too small, due to the unrealistically high rating of the Mach III, not confirmed in subsequent events. Even the Mach IV was probably a bit lucky in its C.R.A. test, but it does appear to be at or near the USCF 2300 level. In Action chess (game/25'), it scored 1 1/2 out of 4 against four strong Grandmasters in the Harvard Cup -- its win was from former Soviet champion Boris Gulko. In blitz (game/5'), it performed at the 2485 (U.S.) level in 24 W.B.C.A. rated games, confirming my contention that computers perform about a class better in blitz than in 40/2 events. Its actual W.B.C.A. rating is only 2388, because it was required to begin at its "lowly" USCF rating of 2325. Clearly, this new model is the strongest available without spending around a $1000 for the Mephisto Lyon or Vancouver 16 bit, and even those models have little if any edge in playing strength, though Mephisto has more features and is autosensory. If you want a solid master for a decent price, the "2325" is the model for you.

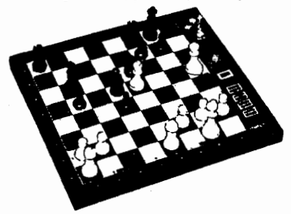


The Designer 2265 is going on sale for under $200 to members of I.C.D.'s Preferred Buyer's Club (which you are in if you're subscribing to this magazine). This is by far the cheapest price ever on a Master rated (by nearly all sources) machine, and makes it the obvious choice for anyone who wants good playing strength at a modest price. Because of this sale, models like Designer 2100 Display will no longer be of interest to most serious chessplayers, since the strength difference is large while the price difference is small.

The Travel Master ran into various production delays, in particular the bankruptcy of CXG, the company making the units in China for Fidelity. Other production arrangements have been made, but so far Travel Master has been shipped only in limited numbers. Although the C.R.A. action chess rating of 2062 was below expectations, it is still much better than any other hand-held or any other sub-$100 model would have done. The small opening book and the lack of elementary endgame knowledge probably cost it a hundred points or more in the test; its middle game play is quite strong generally. In my 30' computer-computer testing (in which a small opening book is not a serious handicap) it has been performing around the 2125 level, as it also does on my problem test. Eric Hallsworth's list based on games at 1 minute per move minimum puts it at 2127 USCF equivalent (he actually gives a figure of 2096 USCF but he mistakenly included the C.R.A. games, not knowing they were game/30') in England. For the price, it can't be beat.

Some problems encountered with the early Travel Masters seem to have been corrected in the latest shipment, but others have surfaced. There are some play bugs that show up every 20-30 games, including disappearing pieces (or pieces that magically transform to other pieces), and a curious bug that causes the machine to think that promoting a pawn to a bishop is a wonderful move even if it's a blunder. But these bugs occur only in very specific types of positions, and so are tolerable. A more serious problem is that the tournament levels do not work properly; after playing for a while the Travel Master will revert to a blitz mode. This means that the unit should be used on either the average time per move levels, the game in x (sudden death) levels, or for maximum strength with plenty of time available per move the deeper fixed depth levels. This problem went undetected because all of the testing for CCR as well as the C.R.A. test were done at game in x (mostly 30'). We didn't have time for extensive 40/2 testing, but I regret not having tested it at all on that level. There are also complaints about some of the physical aspects of the unit. For example, the magnets in both the disk pieces and the case (to keep it closed) are too weak to be of much use, and the standard pieces are a bit large for the board. Most buyers are satisfied with the unit in view of the low price, high playing strength and many features, but keep in mind that the Travel Master comes with a one year warranty from Fidelity and if problems should surface, they will repair or replace your computer at no charge in that time frame. The table top version, "Table Master", has been "tabled" until next year.

As for table top models under $100, the three strongest, in order of strength (from top to bottom) are Designer 2000, "Little Chesster", and "USCF Academy". Designer 2000 is about 75 points stronger than Little Chesster because it runs 3 MHz vs. 2 MHz and,because it has the Par Excellence program with large book vs. the Excellence (final version) program with small book. The actual program difference is very small, perhaps 10 points or so, but the speed and book make the Designer noticeably stronger. Little Chesster *[on right]* is in turn slightly stronger than Academy because it has much more RAM to work with than the Academy. Little Chesster should play around 1900, while Academy is equivalent to Mephisto Europa (and Marco Polo) which are rated 1881 based on "Ply" ratings adjusted to USCF level. I would note that in the middle game they are well matched, but the endgame of Little Chesster is far more sophisticated than the primitive endgame of the Academy. Little Chesster also has more features (and the voice) than Academy, and is slightly cheaper. While Fidelity now has three table models under $100 in Class A, no other company has even one to date. Saitek's cheapest class A model is $160 (Radio Shack 2150L), while Novag's is the similarly priced "Beluga" (except for the hand-held Super VIP, which is still over $100).



Mephisto Review

Because the 1991 World Micro in Vancouver was held only about a half year after the previous one in Lyon, the Mephisto 16/32 bit program was not yet much improved over Lyon and it only placed third in the software section, although as default winner of the manufacturer's section it qualified for a play-off with Schroeder's "Gideon", which resulted in a tie for the grand championship (see last issue). However, I understand that further improvements (endgame, opening book, and "strategic") have been made and the new program may be released before you read this under the Vancouver name. Tactically, the program is nearly unchanged from Lyon, so my problem test should show little change. Since the improvements are not nearly as significant as those from Portorose to Lyon, which produced an estimated 45 point gain, a 20 point increase is about all we can reasonably expect (Mephisto claims 30-50, but in the past such claims have generally been inflated by about a factor of 2). While this may not be enough to induce many owners of Lyon to pay for the upgrade, for those who still own Portorose or even Almeria the total gains would be rather impressive and would warrant getting an upgrade. The Vancouver has a new and enlarged opening book, actually a choice of twelve books (normal, human, gambit, classic, modern, and blitz, each with choice of random or tournament). Mephisto claims 150,000 half moves and 17,000 variations, but these numbers are impossible to verify. New features have been added to make it easier to use for analysis of games and to give the user the ability to reduce the number of selective plies (to any even number from 0 to 12). As with the Lyon, three playing styles, permanent memory, and programmable book are offered. If the price remains around $1000 for the 16 bit Modular and $2000 for the 32 bit Munich board these models will remain attractive. I believe that the 68030 36 MHz model (3 1/2 times faster and 100 + points stronger than the normal 32 bit) will be around $8000.

As for the more affordable models, an upgrade of the Polgar and MM5 programs is expected to be offered soon in a less expensive format under the name "Milano" *[shown left]*. The Milano is not autosensory, but is designed like a laptop pc for portability. It should be about the same strength as the Fidelity Mach III, with the superior Schroeder program (similar to the one in the "Chess Machine" which won the World Micro as "Gideon") compensating for the inferior hardware (5 MHz 8 bit processor and insufficient RAM for Hash Tables). My problem test puts it at 2215, five points over the Mach III (well within the margin of error of the test). The Milano is expected to cost under $300 (at least to ICD Preferred Buyers), which would make it a clear cut best buy if not for the bargain-basement sale of Mach III for under $200. In view of the solidity and attractiveness of Milano and the carrying case, plus the reputation for reliability of Mephisto products, it deserves to sell for more than Mach III, but probably not $100 more. The Milano has most of the same features found in the Polgar, plus memory of position when shut off. In choosing between Milano and Mach III, consider that the Mach III will be superior in the endgame (due to hash tables), while the Milano should offer superior positional play. After three whole years during which the Mach III was the only modestly priced master level unit, at last the consumer has an alternative. The rival Novag Scorpio, although slightly stronger than both Milano and Mach III, costs considerably more.

LuvCes # I
Computer Graphic
by Paul DeStefano

Novag Review

In the last issue, my problem test predicted a USCF rating of 2247 for the Novag Diablo (and Scorpio), the new 16 bit 68000 based models. My latest version of the test gives 2254. Since then I have had time to run nearly 40 games each of Action (30') chess and 10' chess against other models, with somewhat worse results (2224 at 30', only 2170 at 10'). Early results from "Ply" magazine testing in Sweden are also a bit disappointing at just under 2200 USCF, but this is based on only 45 games and so is still rather unreliable. Probably the true strength of Diablo is around 2225, the average of the three non-speed ratings, which would make it just slightly stronger than Fidelity Mach III, Elite v.2, and Mephisto Milano.

There were some problems with the first run of the Diablo. Certain operations cause the sound to go off, which is easily remedied by pressing the sound on button. The fixed time per move levels don't work-- the machine freezes up and has to be turned off and on again. In one 10' game the Diablo made a ridiculous blunder which it repeated on take-back but stopped making on further take-backs. It turned out to be a bug in the repetition of position code. Other problems have been reported by other purchasers. I don't know whether these problems affect the Scorpio (the plastic, pressure board version *[shown right]*) or not. Novag has been notified of the problems and has already corrected them in the latest shipment. To avoid confusion with the faulty first run these new units are being sold as the "B" version by I.C.D. If you want to know whether a given Diablo has the "B" corrections, just try it out on a fixed time per move level; if this works OK then it's probably the "B".

While the Scorpio has clearly been surpassed in strength by the new Fidelity Designer 2325 thanks to the latter's much more powerful 32 bit hardware, and is overpriced vis-a-vis Mach III and Meph. Milano, the Diablo remains the strongest autosensory model for the money and deserves consideration, especially if you like a wood board and value the great many features Novag offers. Novag has not yet announced any plans for 32 bit models.

As for the hand-held travel unit Super V.I.P., although it has been clearly surpassed in strength and undercut in price by the Fidelity Travel Master, its much larger opening book and nice appearance may appeal to some.

The current crop of Novag table models (SuperNova *[shown right]*, Beluga) in the $100-200 range are not competitive in strength with comparably priced Fidelity models, but I understand that stronger models are expected next year in this price range that may put Novag back in that ball game. Novag has been handicapped by its choice of the 6301 processor for this range (while Fidelity uses the superior 6502 and h-8 chips), but Dave Kittinger is a fine programmer and just might be able to compensate for this mild handicap. Of course, the competition won't be sleeping!

Saitek Review

The only new product since our last review is the Radio Shack "2150 L" model, which replaces the old "Chess Champion 2150". All Radio Shack chess computers are actually manufactured by Saitek with the "Radio Shack" label. In this case, the new unit is essentially the Saitek Prisma, C.R.A. rated 1963, "Ply" rated (adding 200 for USCF equivalence) 1912, but apparently running at only 8 MHz (I base this on its taking 25% longer to solve problems, since the manual does not state the MHz) instead of the Prisma's 10, which should reduce it by about 25 points. The new model is thus slightly weaker than the old Champion 2150, although the new one is stronger at fast chess. Note that the two models are totally unrelated, the old one using a 3 MHz 6502 chip with 64k ROM and 4k RAM, the new one using an 8 MHz h-8 chip (said to equal about a 6 1/2 MHz 6502 in speed) with 32k ROM and 1k RAM. So the new model has over twice the processor speed (although the small RAM slows it down somewhat) but much less chess knowledge, which makes it better at blitz but not at 40/2. The price is down a bit due to the single chip design of the new unit. While the new model is well featured and affordable, it is not competitive in strength with comparably priced Fidelity models and is being grossly misrepresented by the "2150" name.

The "Brute force" module for the Renaissance and Galileo boards promised for this spring never materialized. The program, by Franz Morsch, apparently did not achieve the necessary playing strength. This is surprising to me, considering how strong the Fidelity Travel Master (by Morsch on the same h-8 chip) is with much less memory than in the planned module. I don't know what the problem is.

The Spracklens' RISC module is still under development. It will probably initially be offered (date and price unknown) with a 20 MHz SPARC processor. It is claimed that this is comparable to a 486 at about 29 MHz. Assuming the program is at least no weaker than the one they did for Fidelity, this would put it at around the USCF 2375-2400 level, a bit above the Mephisto Lyon 32 bit (12 MHz). We shall see.

One model that deserves mention is the "Chess Shadow" *[shown left]*, a pocket model (well, if you have large pockets) with an LCD screen that is ideal for travel. I hate to have to fool around with real pieces on an airplane; they soon get lost. Unfortunately the playing strength is not in the same ballpark with the Fidelity Travel Master (my quick tests on problems indicate 1582, about 600 points below Travel Master), but if you are not a strong player or just can't stand fiddling around with tiny real pieces the Shadow might be right for you. It is an attractive unit, but is rather deficient in features (no setup mode) and has a miniscule opening book. The method of move entry is unique and takes some getting used to. I would love to see a travel unit made with the Shadow LCD screen and a strong full featured program like the Travel Master.

The Cavalier is a less expensive and stronger travel game, but uses conventional pieces and a peg-board. Its USCF rating should be 1685 based on Eric Hallsworth's list.

The Blitz remains the least expensive autosensory unit, and is C.R.A. rated 1963, while the Corona remains the least expensive wood autosensory model and does qualify as an Expert. Both may interest many players to whom maximum playing strength is not so important. I would like to see Saitek put a strong program in the "Blitz" board; that would be a nice product.

How Fast Is My Chess Computer?

In past issues, we have discussed how to measure the speed of the hardware in a chess computer ("Chess Mips"). Readers interested in delving further into the question of how to compare computer hardware may want to refer to the new book "The Art of Computer Performance Analysis", by Raj Jain (John Wiley & Sons, Inc.). Now it's time to address the more relevant question of comparing the speed of the whole chess-playing entity, hardware plus software. Of course I'm not referring to how quickly the computer moves, which is solely a function of the level set. By speed I mean how fast the machine finds the best move in critical situations. Whether this is done by clever programming or expensive hardware is not important to most buyers; what counts is the overall performance.

To measure speed I make use of my new CCR Problem Test, as discussed in the rating article. To give a speed index I need only divide the geometric mean problem time for a given machine into the same time for whichever machine is deemed the reference point. I have selected the Fidelity Designer 2000 to be my reference machine, so by definition its speed index is 1. I chose this model because its program remains unchanged and identical to that used in the C.R.A. rated Par Excellence, Designer 2100, Chesster, Phantom, and Elite 2100--these models differ in processor speed and opening books, but not in program. Also, the 2000 is one of the most widely sold high level chess computers due to its low price, and may be considered the bottom table top model suitable for the average active tournament player (Class B). Any model with an index much below 1 is intended primarily for non-tournament or below average tournament players. An index of 3 would mean that the machine typically finds critical moves three times faster than the "2000" while an index of 0.5 would mean that the model runs only about half the effective speed of the "2000". The speed indices are slightly understated for the fastest models due to our policy of rounding all fractions of seconds up to the next whole second.

Here are the speed indices of all the models tested, from best to worst:

Meph Lyon 68030	75.55
Elite v.10	44.88
ChessMachine 512k (v.2.1)	41.36
Chess Machine 512k ("King" program)	38.05
Meph Lyon 32 bit	26.30
Elite v.9	26.04
Meph Lyon 16 bit	16.05
Fid Designer 2325(Elite v.6)	14.67
Novag Diablo	9.49
Meph Polgar 10 MHz	8.14
Meph Roma 32 bit	7.28
Meph Milano	6.73
Fid Mach III (Des. 2265)	6.49
Meph MM5	5.57
Meph Polgar 5 MHz	4.20
Novag Super Expert C	4.04
Fid Travel Master	3.42
(with selective turned off)	2.38
Meph Roma 16 bit	3.29
Fid Mach II L.A.	3.29
Meph Mega IV	3.22
Meph MM4	2.22
Fid Designer 2100 Display	1.98
Saitek TurboKing II	1.95
Fid Par Excellence/ Chesster/Phantom	1.67
Saitek Corona	1.61
Fid Designer 2000	1.00
Saitek Prisma/Blitz/ RadioShack 2150L	0.78
Novag Super VIP	0.31

As for pc programs, the following were tested on my 80486 25 MHz computer, with these results: MChess (v.1.38) 29.43, Alpha (not final version) 21.24, Zarkov (v.2.50) 17.4, Fritz (=Knight- Stalker) 17.07, Rex (v. 2.30) 15.9. Testing is not yet complete on the popular mass market programs such as Chessmaster 2100, Colossus x, and Sargon 4, but they will surely fall well below all of the above. For those with lesser hardware, divide the above numbers by the following: 80386/33 MHz 1.5, 80386 25 MHz cache 2, 80386sx 16 MHz 4, 80286 12 MHz 0 wait state 5, 80286 8 MHz 1 wait state (original IBM AT) 10, 8088 (xt) Turbo (9-10 MHz) 20, 8088 (xt) original (4.77 MHz) 40. These numbers are only approximate and may vary depending on the exact model and on which program is being tested. If you are lucky enough to enjoy an 80486/33 MHz machine, multiply my numbers by 1.3; on an 80486/50 MHz model multiply by 1.9.

One interpretation of the speed index is this: If you want your machine to play chess around the 2000 level (the Designer 2000 is only slightly weaker than this at

40/2) but don't want to wait long for your computer to move, then dividing the desired response time into 180 seconds will give you the necessary speed index. For example, if you don't mind 1 minute per move, a speed index of 3 (Travel Master or Mach II L.A.) will do, for 30" per move you need a 6 (Fid Mach III or Meph Milano); for 15" a 12 (Designer 2325 or Lyon 16 bit); for 5" a 36 (ChessMachine or Elite v. 10). This does not consider the effects of the computer thinking on your time, which somewhat reduces the required time for a machine to reach a specified level. If you want 2200 play at a fast clip, multiply the above required numbers by 6. So if you want a machine that plays blitz as well as a 2200 player plays tournament chess, you would need an index of 216, which means you either must play Deep Thought or wait a couple more years for a commercial machine to achieve this figure!

How Computers Play Chess

From talking to many computer chess game owners, I have learned that many of them have little idea of how a computer plays chess. This article will give the non-technical reader a general answer to this question, then will take a look at how the various models differ in this regard.

Most chess computers operate on the same general lines. They employ what is known in the trade as "iterative alpha-beta minimax search". Don't be frightened by the name, I'll explain it in plain English.

First of all, while in the opening, computers normally play by memory, selecting a move at random from those stored in its opening book, or perhaps only from the first two or three listed. Since looking up a line in memory only takes a modern computer a second or so, your computer will move almost instantly as long as you play moves to which replies are listed in its book. Some computers consider only exact move sequences in the opening, while others will look to see if an unorthodox move order has brought about a book position. In any case, once you have left the computer's list of known opening positions, it must calculate a move on its own, by what we call minimax search. That means that it tries to maximize its point score, according to some programmed formula for evaluating a position, and assumes that its opponent will try to maximize his own point score, or in other words to minimize the computer's score. A typical scoring system might be:

pawn = 100 knight = 325 bishop = 350
rook = 500 queen = 950
doubled, isolated, or backward pawn -20
passed pawn +20
king on third rank or beyond in middlegame -50
king on edge in endgame -25
knight in center 16 squares +20, etc.

Often mobility is scored, say 2 points for each legal move or for each square controlled by a "ranging" piece (bishop, rook, or queen). The more expensive models generally have much more sophisticated scoring systems than the cheap ones, but even a fairly simple system such as the Fidelity Travel Master uses can play quite well most of the time. The computer calculates all variations as deeply as time permits, and then selects the move that gives it the best score assuming the opponent plays so as to make things as difficult as possible for the computer.

Well, now what's this "alpha-beta" all about? This is the discovery that made modern computer chess possible. There are too many possibilities in chess for a computer to look at all of them to more than 3 or 4 plies (half-moves) in three minutes--if we assume 32 legal moves in an average position then a computer would have to examine and score over a million positions (a ten minute task for today's $500 models) to consider all moves to 4 plies ($32 \times 32 \times 32 \times 32 = 1{,}048{,}576$). Fortunately, this isn't necessary since many moves are irrelevant to the choice of the initial move. For example, in the opening position if we first analyze a good move like e4 or d4 and conclude that white retains his initial initiative, and then we consider 1 h4, if we analyze the reply 1...d5 or 1...e5 we will surely conclude that white has lost his initiative by opening 1 h4. At that point it no longer matters what black's best reply to h4 is; since we have already proven that 1 h4 is inferior to 1 e4 or d4 we need not consider the other 19 legal replies to h4. "Alpha-beta" is simply a technical procedure for avoiding looking at moves that are irrelevant to the choice of the first move. It permits a program to look nearly twice as deeply as it could without alpha-beta. A modern master rated program would probably play about 1200-1400 level if alpha-beta were disabled-come to think of it this would be one possible way to create novice levels!

Now what's this "iterative" word? One way to write a program would be to first calculate how deeply the program could be expected to search in the available time, then just search to this depth. However, such a calculation could be wildly inaccurate, and a move that was allotted three minutes might take an hour. If we quit after three minutes we might have only looked at the first move, which might be a silly blunder. To avoid this trouble and to make alpha-beta work better by getting the moves sensibly ordered, it is standard practice to search first to a depth of just 1 ply, then try 2, then 3, 4 etc. until there is insufficient time remaining to continue. This would seem to be a waste of time but actually it is not much if any slower than starting at the last ply would be (if we could determine in advance what that ply was). This "iterative" search is universally recognized as an improvement over a direct search, although a few programs try to skip plies under some conditions.

The next point to consider is "quiescence". If we evaluate at the end of a fixed number of plies, we will get ridiculous play unless the evaluation function takes into account pieces en prise. For example, after 1 d4 d5, a three ply search will conclude that 2 Nc3 wins a pawn, since after any reply white can play 3 Nxd5, and that's the third ply. Some programs attempt to handle this by penalizing en prise pieces of the side which just moved and doing other analysis of tactical threats, but generally it has been found to be more reliable to extend the search beyond the stated depth for captures (and in some programs some checks). In other words, beyond the stated depth each side may either accept the score as is or try captures to see if they help. This "capture search" has raised the quality of modern programs quite a bit. Even a one ply search plus a capture search can play good chess most of the time, at least by the standards of the average non-tournament player. Since this is the lowest level on many chess computers (nearly all Fidelity models prior to Travel Master and Little Chesster), many owners complain that even the lowest (1 ply) level is too strong for them! If however the program considers only recaptures after the 1 ply search the strength of play drops drastically, and such levels (offered in Novag models, Little Chesster, Rex and others) can be beaten even by 8 year old kids with three digit ratings. This clearly shows the value of capture search.

Is it really intelligent to consider all possible moves up to the depth limit? Intuition says no, but thanks to Alpha-Beta it is not as silly as it sounds, and all Fidelity (prior to Travel Master), Saitek, and Conchess models and the older Novag (until Forte B) models do so. Programs that picked out moves by arbitrary rules just made too many mistakes and rarely emerged on top in tournaments. Selective search programs began to be successful when they began throwing out moves only if they seemed unlikely to make back material or positional losses already incurred. For example, if white has just analyzed a move that allows his rook to be taken for free, and if he has already found a move that loses nothing, then only moves that threaten at least a rook (or mate) need be considered after that. This so-called "razoring" or "marginal forward pruning" is not perfect, as some threats are too subtle to detect easily and it ignores the concept of Zugzwang, but it is highly reliable and typically allows a program to search one ply deeper than it could otherwise, more than sufficient compensation for the occasional error it causes. This technique is used in one form or another in the programs of Ed Schroeder (Mephisto Polgar, MM5, Milano, and the "Chess Machine"), Franz Morsch (CXG Dominator, Travel Master, Knight-Stalker), Dave Kittinger (Super Expert B & C, Diablo), John Stanback (Zarkov), and our own Rex and Alpha. I believe that Richard Lang (Mephisto Amsterdam thru Lyon) also uses similar techniques, but his program is so unusual that I lack a clear understanding of how it works. His programs, as well as Saitek's 6502 models and Marty Hirsch's "M-Chess", all consider many more moves in the quiescence search than just captures and checks (the Fidelity Mach 3 and 4 do a little of this). Whether this approach or razoring (or both) is best is still an open question, but it is clear that either of these selective search techniques is superior to the old way of full width, then only captures. The fact that the top programs utilizing selective search on a 5 MHz 6502 chip (MM5, Polgar) rate over 150 points (by "Ply" magazine testing) above the top full width programs on that hardware (Par Excellence and Novag Forte) shows this rather clearly, although part of this difference is due to the selective programs being of more recent vintage.

There are many other aspects to a chess program search, such as whether to count replies to checks as plies or not, or when to include checks in the capture search, but we'll leave these matters for another time. It should also be mentioned that there are alternatives to the Alpha-beta search which may be just as good or even better for certain types of programs, but as far as I know no commercial machine uses such a search.

Physical Features

by Paul DeStefano

If you're like me, you looked at the title of the piece on the other page called "How Do Computers Play Chess", and you answered "A lot better than I do". Most computers out there can humiliate most players without trying. Since you know most computers are strong enough for an average player, you have to start looking at the features, ease of use and durability. Let's take a look at some of the newer models, since most players buy computers through the mail and rarely get to really see a unit before they own it.

From Mephisto we have the Milano - a really well designed unit. They tried to make it look like a laptop computer, and it is easily playable on a lap (preferably your own, or at least someone you're very close to). For the purposes of portability it comes with the familiar plastic pieces with two sets for white - one plain and one chromed - AND very, very nice disc pieces. The cover hides away under the unit while playing, although you may want to keep it out; the cover has a scorepad slot (scorepad included) and a magnetic surface to hold the pieces when captured. Excellent for travel, but not *really* a portable.

The Saitek Shadow is an excellent LCD portable unit with an odd move entry system, as Larry mentioned earlier. The four arrow keys are not used as arrows. Instead, they are labelled "previous move", "next move", "previous piece" and "next piece". When your turn comes up, a piece blinks. You must hit Next and Previous piece until the right piece blinks, then cycle through next and previous move. This makes speed chess impossible. An unfortunate design flaw for an excellent machine. If you don't mind learning the new system, and it's 1600 rating is enough for you, don't hesitate in getting one.

As for Fidelity, we find the Eyeball Phantom, the first chess computer with "visual sensors". That means not only does it talk and move it's own pieces, but it sees when you enter a room and asks if you would like to play a game. Of course, you should unplug it at night if you own a pet, or it will ask Fido to play chess at 3:30 in the morning when he wanders by. The Designer 2325 is just like all of the Designers, but the colors are finally the comfortable green and buff. Speaking of Designers, the 2265 (Mach III) has dropped to an unbelievable price - how can anyone resist the bargain?!

Novag's Super System (Tournament board, sensor board, TV interface - all which can connect to several of their units) is extremely disappointing. Don't buy a Novag if that's the reason you chose their unit. Buy Novags because they're good machines as stand alones - the expansions are virtually useless.

Rating The Commercial Chess Computers

In the last issue I introduced the idea of rating computers by the (so far unpublished) CCR test, a set of 28 tactical and endgame problems. Problems are timed until the completion of the iteration of solution, not merely until the move is found. Scoring was by the "Renard" formula invented by a Frenchmen of that name and published in "Europe Echecs" and in an earlier CCR.

In the last four months I have made a number of changes to improve the accuracy of the method. Firstly, I have deleted some problems which were being solved or missed for more or less random reasons. I have added new problems, including one that tests for whether the program understands "mobility", to bring the total up to 33. Next, I have changed the scoring method to one inspired by a CCR reader, Mr. Glenn Morrison of Evanston Illinois. This formula takes account of the fact that successive doublings of processor speed must bring diminishing returns, else an all-seeing computer would have an infinite rating. The formula I use now assumes that a perfect player would have a 3700 USCF rating, which seems reasonable to me, though readers may have widely differing opinions, since no one really knows what perfect play is like. The coefficients of the formula are chosen to fit the "Ply" magazine (Sweden) computer vs. computer ratings as closely as possible for the 24 models tested by both "Ply" and myself. The resultant ratings are listed below, with 200 points added to all ratings to adjust for the difference between Swedish and USCF ratings as measured by comparison of C.R.A. ratings with "Ply" ratings. Actually, some recent steps taken by the U.S.C.F. to deflate our ratings appear to be working and may justify a smaller adjustment than 200, perhaps 175 or 180, but until I have enough data to measure the deflation I'll use the 200 figure.

I am rather pleased with the closeness of fit of my latest set with the "Ply" data (which is based on nearly 25,000 games at 40/2 !!!). The median spread between my figures and theirs is a mere 13 points, well below the statistical margin of error in the "Ply" ratings themselves. Out of the 24 models tested, only four differ from the "Ply" ratings by more than the statistical margin of error listed by "Ply" for their ratings, and in no case does the spread exceed that margin by as much as 20 points. Considering that the test is primarily a tactical one and that positional knowledge is judged quite crudely, this is rather remarkable. I had hoped to have a more refined measure of positional knowledge by now, but it is extremely difficult to find or create positional problems whose solution time correlates well with rating. Too often positional problems are solved or missed for essentially random reasons. Apparently, tactics are so important in chess that even the inclusion of a few knowledge based problems in my tactical set is enough to give it high predictive value.

For the mathematically inclined, the formula I use to compute a rating from my problem data is: Predicted USCF Rating = 3700 - 1020 * T^.078, where T is the geometric mean of the 33 problem times, in seconds. All fractions of a second are rounded to the next higher second, so an instant solution still counts as 1 second, and any problem not solved after 7 hours counts as 14 hours. The formula implies that the value of a doubling of processor speed is a function solely of the rating level of the computer, an idea proposed by Szabo in the ICCA journal. This idea is surely not fully correct, but it is the simplest and best assumption I can think of to use.

I have continued to run action chess (30') and 10' games on new models, especially Diablo and Travel Master, and am pleased to report that the resultant ratings (esp. at 30') agree quite well with my problem test. I must point out that neither my problem set nor computer-computer testing gives much weight to the thoroughness of the opening book. Since most computers stick to main lines, a model that does not have replies to dubious but dangerous lines in its book will rarely be caught by another computer, but will often be tricked by human players who are aware of the limited book. This "book" factor seems to play a larger role in human events than in comp-comp testing; models with good, large books have generally done better in C.R.A. tests than the "Ply" ratings predict (i.e. Novag Super Expert A and Fidelity Mach III), while small book models have not (Travel Master being the best example). The ratings given below are thus indicative of the computer's play when it reaches a playable middlegame, which is nearly always for the models with good books. If you buy a model with a small book, like Travel Master or Saitek Blitz or MM5, you may get many wins right out of book if you play trappy lines and will probably feel that your model is overrated. Perhaps I'll find a way to rate the opening book separately in the future.

In the below list, all CCR ratings are based on a minimum of 30 games, unless in parenthesis which signifies either small sample or a rating calculated by an adjustment for a speed difference from another model. All CCR ratings are compressed by 25% to adjust for the tendency of fast games to magnify differences in strength. "Ply" ratings require at least 40 games. The "Mean" rating listed is the average of the three ratings (excluding the 10' chess rating) for each model, and is most likely the most reliable rating to use. For the record, note that no less than 27 models/programs are now listed as masters below, with virtually 100% agreement on this point by the three main rating methods. Computer chess has come a long way!

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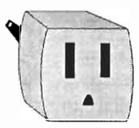

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CCR RATINGS CHART

Computer	MHz	Mean (problems)	CCR test	"Ply" +200	CCR 30' games	CCR 10' games
Meph Lyon 68030	36	2469	2470	2463	(2475)	
ChessMachine 512k	16	2432	2411	2453	****	
Meph Port 68030	36	2419	****	2444	(2394)	
MChess 80486	33	2418	2401	2435	****	
Elite v.10 68040	25	2415	2419	****	(2411)	
Meph Lyon 68020	20	2412	2410	****	(2414)	
ChMach512-"King"	16	2402	2402	****	****	
ChessMachine 128k	16	2400 est.				
Meph Lyon 68020	12	2361	2364	2354	2366	2351
Elite v.9 68030	32	2350	2363	2326	(2360)	
Mchess 80386	33	2350	2336	2347	(2367)	2351
Zarkov 2.5 80486	33	2348	2348	****	****	
KnightStalker80486	33	2346	2346	****	****	
Rexchess2.3 80486	33	2338	2338	****	****	
Meph Lyon 68000	12	2309	2312	2310	(2306)	
Meph Port 68020	12	2307	****	2329	2285	
Fid Designer 2325, Elite v.6 68020	20	2298	2302	2293	2300	2237
Meph Almeria 68020	12	2285	****	2288	2282	
Rexchess2.3 80386	33	2253	2263	2243	****	2252
Meph Polgar	10	2242	2237	2241	2249	2225
Meph Port 68000	12	2237	****	2246	2227	
Fid Elite5,2x68000	16	2234	****	2234	****	
Novag Diablo 68000	16	2225	2254	2198	2224	2170
Meph Roma 68020	14	2220	2224	2233	2204	
Meph Almeria 68000	12	2215	****	2218	2212	
Meph Milano	5	2215	2215	****	****	
Elite v.2 68000	16	2210	2216	****	(2204)	
Fid Designer Mach3	16	2204	2210	2202	2200	2175
Meph MM5	5	2173	2193	2184	2143	2143
Meph Polgar	5	2173	2159	2172	2189	2150
Novag Super Exp. C	6	2150	2154	2149	(2147)	(2252)
Meph Roma 68000	12	2149	2129	2166	2152	
Novag Super Exp. B	6	2144	****	2099	(2189)	
Fid Mach II L.A.	12	2131	2129	2116	2147	
FidTravelMaster h8	10	2128	2134	****	2121	2159
Meph Mega IV	5	2121	2127	2115	****	2066
Saitek Maestro D	10	2107	****	2113	2101	
CXG SphinxDominator	4	2107	****	2079	2135	2112
Meph MM4	5	2103	2081	2104	2124	
Fid Des Disp 2100	6	2073	2066	****	(2080)	2041
Saitek Turboking II	5	2045	2064	2073	1997	
Fid ParEx, Chesster	5	2042	2044	2021	(2060)	
Saitek Corona/Simul	5	2037	2039	2001	2070	
Fid Des 2000	3	1991	1977	****	(2005)	
Saitek Prisma/ Nov SuperNova 6301	16	1934	****	1934	****	
Saitek Blitz h8	10	1925	1943	1918	1913	2040
Little Chesster	2	1900 est.				
RadioShack 2150L h8	8	1899	1915	(1893)		(1888)
Meph MarcoPolo 6301	8	1881	****	1881	****	
USCF Academy 6301	8	1881	****	1881	****	
Final Chesscard	5	1878	****	1878	****	
Nov Super VIP 6301	10	1870	1811	1881	1918	
CXG Super Enterprise		1756	****	1756		****
Saitek Astral/Cavalier/ Conquistador 6301		1685 (based on Eric Hallsworth)				
Saitek Galileo 6301		1669	****	1669	****	

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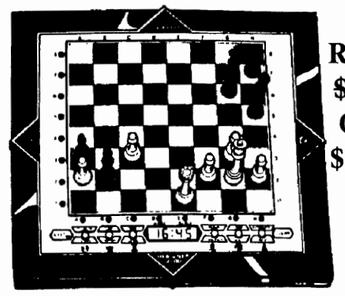

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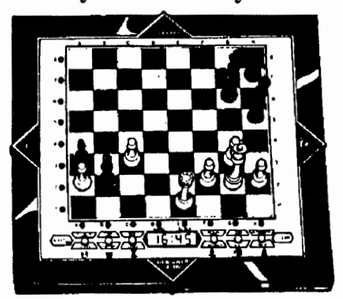

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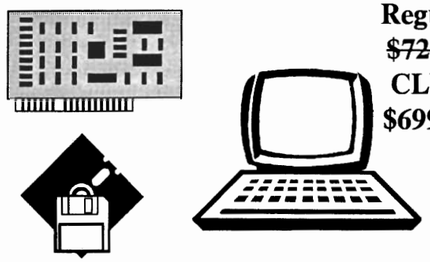

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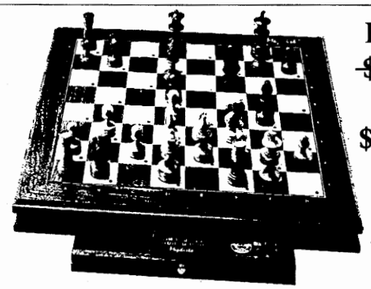

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Just before press I received Eric Hallsworth's latest newsheet ("Selective Search"), and was pleased to see that his ratings for the new models agree quite closely with my above "Mean" ratings, after adding 100 for USCF equivalence. He has the Diablo at 2212, the Designer 2325 (Mach IV) at 2294, the Lyon 16 bit at 2327, MM5 at 2186, and the Travel Master at 2127 (excluding C.R.A. action games which he mistakenly thought were slow games), all quite close to our list.

Other Publications On Computer Chess

The following is a list of various other periodicals on computer chess with a brief description. They are in English unless otherwise specified.

1. "Selective Search". Editor Eric Hallsworth. Address: The Red House, 46 High St. Wilburton, Cambs CB6 3RA, England. Eric works for the Mephisto distributor in England, but reviews all models of commercial chess computers. Includes a rating list and lots of games. Also results of various events in Europe. Price 12 pounds Sterling to U.S., six issues per year.

2. "ICCA Journal". c/o Dr. J. Schaeffer, Dept. of Computing Science, University of Alberta, Edmonton, Alberta T6G 2H1, Canada. A rather technical publication, with many articles of interest to those who are writing programs. Also reports on Database work, computer tournament reports, the Swedish rating list, and book reviews. $30 per year for four issues.

3. "Computer Schach und Spiele" -- in German. Druck+Verlag Ernst Vogel GmbH, Postfach 1000, D-8491 Stamsried, Germany. Mostly about commercial chess computers, with many games, stories, letters, reviews, etc. Six issues per year.

4. "Ply" -- in Swedish. c/o Goran Grottling, Diabasvagen 3, S- 437 32, Lindome, Sweden. Includes the famous Swedish Computer Chess Association rating list and the results that go into it, with an assortment of articles rather like CCR ("Ply" sometimes publishes translations of CCR articles). Many letters and replies, reviews of new machines, tournament results and games. Despite my total prior ignorance of Swedish, I am able to make sense out of some of the articles. Quarterly. The rating list itself may also be ordered, either 4 or 8 per year.

5. "Modul" -- in German. Wiener Schachverlag, Postfach 57, A- 1082 Wien, Austria. Like "Ply" and "Computer Schach und Spiele" it concentrates on commercial chess computers, but "Modul" is best known for emphasizing how machines perform on problem sets. They have published so many problem sets it's difficult to keep them all straight! "Ply" and sometimes CCR rating lists also appear in "Modul", along with lots of games and offbeat articles. Quarterly.

6. "A.N.A.C.A." -- in Spanish. Articles on Spanish problem tests, Spanish computer tournaments, and computer chess history.

7. "Computerschaak" -- in Dutch. J. Visser, Agnietenbergweg 11, 8034 PH Zwolle, Netherlands. Emphasis on computer chess events in Holland, of which there seem to be quite a few. For some reason, I find Dutch to be more difficult to make sense out of than German or Swedish (without knowing any of them), so I can't say much about it. Six issues per year, I believe.

Bits & Pieces
(Readers' Letters and Replies)

William McKinney, Corvallis, Oregon

I have finished the test of the 16 bit Mephisto Lyon which I bought from I.C.D. in July. I played 50 games with it against the Radio Shack "Chess Champion 2150" at the 3' per move level, and Mephisto won 49 games, with one draw.

Apparently when one is able to play these machines with a substantial time limit the superiority of the Mephisto is at least as much as the difference (a bit over 300 points) found in your previous tests. Certainly the programming of the Mephisto is top-notch, during the test it played very much in a "human" fashion, for example making numerous clever sacrifices which I would call bona fide "artificial intelligence."

I should also note that the Mephisto is very well-constructed. Shortly after I got it I accidentally knocked the unit down to the floor. It was a hard blow, but except for a couple of small scuffs there was no damage. Fortunately it still runs just as well as it did when I took it out of the box.

Most importantly, my ability to play chess has already improved as a result of what I have learned playing against the Mephisto, and observing the games it played against the Radio Shack computer. Having had some personal experience with computer programming, I must say that Richard Lang's abilities in that field are impressive.

[Reply: Your result suggests an 800 point difference between the two models, whereas the 40/2 testing by "Ply" shows a gap of about 365. There have been several other reports of results too one-sided for the stronger machine--for example, "Chess Machine 512k" leading 19-0 at 40/2 against Mephisto Amsterdam, which once had a USCF rating of 2229 and earned about 2176 in its C.R.A. test. Results like these strongly support the idea that computer vs. computer results overstate rating differences. I think even a strong grandmaster could not shut out Mephisto Amsterdam that way (assuming varied openings), and yet "Chess Machine 512" is at best a "weak" International Master, not a GM. I think the answer is that if two computers have a similar type of search (the four above mentioned models are all selective search) the stronger one tends to win too decisively, whereas if they are quite different (say one full width and one selective) the results may be more in line with the rating difference. This whole question needs further research.]

David Bessey, Strathmore, Cal. (excerpts only)

The price reduction in the Lyon computers are certainly welcome. I hope it becomes a trend because even at the reduced rate you still have to just about sign your life away to buy one.

[Better price/performance ratios are indeed a trend--just look at Designer 2265, Designer 2325 and Mephisto Milano--ed.].

...Perhaps in a coming Report you will do an article on how many games these computers should play before wearing out and how much heat faster megahertz creates and its effect on the computer's electronic parts. *[When machines are run much faster than intended by the chip's manufacturer there can be heat problems. Both the 10 MHz Polgar and the 20 MHz 68020 Lyon have had some overheating problems reported, which is why these models are not generally carried by distributors. If the machine is designed for high speed (like 68030 Mephisto at 36 MHz or 68030 Fidelity Elite at 32 MHz) there should be no overheating.--ed.]*

...I am surprised programmers are so long time employing (singular extension) in the software. Computers calculate forced moves best. *[Singular Extension is a very specific, technical method of identifying and extending forcing lines. It was invented by Deep Thought's creators. Until it was published, no one could have used it.-- ed.]*

...I am confused with the differences (in bits) between the 68000 family CPU's. *[68000 is 16 bit; 68020, 68030, and 68040 are 32 bit. In the pc family, 80286 is 16 bit; 80386 and 80486 are 32 bit. I have heard that 80586 may be 64 bit. This might suit chess well, with 64 squares.--ed.]*

Another item of confusion is your statement on page one of the latest Report that the 68000 chip is a faster chip than the 6502. From previous Reports I got the idea the 6502 was actually 1.6 times faster. *[The 6502 is faster at the same MHz, but 68000 chips are made to run much faster--in the case cited, Novag, 16 MHz vs. the 6 MHz speed of the 6502.--ed.]*

One thing I appreciated learning was the notation that the Novag's don't consider mobility in their search. This seems elementary to me...If it doesn't consider an important item like this what heuristics does it employ? *[Considering mobility does slow down the search, so Novag, along with Fidelity Travel Master and Deep Thought, doesn't use it. They rely on rules that bring the pieces to squares that are likely to be good ones, without actually counting out how many moves each piece will have. In my opinion, this short-cut is okay for speed chess or for slow processors, but for long time controls and fast processors it is better to spend the time needed to count mobility correctly. This probably explains why Diablo, although nearly equal to Mephisto Lyon on purely tactical problems, is not actually as strong in tournament level games.--ed.]*

Michael Brown, New York, NY

I am a pro boxer; I am not a tournament chess player, but chess is my first love.

Not being a tournament player, I just couldn't conceive of anyone's being capable of beating Chessmaster 2000 (Amiga) -- especially level #3 no matter what; as I progress, I almost beat level 3. I was getting close--real close--but I still couldn't beat it.

I thought that a Fidelity computer would improve my game, and teach me a strategy to trounce CM level 3. ...I purchased a Fidelity Marauder. I was very excited to play the Marauder. I eventually learned to beat the Marauder on every level except 7, but I am sure I would have in time. However, my champion CM 2000 destroyed every level on the Marauder. *[No surprise, the Marauder is not a high level model.-- ed.]*

For my birthday, my girlfriend gave me the extraordinarily powerful Mach II. Boy, was I surprised at the computer's ability!

My story:

CM 2000 level 3 demolished all levels on my Marauder, and all levels on BattleChess. I was so impressed with CM that he became my undefeated chess champion. I had nothing that could come close to overthrowing even level 3 of CM 2000. Levels 6-7? Inconceivable! I loved my CM, and used it to teach me new openings and learned many ways to defeat the Marauder myself. Needless to say the Marauder became nothing more than a sparring partner for me and Chessmaster, played on the Amiga computer with two megs of memory.

A match between the power Mach II and CM 2000 was inevitable.

Chessmaster 2000 defended his undisputed championship of E. 71st Manhattan 4 times against the powerful Mach II -- I mean powerful!!! Chessmaster level 3 defeated levels g1,g2,g3, and g4, a struggle but all impressive wins and a very successful defense of CM 2000 championship. *[Those are fixed depth levels for players who find even the lowest standard level, a1 (5"), too strong. A very unequal test!--ed.]*

CM 2000 really enjoyed being champion, unbeaten in many wars none of them really a match against the master, literally crushing his foes to the point of its being useless to play them against him (CM 2000).

May 15, 1991

Chessmaster level 3 was challenged by the powerful Mach II, level a1 [5"]. The Chessmaster fought with all his 68000 computer chips, and then some; he tried every trick he knew, but the powerful 68000 processor Mach II countered very effectively, making the master pay dearly for his mistakes. The powerful Mach II was unforgiving, pulling out a close win over a reluctant CM, to become the first and only new champion.

The CM 2000 who was undefeated, was furious about being defeated by the powerful Mach II and decided to get serious. CM levels 1,2,3,4,and 5 were all crushed!

Utterly ripped apart by the powerful Mach II level a2 [10"]. As a last attempt, the CM 20000 level 7 challenged the Mach II, level a3 [15"] and lost again in a hard-fought battle.

The Chessmaster is no longer champion; the Mach II is the authoritative, ruthless reining conqueror, destroying all comers; in fact, the Mach II is so powerful that many levels are completely unexplored. Unfortunately, when the time came to use those levels, it just wasn't sufficient to conquer the mighty Mach II.

There is, however, another challenger out there named Checkmate, claiming to be the strongest of all Amiga computer programs. My new champion, undefeated, waits, relishing his championship, waiting for Checkmate, the new challenger. From somewhere in the close distance, I can see this battle, as the masterful Mach II says " YOUR MOVE" ...

[Thanks for the story. Many readers enjoy pitting computers against one another as you do. Don't expect "Checkmate" to fare any better than CM 2000, as the "Ply" rating for the similar program "Chessplayer 2150 Atari/Amiga" is nearly 200 points below the Mach II L.A., and the later "Chess Champion 2175" is even lower. In computer chess, everything is relative. If you pit your Mach II against a Designer 2325, or Mephisto Lyon, or ChessMachine or MChess on a 386/33, you will see it get crushed just like it did to CM 2000 or like CM did to Marauder. Big fish eat little fish, and strong chess computers beat weaker ones! In the future, set your machines for equal time levels if you are interested in seeing which is stronger; otherwise it's like a boxing match with one contestant having one hand tied behind his back.--ed.]

Computers On Grandmaster Combinations

Instead of giving composed problems to the computers to solve, I thought it might be interesting this time to try some positions from recent Grandmaster play featuring fairly deep sacrificial combinations. As in the last CCR, my method is to set the computer for a short (3 ply) fixed depth search, then increase the depth by one repeatedly until the computer finds the correct move, and record the total time required to complete the search and make the move, not just the time to find the move. If the move is found in less than 5 plies, I require that the move also be chosen at 4 and 5 plies to insure that the right move was not found for the wrong reason. All times quoted for pc programs are based on my 80486 based 25 MHz machine--remember that times on lesser PCs will be much longer--up to 40 times longer on an old 4.77 MHz xt.

Our first combination comes from the game GM Gata Kamsky vs. World Junior Champion Ilya Gurevich from this year's U.S. Championship. Kamsky's win set him on the path to become the youngest U.S. Champ since Fischer. White: Kb1, Qe2, Rd1 & f4, Nc7, P a2 b3 c2 d6 & g4; Black: Kf8, Qg6, Rd8 & h8, Be4, Nf6, P e6 and f7. White to move has 3 pawns and an attack for the bishop, but only Nxe6 check ! wins decisive material advantage. The main line runs: 1 (Nxe6 ch) PxN 2 Rdf1 Rh1 3 RxR BxR 4 QxP Kg7 5 Qe7 ch Qf7 6 QxR. Nearly any program should see this in a 9 ply search, since most programs examine escape from check and captures beyond the nominal depth, and the ninth ply is a check. This can be shortened by a ply for programs that don't count escape from check as a ply (PxN), and by another ply for programs that look for checking moves on the ply beyond the nominal depth. So we can expect a range of 7-9 plies for most computers. Programs that follow up on threatening captures, such as MChess, Saitek programs, and perhaps the Mephisto 16/32 bit models may solve it in 4 or 5 ply. Let's see how this works out.

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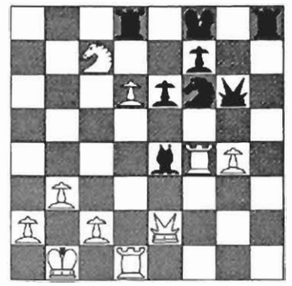

WHITE (10+8)

The best time was achieved by MChess (1.38) on the 486, which took only 1'24" and 4 ply. "ChessMachine - The King" took 1'35", and the normal program in "ChessMachine" (512k,v.2.1) took 2'35" (both 7 ply). Next came Zarkov 2.5 at 3'6" (6 ply). Rex 2.3 took 4'9" (7 ply), an earlier MChess (1.32) took 4'31" (5 ply), and Alpha (May 28 version) took 5'8" (7 ply). Mega IV + Turbo Kit (18 MHz) took 6'7" (7 ply). Mephisto Lyon 32 bit took 11'14" (5 ply), not impressive compared to the above but still the best of the standard dedicated chess computers. Diablo took 12'55" (7 ply), "Fritz" (="Knight-Stalker") on 486 took 13' to do 9 ply, a ten MHz Polgar took 14'13" (7 ply), and MM5 took 23'20" for 7 ply. Milano took 24'6" (7 ply), Designer 2325 took 27'27" for 7 ply, a standard Polgar takes 28'26" (7 ply), and TurboKing II took 31'32" for 5 ply. MM4 took 38' for 7 ply, Corona took 45'30" for 5 ply, Roma 32 bit took 48'37" for 4 ply, and Mach III took 1 hour 16' for 7 ply. Travel Master takes 1 hour 42 minutes for 9 ply (with selective turned off it still takes 9 ply but about 10 hours!), Novag Super C takes an hour and 57 minutes for 9 ply, Novag Super VIP takes 2 hours 37' for 8 ply, Fidelity Mach II L.A. takes 3 hours 23' for 8 ply, Par Excellence (or Chesster or Phantom) takes about 5 1/2 hours for 8 ply, Designer 2000 takes over 9 hours for 8 ply, and Saitek Prisma (or Blitz) needs more than two days for 9 ply.

Now let's take a position from the Candidates' Match Ivanchuk vs. Yusupov. Yusupov's brilliant play in this game was critical to his match victory over the world's #2 rated player. White: Kf1, Qb7, Ra1 & d1, Bd6 & g2, Nc6 & f5, P a2 c4 d4 & e2. Black: Kh8, Qh2, Ra8 & e6, Bg7, Ng4, P a7 e3 f4 f7 & h6. Black to move played 28...Rg6!!. Although white is already way ahead in material and can now take a free rook with check, he can only stop the mating threats by then sacrificing his queen on g8 and checking with Ne7. This still leaves white ahead in material, but the mating attack remains and black won quickly. Note that to find the move Rg6! it is not necessary to see that it wins the game, only that it forces white to surrender some of his huge material advantage. After 29 Qxa8ch Kh7 the computer must see 2 variations before selecting 28...Rg6!!, namely 30 Nce7 (or any other non-sacrificial move) ...Qh1ch!! 31 Bxh1 Nh2ch 32 Ke1 Rg1 mate (a 9 ply line, but found in 5-8 plies by nearly all programs due to various check extension algorithms), and 30 Ng3 (since this does stop the above mate and returns less than the rook just taken, it must be refuted) ...Qxg3 31 c5 (or any move to save the bishop on d6) Qf2 mate, a seven ply line at most. Note that a human player would only consider 31 Kg1 to stop mate in 1, but many programs spot the direct threat of 31 Rxd6 a ply sooner than the more subtle threat of mate. Since the capture on the bishop would more than justify the original sacrifice ...Rg6!, as it brings a return of two minor pieces for the sacrificed rook, it does not matter that black has even better moves than taking the bishop after 31 Kg1. This problem is above all a test of check extension and of mate threat detection (for selective programs).

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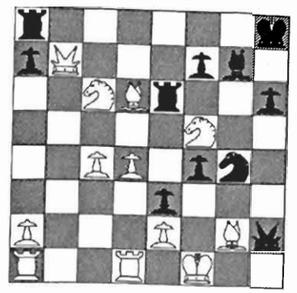

WHITE (12+11)

This time, Alpha (May 28 version) was the champ at 26" for 5 ply. Designer 2325 (=Elite v. 6) was next, taking just 47" for 5 ply (Elite 9 would have equaled Alpha's time and Elite 10 should be around 15", but I don't have these models). "ChessMachine-- TheKing 512k" was third at 50" (6 ply), and MChess (1.38) was next at 60" (only 3 ply). Then came the normal "ChessMachine" (512k, v.2.1) at 1'29" for 6 ply, the Mach III at 1'45" (5 ply), and an earlier MChess (1.32) at 1'48" (3 ply). Diablo comes next at 2'3" (5 ply), then Polgar 10 MHz at 2'31" (5 ply). "Fritz" ("Knight-Stalker") takes 3'20" (7 ply), Mephisto Lyon 32 bit takes 4'55" for 4 ply, and a standard Polgar takes 5'2" for 5 ply. Roma 32 bit took 5'38" (2 ply), the Mega IV with turbo kit (18 MHz) takes 5'57" (7 ply), the Mach II L.A. 6'2" (6 ply). Mephisto Milano 7'25" (6 ply), Zarkov 2.50 8'58" (6 ply), Par Excellence (Chesster, Phantom) 10'20" (6 ply) and MM5 10'30" (6 ply). Travel Master takes 12'42" for 7 ply (but with selectivity off it saves a ply and hence takes only 3'54"), while Novag Super Expert C takes 13'5" for 6 ply. Designer 2000 takes 17'13" (6 ply), Rex takes 20'2" (8 ply because the selectivity misses the subtle mate threat), MM4 takes 23'28" for 7 ply, Corona 31'34" for 4 ply, and TurboKing II 39'26" for 4 ply. Saitek Prisma (or Blitz) takes a long time--2 hours and 53' for 6 ply, as does Novag Super VIP -- 3 hours (7 Ply).

In general, the ordering of the programs on these two problems agrees well with their ordering on the "Ply" rating list and so I have included these two combinations in my problem set.

Games

Aegon Tournament - Holland, June 1991 - 40/2

White: Grandmaster G. Sosonko (Dutch)
Black: Mephisto Lyon 68030 60 MHz

1 d4 d5 2 Nf3 Nf6 3 c4 dxc4 4 Qa4+ Nc6 5 Nc3 Nd5 6 e4 Nb6 7 Qd1 Bg4 8 d5 Ne5 9 Bf4 Bxf3 (ECO gives only 9...Ng6 with white retaining an edge) 10 gxf3 Ng6 11 Bg3 e5 12 dxe6 Qe7 (an interesting move which I imagine few humans would play) 13 f4! (to force black to capture the less desirable way) fxe6 14 Bxc4 Nxc4 15 Qa4+ c6 16 Qxc4 o-o-o 17 Rd1 Rxd1+ 18 Kxd1 Qf6 19 Ke2?! (19 Kc1! is better, to answer ..Nxf4? by 20 e5) Nxf4+ 20 Bxf4 Qxf4 21 Qxe6+ Kb8 22 Qe8+ Kc7 23 Rf1 (to defend against 23...Qxf2+!! and 24...Bc5+) a6 24 h3 g6 25 a3?*(diagram)* (White's queen needs to escape by 25 Qe6) Qf6! 26 Rc1? (white must play 26 e5, but ...Bxa3! still should win for black) Bc5,

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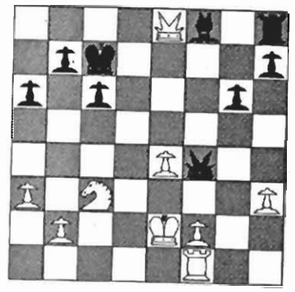

WHITE (9+9)

and white resigned in view of 27 Nd5 cxd5 28 Rxc5+ Kb6. Some of the analysis was by IM Otto Borik and appeared in "Computer Schach und Spiele". GM Sosonko had a good position until move 19, but it was the type of position that computers play quite well. This game shows why the Queen's gambit accepted is the favorite defense of many computers. It was also the defense that earned me my IM title a decade ago with several wins over strong masters.

Aegon Tournament - Holland, June 1991 - 40/2

White: Mephisto Lyon 68030 60 Mhz
Black: Grandmaster Larry Christiansen

1 d4 Nf6 2 Nf3 e6 3 c4 Bb4+ (the Bogolyubow Indian) 4 Nbd2 b6 5 a3 Bxd2+ 6 Bxd2 Bb7 7 Bg5 h6 8 Bh4 c5 9 e3 cxd4 10 Nxd4 o-o 11 f3 Nc6 12 Nxc6 Bxc6 13 Be2 Qe7 14 o-o Rfd8 15 Qd4 e5 16 Qc3 d5 17 cxd5 Bxd5 18 Ba6! Qe6 19 Rac1 Rab8 20 e4 Bb3

21 Bxf6 gxf6 (White has converted his bishop pair into a clear advantage in pawn structure. It's not easy to say where black went astray--he failed to get any compensation for the bishop pair.) 22 Qc7 Kg7 23 Rc3! b5!? 24 Bxb5 Rdc8 25 Qa5 Rxc3 26 bxc3 Qe7 *(diagram)* 27 Bc6? (better 27 Be2 to support the advance of the passed c pawn, with excellent chances to win.) Bc4 28 Rd1 Rb6 29 Bd7 Be2 30 Rd2 Rb1+ 31 Kf2 Bc4 32 Qc7? (white should have prevented the sacrifice of the f pawn by 32 Bf5) Rf1+ 33 Kg3 f5! 34 Kh3 Rxf3+ (A pawn down, black chose to force a draw by perpetual check, seeing nothing better.) 35 gxf3 Bf1+ 36 Rg2+ Bxg2+ 37 Kxg2 Qg5+ 38 Kf1 Qc1+ 39 Ke2 Qc2+ 40 Ke1 draw agreed. It is impressive to see Mephisto come close to defeating a Grandmaster in top form (Christiansen won a strong Grandmaster tournament within weeks of this game). As reported in the last issue, MChess on a 486 did manage to defeat Christiansen in this same event. These games show what happens when you combine an excellent program with very powerful hardware.

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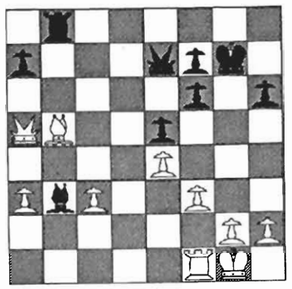

WHITE (10+9)

"Correspondence Game", 12 hours per move (from "Ply")

White: Fidelity Mach III
Black: Mephisto Lyon 68020

1 e4 d6 2 d4 Nf6 3 Nc3 g6 4 Nf3 Bg7 5 Be2 o-o 6 o-o Bg4 7 h3 Bxf3 8 Bxf3 Nc6 9 Be3 e5 10 d5 (if a computer can't play closed games well it should take on e5 instead) Ne7 11 Qd2 Ne8! (an easy move for humans to find, but perhaps difficult for most computers) 12 Bh6?! (exchanging off good bishop for bad is not advisable) Bxh6 13 Qxh6 f5 14 Rad1?! Nf6 15 Qd2 f4! 16 Qd3 g5 (showing that black "understands" the position) 17 Qb5 Qc8 18 Be2 Ng6 19 Rd3? (merely obstructing Q & B) a6 20 Qc4 Rf7! 21 Qb3 Nh4 22 a3 Rg7! 23 Re1 g4 (Lyon correctly rated its game as much superior, more than a pawn, while incredibly Mach III still thought it stood better.) 24 hxg4 Nxg4 25 Bf1 f3! 26 g3 *(diagram)* Nxf2 27 Kxf2 Qg4 28 Ra1 Qxg3+

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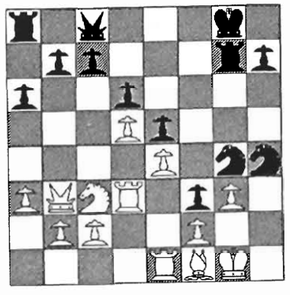


WHITE (13+13)

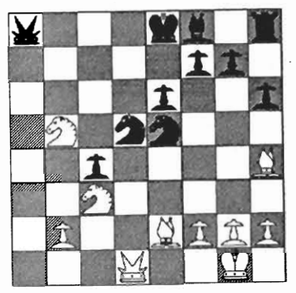
and black announced mate in 9 moves! Masterful, human-like play by Lyon but totally planless play by Mach III. In open games, the Lyon's superiority is not so marked, but clearly in closed positions they are not in the same class. I was very impressed to see a computer carry out a classic King's Indian attack in such fine style. Most computers score well against people only by avoiding closed games like the plague, but perhaps with the Lyon that will not be necessary. This was also the first game between top machines at correspondence time controls that I had seen.

Hannover Germany Grandmaster tournament – March 1991

White: International Master H. Grunberg
Black: Deep Thought II

1 d4 d5 2 c4 dxc4 (This gives the computer the open game it craves. Hence its great popularity among computers. White would be best advised not to play the Queen's Gambit against computers for this reason.) 3 Nf3 a6 4 e4 (safer is 4 e3) b5 5 a4 Bb7 6 axb5 axb5 7 Rxa8 Bxa8 8 Nc3 c6 9 Be2 e6 10 o-o Nd7 11 e5 Ne7 12 Bg5 Qb8 13 Ne4 Nd5 14 Qc2 h6 15 Bh4 c5 16 Ra1 cxd4 17 Nxd4 Nb4 18 Rxa8 (Grunberg said afterwards that 18 Qb1 was better) Qxa8 19 Nxb5 Nxe5 20 Qd1 Nd5 21 Nec3 *(diagram)* Kd7 (21 ...Qc6 looks safer; perhaps Deep Thought was unwilling to allow 22 Nxd5 exd5 23 Qxd5 Qxd5 24 Nc7+, which wins a pawn but leaves white down the exchange in an ending. I am told that Deep Thought is "absolutely" materialistic, and so would not give up a pawn even to simplify to a won ending.) 22 Bg3 Nd3 23 b3 Nxc3 24 Nxc3 Qa5 25 Bxd3 cxd3 26 Qxd3+ Ke8 27 h3 Bb4 28 Nb5 Kf8 29 Kh2 Kg8 30 Nc7 h5 31 h4 Rh6 (With the activation of this rook it is clear that white has little compensation for the exchange and must lose.) 32 Qd8+ Kh7 33 Qd3+ Rg6 34 Nb5 Be7 35 f3 Bb4 36 Nd6 Be1 37 Bxe1 Qxe1 38 Ne4 Qxh4+ 39 Kg1 Qe1+ 40 Qf1 Qe3+ 41 Qf2 Qxb3 42 Qh4 Qb6+ 43 Nf2 Qb1+ 44 Kh2 Qe1 45 g4 Qf1 46 Kg3 Qg1+ 47 Kh3 f5 and white resigned. This game shows how computers excel in open positions and in hanging on to material.

BLACK



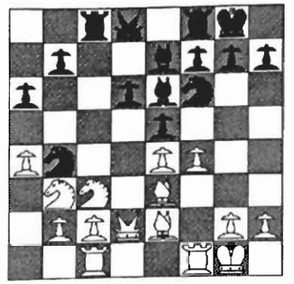
WHITE (10+11)

Test game -- from Modul magazine -- 40/2

White: Mephisto Milano
Black: MChess 386 20 Mhz

1 e4 c5 2 Nf3 d6 3 d4 cxd4 4 Nxd4 Nf6 5 Nc3 a6 6 Be2 e5 7 Nb3 Be7 8 o-o o-o 9 a4 Be6 10 f4 Nc6

BLACK



WHITE (15+15)

11 Be3 Nb4 12 Qd2 Rc8 13 Rac1 *(diagram)* Ng4? (This leads to the queen's bishop getting put out of play) 14 Bxg4 Bxg4 15 f5 Bh5 16 h3 f6 17 Nd5 (Note how white provoked f6 first so that 17...Nxd5? could be answered with a pawn winning check) Nc6 18 c4 Kh8 ,19 Rc2 Re8 20 Ra1 (a bit odd) Bf8 21 Rcc1 Rb8 22 Bb6 Qd7 23 Nc7 Rec8 24 Nc5 Qe7 25 N(c5)e6 Bf7 26 b4 Qd7 27 a5 (white's space advantage gives him a winning game) Bh5 28 Nxf8 Rxf8 29 Ne6 Rfe8 30 Bc7 (winning a pawn) Rbc8 31 Bxd6 Nd4 32 Nxd4 Qxd6 33 Nb3 Qe7 34 Nc5 Red8 35 Qc3 Rd4 36 Qe3 Qd6 37 Ra3 Bf7 38 Rac3 Rc7 39 Kh2 Rc8 40 R3c2 Qe7 41 Rd2 Rcd8 42 Rxd4 Rxd4 43 Qe2 Qd6 44 Qa2 Be8 45 Qb3 Bc6 46 Qe3 Rd2 47 b5 Be8 48 Nxb7 Qd7 49 Nc5 Qd8 50 b6 Rb2 51 Qd3 Qd4 52 Qxd4 exd4 53 Rd1 and white soon won. This was a very nice game for Milano, and gives me confidence that the master rating awarded to it by my problem test is indeed warranted. Computers tend to mishandle the white side of open Sicilians (hence the popularity of 2 c3 among computers), but not so here.

Common Computer Chess Misconceptions

by Steven Schwartz

Misconception: Computerized chess playing machines are well made and reliable.

Truth: My 14 years in this business tells me otherwise. Over the course of the years, we have been confronted with defect rates approaching 100%, and I am not referring to minor glitches in programming but rather major software errors and electro/mechanical problems. Of course, this does not mean that ALL chess computers are unreliable, but you would be surprised by the overall percentage. ICD keeps pretty accurate records, and I think that 15% does not stray too far from reality. Units that stand out in my mind from the ancient archives are the Elegance, Savant, Robot Adversary, Prodigy, Voice Sensory, and more recently the Diablo "A" Versions (seven major software bugs), Portorose (back-up battery defects and "vector errors"), and Travel Master (software glitches and design problems). Advice: avoid having your new machine drop-shipped from the factory/distributor. If it is not tested first, you are much more likely to be confronted with problems, and who needs problems?

Misconception: You should sell your home in order to purchase the strongest/most expensive chess computer on the market.

Truth: I can understand mortgaging the house and selling the spouse and children to buy a CAR; after all, LOTS of people will see your new car and be impressed, but a CHESS COMPUTER??? You buy a chess computer for your own enjoyment - no conspicuous consumption here. You should only spend zillions on the project if you have HUNDREDS of zillions. This is no longer the "Dark Ages" of chess computers where if you don't lay down your first born, you will wind up with a chess computer that plays 600 rated chess. We are now finally at the point that just $100 or $200 will get you a machine that, under tournament conditions, will already play better that 95% of tournament players and better than 99.999999% of all players. If you have extra money left over after "under-spending" on your next chess computer, send it along to me so I can buy a snazzier car to drive around in; after all, we all have our priorities.

Misconception: Selling chess computers is "a piece of cake".

Truth: Someday you should come visit us at ICD. Our retail store, Your Move Computers, and our mail-order business, Institutional Computer Development Corporation, share the same building and frenetic, chaotic, feverish, frenzied, hectic, frantic, turbulent are all terms that come to mind to describe a typical day's activities here. Each of us salespersons is the equivalent of baseball's "utility" player; we are all trained to and expected to handle in-store customers who usually wish to have several chess computers demonstrated; on-phone customers who, because they cannot enjoy a hands-on demo, wish to have the myriads of features, functions, and dimensions relayed over the phone; on- phone customers who have already purchased a chess computer and need tech-support, customers requesting catalogs, customers ordering product, customers ordering the Computer Chess Reports, customers wanting to know if we sell chess books (we do not), and customers who call simply to say "Thank you", "You guys are great"(we love those calls), "Joe's Pizza is selling that very same chess computer for 3 cents less than you are; will you match the price?", or "How's the weather up there in New York." Now just add to all of this our "real" computer business which is also located in the building and phones that never stop ringing and you have a sense of what it is like to sell chess computers - at least here at ICD. We love it, but no "piece of cake" for sure.

Misconception: Chess software for PC's is going to make the stand-alone chess computer obsolete.

Truth: My crystal ball is a bit weak on this one, but my intuition is that no matter how good the graphics are on a Super Duper VGA screen, there is nothing like playing

on a three dimensional chess board. Add to that the amount of time the average player spends playing his chess computer and how much radiation he will not be exposed to by staying away from his computer monitor. Perhaps as time goes on, each piece of chess software will come with a lead apron (like the one they put on you when you take x-rays at the dentist's office). Eventually what will most likely happen is that the software people writing for your PC will get together with the hardware people and we will see sensor boards that attach to your computer thereby allowing you to play in the third dimension and away from the radiation. Applied Concepts (now out of the chess computer business for about seven years) actually marketed such a product back when but they were WAY ahead of their time. Consequently, the price advantage now enjoyed by the PC software over the stand-alones will be negated with the sensor boards and the stand-alones will continue to survive in spite of them.

Misconception: A perfectionist will be happy with any chess computer he buys.

Truth: Most chess computers are aesthetically pleasing, none are perfect. This does not mean there are gashes, incisions or punctures in the machines as they leave the factory, but there has rarely or ever been one that did not have SOME imperfection however slight it might be. We have our share of fusspots, and they are spending good money (and sometimes lots of it) and have a perfect right to be, but I always advise my customers that chess computers are not perfect. We have one local customer who is also a friend (as many of our customers become) who buys a computer every couple of years, but he will not accept any machine without looking at ALL of them first. We are talking in some cases up to 100 computers! And in every single case, after he finally selects the most perfect iteration, he comments on SOMETHING that he found that was "not quite right!" On cue we all chime in, "We told you so." If you choose to buy a chess computer, you will more than likely be very pleased with its appearance, but if you are in the business of manufacturing fine tooth combs, don't say we didn't warn you.

Misconception: The more expensive a chess computer is, the stronger it is.

Truth: The price of a chess computer does not necessarily correlate with its strength. Quite often you are paying for pretty boards or features or functions such as pieces automatically moving by themselves. This is not to say that you are not entitled to want a machine that moves its own pieces, but note that you are sacrificing some strength for that ability. In many cases the same exact program comes in both a plastic and a wood housing and the difference in price can be anywhere from $200 to $1000!!! Some manufacturers make beautiful full-sized wood boards, but the programs are way below average. This has never stopped them from advertising that the machines played "Expert" or "Master" chess even though those claims were severely exaggerated.

Misconception: RAM and ROM numbers are vitally important when selecting a chess computer.

Truth: The amount of memory possessed by a given chess computer is just one of many factors that determine how strong a computer really is, and it is, by comparison, a rather minor factor. The quality and efficiency of the actual program and its speed are, by far, the two most important components. The tiny h-8 programs are a perfect example of how a small amount of memory does not really hinder a good program. I guess the best analogy would be a gas tank (RAM and ROM). It can be very big but if you do not put much gas (programming knowledge) in, you will not get very far. And the size of the gas tank has no bearing whatsoever on the power of the engine (speed of the microprocessor).

Misconception: Larry Kaufman is really a mainframe computer with 300 million gigabits of memory.

Truth: I have seen Larry Kaufman on many occasions and you have my word: he is a bonafide member of the human race.

That's Not Chess!

by Paul DeStefano

The next few pieces you are about to read have nothing to do with chess. *What!?!* you cry in anger and anguish. Is this not Computer **CHESS** Reports? Yes, of course it is, but that doesn't mean that we don't want to expand our horizons; expand our horizons to new games, particularly those originating in China and Japan.

I'm talking about Go and Shogi. Some of you may be intimately familiar with these games. Some of you may have heard them in passing conversation. Some of you may only believe them to be words found on the menu of a Sushi Bar. Ah-ha! You know who you are. Well, anyway, Go and Shogi are making their way into the computer markets, and we thought you'd all like to know a bit about what's out there, since most chess players are at least curious about the other games.

Both Go and Shogi are more complex than standard international chess, which is why the respective programs are worlds behind the chess programs. Shogi is easier for most chess players to relate to; it is, after all, Japanese chess. Go is a bit more alien to chess players and far, far more complex and profound than either chess or shogi even though it has far fewer rules than either. Books and supplies for enthusiasts and the merely curious on either game are available now through ICD.

I, personally, have become addicted to Shogi Master, an absolutely great program which Larry will review later in this issue. I find Shogi far more interesting than chess ever was, and stay up into the wee hours with my Shogi board and Shogi Master. I actually got interested in Shogi way back in junior high as a school project, and founded a Shogi Club. We had our own page in the yearbook - and they put my name as someone else, but that's another story. Go is not my cup of saki, but our good friend Milton Bradley is the ultimate enthusiast. Milton is not THE Milton Bradley of board game fame, and yes, that is his real name. We like to sit around the ICD offices and debate which is best - Go, Shogi or Chess. Shogi gets my vote, but Milton poses some nice arguments for go on the next page.

Please write with responses to these pieces, and maybe we'll give Milton a semi-regular spot on these pages when new Go stuff appears or if you would like to see CCR talk about ONLY chess, let us know that, too. I would write the Shogi review myself, but I gracefully tip my hat to Larry, the strongest Occidental Shogi player in the world. As usual, Larry writes all pieces unless another byline is given. We now proudly present Larry and Milton with Shogi and Go. Enjoy.

The World's Premiere Strategic Board Game - Chess Or Go?

by Milton N. Bradley

Former World Chess Champion Emmanuel Lasker had no doubt that Go was superior when he said "If intelligent extra-terrestrial life is ever discovered perhaps they will play Chess, but *certainly* they will play GO"! This certainly is distinguished opinion, but let's see if we can't develop some objective facts to provide a more definitive answer to this provocative question.

At first unsophisticated look, it appears that Go must be simpler than Chess because it is structurally far more elegant, lacking different piece moves and such artificial complexities as Promotion, Castling, En Passant captures, etc. This erroneous impression is reinforced by the fact that all of Go's devilishly clever tactics and almost infinitely profound strategy derive from only two simple operative rules of play, one of which is designed to prevent draws by infinite repetition. But play is actually orders of magnitude more complex than in Chess and the structure of every game is unique, because the Go board starts empty and fills up (except for captures) as the players move anywhere that they wish within the constraints imposed by its two simple rules. Thus, it isn't feasible in Go to sharply reduce the Opening "book" that must be mastered as can be done in Chess by adopting a simplifying scheme such as always playing a Queen's Pawn Opening as White and as Black answering a King Pawn Opening with the Sicilian, as a former New York State Chess Champion of my acquaintance confessed that he did.

An aspect of Go which exists only in rudimentary form in Chess and which greatly adds both to its elegance and complexity is the existence of two different but intimately interrelated levels of play - the micro game, consisting of the concept of "shape" plus Joseki and tactics, and the macro game - consisting of the grand full board strategy into which the multitude of separate occurrences of the micro game must be integrated.

A particularly relevant basis for comparison can be obtained by contrasting the difficulty in programming the two games. Inexpensive dedicated Chess computers and software already play at levels up to about 2400, which is better than 99% of all human chess players. And specialized RISC hardware/software running on massive mainframe computers, like IBM's Deep Thought, are already approaching the point where it is anticipated they will soon defeat even World Chess Champion Gary Kasparov. In contrast, even after 10 years a $1 million prize for a program that can defeat a 5-Dan amateur GO master (who is light years away from world championship caliber) is still unclaimed, and probably will remain so for the foreseeable future. The reasons for this remarkable disparity are instructive.

The most visible difference between Go and Chess is one of scale, and this profoundly influences the feasible programming techniques for each. Chess programs are outstandingly successful because the relatively small scale of the 8x8 (= 64 square) Chessboard, despite the complications introduced by different piece moves, produce move trees that are small enough to allow even microcomputers to calculate them within acceptable time frames using Heuristic Search, Branch-and-Bound and Alpha-Beta Pruning techniques. In contrast, even without the complexity of piece differentiation the immense 19x19 line (= 361 intersection) Go board produces such enormous move trees that even super computers cannot calculate them using these same techniques in less than hundreds of years time. So Go programs must rely upon attempting to achieve "Artificial Intelligence", and as yet no one really knows how to do this. The result is that the best Go programs still only play at an advanced beginner's level (13 - 15 Kyu), although they continue to inch forward each year.

To understand the implications of this difference in scale from the player's perspective, it is instructive to compare the Chess opening with a Joseki in Go. There are hundreds of each with thousands of variations within those, but a Chess Opening is an independent entity which completely structures the entire board. In contrast, a Go Joseki structures only a single one of the four corners of the board, and even then those corners are not independent but are tied together with the sides and center in a grand overall Opening (Fuseki). As a consequence, whether or not a given Joseki is playable in a particular corner is a function of **all** of the moves that have already been made elsewhere on the board!

The result of the foregoing is that **almost every observer who is sufficiently proficient in both games to make a sophisticated judgment agrees that Go is far superior.**

Getting Started In Go

A generation ago, only those fortunate enough to have contact with an Oriental community could really learn Go because there was almost no literature in English, and no source of sophisticated opposition against which to hone your developing skills. Today, all of that is changed for the better. The truly complete, lucid and insightful primer "THE BEGINNER'S GUIDE TO THE GAME OF GO" is now available, complemented by a complete line of excellent secondary texts from Ishi Press covering every aspect of the game in great detail. Inexpensive computer Go software pack-

ages "The Many Faces Of Go", "Star Of Poland" and "Nemesis" (which also has a stand-alone Igo Dojo hand held computer version) each provide beautiful graphics, tutorials, Joseki, master games, an easy menu driven format, and a tireless, ever available opponent. Although all three are more than strong enough to challenge a rank beginner through many months of development, for the reasons stated above neither is as yet really strong. These computer programs and books as well as a complete line of excellent and attractive Go equipment is now available from ICD. For human competition at all levels there are now Go clubs all over the US and Canada under the auspices of The American Go Association (Box 397, Old Chelsea Station, N.Y., N.Y. 10113), which issues a quarterly magazine and sponsors lots of tournaments. So why not give Go a try? I'm sure that you'll love it.

Oriental Chess Programs

When an American speaks of chess, he usually means the type of chess played everywhere except in the Orient. Actually, though, there are three major families of chess games in the world today. The first is international chess (our game) and the closely related Indian and Thai chess. The second is Chinese chess (Shang-Chi *[or Siang Ch'i - eds.]*) and its relative Korean chess (Jung-ki), which are characterized by the King's confinement to the Palace. Third is Japanese chess, characterized by the use of captured enemy pieces (as in "bughouse" or "double chess").

Chinese chess has been available in a dedicated computer by Novag for some years now. It plays at a level that is more than adequate for novices but not strong enough to challenge serious players. The same can also be said of the new pc program for Chinese chess called "Battle Chess II". The animation is the main selling point for this program, but I find that it is nearly impossible to play the game well on the animated display because the pieces obstruct each other. Fortunately both conventional and English notation displays are available. I was disappointed with the level of play, but then I am one of the top Occidental players. If you are just learning, it will trounce you. I also experienced problems when altering or setting up positions. Chinese chess is an interesting game, rather more tactical than our form of chess. It should be possible to write a master level pc program as has been done for international chess, but so far I don't believe this has been done.

Shogi is am absolutely fascinating form of chess. If you ever wondered why there are no strong Japanese masters of inter- national chess, it is because the Japanese nearly all prefer their own form of chess, Shogi. Shogi features incredibly wild tactics, profundity of positional evaluation, an excellent handicapping system, and a draw frequency of around 1%. It also shares with chess a rich history and a vast literature (with a fair amount in English now), and offers much better career opportunities for professional players than does international chess. As the U.S. Champion and top ranked Occidental player (5 dan) of shogi I am naturally very enthusiastic, and have been to Japan seven times primarily to play shogi (and Go). Some years ago I wrote a long article on shogi in "Chess Life". There are active shogi clubs in New York, Washington D.C., Los Angeles, San Francisco, Seattle and other American cities, as well as in several Canadian and European cities and even in Brazil.

Until now the only shogi programs available were for Japanese computers, except for one dedicated model that never sold in any quantity due to its $900 price and low level of play. Now a pc program has finally come out, "Shogi Master" by Ishi Press Int'l (they also publish a shogi magazine in English). It is certainly not comparable in either strength or features to the current crop of pc chess programs, but it is quite good for the first pc shogi program to reach market. It comes with full instructions on how to play, and offers the choice of Japanese style or Western style pieces. You can review games, rotate the board, take back moves, save games, use with or without mouse, and play giving or receiving any of the standard handicaps. You can also enter moves for both sides or have the program play itself. "Shogi master" does not announce mate, but it will resign when about to be mated. One big negative is the lack of any problem setup mode. There are six levels, ranging from novice to about 5 kyu in my opinion (2 kyu is claimed but without any substantiation). The low levels are fast enough, but in the late stages of the game the high levels take too long to be practical unless you have a high speed 386 or 486 machine. Unfortunately the levels do not correspond to any predictible amount of time per move, even loosely, so if you want to play at a fairly steady pace you will need to lower the level as the game becomes more and more wild. I hope that future versions will incorporate levels such as game in x minutes as the chess programs do. A beginner will probably need to take the maximum handicap (six pieces) even on the lowest level (my eight year old son won thus) but soon you may graduate thru the handicaps and then on to level 2 or more. If you are a strong chess player you should surpass the top level after a few months (or less), but the average person may find it difficult to reach this level.

My own experience with it is that on the top level I can give it the maximum handicap (six pieces) and still beat it about 2 out of 3 times. At any lesser handicap it has virtually no chance against me. This makes it sound horribly weak, but the fact is that most western players (and even the majority of Japanese players!) cannot beat me or other players of 5 dan rank even with the six piece handicap. Shogi is very difficult to master, and since captured pieces are used by the capturing side one cannot simplify the game when ahead by exchanges.

"Shogi Master" has certain obvious weaknesses in its play, such as trying to promote pawns far from the scene of action, not following thru consistently on book openings, and making pointless moves or sacrifices merely to delay an opponent's plan or threat. It is fairly good at mating attacks (very important in Shogi) and at winning material, as one might expect. In sum, although I believe much stronger programs will eventually appear (perhaps some day by Don Dailey and myself), "Shogi Master" is good enough to be an entertaining opponent (at some level and/or handicap) for all but Dan (expert) level players.

While we're discussing other games, I should mention that Colossus now offers a checker game for the pc that is quite strong. Running on a 486/25, it won a decisive majority of the games in a recent match with Alabama's top checker master. Don Dailey and I have also done a pc checker program recently, not yet released. As for the game of Go, the dedicated version of Nemesis (sold by Fidelity) has come down in price somewhat and is an excellent tool to learn the game, although the strength is still far below the average club player, perhaps 13 kyu or so. It does offer instruction suitable for much stronger players, up to 1 or 2 dan. The programmer, Bruce Wilcox, is a strong 5 dan known for his original ideas about how to teach Go, which are evident in "Nemesis". There are several pc programs strong enough for a novice to learn from, including Nemesis and "The Many Faces of Go", but none are better than about 12-14 kyu. That means that even with the maximum serious handicap of 9 stones, they have no chance against a Dan (Expert) player.

Computer Go Reports

By Milton N. Bradley

[Milton is a 1-Dan player - eds.]

At this writing there are 3 major competing GO software packages: the **Many Faces Of Go, Nemesis,** and **Star Of Poland;** as well as one hand held dedicated micro computer called Igo Dojo, which is actually the hardware version of Nemesis. Time constraints and the fact that only a Beta test variant of the Windows version of Nemesis was available for testing prevented playing them head-to-head for this report, although I hope to be able to do this by the next one. At that time, a detailed critique of each program will also be provided. For now, all appraisals were derived from human (me) vs. computer interactions.

The **Many Faces Of Go** and **Nemesis** are full-featured display/ tutorial/playing packages, while **Star Of Poland** offers only monochrome display and playing ability, with no tutorials. All are nicely menu driven. The good news is that all 3 of these programs continue to inch forward in playing strength year by year, especially in the Fuseki (full board opening). The bad news is that they are all still quite weak (in the 12-15 kyu range). In the several even (non-handicap) games that I played against each program it actually got a fully satisfactory and/or sometimes even a superior position in the Fuseki, then completely failed to follow up appropriately. This was most noticeable in **Star of Poland** because its Fuseki was the strongest, and to only to a slightly lesser degree in the others. I defeated **MFGO** by about 155 points in each game and **Nemesis** by about 150, while **Star Of Poland** consistently lost by only 100 or so. This would seem to imply that **Star Of Poland** was playing at about a 10 Kyu level, which would represent a real breakthrough. To test this premise more fully I played it again at a 5 stone handicap. In this same situation a human player would show about a 50 point improvement, so I confidently expected the program to lose by only 50 points or so. You can imagine my surprise when it actually lost by over 130!! This kind of behavior would never occur in a human and seems incomprehensible on its face, but is really quite logical when you understand the program deficiencies which cause it. This anomalous and seemingly incomprehensible performance is largely a result of the fact that, to varying degrees, all of these programs exhibit quite prominent weaknesses in the critical micro game (extensions/connections, shape, the conduct of contact fights, and eyemaking/killing) that ultimately decides victory or defeat in most games. The following will clarify the exact nature of these deficiencies, and what I believe might be done to correct them.

In every Go game, many occasions arise in which the globally best move is to establish/maintain a connection between two groups or to lead a threatened group out into the open center of the board. When a human player makes this decision, his next step in deciding on his move is to find the optimal connection/extension method in the current context. In most cases, the solid or "hard" connection/extension is sub-optimal since it usually (but not invariably) produces bad shape, is Gote (cedes the initiative), and impacts only the local situation. Preferred methods involve the various forms of "virtual connection" and other Tesuji (optimal tactical plays) partly because they usually produce better shape, but equally importantly because they extend further out and therefore impact upon other board areas, often allowing the retention of Sente (the initiative). In some cases the preferred move doesn't actually insure a connection at all. but merely makes it unproductive for the opponent to cut. In contrast to this two-step human process, all of these programs seem simply to stop at step one and make the hard connection (even when it produces the horrible double "empty triangle" shape). These programs also seem not to have any idea at all of what Aji (residual threats in the position, especially as a result of the potential remaining in "abandoned" stones) consists of and how to exploit it. They also consistently attempt things that even beginning human Go players quickly learn to abjure as non-productive, such as trying to directly cut a "bamboo joint" virtual connection. These are modestly expensive flaws in terms of playing strength that I believe (perhaps incorrectly) could be readily remedied via the introduction of a secondary connection/extension optimization subroutine, and a catalog of shape lookups/followups (analogous to the Joseki book).

These programs' critical and much more costly flaw is in the absolutely vital area of eyespace/eyeshape and accompanying life and-death fights. To greater or lesser degree, they all allow their fairly reasonable Fuseki (full board opening) positions to be gratuitously cut apart, then surrounded and destroyed one-by one when they could easily live. In situations in which even a beginning human player would block the enemy's incursion, or be aware of danger and at least try to escape or increase eyespace and/or make eyeshape. these programs all remain more or less oblivious. To give the non-Go play-

ing reader of this report some idea of the significance of these flaws, I'll give an admittedly imperfect Chess analogy, which must not be taken too literally because of the vast difference in the structure and philosophy of the two games. But just imagine how much it would decrease the strength of a Chess program if it had difficulty in recognizing and responding appropriately to pins and forks, and you'll have some (however imperfect) notion of how much their flaws in the critical micro game detract from the playing strength of these Go programs! That solving this problem may be rather more difficult than it superficially appears is demonstrated by the fact that all 3 programs also have great difficulty in identifying abandoned ("dead", but not physically captured) stones during play. and even have some trouble in identifying them at game's end when things are always clearly defined. Nevertheless, I believe (again perhaps incorrectly) that some significant progress in this crucial area should be possible immediately.

The 3 very different and quite excellent programmers who created these programs are all obviously very smart fellows, so I infer that their almost uniform lack of success in the critical micro game areas noted above must result from some combination of two factors:

1. Intrinsic Difficulty. If true, this is most puzzling to me because the greatest failing of these programs is in life-and death situations, in which only a restricted board area (often with only a mere handful of open intersections) is necessarily involved. In such limited contexts, it is logical to expect that the techniques used so successfully in Chess programming such as Heuristic Search, Branch-and-Bound, Alpha-Beta Pruning (and in sufficiently restricted contexts even Brute Force) should be applicable with much the same degree of success. If they're not, for reasons that I'm not aware of, then this problem is truly difficult to solve. But if they are, as I expect that they must be, then the rationale for the inadequacies of the current. programs must lie in the second reason given below.

2. Programming Philosophy. Each of these programmers has more or less explicitly expressed the objective of producing a true "Artificial Intelligence" (AI) Go program, essentially attempting to implement a single coherent set of generic rules of behavior which will produce optimal play in all phases of the gale, with only the addition of a Joseki (optimal corner sequences equivalent to the Chess Opening) and possibly an endgame sequence "book". If they ultimately succeed in this noble objective some years down the road, the result will certainly be the desired strong human-like AI Go program. But in the interim, the many playing deficiencies noted above (that I once again perhaps incorrectly believe to be readily correctable) continue to significantly drag down the strength and tutorial value of these programs.

Master level Go requires delicate and precise full board positional appraisal and the continuing selection of the globally best move at each turn, and is obviously the optimal way to play if one can! But as things stand the state of the art of Go programming is still light years away from that exalted ability, and these programs actually get crushed because they gratuitously allow large groups to become surrounded and then die. Although it can correctly be argued that making "safe" defensive plays even when they're not strictly necessary are Gote and may constrain the programs to loss against strong opposition, it won't be by much, and this prophylactic procedure will almost certainly increase their ratings by at least 3 or 4 stones immediately. Doing this will also have important tutorial value because their opponents (especially beginners) will then have to play much harder to win instead of being given gift victories via easy kills of important groups as at present. By adding these "safety first" plays as subroutines, it should readily be possible to later excise them without penalty if and when the main algorithm develops to the point that it can handle such situations

The bottom line is that even with their existing imperfections these computer Go programs can be useful teachers and even fun to play against if you are aware of their limitations and approach them with the right objectives. For rank beginners, the tutorials in MFGO and Nemesis are serviceable if not perfect, and all 3 certainly play well enough to provide real competition for both beginners and intermediates. The caveat that must be observed is that their weaknesses in the key micro game may lead the unwary to develop incautious habits that will prove costly when more competent opposition is encountered. Even strong players can enjoy competition against any of these programs if they are willing to settle for always playing White, almost never being strongly attacked, and seeing how large a margin they can win by in every game. So why not use one of them to give Go a try if you don't already play? It will add a new dimension to your thinking, which might even improve your Chess as well!

A Final Word

The Editorial Staff

We at Computer Chess Reports are pleased that we could offer you an issue that is 50% larger than previous ones, and we hope that you have enjoyed reading it as much as we have enjoyed bringing it to you. When your last issue of your 1991 subscription arrives - possibly in January/February 1992 - we will be asking you to renew your subscription, and we hope that you choose to remain loyal to our publication. In the meantime, however, we are not above asking for donations. This magazine makes no profit and the small compensation paid to all involved never even comes close to justifying the man-hours involved. Naturally, you are under absolutely no obligation to contribute, but if would like to help us improve this magazine, we promise that all funds collected will go directly into making the Quarterly even bigger and better. In addition, since we now have the use of a scanner, any pictures you may have of computer chess events or happenings can be submitted to us for possible publication. In addition, any comments you might have - positive or negative - are welcome. Thank you again for being part of our ever-growing family.

See you in a few months!