COMPUTER CHESS REPORTS 1987-88

FALL / WINTER EDITION

ADDENDUM

The following information has come to light since the printing of this issue of *Computer Chess Reports.*

1. Novag went on to New York on January 1, 1988 to continue its CRA event and finished with a rating of 2150 for its Super Expert running at 6 MHz.

2. Fidelity went on to Connecticut in Mid-December to continue its CRA event and its rating dropped to approximately 2185 for its 68020 unit.

3. Senior Editor Larry Kaufman indicates that the actual CRA- rated Fidelity machine is 3 times faster than the commercially available Excel 68000 Mach II Los Angeles.

4. Mephisto Mondial received a 2154 official rating at the American Open.

5. Novag Forte "B" is discontinued and there is some concern about availability of repair/service parts for the unit. Super Forte has now replaced the Forte "B".

6. Super Forte and Super Expert will only be marketed in 5 MHz form until May when 6 MHz versions may join them.

7. Novag does not market a Forte "C" version. The program which received the CRA rating and performed at the American Open can only be found in units called Super Forte and Super Expert. These can be easily distinguished by three rows of buttons rather than the two rows on the earlier Experts and Fortes.

8. The article entitled "Pity the Poor Chess Computer Buyer" was written by Steven Schwartz.

9. Larry indicates that the Roma program is improved at slower chess at the expense of speed chess.

10. Larry has also discovered that the Mach II Los Angeles has a 24K opening book, and its announced software speed up is at the expense of inferior check extension algorithm. The most significant improvement over the Mach II"B" is in speed chess and on the B levels (game in X minutes).

11. Larry has found that testing between the Mondial and Mach II Los Angeles in fast games shows the Mondial only slightly ahead in freestyle games in which the machines play from their tournament opening book. However, in reversal testing in which the same opening is repeated with colors reversed each game, Mondial leads by about a 2 to 1 ratio. The reason for this discrepancy is that Mach II Los Angeles opening book was designed to outbook Mephisto in every variation.

12. Larry's ongoing testing shows Mondial leading Super Expert 6 MHz by about 3 to 2 ratio.

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COMPUTER CHESS REPORTS

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EDITORIAL

by Larry Kaufman

Readers of last year's "CCR" and/or "Chess Life" will know that I have been quite critical of many USCF decisions and policies in 1986. I am happy to report that my complaints apparently did not fall on deaf ears, as within a few weeks of the distribution of CCR the USCF abandonned its policy of selling only Fidelity table-top chess computers, and now sells all four of the major brands, although Fidelity is still given top billing. As for the CRA, after an unconscionable delay and absurdly high proposed fees, it was finally put on a sound footing at the 1987 U.S. Open when delegates voted for a consistent set of rules and reasonable fees. Regrettably, a proposal for the publication of the Swedish computer rating list in "Chess Life" was voted down by the tie-breaking vote of the outgoing president, which means that CCR is now the principle source in the U.S. for information on the relative strength of commercial chess computers except for those few that will obtain CRA ratings under the new rules. I should be happy about this, but I would rather see the USCF membership given objective information such as the Swedish list even if that detracts from sales of CCR.

One remaining problem with the CRA is that new ratings will inevitably be compared to the Par Excellence rating, earned under much less stringent circumstances. Aside from the inequities reported in the last CCR, it has become clear from results around the world that ratings earned in major tournaments are almost invariably lower than ratings earned in privately arranged tests (such as the Par Ex test) in which the humans have nothing to lose, not even rating points. I hope that USCF advertising will make it clear that future CRA ratings and the older private ones are not comparable.

One other point about ratings deserves mention. The USCF has decided that beginning in Jan. '88 bonus and feedback will be eliminated in an effort to lower the rating levels to those seen elsewhere in the world. This may be advisable, but it means that in the future computers will no longer deserve whatever ratings they earned before 1988, so I fear that the CRA may be abandoned because of this lowering of ratings. If that happens, attention will be focused more on computer vs. computer results as the only basis for comparison. I suggest that USCF address this problem when and if rating levels do decline significantly.

U.S.C.F. remains in a conflict of interest situation by accepting sponsorship by Fidelity while rating their (and other) computers, but since 1986 no abuses are visible. If any occur, CCR will be sure to report them.

COMMERCIAL CHESS COMPUTERS IN 1987

by Larry Kaufman

This year brought very little progress in the low priced segment of the market, but great progress, especially in price/performance, above $200. By year's end, $400 would purchase a clearly stronger machine than $1200 would a year earlier. All the companies made good progress, despite a lack of any hardware improvement this year (except at huge prices).

Fidelity made the most innovative change, switching to the more powerful 68000 processor and implementing "hash tables". The gain, at least on the latest version, is clear but less than many, including myself, expected. Still, in view of the modest price, I expect the 68000 chip will spread to other manufacturers.

Mephisto concentrated on refining its existing 68000 program, first with the Dallas and now the Rome versions. More significantly, to compete with Fidelity, they put their Dallas program in an inexpensive board and dropped the price below $400.

It is becoming clearer that both their formerly high price and incredible strength are due more to their ultra-sophisticated selective search program than to the 68000 processor, though the latter may have made the former viable. Mephisto also marketed the first 32 bit, 68020 machine, but at a price that makes the term "commercial model" seem inappropriate.

Novag moved successfully towards selective search with the Forte B, then announced the "Super Expert" and "Super Forte" with an expanded program and a huge opening book (authored by me). No radical changes, but the increased ROM allowed room for all the best algorithms from both the Forte B and the Expert, plus some new ideas. Novag also released the strongest ever affordable hand-held unit, the VIP, based on the same principles as Forte B.

SciSys (now Saitek) attacked the luxury market by offering a 6 MHz, upgraded Turbostar program in an elegant, feature-laden board as the Leonardo Maestro, then further improved the program with the Maestro B, which program will also be offered in the affordable Turbo King, though at 5 MHz.

CXG entered the upper-end competition with the "Sphinx" by David Levy et al, using the 68000, selective search, and hash tables. Despite all this, they have yet to prove themselves competitive with the other companies.

One nice development is that nearly all the newer machines now come with a display for such important information as evaluation, time, expected move, and depth of search. This used to be limited to high-priced models, but no more.

Despite the clear program improvements, results in recent human tournaments have mostly been a bit disappointing. It seems that people are learning how to beat the machines. This maintains the pressure on the manufacturers to keep on making them stronger. I sense that the next big leap will be on the hardware side, which will in turn allow for more sophisticated software. As for the future, I side with David Levy in his recent large wager that a computer will defeat the World Champion in a match by the turn of the century, though I feel that Hans Berliner's estimate of 1992 is too optimistic. With his Hitech already at or near IM level, his opinion must be respected.

Dr. Robinson's test

by Larry Kaufman

Dr. Maurice Robinson submitted a very interesting article on the testing of chess computers to CCR, along with the results of his own testing. As the article runs to 25 pages, far too long for CCR, I have chosen to reprint the first two pages verbatim together with a summary of his testing conditions and results. Interested readers may order the full article directly from : Maurice A. Robinson, Ph.D., 4503 Morris Rd., Jacksonville, FL 32225. Enclose $3 to cover copying and mailing costs.

His test procedure was to play matches at 40/2 level between machines, using openings randomly selected from MCO, with each machine playing one white and one black from each opening. Half the games of each match were begun at the point when either machine was taken out of its book, while the second half were begun at the end of the book line, with both sides out of book. In 80 games between the Par Excellence and the Super Constellation, the Par won by 26-14 in the first half and by 23.5-16.5 in the second for a total score of 49.5 to 30.5, implying a rating difference of 86 points, nearly the same as the difference in their CRA ratings. In forty games between the Par and the Novag Forte A (now obsolete), the Forte won the first half by 11.5 to 8.5, while the Par won the second by 12 to 8, for a nominal plus to the Par of 20.5 to 19.5, implying a rating difference of 9 points. Dr. Robinson points out that relative endgame strength seems to play a disproportionate role in computer-computer tests, with average game length much longer than when humans play computers. This factor greatly favored Fidelity, as the endgame is their strong suit and Novag's weak one. I would also add that although I approve of Dr. Robinson's test methods, a variety of opponents is necessary to establish ratings for computers. The particular pairings he used were ideal for Fidelity, since the Par's parent program was developed with the Novag Super Connie as its "sparring partner". Perhaps Dr. Robinson will test against Mephisto and Saitek models next, so as to determine meaningful ratings for all.

BEYOND HYPE AND NON-SENSE:

THE PAR EXCELLENCE AND SUPER CONSTELLATION TESTED UNDER STAND-ARDIZED CONDITIONS

by Maurice Robinson Ph.D.

In last year's *Computer Chess Reports* the present writer addressed the issue of the USCF Computer Rating Agency (CRA) in terms which were rather severe but necessary concerning both the inadequacies of the CRA testing methodology and the resultant over promotion by the USCF of the Fidelity Par Excellence with its CRA rating of 2100.[1] The primary issue therein addressed was not the testing of computers in general, but rather the matter of apparent conflict of interest between a CRA and its USCF ties coupled with the corporate sponsorship of Fidelity Electronics in a number of areas significant to the USCF.

The present paper will not attempt to further fan those flames beyond a personal reply to the matter of "disturbing allegations" which were perhaps made in that article. Frank Elley, in a reply to a question in GM Larry Evan's column (*Chess Life*, April 1987, p.69), leaves the impression that articles in that issue of *Computer Chess Reports* were themselves somehow biassed due to the "ICD connection". My reply to GM Evans was not published, although he encouraged me to make these concerns known to the USCF policy board (which I did not do, in the inter-ests of courtesy to the USCF editorial staff). Yet in that reply were certain statements which would be of benefit to the readers of this current issue of *Computer Chess Reports* regarding any alleged "partiality" of the present writer's work. I stated the following to GM Evans:

Without speaking for IM Larry Kaufman (Senior Editor of CCR) or for other contributing editors thereto, I can state that I *did* attempt to secure a thorough and clear explanation of the CRA procedure from the US Chess offices...I did not identify myself as a writer for CCR simply because at that time I was gathering data purely for personal use and did not anticipate any publication of my findings. In other words, I received the information which any USCF member might have obtained over the phone....All the material derived from my contact with US Chess was utilized in my article.

In addition, I also spoke (with other sources including) ICD. These sources similarly provided varying degrees of useful information.

The research and writng of my article were done *entirely independent* from any control or influence from ICD. Originally, I intended to send my article to US Chess in order to express my concerns with the CRA methodology and resultant promotion of "favored" brands by the USCF. However, I saw that IM Larry Kaufman as the Senior Editor of CCR was to be free and independent in his editorial/testing duties in order to produce an unbiassed and accurate...evaluation covering *all* major chess computers on the market. I sent my article to him, and it was published in CCR without editorial change or content alteration....

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1   Maurice A. Robinson, "Hype and Nonsence: Right andWrong Ways to Evaluate the Playing strength of Commercially Available Chess Computers", *Computer Chess Reports* (Fall/Winter 1986): 114-123

I stand by my "disturbing allegations" contained therein, since they were based upon personal contact with the USCF and since my repeated requests during my phone call for more specific information were continually shunted aside or minimized in order to promote only the Fidelity Par Excellence....Questions regarding the Super Constellation CRA tests were summarily dismissed since its rating was "so much lower" than that of the Par....

In short, USCF information regarding chess computers in general and the CRA procedure in particular ws minimal and not and not easily extracted. I received no answer to the question of other computers being submitted for CRA ratings, although the Mephisto "S" CRA triumph and debacle was already a known fact (see IM Kaufman's article in last years CCR....)

My testing of chess computers and suggestions for improving the CRA procedures were, are, and will remain totally independent of the control or influence of either the USCF, ICD, or *any* distributor or manufacturer of chess computers.

Although those issues are now past history[1], It remains significant that no other chess computer to date has become "officially rated" by the CRA despite various attempts by various manufacturers (including Fidelity itself). Even though those machines being submitted and consequently withdrawn from CRA testing were by all estimations stronger than the Par Excellence, their human vs. computer CRA tests were systematically showing a weaker rating performance -- and no manufacturer wants to market a new machine at the top of their line which cannot exceed the CRA "leader".

1.   See also the published exchanges between Frank Elley and Larry Kaufman in *Chess Life* (JULY 1987) , pp6-7,63 and (AUG. 1987) , pp 5-7, which cover different issues from those of the present writer. My letter to GM Evans was dated 6 March 1987.

NORTH AMERICAN COMPUTER CHESS CHAMPIONSHIP

by Larry Kaufman

The ACM's seventeenth North American championship was held in Dallas in early November, 1986, and attracted 16 entrants. The two leading machines in the world, Hi-Tech and Cray Blitz, were absent, Cray Blitz being replaced by Belle at the last minute when Cray was refused sufficient computer time. Although Belle had not been worked on in recent years, Ken Thompson was persuaded to play Belle and was rewarded by a 5-0 victory and a $2000 prize. Lachex, which runs on a Cray computer, took clear second at 4-1. Third place, surprisingly, went to a micro program--an experimental Novag program, similar to the one later marketed as Forte B, running on bit slice hardware at 12 MHz, scoring 3.5. Fourth and fifth, at 3, were two more of the "big guys"--Bebe and Sun Phoenix. These two had tied for the 1986 World Computer Chess Championship with Cray Blitz and Hitech. Bebe is a specially designed chess machine by Tony Scherzer, and consistently places near the top in every event. Sun Phoenix, by Canadian master Jonathan Schaeffer, runs on a network of 20 Sun Workstations in parallel. At 2.5, in order of tie-break, were Mephisto (which won the concurrent World micro championship), Fidelity Challenger x (using 28 processors in parallel), Recom (a 16 MHz version of what became MM4), Cyrus 68k (now marketed as Sphinx), and Fidelity Experimental (the 68020 runner-up in the micro event). Mephisto might have done even better, but lost its last round game to Novag on time in a good position because the operator made a slight error in setting the time limit. While the top three finishers won all games except amongst themselves, Sun Phoenix was upset by both Recom and Cyrus in the first two rounds reportedly because of one or more bugs which were fixed in time to salvage a good showing. Last among the 2.5 group was ChipTest, a primitive version of a Carnegie Mellon project which is now reportedly the fastest chess program on earth, at one million nodes per second (some 200 times the fastest commercial unit). Its relationship to Hitech, also of Carnegie Mellon, is not clear. At 2 points were the Austrian program Merlin and the English Vaxchess (neither a micro). The Canadian Ostrich, using 8 computers, scored 1.5, while the final places at 0.5 went to WayCool and Rex III. WayCool reportedly used 128 processors in parallel (!), which shows that powerful hardware is useless without good software. Rex III was an amateur PC program in Pascal which was so totally outgunned by all others in speed that even half a point was not bad. I contributed the opening book, which brought Rex several good positions, mostly in vain.

One highlight of the event was a pair of blitz matches for high stakes between Mephisto and two very strong human players, IM Mike Valvo and Senior Master John Hall. Valvo won 6-4, but Hall (rated almost 2500) was defeated 4.5 to 3.5. Both are known as blitz specialists. The Novag bit slice also had some spectacular results at blitz, though in informal games. It scored quite a few victories over such opposition as Cray Blitz, Bebe, and various (human) senior masters. In general, it seems that most programs perform about a class better at blitz than under tournament conditions. Probably the computers' play is weakened by about two classes at blitz, but the humans' by three.

1987 North American Computer Chess Championship

by Larry Kaufman

This year's ACM tourney was a 4 rounder with 13 entries, held in Dallas in October. Only HiTech was missing among the top machines in the world. The winner with a perfect 4-0 score was "ChipTest" by Feng-hsiung Hsu and others of Carnegie-Mellon University, which last year only managed an even score. In view of the fact that this year's version reportedly analyzed half a million nodes per second (about 400 times the speed of commercial models in the $300 range), its victory was no surprise. It is not clear what connection there is between "ChipTest" and "HiTech"(also from Carnegie Mellon), if any, but it was claimed that "Chip-Test" defeated HiTech 11-5 in a match. It reportedly searched full-width routinely to a depth of 9-10 plies (unprece- dented), and also showed reasonable knowledge of chess strategy. It is said to be modeled somewhat along the lines of Belle, but using new "VSLI" technology. Interestingly, the actual hardware cost of "ChipTest" is said to be quite low, raising the possibility that in a few years such technology may appear in commercial machines. It is not yet clear how well it plays against people, although HiTech appears to be over 2400 strength against humans based on recent events (it won the Pennsylvania championship with a performance rating around 2550, and beat the World under 14 champion 2-0 in a mini-match). I believe that if the sophisticated program of "Mephisto Roma" could be combined with hardware like ChipTest a Grandmaster level machine could be constructed, but whether economics will permit this is not clear.

Second place at 3-1 was shared by Cray Blitz and Sun Phoenix, both perennial title contenders running on massive multi-processor systems. Next at 2.5 was Lachex, also running on a Cray computer. The only entries by manufacturers of commercial machines, Cyrus (David Levy/CXG) and Novag, were in a large group at 2-2 along with BeBe, Belle, Waycool, and GNU Chess (an amateur program on a Cray). At 1.5 was BP, an amateur selective search program on a Compaq 386, while Ostrich and Greco each went scoreless except for getting the bye. Cyrus beat out Novag on tie-break points for the "small computer" prize. Cyrus managed to upset Belle, though this was said to be due to hardware failure by Belle, which reported-ly plagued it through out. There was even talk of putting Belle in a museum—its day has passed.

IM Mike Valvo played a simul against seven of the machines, losing to Cray Blitz, drawing with BeBe and Novag, and winning the rest. Regretably, there were no reported games between Valvo and the tournament winner.

A conference on rules for the World Micro was held during the event. It was decided that in the future "bit-slice" machines would be allowed, but multi-processors would have to enter a separate section.

Soon after the ACM tourney, I played a two game mini-match at 40/100 against Chip-Test. Although I won both games, the first was a very tense, exciting struggle in which I was losing at one stage. I won the second quite easily, but I lost a quick game (40 in 20

min.) by trying to win a drawish endgame. ChipTest is handicapped at present by a poor opening book and little knowledge of the endgame, but its tactical powers are awesome. I feel that the only way to beat it is to develop a direct king- side attack by a timely gambit of a pawn or two, as it is quite materialistic and has insufficient knowledge of king safety. If these deficiencies can be remedied I think ChipTest will be IM level, as HiTech may already be. A much faster, stronger version of ChipTest is in preparation already. With a good opening book, perhaps it could reach GM level in 1988. My forecast of a World Champion level program by 1995 looks quite reasonable. Here is game 1 of my match, with light notes.

White:ChipTest
Black: Larry Kaufman,IM (2483)

1 e4 c5 2 c3 d6 3 d4 Nd7 (*to take ChipTest out of book--I was not interested in testing its meagre opening book*) **4 Nf3 g6 5 Bd3 Bg7 6 Be3** (*6 O-O was better, so as to answer ...Ngf6 with e5*) **Ngf6 7 O-O O-O 8 Nbd2 b6 9 d5 Ng4** (*dubious*) **10 Bg5 h6 11 Bh4 a6 12 Nc4 g5 13 Bg3 b5 14 Ncd2 Rb8 15 Be2! Nge5 16 h4 Nf3 17 Bf3 b4** (*17...Ne5 18 Be2 e6 looks better*) **18 Rc1 bc3 19 b2c3 Ne5 20 hg5 hg5 21 Be5** (*surprisingly strong*) **Be5 22 Nc4 Bg7** (*22...Bf6 was the lesser evil*) **23 Qd2! g4 24 Be2 Bd7 25 Ne3 Qc8 26 Rb1! Rb1 27 Rb1 f5** (*my only, slim, chance*) **28 ef5 Bf5 29 Rb6 a5 30 Ra6?** (*Too greedy. 30 g3 first would have deprived me of counterplay*) **g3! 31 fg3 Bh6 32 Ra5 Qe8** (*my attack is worth the two pawns*) **33 Ra6** (*A very subtle way of deter- ing ...Qg6, by 34 Nf5 Bd2 35 Ne7 Kg7 36 Ng6 Kg6 37 Rd6, but as I have other ways to play, it hardly seems correct*) **Be4 34 Ra7 Qf7 35 Bb5 Bg2! 36 Ra4! Qf3 37 Kh2! Bh3 38 Kh3 Be3 39 Qe2 Qh1 40 Kg4** (*why not 40 Qh2*) **Qh6! 41**

Qd3 Kh8 42 Qe4 Bf2 43 Bd3 (*43 Qe7 was the best practical chance, even if it loses*) **Qh2!**

44 Qh7 (*forced. I now relaxed, always dangerous to do against a computer*) **Qh7 45 Bh7 Kh7 46 Kh3 Kg7?** (*I didn't notice that my bishop was in danger of being trapped on an open board--quite unusual. 46...Be3 wins safe- ly*) **47 Re4! Kf7?** (*47...Rf7 48 Kg2 c4! should still win*) **48 Kg2** (*oops!*) **Ke8 49 Re2 Bg3** (*I am still better, but no longer winning*) **50 Kg3 Rf1 51 c4 Rc1 52 Re4 Rc2 53 a4 Ra2 54 a5 Ra5 55 Kf4 Kd7** (*of course this should be a draw, but ChipTest lacks sufficient endgame knowledge to hold*) **56 Kf5 Ra8 57 Re2 Rf8 58 Ke4 Rf6 59 Rh2 e5 60 de6 Re6 61 Kf4??** (*absurd, but the refutation is too deep for even ChipTest to see, although obvious to any strong human player. I imagine most commercial machines would play 61 Kd3 on general prin- ciples, and draw.*) **Re1 62 Rh7 Kc6 63 Rh4 Kb6 64 Kf5 Ka5 65 Rh6 Rd1 66 Ke6 Kb4 67 Kd7 Kc4 and black soon won.**

Sixth World Microcomputer Chess Championship

by Larry Kaufman

The 1986 World Microcomputer Championship, held in Dallas, Texas in early November, was the only one of the past three to be closely contested. Fourteen machines from six companies participated. Interest was increased by the decision to hold the event concurrently with the prestigious ACM North American Computer Chess Championship. I was able to observe both events.

Mephisto, Fidelity, and Intelligent Software (David Levy et al) each entered three 68020 machines, reportedly at speeds of 20 to 28 MHz. Because the rules prohibited "bit-slice" and other sophisticated hardware, 6502 programs could run at no more than 8 or 9 Mhz. Since the 6502 is considered only slightly faster than the 68020 at the same MHz, such machines would have no chance and so Novag and Saitek (SCISYS), which had no 68000 programs, stayed out. Despite this handicap, Recomdeventer, creators of the MM3 and now the MM4 programs of Mephisto, entered three 6502 programs. There was a debate as to the legality of this entry, because of the rule limiting each company to three units. Since the program was then owned by Recom, a totally separate company from Mephisto in a different nation (Holland), and programmed by different programmers on a different processor, the entry was permitted. Fidelity then demanded the right to enter three more units under a separate corporate name, but as the programs and programmers were the same

this sham was disallowed. Fidelity then withdrew and publicly threatened to sue the tournament officials, but then changed their minds and the tournament proceeded. I hope that in the future the rules shall limit entries to three per programming team to avoid such disputes. The final two entries were Chess Monster on a Compaq 386 and Atari Kempelen on an Atari ST.

The first three rounds saw Mephisto and Fidelity trade blows and mow down the other entries. The fourth round effectively settled the tournament when Mephisto met Fidelity on two boards and won both, in one case turning a poor opening into an overwhelming victory by move 20. These two games proved to be the final margin of superiority by Mephisto over Fidelity in both their individual encounters and in total scores. The Recom entries demonstrated clear superiority over the remaining entries, rather an achievement considering the speed handicap they suffered relative to every other entry save perhaps Atari Kempelen. The last round saw Recom upset the leading Mephisto unit, ruining its perfect score but not its clear first place.

The final standings showed Mephisto taking first at 6 out of 7 and third with 5, with their third unit at 4.5 for a team total of 15.5. Fidelity took clear second at 5.5, with their other units at 4.5 and 3.5 for a total of 13.5. Recom units scored 4, 3.5, and 3.5 for a total of 11, just over 50%. The Intelligent Software entries, known as "Cyrus", scored 3, 2.5, and 2 for a total of 7.5. This program, reportedly after many improvements, was recently marketed by CXG under the name "Sphinx". "Chess Monster" scored 1.5, while Atari Kempelen was shut out. The relative standing of the six companies was thus clear beyond a reasonable doubt, but one must wonder how Recom would have fared with comparable hardware (their 16 MHz bit- slice).

As for the quality of play, in my opinion Mephisto was clearly superior to all others in the middle game, especially in tactics, but Fidelity seemed to play the best endgame. This is undoubtedly due to Fidelity's transposition tables, which are known to be far more valuable in simplified positions. Since the rules imposed no limit on memory, much larger tables were possible than in commercial units, where memory cost is a major factor. "Cyrus" also reportedly used transposition tables, though obviously without success in this event. Mephisto so far has stayed away from these tables, reportedly because the chip board they use has no room for more memory chips, but ultimately they will have to tackle this problem to remain number one.

Seventh World Microcomputer Chess Championship

by Larry Kaufman

The 1987 World Microcomputer Championship in Rome, Italy was not as interesting as the 1986 event in Dallas, Texas due to the absence of Fidelity, Novag, and Saitek (formerly SciSys). The reasons for their absense are rather clear. The rules of the event did not allow bit slice, gate array, or multiprocessor systems in the dedicated microcomputer section. This effectively ruled out all 6502 based programs, as they can only reach competitive speeds by such techniques, while the 68020 processor used by Mephisto ran at 28 Mhz in Dallas. As Novag and Saitek do not now have a 68000 (or 68020) program, their participation would be pointless, as they would have been outgunned in raw speed by about 3-1. But Fidelity has a 68000 program which won the 1987 U.S. Computer Championship (on tiebreak over a Novag bit slice) on a 68020 at a reported 25 Mhz, so their absence seems like an admission of the inferiority of their program to Mephisto's. The stated reason for Fidelity's absense is that their best (experimental) machine is a multiprocessor, and they did not wish to compete with second-best. It seems to me, though, that if such machines are allowed the event will no longer be a microcomputer event. Perhaps future events will simply have a weight limit, though perhaps a new name will then be called for.

In the "Chess Computer Manufacturer's Group" only six machines from two companies entered. Mephisto played three units

of their new "Mephisto Roma" program, an upgraded version of "Mephisto Dallas" by Richard Lang running on a 68020, speed unknown. CXG entered three units of "Newcrest Technology Sphinx" by David Levy and Mark Taylor, also on a 68020, speed unknown. Each Mephisto played each CXG once. The score: Mephisto 9, CXG 0!! If you think this means the CXG program was garbage, read on.

The "Software group" was also won by Richard Lang, with "Psion Chess" running on a 12 MHz 68020, scoring 5.5 out of 6. How similar this program was to the "Mephisto Roma" I don't know, but I do know that the "Atari ST" version of Psion on the market is nearly identical to Mephisto Amsterdam (except for speed and opening book). Second place at 4.5 went to Cyrus 68k by Levy et al on a 24 MHz 68020. Presumably this was similar to or the same as the entry in the other section, which makes Mephisto's shutout there seem rather incredible. Third at 4 points went to Ulf Rathsman's "Plymate" on a 6502 at a mere 6 MHz, while fourth at 3.5 went to "Mephisto Experimental" by Schroeder on a bit slice 6502 at 18MHz, an attempted upgrade on the MM4 program. The tail enders were Pandix by Horvath at 1.5 points, Chat by Delmare (on a 68020 at 20 MHz!) at 1, and Atari Kempelen by Kovacs at 1.

All prizes and trophies in both sections went to Mephisto and/or Richard Lang, except the "Amateur" prize, won by Pandix. Mephisto can be proud to have won the championship for the fourth straight year, but I hope that next year a set of rules can be devised that will allow all manufacturers to compete on equal terms.

ROUND 1
Mephisto A

Sphinx A

1.c4 e5 2.Nc3 Nf6 3.Nf3 Nc6 4.e3 Be7 5.d4 exd4 6.Nxd4 O- O7.Bd3 Ne5 8.e4 Bc5 9.Be2 Bb4 10.Bg5 h6 11.Bxf6 Bxc3 12. bxc3 Qxf6 13.Nb5 Qg6 14.O-O Qxe4 15.Nxc7 Rb8 16.Nb5 b6 17.Nd6 Qc6 18.Qd5 Ng6 19.Bf3 Qc5 20.R(a)d1 Ba6 21.R(f)e1 Nf4 22.Qxc5 bxc5 23.Re7 Rb2 24.a4 Ng6 25.Rxd7 Ne5 26.Rxa7 Bxc4 27.Nxc4 Nxc4 28.Rc7 Ra2 29.Bd5 Rxa4 30.Rxc5 Nxb6 31.Bb3 Ra7 32.Rc6 Nd7 33.f3 Rb8 34.Bc2 Ra2 35.Bf5 Nf8 36. Re1 Rd8 37.Rc8 R(d)d2 38.Bh3 g6 39.c4 R(d)b2 40.c5 Kg7 41.Rc7 Nh7 42.f4 Nf6 43.c6 Nd5 44.Rxf7 Kxf7 45.Be6 Kf6 46.Bxd5 Ra7 47.g3   Rd2 48.Bf3 R(a)a2 49.Be4 Ra4 50.Rc1 Rxe4 51.c7 Re8 52.c8(Q) Rxc8 53.Rxc8 Rd1 54.Kg2 Rd2 55.Kh3 h5 56.Rc1 Kf5 57.Rh1 Rd3 58.Kh4 Rd2 59.h3 Kf6 60.g4 Rf2 61.Kg3 Rc2 62.Rb1 Rc3 63.Kh4 Rc5 64.Rb6 Kf7 65.f5 gxf5 66.g5 Kg7 67.Kxh5 Rc7 68.h4 Ra7   (1 - 0)

ROUND 1
Plymate

Cyrus 68

1.e4 c5 2.Nf3 Nc6 3.d4 cxd4 4.Nxd4 Nf6 5.Nc3 d6 6.Bg5 e6 7.Qd2 a6 8.O-O-O Bd7 9.f4 Be7 10.Nf3 b5 11.e5 b4 12.exf6 bxc3 13.Qxc3 gxf6 14.Bh4 d5 15.Kb1 O-O 16.Nd4 Nxd4 17.Qxd4 Kh8 18.g4 a5 19.g5 Qc7 20.Rd3 R(f)b8 21.Rb3 e5 22.Qxd5   Bc6 23.Qc4 Qd8 24.Rd3 Qb6 25.Rb3 Qd8 26.Rd3 Qb6 27.Rb3 Qd8   (1/2 - 1/2)

ROUND 1
Mephisto Experimental

Psion Chess

1.d4 d5 2.c4 dxc4 3.Nf3 a6 4.e3 Bg4 5.Bxc4 e6 6.h3 Bh5 7.Nc3 Nf6 8.O-O c5 9.dxc5 Nc6 10.Na4 Qc7 11.Be2 Rd8 12.Qc2 Be7 13.b3 Bg6 14.Qc4 Na5 15.Qf4 Qxf4 16.exf4 Nc6 17.Be3 Nd5 18.Bd2 O-O 19.Ne5 Nd4 20.Bc4 Be4 21.Ba5 Rc8 22.R(a)d1 Nc2 23.Nd7 R(f)e8 24.N(a)b6 Nxb6 25.Bxb6 Nb4 26.Ba5 Nc2 27.b4 Bd8 28.Bb3 Bxa5 29.bxa5 h6 30.Rd6 Rc7 31.R(f)d1 Re7 32.Ne5 h5 33.c6 Na3 34.f5 Bxf5 35.cxb7 Rxb7 36.Rxa6 Rb5 37.Rd8 Kh7 38.Nd7 Kh6 39.f4 g5 40.fxg5 Kxg5 41.Rg8 Kf4 42.Nf6 h4 43.R(a)a8 Rc7 44.Ne8 Rd7 45.Rh8 Rd2 46.Ra7 Kg3 47.Rg8 Bg6 48.Rxf7 Rxg2 49.Kh1 Rg5 50.Rxg6 Rxg6 51.Rf6 Rg5 52.Nd6 Re2 53.Kg1 Nc2 54.Bxc2 Kxh3 55.Kf1 Rxc2 56.Nb7 R(g)g2 57.Rf3 Kh2 58.Rf2 R(c)xf2 59.Ke1 Rxa2 60.Nc5 Rg1 (0-1)

ROUND 1
Kempelen

Pandix

1.e4 e6 2.d4 d5 3.Nd2 c5 4.exd5 exd5 5.N(d)f3 Nc6 6.Be2 Nf6 7.Bf4 Qb6 8.Nh3 Qxb2 9.Rb1 Qxa2 10.O-O cxd4 11.Nxd4 Nxd4 12.Qxd4 Qxc2 13.Bd3 Qc5 14.R(f)e1 Kd8 15.Qe5 Bxh3 16.gxh3 Qd6 17.Qxd6 Bxd6 18.Bxd6 Kd7 19.Bf4 b6 20.R(b)c1 Ne8 21.Bb5 Kd8 22.Bc6 Rc8 23.Bxd5 Rxc1 24.Rxc1 f6 25.h4 h6 26.h5 f5 27.Rc3 Nf6 28.Bf3 Nd7 29.Rc7 a5 30.Bc6 Nf6 31.Rb7 Rg8 32.Bd6 Nd7 33.Rxd7 Kc8 34.Rb7 g6 35.Rb8   (1-0)

ROUND 2
Sphinx B
Mephisto B

1.d4 d5 2.Nc3 c6 3.e4 dxe4 4.Nxe4 Bf5 5.Ng3
Bg6 6.Nf3 Nd7 7.Bd3 Bxd3 8.Qxd3 e6 9.O-O
N(g)f6 10.Re1 Qc7 11.Bg5 Be7 12.Re2 O-O
13.R(a)e1 c5 14.c3 Bd6 15.Ne4 Nxe4 16.Qxe4
cxd4 17.Qxd4 a5 18.Qg4 Kh8 19.Qh4 R(f)c8
20.Qh5 Kg8 21.Be3 Nf6 22.Qh4 Nd5 23.Bd4
Nf4 24.Rd2 Ng6 25.Qh5 Bf4 26.R(d)d1 a4
27.Ng5 Bxg5 28.Qxg5 a3 29.bxa3 Rxa3
30.Rd2 Ra5 31.Qe3 Qc6 32.Qe4 R(c)a8
33.Qxc6 bxc6 34.Ra1 Ra3 35.c4 R(3)a4 36.c5
Ra3 37.Kf1 h6 38.Rc2 f6 39.Be3 Ne5 40.Bc1
R(3)a4 41.Bd2 Kf7 42.h3 R(8)a7 43.g3 g5 44.f4
Nc4 45.Bc1 R(7)a5 46.Rf2 Rxc5 47.fxg5 hxg5
48.h4 gxh4 49.gxh4 Nd6 50.Bb2 Nf5 51.h5 Ng3
52.Ke1 Nxh5 53.Kd2 e5 54.Rh2 Nf4 55.Rh7
Kg6 56.Rh2 Rb5 57.Bc1 e4 58.Kd1 Nd3
59.Be3 c5 60.a3 f5 (0-1)

ROUND 2
Mephisto C
Sphinx C

1.c4 Nf6 2.Nc3 e6 3.d4 Bb4 4.Bg5 h6 5.Bh4
c5 6.d5 d6 7.e3 Bxc3 8.Bxc3 e5 9.Qc2 O-O
10.Bd3 N(b)d7 11.Ne2 Qe8 12.e4 Nh5 13.O-O
Nb6 14.R(a)b1 f6 15.f3 Bd7 16.Qd2 Qg6
17.Kh1 Qe8 18.g4 Nf4 19.Nxf4 exf4 20.Rb3
Qe7 21.R(f)b1 Qe5 22.R(3)b2 R(a)d8 23.Bf2
Rc8 24.h3 R(f)e8 25.Bg1 Rc7 26.Bh2 g5
27.Bf1 R(c)c8 28.Qd3 Re7 29.Bg1 Rh7 30.Bf2
h5 31.Kg2 hxg4 32.fxg4 Na4 33.Rb3 b5 34.Qf3
bxc4 35.Bxc4 Re8 36.Re1 Nb6 37.Bb5 Rb8
38.Bxd7 Rxd7 39.Rb2 Re8 40.Qd3 Rc7 41.a3
Na4 42.Rc2 Rb8 43.Qc4 f3 44.Kxf3 Nb2
45.Qe2 Rb3 46.Kg2 Na4 47.Bg3 Qe7 48.Qa6
Nb6 49.Re3 Qf8 50.Rf2 Rh7 51.R(e)f3 Rf7

52.a4 Ra3 53.a5 Qe7 54.R(f)e2 Rh7 55.Bh2
Qd8 56.Qb5 Nc8 57.Qb8 Ra5 58.Bxd6 Rd7
59.Bg3 Ra3 60.R(e)f2 Nd6 61.Qxd8 Rxd8
62.Rxd8 Bxd6 (1-0)

ROUND 2
Cyrus 68
Kempelen

1.d4 f5 2.Nc3 Nf6 3.Bg5 d5 4.a3 Nc6 5.e3 e6
6.Nb5 Be7 7.Bf4 O-O 8.Bxc7 Qd7 9.Bf4 a6
10.Nc3 Ne4 11.Nxe4 dxe4 12.Qh5 g6 13.Qh6
Qd5 14.Ne2 e5 15.Nc3 Qd6 16.Bc4 Be6
17.Bxe6 Qxe6 18.d5 Qd6 19.Bg3 Na5 20.Bh4
Bxh4 21.Qxh4 Nc4 22.O-O-O Qb6 23.Na4
Qb5 24.b3 Qa5 25.Qe7 R(f)e8 26.Qb4 Qxb4
27.axb4 Nd6 28.Rd2 R(a)c8 29.R(h)d1 f4 30.g4
Re7 31.c4 b5 32.Nb6 fxe3 33.fxe3 R(c)c7
34.c5 Rf7 35.Rc2 Rb7 36.Ra2 R(b)c7 37.Rxa6
Rf6 38.Kb1 Nc8 39.d6 Rc6 40.d7 Rf8 41.Ra8
Na7 42.Rxf8 Kg7 (1-0)

ROUND 2
Psion
Plymate

1.d4 Nf6 2.c4 e6 3.Nc3 Bb4 4.Qc2 c5 5.dxc5
O-O 6.Nf3 Nc6 7.Bf4 Bxc5 8.e3 d5 9.Rd1 Qa5
10.a3 Rd8 11.b4 Nxb4 12.axb4 Bxb4 13.Rc1
Ne4 14.Be5 f6 15.Bd4 e5 16.Nxe5 Nxc3
17.Bxc3 fxe5 18.cxd5 Bf5 19.Bxb4 20.Qc3
Qxc3 21.Rxc3 Be4 22.f3 Bxd5 23.e4 Bf7
24.Rc7 b6 25.Ba6 Be6 26.O-O Rd7 27.Rxd7
Bxd7 28.Rc1 Be8 29.Rc7 Kf8 30.g3 h5 31.h4
g6 32.Kf2 Bf7 33.Ke3 Bb3 34.f4 exf4 35.Kxf4
Be6 36.Kg5 Bf7 37.Kf6 Bb3 38.Kxg6 Re8
39.Rxa7 Rxe4 40.Kxh5 Ra4 41.Kg5 Bc4 42.Ra8
Ke7 43.Bb7 Rxa8 44.Bxa8 Bd3 45.h5 Ke6
46.h6 Ke5 47.Bc6 Bh7 48.Be8 b5 49.Bxb5 Ke6
50.Be8 Ke7 51.Bg6 Bg8 52.h7 (1-0)

ROUND 2
Chat
Mephisto Experimental

1.e4 c6 2.d4 d5 3.Nc3 dxe4 4.Nxe4 Nd7 5.Nf3
N(g)f6 6.Ng3 e6 7.Bd3 c5 8.O-O cxd4 9.Nxd4
Bc5 10.Nb3 O-O 11.Bd2 e5 12.Re1 Re8 13.c4
a5 14.Rc1 Bb6 15.Be3 a4 16.Nd2 Bxe3
17.Rxe3 Qb6 18.Qc2 Nc5 19.Bf5 g6 20.Bxc8
R(a)xc8 21.R(c)e1 Ng4 22.R(3)e2 Ne6 23.Nf3
Nf4 24.Rd2 Qb4 25.Rc1 a3 26.b3 f5 27.R(c)d1
e4 28.Nh4 e3 29.fxe3 Nxe3 30.Qc1 Nxd1
31.Rxd1 Nd3 32.Qc2 Re1 33.Rxe1 Qex1
34.Nf1 Nf4 35.g3 R(c)e8 36.gxf4 R(8)e2
37.Qxe2 Qxe2 (0-1)

ROUND 3
Kempelen
Psion

1.e4 Nf6 2.e5 Nd5 3.c4 Nb6 4.c5 Nd5 5.Nc3
e6 6.Nxd5 exd5 7.Nf3 Bxc5 8.d4 Bb4 9. Bd2
Bxd2 10.Qxd2 d6 11.O-O-O O-O 12.exd6
Qxd6 13.Qc2 Bg4 14.Bd3 Qh6 15.Qd2 Qxd2
16.Rxd2 Bxf3 17.gxf3 Re8 18.a3 Nc6 19.Bf5
R(a)d8 20.h4 Na5 21.Rd3 g6 22.Bg4 Re2
23.Rh2 f5 24.Bh3 R(d)e8 25.Rg2 Kf7 26.Rh2
Nc4 27.Rb3 Re1 28.Kc2 R(8)e2 29.Kc3 Rc1
30.Kb4 Nxb2 31.Re3 Rd2 (0-1)

ROUND 3
Plymate
Chat

1.e4 e6 2.d4 d5 3.e5 c5 4.c3 Qb6 5.Nf3 Bd7
6.Be2 Nc6 7.O-O Be7 8.b3 f6 9.Na3 cxd4
10.cxd4 fxe5 11.dxe5 Qa5 12.Nc2 Rc8 13.Be3

ROUND 3
Kempelen
Psion

ROUND 3
Plymate
Chat

ROUND 4
Psion
Pandix

1.d4 e6 2.c4 Nf6 3.Nf3 Bb4 4.Bd2 c5 5.Bxb4
cxb4 6.a3 bxa3 7.Rxa3 O-O 8.e3 d5 9.Nc3
Nc6 10.Bc3 dxc4 11.Bxc4 Na5 12.Bd3 Qb6
13.O-O Qxb2 14.Qa4 Bd7 15.Qxa5 b6 16.Nd1
Qc1 17.Qc3 R(f)c8 18.Qxc1 Rxc1 19.Nb2
R(c)c8 20.R(f)a1 a5 21.Nc4 R(a)b8 22.N(f)e5
Bc6 23.Nd6 Rc7 24.Rc1 Rd8 25.N(e)xf7 Rxd6
26.Nxd6 Nd5 27.Be4 Bd7 28.Rxc7 Nxc7
29.Nc4 Nb5 30.Ra1 Nc3 31.Nxb6 Nxe4
32.Nxd7 Kf7 33.Nc5 Nd6 34.Rxa5 Kf6 35.f4
Ke7 36.e4 (1-0)

ROUND 4
Chat
Kempelen

1.d4 f5 2.h3 Nf6 3.g4 fxg4 4.hxg4 Nxg4 5.Qd3
Nf6 6.Rxh7 Nxh7 7.Qg6 (1-0)

ROUND 4
Mephisto Experimental
Plymate

1.d4 Nf6 2.c4 e5 3.dxe5 Ng4 4.Nf3 Nc6 5.Bg5
Be7 6.Bf4 Bb4 7.N(b)d2 f6 8.exf6 Qxf6 9.Bxc7
Qxb2 10.Qc1 Qf6 11.Rb1 Qe7 12.Bg3 O-O
13.h3 Nf6 14.Bh4 Qc5 15.Qc2 d5 16.Rc1 Ne4
17.cxd5 Qxd5 18.e3 Nxd2 19.Nxd2 Kh8
20.Qb2 Qa5 21.Rc2 Bf5 22.Rc4 Be6 23.Rc2 Bf5
24.Rc4 Be6 25.Rc2 Bf5 (1/2 - 1/2)

ROUND 5
Sphinx B
Mephisto A

1.e4 Nf6 2.e5 Nd5 3.c4 Nb6 4.c5 Nd5 5.Bc4
e6 6.Nc3 Nxc3 7.dxc3 Qh4 8.Qd4 Qxd4
9.cxd4 b6 10.cxb6 Bb4 11.Bd2 Bxd2 12.Kxd2
axb6 13.Nf3 Bb7 14.Ke3 Bxf3 15.Kxf3 f6 16.d5
exd5 17.Bxd5 c6 18.exf6 cxd5 19.fxg7 Rg8
20.R(h)e1 Kf7 21.Re5 Ra5 22.Rf5 Kxg7 23.Rg5
Kf7 24.Rh5 Kg6 25.Rh4 Rf8 26.Kg3 Nc6
27.Rg4 Kf6 28.Rf4 Kg7 29.Rg4 Kh8 30.a3 d4
31.Rf1 Rb5 32.b4 Ra8 33.Ra1 d3 34.a4 Rxb4
35.Rxb4 Nxb4 36.f4 Kg8 37.Kf3 Ra5 38.Rc1
Rxa4 39.Rc8 Kf7 40.Rh8 Kg7 41.Rd8 Ra7
42.Re8 d2 (0-1)

ROUND 5
Mehisto B
Sphinx C

1.c4 c5 2.Nf3 Nf6 3.Nc3 Nc6 4.d4 cxd4 5.Nxd4
e6 6.N(d)b5 d5 7.Bf4 e5 8.cxd5 exf4 9.dxc6
bxc6 10.Qxd8 Kxd8 11.Rd1 Ke7 12.Nd4 Bd7
13.Nf3 Rb8 14.Rd2 Ke8 15.a3 Rb3 16.Nd4 Rb6
17.h3 c5 18.Nf3 Bd6 19.Ng5 Be5 20.Nd1 Rb3
21.Rc2 h6 22.Nf3 Bd6 23.e3 fxe3 24.Nxe3 Be6
25.Bc4 Bxc4 26.Nxc4 Bf4 27.O-O Rd3 28.Re1
Kf8 29.N(c)e5 Rd5 30.b4 Nd7 31.Nxd7 Rxd7
32.bxc5 Bc7 33.R(c)e2 g6 34.c6 Rd6 35.Ne5
Rh7 36.Rb2 a6 37.Rb7 f5 38.Nd7 R(d)xd7
39.cxd7 R(7)xd7 40.g3 R(7)f7 41.Ra7 f4
42.gxf4 a5 43.Re6 Kg7 44.R(a)a6 Bxf4 45.Rxg6
Kh7 46.R(g)c6 47.Rc2 R(f)d7 48.Kf1 Bg5
49.Rxa5 R(7)d3 50.Kg2 Kg7 51.a4 Kf6 52.Rc6
Ke7 53.Ra7 R(3)d7 54.Rxd7 Kxd7 55.Rg6 Bd2
56.h4 Ke7 57.h5 (1-0)

ROUND 6
Sphinx A
Mephisto B

1.d4 c6 2.c4 d5 3.Nc3 e6 4.e3 Nf6 5.c5 b6
6.cxb6 axb6 7.Nf3 Bd6 8.Bd3 O-O 9.O-O Qc7
10.e4 Nex4 11.Nxe4 dxe4 12.Bxe4 Na6
13.Qb3 F5 14.Bb1 c5 15.dxc5 Nxc5 16.Qe3
Bb7 17.Re1 Bd5 18.Bc2 Bxf3 19.Qxf3 Bxh2
20.Kf1 Be5 21.Qe3 Bf6 22.Qf3 Qd7 23.Qe2
R(f)d8 24.a3 Qd6 25.Qb5 Ra5 26.Qb4 Qc6
27.Qc4 Rd4 28. Qe2 Rg4 29.f3 Rh4 30.g3 Rh1
31.Kg2 Rxe1 32.Qxe1 Rb5 33.Qe3 Bxb2
34.Bxb2 Rxb2 35.Qc3 Qb5 36.Kh3 Kf7 37.Rc1
Ra2 38.Bb1 Rf2 39.Re1 Qc6 40.Re3 h6 41.Bc2
g5 42.Bxf5 exf5 43.Qc4 Kf8 44.g4 f4 45.Rd3
Rxf3 46.Rxf3 Qxf3 47.Kh2 Qf2 48.Kh1 Rf3
49.Qc2 Qxc2 50.Kg1 Qg2 Mate (0-1)

ROUND 6
Sphinx C
Mephisto A

1.d4 d5 2.c4 dxc4 3.Nf3 Nf6 4.e3 Bg4 5.Bxc4
e6 6.h3 Bh5 7.Nc3 a6 8.a3 c5 9.d5 b5 10.Ba2
c4 11.dxe6 Qxd1 12.Nxd1 fxe6 13.Ng5 Bxd1
14.Kxd1 e5 15.Bb1 N(b)d7 16.Ne6 Rc8
17.Nxf8 Rxf8 18.Ke2 Nc5 19.Rd1 e4 20.f4 Nd3
21.Ra2 Nh5 22.Kd2 Ng3 23.Ra1 g5 24.Kc2
gxf4 25.exf4 Ne2 26.Be3 N(e)xf4 27.Rf1 Nxg2
28.Rxf8 Kxf8 29.Bh6 Kf7 30.Kc3 Rc5 31.Bc2
Rh5 32.Rf1 Ke6 33. Bg7 Rxh3 34.Kd4 Rg3
35.Bh6 Nh4 36.Kxe4 Rg4 37.Ke3 Nf5 (0-1)

ROUND 7
Mephisto C
Sphinx B

1.c4 c5 2.Nf3 Nf6 3.Nc3 Nc6 4.d4 cxd4 5.Nxd4
e6 6.N(4)b5 d5 7.Bf4 e5 8.cxd5 9.dxc6 bxc6
10.Qxd8 Kxd8 11.Rd1+ Ke7 12.Nd4 Bd7
13.Nf3 Rd8 14.Ne5 Be8 15.Nd3 Rd4 16.g3 fxg3
17.hxg3 Nd5 18.Rc1 Nb4 19.Nc5 Kf6 20.e3
Rd8 21.N(3)e4+ Kf5 22.d3 Nd5 23. Bd3 Nf6
24.Nd2+ Rxd3 25.Nxd3 Bd6 26.e4+ Ke6
27.f4 Bc7 28.Ke2 Bb6 29.e5 Nd5 30.Ne4 Ke7
31.N(3)c5 f6 32.Nd6 fxe5 33.fxe5 Bg6
34.R(h)f1 Bc7 35.Nf5+ Bxf5 36.Rxf5 g6
37.Rg5 Bb6 38.Rg4 Rf8 39.Nd3 Kd7 40.R(g)c4
Ne7 41.Nc5+ Ke8 42.g4 h5 43.gxh5 gxh5
44.b4 Rh8 45.Rh1 Rh6 46.Kf3 Ng6 47.Nd3 Bc7
48.Ke4 Ne7 49.Rh4 Nd5 50.Rc2 Bd8 51.Rh1 h4
52.R(h)c1 Ne7 53.Nf4 d5 54.Rh2 axb4 55.axb4
Kf7 56.Rf1 Nc8 57.Nh5+ Ke7 58.Rxh4 Rh7
59.R(4)h1 Bb6 60.Nf4 Tg7 61.b5 cxb5 62.Rc1
Rg4 63.Rxc8 (1-0)

Round 7
Mephisto B
Sphinx A

1.Nf3 d5 2.d4 Nf6 3.c4 e6 4.Bg5 Bb4+ 5.Nc3
Nc6 6.e3 O-O 7. Bd3 dxc4 8.Bxc4 Na5 9.Bd3
h6 10.Bxf6 Qxf6 11.Qc2 Nc6 12.O-O Qe7
13.a3 Bxc3 14.Qxc3 a5 15.R(f)c1 Rd8 16.Be4
Ra6 17.Bxc6 bxc6 18.Rc2 Bb7 19.Ne5 Qd6
20.Rc1 f6 21.Nd3 Ba8 22.Nc5 Ra7 23.Qc4 Re8
24.Qd3 e5 25.Qg6 Rd8 26.Rd2 Qe7 27.Rd1
exd4 28.Rxd4 Rd6 29.R(1)d2 Rd5 30.Nb3 Qd7
31.e4 Qe7 32.h3 Rd6 33. Qf5 Qe5 34.Qxe5
fxe5 35.Rxd6 cxd6 36.Rxd6 a4 37.Nd2 c5
38.f3 Kf7 39.Nc4 Ke7 40.Rg6 Kf7 41.Nxe5+
Ke8 42.Nd3 Kf7 43.Rb6 Ra5 44.Rb8 Ke7
45.Rg8 c4 46.Nf2 g5 47.Rh8 h5 48.Rxh5 Bc6
49.h4 Rb5 50.Nd1 gxh4 51.Rxh4 Rb3 52.e5
Rb5 53.Rxc4 (1-0)

1987 U. S. Open

by Larry Kaufman

No less than 14 computers participated in this year's U. S. Open in Portland, Oregon, an all-time record. Novag entered four different machines for the full 12 rounds--I operated two of them as the author of the opening book they employed, while programmer Dave Kittinger ran the other two. Fidelity entered eight "clones" for the second half only to get a C.R.A. rating but withdrew after finishing only 3 rounds--24 games. Two amateur programs, "Rex IV" (of which I am co-author with Don Dailey of Virginia) and "Terminator" each played the final six rounds only.

In general the computers performed below expectations. One possible explanation for this is that the players in the Northwest, where the event was held, are said to be seriously under-rated because until recently they had their own rating system so few events were USCF rated. Consequently they largely missed out on the rating inflation fueled by the too generous "fiddle points" given out in 1980.

Novag began poorly but finished strongly to salvage a respectable performance. Curiously, the four Novags finished in reverse order of speed. A 5 MHz prototype of the new "Super Expert" was the top computer with 8 out of 12; a 5.5 MHz Forte B was next with 7, then an 18 MHz experimental program at 6.5 and a 20 MHz experimental at 6. Post tournament established ratings for the four are as follows: Super Expert 2110, Forte B 2081 (now over 2100 by calculation), 18 MHz unpublished as still provisional (probably mid-expert), and 20 MHz 1836 (!). While the ratings for the commercial speed units are reasonable, the poor results of the "bit-slice" models, especially the 20, require explanation. The experimental program used in them was found to contain at least two bugs, which cost one game outright and wasted considerable time in all. Moreover, the 64k ROM limit forced the severe truncation of my opening book (which was written for the 96k Super Expert) which greatly dimished its value. Despite these handicaps, the bit slices won some very impressive games at the Open, and although Novag did not defeat any masters this year there were two noteworthy close calls. In one game one of the bit-slice units held Alex Fishbein (2529) even in a tense game for thirty some moves before missing a strong sacrificial continuation, and in a first round encounter the Forte B achieved a won game against GM Arnold Denker after he played a dubious sacrifice only to later go astray and lose.

The two fast Novags also played in the U. S. Speed Championship, sponsored by Fidelity and won by Lev Alburt, who also won the main event. The 20 MHz missed qualifying for the finals by half a point, then easily won the class A section. The 18 MHz dropped only one point in the prelims (to Stuart Rachels, 2481, on time in a drawn ending), and then scored 6 out of 12 in the grand finals against master and senior master opposition. Total performance for the two units in this event was around 2350, despite the handicap of having to play at 60 moves in 2.5 minutes to allow enough operator time and still losing several good games on time. Another Novag highlight was a blitz match (actually 7 minute chess) by the Super Expert by master Jerry Hanken, known for his battles with computers in the pages of "Chess Life". Jerry lost nearly every game (about ten were played), but somewhat

redeemed himself by holding Novag about even in a return match another day.

Unlike Novag, Fidelity has little to cheer about. The program was described as experimental, although the machines used and their operation appeared identical to the commercial "excel 68000" and "Mach 2". Based on problem solving times in a public demonstration, the program appears to be very similar to the "Mach 2", but not identical. Fidelity says that an experimental timing algorithm was tried and is blamed for the fiasco, and indeed I must believe something was seriously wrong because in one game Fidelity simply failed to recapture a rook, losing instantly. The opening book used was a totally new one, which, like the Par, played some rather obscure lines, like the Cozio defense to the Ruy. The result for Fidelity was a score of 8.5 out of 24 and a performance rating of 1940, rather disgraceful compared to their performance of around 2050 (2066 with feedback points) at the 1986 C.R.A. test. Fidelity's president told me they expected to do a hundred points better than in '86, but finished over a hundred points worse. In my opinion Fidelity's testing procedures for their programs must be deficient. Whatever flaw caused this awful result should have been detected before the CRA test. Fidelity plans to try again for a CRA rating at the American Open, which indicates that the problem has been corrected. Assuming the hardware is unchanged (68000 at 12 MHz, 128k RAM), I feel they have a good chance to finally surpass the inflated 2100 rating earned by the Par in early '86.

As for the amateur programs, Rex performed around 1850, not too bad considering the slow machine it was forced to run on (about a quarter the speed it used in Alabama). Terminator, despite super fast hardware (Compaq 386) could only manage a performance in the vicinity of 1600.

In general, it appears that a major reason for the rather low performance ratings here is simply that a much higher percentage of strong tournament players now own their own chess computer than did two years ago. While the computers are getting stronger, the humans are learning their weaknesses. Once this percentage levels off, we can look for computer performances in human events to rise more rapidly.

U. S. Open Computer Chess Championship

by Larry Kaufman

This annual event was again held in Mobile, Alabama, in April 1987. Although not restricted to microcomputers, it has become in practice a microcomputer event, although in 1986 the winning Fidelity computer was a 16 processor machine. This year's event was essentially a Fidelity-Novag duel, although seven other micro programs participated. I was present in connection with my work on one of these other programs, "REX IV", as well as to operate a Novag unit with an opening book I did for Novag. Mephisto stayed out, ostensibly because of the rule that allowed computers from the same company to play each other. As this is an open invitation to cheating, the director simply announced that a company could forfeit to itself without play, and sure enough each of the three participating "teams" did so once. I am told that next year company self-pairings will be outlawed to end this foolishness.

Fidelity's three entries took first, sixth, and seventh, each on tiebreak. Their winning unit, "Private Line", scored 5.5 out of 6 and ran on a 68020 machine at 25 MHz, according to Sid Samole, Fidelity's president. The other two Fidelity entrants were "Chessmaster Apple" and "Chessmaster Mac" which scored 3 each. The programs are Fidelity's but are destined for sale under the "Chessmaster 2100" label. The Mac was said to run at 16 MHz on a 68020, the Apple at 12 on a 68000.

While Fidelity narrowly won the tie-break, Novag was the moral victor. Not only did Novag tie for first at 5.5 with their old Expert program (at 20 MHz), but took the next three places outright at 3.5 each. These three machines were an 18 MHz experimental program, a Forte B at 5.5 MHz, and a commercial 5.7 MHz Expert. Both the experimental and the Forte B had my opening book (not the much larger one I later did for the commercial Super Expert and Super Forte). In individual encounters between Fidelity and Novag, the score was dead even.

The remaining three point programs were all running on a a Compaq 386 computer. In order of tiebreak, they were BP and REX IV, both amateur efforts, and "Coffeehouse Chess Monster". Next came PSION-MACINTOSH at 2.5--a very strong program running on non-competitive hardware (7 MHz 68000). Coffeehouse Chess Monster took the next two places at 2 and 1 with their Commodore and Apple versions. Finally, another amateur program, EGA, was shut out despite running on a Compaq 386.

As for Rex IV, by Don Dailey and myself, we were quite pleased to tie with Fidelity Chessmaster for top PC, although they won on tiebreak points. Had repetition detection been added before the first round instead of after we would have picked up half a point then. Rex is unique in that it allows a chessmaster with minimal programming expertise (i.e. myself) to input chess knowledge directly into the program without bothering the programmer. Whether it will become commercial is not yet clear.

The sharp opening book I did for Novag produced some quick wins, although it also backfired against Fidelity in one game where the refutation of Fidelity's unsound move proved to be too deep for Novag's search. In

general, I emphasize tactical lines in Novag's book because Novag excels in tactics.

The three Coffeehouse entries were nearly shut out except against each other and tail-ender EGA. The package of chess software which includes this program looks very promising as a teaching tool, but strictly in terms of chess playing strength the Chess Monster does not appear to be competitive with other software. Psion, on the other hand, was clearly much stronger than its lowly score suggests. With similar hardware to the Chessmaster entries I believe it would have won top PC. The BP program, said to be the world's most selective, was also quite good though not immune from blunders.

Novag took the "Supercomputer" prize and Fidelity the "Dedicated" prize, but it could (should?) have been reversed, as the Novag unit was a chess playing board while the Fidelity was a computer with terminal etc. These terms are too poorly defined to have any significance.

I hope that Mephisto can be induced to compete next year with the rules change, but with Fidelity holding its multiprocessor (28 now I'm told) in reserve for such events I would not fault Mephisto for staying away. Even for the World Champion, 28-1 odds is a bit much! If Fidelity ever markets a multi-processor machine, though, Mephisto may have to compete with it. But don't hold your breath--such machines will not be cheap when and if they are ever sold.

American Open:
The CRA tests

by Larry Kaufman

Twenty one years ago I last attended the American Open in Los Angeles, and I won the tournament. This year I returned, not to play, but to participate in the spectacle of no less than 19 computers battling it out in the 800 player event. Each of the three manufacturers of the strongest machines, Mephisto, Novag, and Fidelity, entered 6 identical units for the eight rounds to obtain a CRA rating, while in the non-commercial category Hans Berliner of Carnegie Mellon operated "Hi-Tech", which employs a processor for every square on the board. HiTech drew two players in the 2500s (Alex Fishbein and IM Jack Peters), lost to two in the 2600s (Jay Whitehead and GM Max Dlugy), and beat three play- ers in the expert-low master range for a performance rating of 2443 in this event and around 2480 for its last three events (18 games) combined. HiTech analyzes around 150,000 nodes per second (about 100 times the $300-400 micros), and is thought to contain more chess knowledge than any other program. Berliner predicts that by the end of 1990 a computer will be among the top ten players in the world! I'm skeptical.

As for the micros, Mephisto entered the commercial Mondial 68000 XL, which contains the 1986 World Microcomputer Champion program. Novag entered the new Super Expert, running at 6 MHz, but with a totally new, experimental selective search program. Although the Novag model employed my opening book, I operated for Mephisto since they asked me first. Fidelity surprised everyone by entering a 32 bit, 68020 machine, planned for release by Easter. Such machines were prohibitively expensive until now, but Fidelity hopes (no promise) to keep the price down just below $1000. Although the MHz and RAM size were not announced, my guess based on problem solving times is 16 MHz and 256k RAM. The machine runs about three times as fast as the current Mach II, with an otherwise similar program. Fidelity claims that the software has been accelerated by 30%, which means the 68020 processor and large RAM are multiplying the speed by about 2.3 or so. Fidelity plans to offer the "Los Angeles" program in the 68000 Mach II immediately for around $400 retail, but based on the speed difference of 3-1 it should rate around 90 points below the 68020 unit used in the CRA test. Hopefully USCF will not allow any ads which might imply that the Mach II was the unit rated by the CRA.

Now for the results. The official CRA ratings will not be known for a couple more weeks, but based on wall chart ratings of the opponents Fidelity performed at 2189, Mephisto at 2150, and Novag at 2120 (but see below). All of these numbers are apt to rise by perhaps 5-10 points in the final analysis for technical reasons, so Fidelity still has a chance for getting the first CRA master rating. Scores were Fidelity 28-20, Mephisto 26-22, and Novag 24-24 all against fields averaging around 2120. Fidelity defeated one senior master and three masters for a total score of 4.5 out of 12 vs. 2200+, but finished below 50% against players in the 2100s. Against the weaker players, though, they were merciless, scoring 13.5-1.5. Mephisto had the same +11 total margin of victory over non-masters as Fidelity, but only managed 1.5 out of ten against the masters. Novag scored 3 wins, 5 draws, and 9 losses against masters but was only +6 against the non-masters. No one below 1900 scored even a draw against any computer, in seven tries. In general, the Mephisto played the best positional chess and did surprisingly

well in the endgame, often winning even or inferior positions. Its weakness was that it succumbed to direct king-side attacks in several games. Fidelity tended to reach winning positions in several games only to throw them away in the later stages. Novag, as always, had very sharp games that were often decided early.

Although Fidelity outperformed Mephisto, the result clearly shows that Mephisto still has the better program. Mephisto performed about 30 points better than what Fidelity would have done with comparable hardware. Mephisto would undoubtedly have attained a master rating with the Rome 68020, but because it is so expensive it was not chosen for the test. What has happened is that in the last year Mephisto and Fidelity have traded places in the marketplace in a sense. In 1986 Mephisto had by far the best machine in the $1000 vicinity, while Fidelity was on top in the low price range with the Par Ex. Now, Fidelity has the best unit for around $1000, while in the under $500 category Mephisto is clearly on top with the Mondial.

The Novag result is quite misleading. After five rounds and 30 games with the experimental selective search program, Novag had a performance rating of around 2012, a fiasco. Programmer Kittinger concluded that the experiment was a failure, and was given permission to begin a new CRA test at that point using the standard Super Expert program (still at 6 MHz) instead of the experimental selective search. The results were fabulous—a score of 13.5 out of 18 for a performance rating of 2306! Since 48 games are required for a CRA rating, Novag must now find another event to play the required 30 additional games. While it is clear to all that this 2300+ figure is a fluke, it certainly looks like Novag has a very good chance to obtain a master rating for a $600 machine. If this program is also offered in the Forte hous-

ing as planned, it should be under $400. If so, the new Fidelity 68020 will be dead before its birth. Still, it is also possible that the early Novag fiasco was not just due to the selective search, and so until the extra 30 games are played I am not prepared to admit that the Novag is of master strength or even superior to the Mondial, although there is little doubt that the standard program is superior to the 2120 rating of the whole 48 games of the two programs combined. It is clear to me that my contention that Novag models play much better against people than against computers is correct, as the Super Expert is clearly no match for the Mondial or the Fid. 68020 head to head, yet seems comparable against humans.

If you are now confused about whether the new Novag or the Mondial is the best buy in the $400 range, so am I. The Mephisto plays sounder chess, but the Novag is better at creating tactical positions in which the human is apt to go astray. No matter which of the two ends up with the best CRA rating, the question of which is really stronger cannot be answered simply--it depends on who the opponent is. What seems clear to me is that the Mondial plays better moves most of the time, but the Novag has a more exciting style and is more fun to play against. As for the opening books, it is my feeling that the Mephisto's book was less suitable than Fidelity's or Novag's--Mephisto often saw itself at a disadvantage directly out of book. Perhaps with a book suitable for tournaments, Mephisto could earn a master rating for the 68000 program.

One interesting aspect of the event is that all three companies consistently performed better in the evening rounds than in the first round of each day. Overall, the difference in performance was close to 130 points, an enormous amount. Clearly, people get tired and make more mistakes in the second

round of a day. Such a difference shows that ratings may vary greatly based on the specific conditions of a tournament. So while I hope to see many more CRA tests, I feel one must also consider other evidence, including comp-comp testing, when comparing machines tested under varying conditions. Thus, although the Mondial got a CRA rating nearly 20 points below the Mephisto Amsterdam in its (uncompleted) CRA test in early '86, it is clear that the Mondial is superior, both in speed and program. The explanation is that the first test was, like that of the Par, a private test in which the humans risked neither rating nor money and could only win a few dollars, whereas this test was in a major tourney with thousands of dollars (and ratings) on the line. The more motivated the human, the lower the computer's rating is apt to be. I urge the USCF to make clear to its members the difference between the new, tournament CRA ratings and the old, private ones. Anyone who concluded that the Mondial was only 50-60 points better than the Par Ex, for example, would be seriously in error--the Par would not have done much, if any, better than 2000 in this event. It is about 5 times as slow as the Fid. 68020, and has much less chess knowledge.

Overall, the results of this CRA test agree quite closely with expectations per my ratings article, allowing for speed differentials. The concept of rating computers by comp-comp games with scaling down the differences was shown to be valid for those programs which are developed by comp-comp testing, i.e. all but Novag. It is a great pity that Novag did not play their commercial program from the start, as that would have allowed a proper comparison of all three models under equal conditions.

FIDELITY

by Larry Kaufman

When I first got the new Fidelity Excel 68000, my early impression was "rip-off". My comp-comp tests showed it to be slightly inferior to the much cheaper Par Ex; moreover on mating problems it frequently malfunctioned, and on ordinary middle game tactical problems tended to be slower than the Par. The only bright spot was the endgame, clearly improved. Even the higher priced Mach II (same program, but with 128k RAM for transposition tables) performed only marginally better than the Par. But after about two weeks, Fidelity invited me to exchange the machines for an upgraded program, with the faulty mating mode fixed and some slight technical improvements. Although the difference was supposed to be minor Fidelity claimed to be getting much better results in their testing with the new program,

Excel 68000

and I soon found the same thing in my testing. Fidelity offered to exchange machines with the old program for the new for free, and I recommend anyone with that program to accept this offer. To test which version you have, use this test: White:king a2, queen b1, bishops b8, f5, knights a3, d8, pawns a4, d6, e2, f6, g5, h2; Black:king d5, knights c5, d7, pawn a7. White to move and mate in 4 (level h4). The new version returns the correct solution Bxa7 in about 4 minutes 24 seconds (3 minutes 35 seconds on the Mach II), while the original

defective version takes about 2 minutes 45 seconds (2 minutes 20 seconds for the Mach II) to come up with the incorrect e2-e4. Fidelity also promises to offer future upgrades to the 68000 program as factory upgrades, though at an unspecified price.

My tests show the new Excel 68000 to be superior to the Par at every level except blitz. I consider Fidelity's estimate of fifty points improvement to be pretty close, though of course I consider the 2100 rating of the Par to be unrealistic. Three minute/move level testing in England and Sweden show about a fifty point improvement, while my own tests at 30 seconds and one minute show about 35. The gain is primarily due to the improved endgame which is in turn due mostly to the hash tables. Positional play has also been improved in the middle game, though at the expense of speed, so the Excel 68000 is no improvement over the Par tactically. At blitz, the 68000 is a bit weaker than the Par due to the hash tables being worthless until the fourth ply. The 68000 is also the first program to "understand" and avoid or aim for such basic endings as bishop + wrong RP, 2 knights vs. bare king, and some simple K&P endings. The opening book is adequately varied and quite deep in main lines, but there are some major holes. For example, in the main line of the Ruy Lopez the standard move 7...d6 throws it out of book; another example is the common sequence 1 d4 Nf6 2 Nf3 g6 3c4 out of book. In this last position the 68000, at the one minute/move level, plays 3...e6?, illustrating a problem it shares with Mephisto, namely a tendency not to complete fianchettoes started by the book. The 68000 also has a bad habit of making pawn moves that fatally weaken the king side (i.e. ...h5 or...g5) for no good reason. It also likes to exchange bishop and knight for rook and pawn on f2 or f7, a very bad practice. As

for features, the selectible display is very nice, as is the wide variety of levels.

However, the program plays much faster than it should on the "game in x minutes" levels, diminishing their value. Some people may appreciate the feature that predicts how much time remains until a move will be made. Considering both strength and features, the Excel 68000 is worth the extra hundred dollars in price over the Par, and ranks about equal with the Forte B as the best value under $300. My principal reservation is that the Excel 68000, unlike the Forte B, has yet to prove its strength against human opposition. The two are quite competitive, with the Excel clearly superior in the endgame, the Forte in tactics and blitz.

The Mach II is simply a faster version of the Excel due to its much larger hash tables (see article on this). The gain can be anywhere from 10 to 100%, with perhaps 35% being the average at 40/2, though the gain is less at faster speeds, disappearing entirely at blitz. This should imply about a 30 point gain. Although Eric Hallsworth's list shows only an 18 point gain, my own tests at 30 seconds and one minute show a gain of around 55 points, so perhaps 35 is correct. This puts its gain over the Par close to eighty points and

Mach II

means that at last Fidelity has a machine that truly deserves the 2100 rating. Yet, this program remains without CRA rating after the U. S. Open disaster where a close cousin earned only a 1940 performance rating--see

U.S. Open article. The only real problem with the Mach II is that its price is rather close to the much stronger Mephisto Mondial 68000.

The 20% speed increase of the Mondial over the Dallas removed any lingering doubt as to whether it would surpass the Mach II. While the Mach II seems superior to the Mondial in the endgame and perhaps for analysis, the Mondial is clearly the stronger for practical play. At blitz the difference is enormous-- Mephisto won 9-1 in my test.

The Par Ex remains the strongest machine for its price along with the Turbo 540+, but its narrow opening book and lack of a display may justify
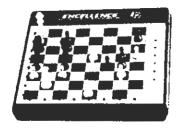
Par Excellence

spending the extra money for the better models. The Elite Avant Garde 2100, although still sold, should be considered obsolete as similarly priced auto sensory units of Novag and Mephisto are clearly stronger. Fidelity expects to offer a 68000 version of the Elite next year. If it runs at 16 MHz with huge RAM, as I predict, it should be very strong, and very expensive.

The new Excel Display deserves special mention as the best value for its price of $100. The program is a 6502 adaptation of the Excel 68000, and runs at 3 MHz. In general it runs a bit slower than half the speed of the Excel 68000, and should play about a hundred points worse. My tests at 30 seconds and one minute imply a somewhat larger spread, around 150. As compared to the old Excellence, my tests show the new program to be weaker by around 25 points at 1 minute level, more at faster

speeds. I believe there are three reasons for this: 1)The new opening book is much more varied, hence generally less deep and less suitable to its style 2)The more sophisticated evaluation of the new program slows it down considerably (on the order of 25%), more so on the 6502 than on the 68000 3)The older program was developed against Novag, the newer against Mephisto, and most of my tests for these models were against Novag models. Probably with enough time the better evaluations will overcome the slowdown, so perhaps the new program may prove superior at 40/2. In any case, the chance to get a display of evaluation, search depth, and time remaining until a move will be made, plus a 1900 vicinity program for such a low price, makes this unit worthy of consideration for budget minded players in class C and below. Class B players are advised to spring for a faster, stronger model, according to my rule that a machine should outrate its buyer by at least 300 points. This model is also available with voice instead of display, or with neither for $10 less. The only real rival to the Excel Display is the Novag Primo, but as the Excel is slightly stronger, slightly nicer, and (in the U. S. only) slightly cheaper, the choice, for Americans, is obvious.

Excellence

MEPHISTO

by Larry Kaufman

Last year, Mephisto had the top machine (Amsterdam), but only at an unreasonable price. Since then, not only has the program been improved in many ways, but an affordable ($400) version has at last appeared – the Mondial 68000 XL. This puts Mephisto clearly on top of the commercial market for high level machines. Not only does the Mondial utilize the 1986 World Champion Dallas program, but it runs 20% faster than the autosensory versions in the $1200-$1600 price range. Although the 1987 World Champion Roma program is clearly stronger still than the Dallas, it is only available in the expensive, slower autosensory boards and hence should only be considered by those already owning one of the boards, or those who demand a first rate board. The pressure sensitivity on the Mondial is so good that it almost seems like an autosensory board, so I just can't see much justification for the enormous price premium for the larger boards.

Some of the flaws reported in the last CCR in the Amsterdam have been corrected in the Dallas/Mondial. In particular, the blindness to enemy passed pawns is largely gone, and the unsound piece sacrifices are totally eliminated. The play has been made a bit more active, though the style remains primarily positional. Like Novag machines, it will sometimes sacrifice a pawn on purely positional grounds. In general, the endgame is markedly superior to the Amsterdam, and it will rarely blow a won game. Improvements were also made in both its positional and tactical play, though it is not hard to find positions in which the Amsterdam is superior. An unfortunate side effect of the elimination of unsound piece sacrifices is an increased vulnerability to sound piece sacrifices by the op-

ponent. In general, the Mondial has trouble with piece sacrifices which have quiet moves in the follow-up, a consequence of the selective search. Although the improvements in the Dallas seem to have slowed it down a bit, the 20% speed increase in the Mondial suffices to offset this. The opening book is about 40% larger, the increase going primarily to increased variety, not depth. There is a tendency to play somewhat unusual open-

Mondial 68000 XL

ings, some of which are not too suitable for the computer's style. The book is not very deep compared to others, and if the Mondial should fail to obtain a master rating in tournaments I think the opening book will be the reason. Since the Amsterdam got a 2229 USCF rating in Alabama tournaments and a 2176 estimated performance rating in 48 games of a scheduled 52 game CRA test (unfinished due to unequal conditions vis-a-vis the Par Ex), the Mondial should by all rights be a master, but with so many people now learning how to play against computers this is in question. Although foreign results since the last CCR show that my 2200 estimate therein for the Amsterdam was somewhat too optimistic (perhaps by 50 points), the improvements in the Mondial may suffice to reach that magic number.

As for improvements from Dallas/Mondial to Roma, there are several. The opening book is both larger (14%) and more suited to its style. Some tactical improvement is apparent from problem solution times. The endgame appears to be somewhat better. Most significantly, the program's mid-

dlegame appears to benefit from an improved understanding of pawn structure. Mephisto also claims other improvements in strategic knowledge and activity. The Roma also has many new levels and features, such as fixed depth of search, handicap levels, and selectable rolling display.

Munich Roma

For those to whom price makes no difference, Mephisto now offers a 32 bit, 68020 version of the Dallas and now the Roma program in the large "Munich" autosensory board for a mere three grand. The 16 and 32 bit versions differ slightly (the 68020 does a slightly "fuller" search). Due in part to its "Cache" memory and 14 MHz speed, the 32 bit runs more than twice as fast as the 16 bit 68000. The exact ratio depends on the position, ranging from about 2.37 on mating problems to about 1.9 for endgames, with perhaps 2.1 being typical in practical middlegames. The difference in strength should be about 75 points in theory, and the Swedish testing shows a 62 point spread, not too far off. My own games confirm that the speed does make a real difference--I played a 10 round two board clock simul (45 in 90) against the two versions of Dallas, and while I beat the 16 bit 8.5 to 1.5 I could only manage 6-4 against the "big boy". As my tests on the new Roma 16 bit show it to be markedly stronger than the 16 bit Dallas (though below the 32 bit Dallas), it follows that the 32 bit Roma will be of incredible strength, a very solid master. At blitz these machines are all incredibly strong against humans. For example, the 32 bit Dallas scored 7.5-6.5 against a blitz specialist rated 2378, and beat

a 2267 player by 13.5 to 2.5 at five minute and by 4-0 at ten minute chess. The 16 bit Rome lost by 7-5 to the above 2378 player--the benefit of the higher speed 32 bit is magnified at blitz. An experimental version of the 32 bit reportedly scored even in a long series of blitz games with Grandmaster Quinteros, a well-known blitz pro. As for intermediate speeds, it is my feeling that the 16 bit jumps in strength between 30 seconds and 1 minute level, while the 32 bit does so between 15 and 30 seconds. These are in general the minimum times required to examine every response move fully, and to look at least 7 plies deep in main lines.

The MM4 program, available in all the autosensory boards and in the Mobil handheld unit, is an upgrade of the MM3 or "Rebell" program. It is the most improved program of the year. While retaining all the strengths of the Rebell, it has eliminated most of the weaknesses. The endgame is vastly improved, and the frequency of blunders is much lower. It is particularly impressive at the 30 second level, at which speed it approaches the Mondial, but at both faster and slower speeds the superiority of the 16 bit Mondial is clear. It is almost surely the strongest 8 bit program in the world, although its small, shallow opening book might hurt it in human competition. It is at least a class above all other hand-held units (although triple the price). In the autosensory category, only the Novag Super Expert is competitive, the choice depending on how much one cares about the large opening

Modular. MM4

book and many extra features of the Novag. As to the choice between MM4 in the Modular board and the Mondial, which are the same price, the Modular offers a slightly larger, auto- sensory board with lights on every square, a larger display and pieces, and the hope of upgrades, while the 16 bit Mondial is perhaps 60 points stronger and has a much larger opening book. Note that the two programs, though both selective search, are by different authors and are not related except in the operation of the many features. The superiority of the Mondial is seen primarily in its positional play, in my opinion. In the arena of mate solving, the Mondial is vastly superior both to the MM4 and to all non-Mephisto brands--in this mode the program reverts to an incredibly fast full-width search, although there is one classic mate in 8 that the MM4 solves in under 1 second!! In practical play mode, though, both Mephisto programs sometimes overlook relatively shallow mates involving quiet moves, but can spot some very deep mates if all the winning side's moves are checks or direct threats. As for features and levels, there is little difference between the MM4 and the Mondial, although it should be noted that the "game in x minutes" levels on the MM4 do not work in the Mobil housing for some obscure reason.

The only other Mephisto worth mentioning is the "Super Mondial", an 8 bit program by a third programmer which came out just after last year's CCR. It was then the strongest affordable machine at the 1 minute/move level, but not very good at either blitz or 40/2 levels. As it is priced close to the Forte B which is superior in most respects, I can no longer recommend it, although I hear that in Europe it is priced well below the Forte and looks very attractive in that price category.

One aspect of all selective search programs, which applies to all Mephisto models, is that they occasionally overlook fairly shallow combinations. This means that even a class B player will occasionally win from even the strongest Mephisto. On the other hand, the deep selective search means moves of a generally higher level than one can find on a full width machine, which makes the Mephisto a tough opponent even for masters. In sum, the play is much more like a human's with selective search, with both the good and the bad points that that implies.
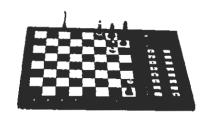

Mobile MM4

NOVAG

by Larry Kaufman

The case for buying Novag machines rests primarily on their suberb record in human tournaments (see article). Scores like 7- 0, 9-0, and 10.5-0.5 in class A or better events around the globe for the Forte B are mighty impressive. While Novag does not do badly in computer-computer competition (Novag took four of the top five places in the 1987 U.S. Computer Open), in general the prices of Novag models cannot be justified by comp-comp results. Novag top models, with 64k and 96k of ROM, contain more chess heuristics (rules of thumb) than most if not all competing models, which tends to give them a more human style of play and to make them difficult to defeat by stereotypical play. Against other computers, though, this chess knowledge goes largely to waste as comp-comp games are usually decided tactically. Novag machines are more willing to sacrifice than others, though this is less apparent in recent models than in the older SuperConstellation.

The Forte A turned out to be equal or marginally weaker than the Expert 5.0, perhaps because some extensions in the search had to be eliminated to make room in the ROM for new features. The Forte B, though, is clearly stronger than either as some cheap speed-ups were implemented. The gain appears to be about 25

Forte B

points based on comp-comp tests, or more if one looks at the human results mentioned above, all achieved with the "B". As with all Novag products, the Forte B is exceptionally strong at blitz against humans. In my testing at 30 second and 1 minute/move levels it scored around 60% against its main rival, the Fidelity Excel 68000, although it lost rather badly to the more expensive Mach II, and by even greater margins to the Mephisto Dallas & Mondial 68000. It is clearly superior to all machines under $200.

The new Super Expert and Super Forte are to be identical in both program and features--the difference is that the Expert board is autosensory and much nicer and larger. Both now have a nice display and so many features that 24 buttons are required to operate them all. The program is the Forte B program with the expert extensions restored and many other improvements, for a net gain of perhaps 30 points or so. Improved time allocation is now being introduced in the second production run, which we expect to add another 10 points. Finally, the opening book has been expanded to 32k. Since I did the expansion, I won't sing its praises, except to state that most of the increase has gone to deepening the lines, in several cases well beyond move 20, and that in popular openings it reflects opening theory through the end of 1986 and even has some 1987 innovations. How much the opening book will add to its strength is not yet clear. All of this was made possible by increasing ROM to 96k, which does increase the price somewhat. If

Expert (5 MHz)

Novag is able to come out with a 6 or 7 MHz version, as is now under investigation, it may well rival the Mondial in strength against humans, especially if experiments with making the search more selective are successful. Although its endgame has been improved, it still remains weaker than Fidelity and Mephisto in this area. Its tactical ability is rivaled only by Mephisto. For players who want an autosensory board, its only rival in terms of strength vs. price is the Mephisto Exclusive MM4, which seems to have a slightly stronger program based on comp-comp tests but a much smaller, shallower opening book and no memory when turned off. Which model is stronger against human opponents is at present too close to call.
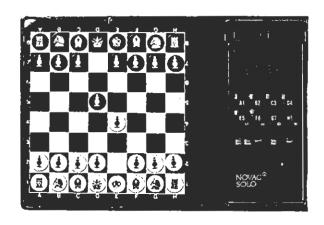
In the hand-held category, the V.I.P. replaces the CXG "Advanced Star Chess" as the strongest hand-held under $100. Indeed, the only stronger hand-held is the Mephisto Mobil MM4 at three times the price. The V.I.P. program is a slightly improved version of the Novag Primo, which my tests showed to be about 1870 level. Although it runs on a processor which is at best equal to a 2 MHz 6502, it appears to be about midway in strength between the old Constellation 2.0 and the Constellation 3.6, which shows that the program is considerably improved since then. The selectivity used in Forte B is also used in the V.I.P. It is between 3 and 4 times as slow as the Super Expert on mate- solving. As for the table top version, the Primo, it cannot be recommended as long as it is priced above the Fidelity Excel display, which is a bit stronger as it runs on a 3 MHz 6502, and with more Rom.

As for Novag's cheapest models, the Novag Accord is a full featured machine that plays perhaps in the upper class C range, not bad for a 4k, but overpriced at anywhere near the Excel. It runs about 4 times slower than the V.I.P. and Primo. The Novag Allegro, a

2k with few features, is too weak to consider. As for the Solo, it is even weaker—its top level can barely defeat the novice (1 ply) level of the Par Excellence. They all play many reasonable looking moves, but have almost no ability to analyze tactics. One must realize that 16k and $75 seem to be the minimum levels for decent chess. It is remarkable to me that a machine like the Solo can play as well as it does with only 2k, but it is still just a novice level toy.

V.I.P.

Solo

SAITEK

by Larry Kaufman

Saitek, formerly SciSys, is the largest seller of chess computers in the world, but is primarily known for lower level machines. Many of their table top models are weaker than the Fidelity Excel Display, despite grossly inflated claims by Saitek, and not so cheap, so this review will cover only the top end models.

The Leonardo may well be the most attractive and feature laden machine on the market, but its playing strength depends totally on what module is used with it, as the machine contains only a weak (class B) program. The Maestro module contains a slightly updated Turbostar program, at either 4 or 6 MHz. A new version, the Maestro B, contains a speed-up in software on the order of 30%, and since it runs at 6 MHz, it should be at least comparable to an 8 MHz Turbostar, which would be quite strong. Unfortunately, results so far have not confirmed this—it flopped badly in the French Open, and has just scored 11-11 in testing against the Forte B at the 1 minute/move levels. Moreover, it is quite weak at blitz. There is reason to believe that its time use algorithm is defective on some levels, as it sometimes plays good games only to get in serious time pressure and crumble. If this can be fixed it may approach its rivals (Novag Super Expert and Mephisto MM4 Exclusive) in strength at the slower levels, but certainly not at the faster speeds. In the future, I expect 16 bit modules to be offered, but whether they will be as strong as the competition remains to be seen. The "analyst" module is the same program with more information displayed. A "brute force" module featuring the old Mephisto MM2 program (updated?) is expected, a development which seems less than thrilling.

The most competitive Saitek model is the new "Turbo King", intended to replace the old Turbostar. It contains the Maestro B program, but at 5 MHz instead of 6 and with a somewhat smaller opening book. Saitek claims a 2150 rating right on the machine, which is nonsense, but it does appear to be the only Expert level machine with a display for under $200. My testing on mating problems confirms claims of a 30% speed-up over the Turbostar 540, but my limited tests to date do not show any increase in strength, perhaps due to level-specific problems as with the Maestro B. Some of the speed gain was given back in return for more accurate evaluation, which tends to hurt the faster levels but to help at 40/2. I suspect that it may surpass the Par Excel, its main rival under
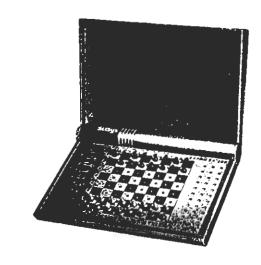
Leonardo
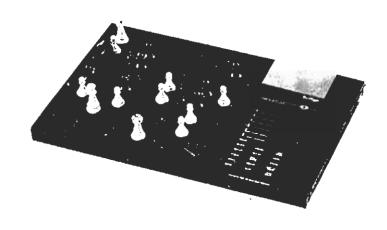
$200, on the slower levels but certainly not at faster speeds. It is almost surely weaker than all models over $200 reviewed in this CCR, at all practical play levels. It seems to do a very thorough evaluation of a very small number of positions compared to other machines, which accounts for its weakness at fast speeds. This suggests that it may excel at overnight analysis, though I have not investigated this point. In sum, if you must stay under $200, don't care about fast play, and value a display and fairly strong play, Turbo King is for you. The opening book is reasonably varied and deep. A nice feature is the ability to take back moves simply by un-making them, previously offered only by Mephisto. On the minus side, it is more difficult to set the levels than on the Turbostar and almost all competing models. A more

expensive 6 MHz version in a wooden board, provisionally named "Stratos" is expected soon.

All of the above Saitek models are rather strong at tactics involving the winning of material, but are exceptionally weak at spotting mating attacks, and are vulnerable to promotion combinations. They tend to develop winning positions frequently, but often toss them away. In this respect they resemble other selective search programs, but the frequency of blundering away a good game is far higher than with the Mephisto programs.

In the hand-held category, the Express 16k at around $75 remains the cheapest decent (class B) model on the market. Although the Novag V.I.P. is a full class stronger, the Express is somewhat cheaper and, unlike the V.I.P., has a pressure sensitive board.

Express 16K

Turbostar 540

CXG and Conchess
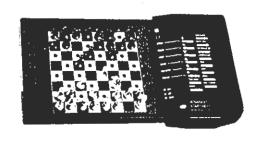
by Larry Kaufman

CXG has teamed up with David Levy's company, Intelligent Software, to produce the "Sphinx", the only commercial machine to date to feature both selective search and transposition tables. I have not yet seen one or received any test results, but I will be most surprised if it turns out to be competitive with the other machines in its price category of $500 or so. I say this because it finished embarrassingly low in the 1986 World Micro, and failed to score even half a point in 9 games this year (all against Mephisto), although it did manage second place in the software section. Moreover, it reportedly runs at only 8 MHz, while the other commercial 68000 machines all run at 12. I think much work remains to be done before CXG will be competitive in the top end market. In the hand-held category, "Advanced Star Chess" remains somewhat viable at $80-90, but has been surpassed in strength by the Novag V.I.P.

As for Conchess, I am told that the only new development is a new opening book. With a rather crude, brute force program (same as Mephisto's old MM2 and Saitek's "Brute Force" module for the Leonardo) and fairly high price, I doubt that it will even be sold in the U.S.

Sphinx 40

Advanced Star Chess

MATING SPEED

by Larry Kaufman

The mate solving mode of chess computers is independent from the practical play mode, and not necessarily similar. Nevertheless, mate solving speed is of interest not only to problemists but also for comparing the speed of different machines with similar programs. It also gives some idea of the relative tactical strength of machines in practical play, though caution must be exercised here. In particular, the mate solving mode of the Mephisto Amst/Dallas/Rome series is incredibly good.   Last year in CCR I reported times for a number of mates, but since then I have learned that much more consistent results are obtained by timing how long it takes to prove that no mate is possible in ordinary positions. I found that even 4 positions were sufficient to give quite a good idea of the relative speed of the machines. I used two endings and two full board positions, then took the geometric mean of the times. Finally, I took the reciprocal and expressed this as a ratio of the Par Excellence, which was defined as 5.00. Consequently a speed index of 16, for example, corresponds to the speed of a Par Excellence running at 16 MHz instead of the normal 5. Thus, the Mondial is seen to be more than twelve times as fast as the Par at mate solving.   Here are the results for the tested models:

model	speed index
Mephisto Dallas 68020	121.5
Mephisto Mondial 68000	61.86
Mephisto Rome 68000	53.37
Mephisto Dallas 68000	51.55
Fidelity 68000 Los Angeles or "C" version	17.73
Fidelity Mach II	15.72
Novag Super Expert 6 MHz	13.72
Fidelity Excellence 68000	10.10
Saitek TurboKing	8.866
Mephisto MM4	7.931
Fidelity Par Excellence	5.000
Novag V.I.P. & Primo	3.252
Fidelity Excel Display	2.507

The Mephisto Rome 68020 was not tested but should score around 125, while the Fidelity "Master" 68020 should score around 50.

Rating the Commerial Chess Computers

by Larry Kaufman

In the absense of exhaustive tournament tests for most machines, how should one evaluate their relative playing strength? This is a difficult question. Let's consider some of the problems and possible solutions.

Computer vs. computer testing is the cheapest and most consistent way of arriving at relative ratings, but how accurate are the resultant numbers? To answer this question, I have examined the results of all commercial machines in human tournaments and compared them to ratings based on computer versus computer games. The data was compiled by Eric Hallsworth of England, to whom I am grateful. My own compilation of human vs. computer results agrees fairly closely with his. Because of varying rating standards from nation to nation, and varying playing conditions, human results are difficult to interpret, but we have both attempted to allow for these variables as best we can. My conclusion is that the results against humans are on average predicted quite accurately by the comp-comp tests for all companies except Novag. The Novag results in human events were about 60 points better than would be expected based on comp-comp play alone, relative to the other companies. This "Novag factor" would be even larger if the Swedish comp-comp list is substituted for Hallsworth's own list. The explanation of this phenomenon is obvious. Fidelity, Mephisto, SaiTek, and CXG all develop and improve their programs primarily by testing them against competing models, while Novag relies almost totally on playing them in human tournaments. Novag's programmer has not even bothered

to acquire any competitor's model for testing since the 1985 Fidelity Excellence. The result is that Novag machines have more heuristics intended to confuse human opponents than do the others, but these heuristics are of no value against other computers. Simply put, strategic knowledge and a bold, aggressive playing style are more valuable against humans than against computers.

The next matter is the "contraction theory", which states that rating differences obtained from comp-comp play must be contracted by some percentage (my predecessor editor claimed 50%, while I suggested 25% in the last CCR). The reasoning is that a difference in tactical ability is more likely to be decisive between computers than against humans, because humans are more likely to play strategic, non-tactical games. The evidence shows that over the years new, stronger machines have generally performed worse than expected from comp-comp results. For example the difference between Mephisto Mondial 68000, the top affordable model of 1987, and Fidelity Sensory 9, the top affordable model of 1981, is about 510 points on the comp-comp Swedish list, but about 390 points based on actual U.S. tournament results. Other examples confirm a contraction of around 25% on average. However, the Swedish magazine "Ply" suggests that this may be due to human players becoming more familiar with how to beat computers rather than to an exaggeration of rating differences, and there is some truth to this. I believe though that a contraction of around 20% does occur. This implies that a doubling of speed is worth only 60 points against humans compared to 75 vs. other computers. Next is the matter of opening books. Should machines be tested "free style" as is done by the Swedes and in England, or should openings be chosen randomly with each model playing one white and one black from the same position, as is

fashionable in Germany and Holland (and as recommended by Maurice Robinson elsewhere in CCR)? There are good and bad points to both methods. The opening book is part of the machine and it hardly seems fair to deprive the machine of the opportunity to benefit from a good book by selecting the opening, but on the other hand "free style" testing involves the danger of repeat games and "rigged" opening wins prepared by the makers of one model to defeat a rival. Also, if both machines stick to main lines, we will never see how either plays against irregular openings, which are often adopted by human opponents against computers. I feel that both methods have value, and I have adopted the policy of using the selected opening method at the 30 second/move level and free style at other levels in my own testing, then blending the two methods to obtain one rating. My results showed no significant consistent tendency of either method to favor one company over the other. The opening sometimes decides individual games, but apparently makes little difference on average. Dr. Robinson's tests showed that even the Par Excellence with its very narrow, deep book scored only marginally worse with selected openings than in free style tests by others. Although it seems to make little difference in practice, I personally prefer the selected opening method as the more reliable.

Now we come to time limits. The Swedes test only at 40/2, which has recently become the norm in international tournaments. I have no quarrel with this, but it is of no use for CCR which must evaluate machines very quickly. Several of the machines reviewed herein were received by me within 2-3 weeks of deadline. I have adopted the policy of testing at the 1 minute level, the 30 second level, and very recently the game in 30 minutes level, now that this level is found on all new models and is USCF ratable. Moreover,

since FIDE plans to award ratings and titles at this last speed, it is especially appropriate. Although computer vs. computer results at these moderately fast speeds tend to approximate results at 40/2, there are exceptions. One difference is that the faster speeds tend to magnify any differ- ence in strength, so I have adopted the policy of contracting my rating differences by 25% at 1 minute/move or less vs. 20% at 40/2. Whether or not results at the speeds I employ can predict 40/2 ratings is rather moot, I feel, because I suspect that far more user games are played at these "practical" levels than at 40/2. I think that most buyers want their machine to play well at a minute a move or less, and don't really care how it plays in 4-6 hour games. I have made the assumption that on average computer results against humans at these faster speeds would be the same as at 40/2, as the limited evidence to date on this point is inconclusive. It is well known that at five-minute chess computers play about a class better against humans than at 40/2, but at intermediate levels this is apparently not true.

I would like to take this opportunity to thank several volunteer testers who have run long, time consuming matches for CCR and/or their own amusement. I list here only those who have no commercial involvement with chess computers. Mike Fay reports that Forte B beat Excel 68000 ("A" version) by 10-9 at 40/2, and Mephisto Amsterdam beat Excel 68000 6-4 at same. Maurice Robinson reports that Par Excel beat Super Constellation by 49.5 to 30.5 at 40/2, and Par Excel beat Forte A by 20.5 to 19.5 at same (see his article). Max Harrell played 22 games between Forte B and Leonardo Maestro B at one minute/move levels (except one game at 45/2), resulting in an 11-11 tie. However, at blitz Forte B won every game, 8-0. Mephisto Dallas beat Leonardo Maestro B 8-2 at one min./move level. Jim Walker reports that

Mephisto Amsterdam beat Forte A by only 11-9 at 40/2, while Forte A beat Super Constellation by 40.5-21.5 at 1-3 minute levels. Finally, Rick Weed reports that the "bit-slice" 16 MHz version of the Novag Expert defeated Mephisto Amsterdam by 13.5-10.5 at the 1 min./move level, and the same bit slice beat the old Turbostar 440 by 9-1 at that level.

As for my own testing, space does not permit a full listing of results, but the highlight was an octuple round robin at game in 30 of six of the newest machines. Mephisto Roma 68000 won overwhelmingly with 32 out of 40, followed by a prototype Mephisto Mondial 68000 at 22.5, Novag Super Expert at 19.5, Fidelity Excel 68000 at 19, Fidelity Mach II at 15.5, and Saitek Turbo King at 11.5. The commercial Mondial will think 20% longer than the prototype, which should improve its performance. The Super Expert thought too deeply and got in time pressure too often, which will be corrected in the next production run. The Turbo King lost some games by unnecessarily playing instantly when below 4 minutes and blundering. The Fidelity machines had the opposite problem--they moved faster than necessary in the middlegame, reserving too much time for the endgame. All of these problems are likely to be corrected in later models or production runs. As for the reverse finish of the two Fidelity units, the slower one finishing higher, this is due to chance and to the fact that at the speed they played the large hash tables of the Mach II are of little value. However, in my tests at 30 seconds and one minute levels, the Mach II did perform quite a bit better than the cheaper Excel 68000. The main conclusion from this event is clear--Mephisto Roma is much stronger than the other, cheaper machines.

One problem that showed up in my testing is "targeting". For example, the Mach II was able to score almost 50% against Mephisto Dallas 68000, Amsterdam, and Mondial 68000 combined at a variety of levels (except blitz, where Mephisto Dallas won 9-1). The total score was Mephisto 33, Fidelity Mach II 31. Yet, against almost all other machines, the Mephisto models scored better than the Mach II, often by a huge margin. For example, the Mephisto Dallas 68000 has a slight plus score against the 16 MHz "bit-slice" Expert, but the "bit slice" obliterated the Mach II (11.5-4.5). The explanation is that Fidelity developed the 68000 by using Mephisto as a "sparring partner", and that while their goal may have been merely to strengthen the program, it has been optimized to exploit Mephisto's weaknesses. I refer here to the actual program, not to the opening book. Similarly the Par Excellence scores well against Novag (as in Maurice Robinson's test) because its parent program was developed with the Super Constellation as its "sparring partner". My conclusion is that computer vs. computer results are only meaningful if one includes several unrelated programs among the opponents of each machine being rated. I have been careful to do this.

The most amusing match I ran was a blitz match between the Mephisto Dallas 68020 and the Fidelity Mach II and Excel 68000 (they are nearly the same at this speed). As even the Dallas 68000 beat the Mach II by 9-1 at blitz, I felt that the 68020, running more than twice as fast as the Dallas 68000, just might be able to concede knight odds. I varied the first move to avoid repeat games. Incredibly, playing a piece down, Mephisto won 11.5 to 0.5!! When I attempted to repeat this at 10 minute chess instead of five, Fidelity easily won two games so I quit. I also paired the Mephisto Dallas 68020 against the cheap Fidelity Excel display at blitz, and found them to be even (2-2)--at rook odds! Clearly, five minutes total is not enough time for Fidelity machines to play respectible

chess. I note for the record that the Dallas 68000 was unable to duplicate its big brother's feat-- it lost 3-0 at blitz giving knight odds to the Excel 68000. It did, however, defeat that machine 2-1 while giving odds of pawn and move at speeds of 15-30 minutes total. I feel that these results are all at least partially due to Fidelity's poor time use algorithm on the fixed time for game levels. I trust this will soon be fixed.

Another problem brought to light by my testing is the odd/even ply problem. My predecessor editor maintained that odd plies are much more valuable for full width programs than even plies, and I concur. This implies that strength does not increase smoothly with more time, but jumps when the time allows for five ply searches to be completed regularly. This tends to be at the one minute level for the current full-width machines. By chance the Mephisto 68000 machines with their selective search also seem to show a jump in strength between 30 seconds and one minute, probably because they reach the odd selective ply (11) at one minute. There are however some machines which "jump" at a different level--for example the MM4 seems to jump at 30 seconds. The point is that to minimize the effect of these jumps one should test at two or more levels, as I have done. I have weighted one minute games twice as heavily as 30 second and game in 30 games, both because they take twice as long and to emphasize the results at the stronger levels. In view of the above, I recommend that anyone wanting a strong game from today's machines without taking forever should try the 1 minute/move level-- at faster speeds the quality of play really drops. To illustrate what I'm talking about, at 30 seconds my tests showed a hundred point gap between the Dallas 68020 and Dallas 68000, while at 1 minute it plunged to a mere 20 points when the faster model was no longer alone at 11 ply but struggling to do an

occasional 12. At 3 minutes the Swedish data shows the gap back up to 62 points, not far from the 75 or so predicted by the speed difference. Only by combining 30 second and 1 minute results do I get a realistic value for the difference.

One other method of testing is problem solving, both practical and mating. In general, this tells us little about the relative strength of unrelated programs, but it is a very good indicator of the relative strength of two programs by the same author, and is even more useful for comparing the same program running on different hardware, such as the Fidelity Mach II and Excel 68000. I have used such tests only to estimate ratings for known programs running on new hardware.

A final problem is the fact that most if not all of the manufacturers have adopted a policy of making product improvements without notice or even any notation on the box or machine. Aside from the risk that a supposed improvement may backfire (as apparently happened to Fidelity at the '87 U. S. Open), any significant improvement may confuse the ratings of opposing machines in testing. I try to stay abreast of all new versions, but there is no guarantee of success. It should be obvious that any estimated ratings apply only to the model actually tested. Only those machines with a CRA rating or those employing a World Champion program can be safely assumed to be exactly as tested, though it has been my experience that nearly all supposed product improvements are in fact beneficial.

My 40/2 rating list is based primarily on the Swedish rating list, which appears in the magazine "Ply". Volunteer testers in Sweden and elsewhere play some 300 games a month at 40/2 between computers, which are rated by the Swedish Chesscomputer Association.

The overall list is calibrated by those machines which have played in Swedish human tournaments. Note that Swedish ratings appear to be between 150 and 200 points below ours, at least in the relevant range. Those wishing to subscribe to the rating list (including all match scores) may do so at a price of 60 SEK (about $9) for four lists a year or 110 SEK for eight. Order from SSDF c/o Goran Grottling, Diabasv. 3, 437 00 Lindome, Sweden. Check with your bank on how to arrange payment so that the SSDF actually receives the proper amount after any bank charges involved.

I originally planned to combine the Swedish results with results in human tournaments around the world, but I finally concluded that it would be more accurate simply to award Novag a uniform 60 point bonus based on its overall results in such events. Accordingly, after first deducting 20% of the excess over 1800 (or adding 20% of the deficit), I add 160 points to all Swedish ratings, then 60 more to Novag. This is the best I can do with the available data. Those who are interested in comp- comp performance only should reverse the above steps. In cases where the same program is sold at a higher speed in the U. S. than tested in Sweden I have added the proper adjustment from the table appearing elsewhere in this issue, and enclosed in parens. Finally, where there is no applicable Swedish rating, I have estimated one from known relationships to rated programs and other data, and enclosed in brackets. All Swedish ratings used for this list are based on at least one hundred games, except for the Mach II (43), the Novag Primo (48), and the Express 16k (90).

Ratings at the faster speeds are based solely on my own testing and trusted friends. I again applied the 60 point Novag bonus and other procedures as above, after first con-

tracting the rating differences by 25% as explained above. All ratings not in [ ] are based on a minimum of 100 games unless otherwise noted.

(a) Based on the speed differential from the excel 68000, whose rating is better established, I would predict the Mach II to rise to about 2100. The version I tested was a "B" version.

(b) 56 game sample: should drop to around 2200 with more data.

(c) 30 game sample; results adversely affected by poor time allocation on certain levels.

(d) 70 game sample, mostly at game/30, its worst level. At 1 minute/move, should rate around 2010.

(e) Much lower than the rating I gave last year for a prototype, though I could not detect any difference in the program.

(f) Turbo 540 played 36 games, Excel 80 games, Quattro 32.

(g) Program was optimized for one minute level.

(h) All these Saitek models were not tested enough to rate at blitz, because they do not have a strict 60/5 min. level. In any case, they are all rather weak at blitz, perhaps in the 1800s.

(i) Small sample—from 20 to 60 games.

Readers of last year's CCR will note that most ratings have been lowered. Last year's numbers were apparently a bit too high, based on subsequent results, and the growing familiarity with chess computers is a factor too. The biggest factor is probably that CRA tests (used to calibrate the level of the whole list) are now done more strictly (in big money tournaments rather than private tests) than in former years.

Note also that the blitz ratings are assumed to equal, on average, the tournament ratings. In reality while these ratings may be realistic against humans at 60 in 15 minutes, computers seem to perform nearly a class better at strict five minute.

As an indication of the degree of progress over the last 6-7 years, the old Fidelity Sensory 9 would rate 1760 and the older Champion Sensory Challenger would rate 1670 at 40/2 by the method used to do the above list. As these numbers are very close to then current estimates, this tends to support the validity of the method used herein.

Finally, a warning. Very few machines have reliable U.S. ratings against humans, so it is possible that the lists may prove to be too high or low across the board. If so, I hope they still serve to indicate the relative strength of the various models at the three different levels shown.

RATING LIST

# computer	40/2 rating	30-60 seconds	5-15 seconds
1 Meph Rome 68020	[2235] $2000	[2260]	[2305]
2 Meph Dallas 68020	2206	2211	2272
3 Fid Master 68020	[2195]	****	****
4 Meph Rome 68000	[2185] $1600/1400/1200	2231(b)	[2215]
5 Meph Mondial 68000	(2172) $1000	2182	(2202)
6 Meph Dallas 68000	2156	2152	2182
7 Nov Expert 16 MHz	2153	2211	2212(i)
8 Nov Super Expert & Nov Super Forte 6MHz	[2145]	(2158)	(2134)
9 Nov Super Expert & Nov Super Forte 5MHz	[2130] $500/$300	2138	2114(i)
10 Mephisto Amsterdam	2118	2143	2145
11 Fid Mach II Los Angeles	[2110]	[2115]	[2070]
12 Meph MM4 5 MHz	2107 $700/500/400/300	2143	2099
13 Nov Forte B	2097	2090	2081
14 Nov Expert 6 MHz	(2086)	2115	2118
15 Fid Mach II (B)	2079 (a) $250	2101	2055
16 Nov Forte A	2078	2060	2134
17 Fid Excel 68000	2074	2045	2006
18 Nov Expert 5 MHz	(2073)	2106	2091

2186 GM
2154 GM
2150 GM
2000 (TARI 5 PSION)

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#	Name					Notes
19	Saitek Stratos & Leonardo Maestro B	[2055]	/320	2026(c)	(h)	
20	Fid Avant Garde ("Mobile Master")	2051		2013	2041	2040 IBM AT PS10N
21	Saitek TurboKing	[2035]	$200	1963(d)	(h)	
22	Par Excellence & Avant Garde 2100	2034	$490/160	2010	2027	
23	Mephisto Rebell ("MM3")	2033		1979(e)	2061	
24	Turbostar 540 +	[2025]		2000	(h)	
25	Leonardo Maestro A 6 MHz	2022		[2005]	(h)	
26	Turbostar 540	[2015]		1977(f)	(h)	
27	Conchess Plymate at 5.5 MHz	2011		****	(2068)(i)	
28	Superconstellation	2005		2015	(2037)	
29	Supermondial 4 MHz	1994		2053(g)	2005(i)	
30	Leonardo Maestro 4MHz	(1988)		[1960]	(h)	1650 IBM AT SARGON II
31	Fid Excel Display	[1960]		1908(f)	1806(i)	
32	Novag Quattro	1957		1925(f)	1905(i)	
33	Novag V.I.P. & Novag Primo	1915	$90	1914	1788(i)	1900 IBM AT ChessMaster
34	CXG Advanced StarChess	1790		****	****	
35	Leonardo (no module)	1731		****	****	
36	Saitek Express 16k	1693	$75	****	****	

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CHESS COMPUTER COMPARITIVE CHART

		SAITEK LEONARDO	TURBO KING	NOVAG VIP	SUPER EXPERT	SUPER FORTE
1	OPENING BOOK	100k	100K	3k	32K	32K
2	MEMORY SIZE	80k	80K	16k	96K	96K
3	BOARD: AUTO / TOUCH SENSORY	T	T	-	A	T
4	KEYBOARD INPUT	N	N	Y	N	N
5	LED: SQUARE / COORDINATE	C	C	-	S	C
6	BOARD: WOOD / PLASTIC	P	W	P	W	P
7	DIMENSIONS (inches)	14x9	20x20	5x3	22x18	15x11
8	PIECE SIZE (king)	2"	4"	-	3"	2"
9	DIAMETER OF SQUARE	1"	2"	-	2"	1"
10	AC/DC OPERABLE	Y	Y	N	Y	Y
11	BATTERY OPERABLE	Y	Y	Y	N	N
12	MEMORY BACK UP	Y	Y	Y	Y	Y
13	GAME IN MEMORY	Y	Y	Y	Y	Y
14	UPGRADEABLE	Y	Y	N	N	N
15	TAKE BACK	ALL	ALL	50	ALL	ALL
16	TRACE FORWARD	N	N	N	Y	Y
17	CLOCK DISPLAY	Y	Y	Y	Y	Y
18	SCORE DISPLAY	Y	Y	Y	Y	Y
19	SEARCH DEPTH DISPLAY	Y	Y	N	Y	Y
20	MAIN LINE DISPLAY	Y	Y	N	Y	Y
21	ANNOUNCES MATE	Y	Y	N	Y	Y
22	GIVES HINTS	Y	Y	N	Y	Y
23	PC INTERFACE	N	Y	N	Y	Y
24	RESIGNS	N	N	N	Y	Y
25	PROGRAMMABLE TIME CONTROL	Y	Y	N	Y	Y
26	COUNT DOWN MODE	Y	Y	N	Y	Y
27	MOVE COUNTER	Y	Y	N	Y	Y
28	PLAYS BLACK FROM BOTTOM	Y	Y	-	Y	Y
29	CHANGE SIDES DURING GAME	Y	Y	Y	Y	Y
30	SET UP POSITIONS	Y	Y	Y	Y	Y
31	MATE SOLVING LEVELS	Y	Y	Y	Y	Y
32	ALTERNATE SOLUTIONS	Y	Y	N	Y	Y
33	PRINTER OPTION	N	N	N	Y	Y
34	PROGRAMMABLE OPENINGS	Y	Y	N	Y	Y
35	MONITOR MODE	Y	Y	Y	Y	Y
36	AUTO PLAY	N	N	N	Y	Y
37	BEEPER ON/OFF	Y	Y	Y	Y	Y
38	RANDOM / BEST OPTION	Y	Y	N	Y	Y
39	OPENING BOOK PRACTICE	Y	Y	N	N	N
40	TUTORIAL LEVELS	Y	Y	Y	Y	Y
41	WARRANTY	3 mo	3 mo	3 mo	3 mo	3 mo
42	LIST PRICE (in dollars)	250	n/a	200	700	500

LEGEND:

Y = YES   N = NO   W = WOOD   P = PLASTIC
T = TOUCH   A = AUTO   S = SQUARE   C = COORDINATE
- = NOT APPLICABLE

EXCEL 68000	EXCEL MACH II	MONDIAL 68000	MEPHISTO MM-IV	MEPHISTO ROMA
16K	16K	35K	15K	40k
64K	128K	64K	32K	64K
T	T	T	A	A
N	N	Y	Y	Y
S	S	C	S	S
P	P	P	P&W	P&W
11x10	11x10	10x14	-	-
2"	2"	1.5"	-	-
1"	1"	1"	-	-
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
N	N	N	N	N
Y	Y	Y	Y	Y
N	N	N	Y	Y
ALL	ALL	ALL	ALL	ALL
N	N	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
N	N	Y	Y	Y
Y	Y	Y	Y	Y
N	N	N	N	N
N	N	Y	Y	Y
N	N	Y	Y	Y
N	N	Y	Y	Y
N	N	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
N	N	N	N	N
N	N	N	N	N
Y	Y	Y	Y	Y
N	N	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	Y	Y	Y
Y	Y	N	Y	Y
Y	Y	Y	Y	Y
3 mo	3 mo	3 mo	3 mo	3 mo
300	400	500	400-900	1700-3700

SELECTIVE VERSUS FULL-WIDTH SEARCH

by Larry Kaufman

The issue of whether full width or selective search is superior is very controversial and dates back to the dawn of computer chess. The leading program twenty years ago, MacHack, utilized a tapered selective search, but for most of the intervening years the full width programs were the most successful. In the past couple years Richard Lang has brought Mephisto pre-eminence in microcomputer competition by reviving the tapered selective search, but so far full width programs remain on top in mainframe competition.

First, let's define our terms. A totally full width program I define as one which looks at every possibility to a specified number of "ply", or half-moves. The only exception is that responses to check are usually not counted as a ply. Beyond the depth limit, each side must either try a capture, pawn promotion, or "stand pat", unless in check. A "stand pat" terminates that branch of the search. All Fidelity programs (except Avant GardeMobile Master) fit this definition, as do the older Novag programs (i.e. Constellation) and many of the older programs of other manufacturers, as well as some of the mainframes.

The first step towards selective search is the inclusion of selected checks other than captures in the "quiescence search", the portion of the search beyond the full width limit. Some examples are the Avant Garde Mobile Master, which considers checks to which there is but one reply, the Novag Expert and Super Expert/Forte, which consider selected knight and back rank rook checks, and Cray Blitz, which considers up to two checks of any sort. Another strategy is to extend the search an extra ply in certain situations, such as after a pawn reaches the seventh rank (most Novags, Cray Blitz) or after a double attack (Novag Forte and Super Forte/Expert). All these programs are still generally called "full width" because the selectivity is so limited. The Saitek Turbostar, Leonardo Maestro, and Turbo King programs are said to be of this same type, but make such extensive use of such extension strategies that they are described as "selective search" programs.

The next step towards selectivity is to throw out apparently bad moves before reaching the stated depth limit. Examples include Forte B and Super Expert/Forte, which limit such discarding to the computer's final move, and the Mephisto MM3 and MM4, which reportedly are selective on the final 3 plies. The effectiveness of this approach depends greatly on how accurately the program can identify bad moves. There is always the risk of throwing out a good move that merely looks bad, but the evidence is very strong that the extra depth possible with this approach more than compensates for this in these programs. The Forte B has clearly outperformed the original Forte both against humans and against computers, and the principal difference between the two is just this selectivity. As for the MM4, it is clearly stronger than all full width programs on the same hardware. Its selectivity allows it to look nearly a full ply deeper than these full width programs, which would be worth nearly a full class if it were for free. Apparently the errors caused by the selectivity lose back about half of this, still leaving a large net gain. Novag has also demonstrated the value of this technique in the "VIP" and

"Primo" models, which are clearly the strongest machines to date on the limited hardware they employ.

Now we come to the tapered selective search of the Mephisto Amsterdam, Dallas, and Roma programs. It is quite different from all of the others. True, it begins with a (shallow) full width search, but then instead of only considering only captures and checks it also considers quiet moves. As the search deepens, the number of moves considered decreases as the criteria for consideration become more severe. The selective search runs nine plies deep. Since the full width portion of the search is about three plies less than on a comparable full width machine, this means that on a selective basis the Mephisto can look up to six plies deeper than it would if it were full width, an enormous difference. This enables it to play with an apparent purposefulness quite impossible for a full width program. The drawback is that tactics, especially sacrifices, may be overlooked this way, but on the whole I feel that the Mephisto is superior in this realm as well. Kathe Spracklen, Fidelity's programmer, quotes Ken Thompson (creator of "Belle") as saying "full width means never having to say you're sorry", but I must take issue with this, as there are too many tactics that exceed the depth limits of full width programs.

There are two principal arguments used in defense of full width search. One is that given fast enough hardware, the full width search may see nearly all the tactics while the selective search will still make oversights. This is clearly true for a totally selective search, but if the increased speed is used to expand the full width portion of a selective search program the argument looks flimsy. The extra speed should then eliminate just as many errors from the selective program as from the full width. Indeed, my tests have shown that the Mephisto performs better at

longer time limits against comparable strength super-fast full width programs. Perhaps the reason that the mainframes have not adopted the Mephisto approach is that it requires an enormous number of man hours to implement properly; moreover the techniques are still largely secret. The other argument is that selective search is more effective against full width computers than against human opposition, because they can consistently out search the full width machines, while humans will play for the sacrificial attacks that the selective search is apt to overlook.

This sounds reasonable, and there is some evidence for this in that the Mephisto machines have not outperformed the others in human events by as great a margin as they have in computer-only events, but even if true it does not contradict the evidence that selective search, properly done, can improve the strength of programs against all opposition, computer or human.

Finally, it is much easier to improve a selective program than a full width one. Increased chess knowledge may improve the positional play of a full width program, but it is very difficult to improve its tactical strength except with better hardware. Giving new chess knowledge to a selective program may well improve both its positional and tactical play as it becomes more accurate in identifying tactically promising moves to analyze.

I conclude that the future is with selective search.

RAM, ROM, AND MHz

by Larry Kaufman

When a new chess computer comes on the market, the prospective buyer may wish to make a decision without waiting for neutral test results to be published. If the programmer is an established one, it is possible to make at least a minimum estimate of the machine's strength from the hardware specifications alone by making the plausible assumption that any software changes have been for the better. For the established companies, this has been true over 90% of the time, I feel. According to the Swedish magazine "Ply", over the past seven years 86% of the progress in the strength of microcomputer chess has been due to improved software, and while I would put the figure somewhat lower it is clear that software strength has been in a strong uptrend. I believe that hardware improvement will play the greater role in coming years, but software will still improve steadily, albeit more slowly.

The first hardware consideration is the processor. If the manufacturer has switched to a new one, only the crudest estimate is possible. Megahertz numbers are not directly comparable between different processors, in part because they take differing numbers of cycles to complete one operation. For example, the Novag Allegro is nominally faster than the Mephisto Dallas 68020, 15 MHz vs. 14, yet the Mephisto is actually hundreds of times as fast and nearly a thousand points stronger (and forty times the price!). Different processors! Since most machines over $100 still use the 6502 processor, let's take that as the standard. If the machine in question uses the cheaper 6301 (examples:

Novag Primo and VIP), dividing its speed by 4 gives a good idea of its 6502 equivalent speed. For the powerful 68000, the situation is more complicated. If the program is basically an adaptation of a 6502 program, then dividing the speed by 2 gives a good indication of its 6502 equivalent speed. However, if the program is designed from scratch for the 68000 (example: Mephisto Amsterdam/Dallas/Roma) then its effective speed may approach its stated speed. In other words the Mephisto program at 12 MHz may well be twice the speed of a similar program on a 6 MHz 6502, which probably explains why no similar program has ever been done on a 6502. The 68020 processor may be expected to be 50-100% faster than a 68000 at the same MHz depending on the program; in the case of Mephisto, the 100% figure seems to apply. As for the IBM family of machines, to get 6502 equivalents, I suggest dividing by 4 for 8088 machines, by 2 for 80286 models, and by 1.6 for 80386 units. At least this gives a rough idea.

If we stick to one processor, predicting a rating differential from a given difference in MHz is not difficult; in fact it is the safest prediction one can make in this field. In last year's CCR I wrote about the "double speed = 100 points" rule, but it is now clear that for expert level machines this figure is too high. Based on my analysis of the massive compilation of computer vs. computer results and ratings published by Eric Hallsworth of England, I conclude that the average value of a doubling in speed is now around 75 points, which agrees with the conclusions of a similar study by the editors of "Ply" magazine. If the program is modified to take advantage of the extra speed optimally the figure may revert to 100, but this modification cannot be assumed. Also, there is every reason to believe that this doubling figure will drop with each further doubling, although a study in the ICCA journal

concluded that the decline will be rather gradual. Taking the above into consideration I have revised the chart I published in last year's CCR for speed adjustments. A 6502 processor is assumed, although the adjustments would be very close for other processors:

MHz:	1	2	3	4	5	6	8
Delta:	0	81	127	158	182	202	232

MHz:	10	12	14	16	18	20	25
Delta:	255	274	289	303	315	325	347

To estimate the effect of a speed increase, just subtract the Delta figures for the two speeds. Thus, a 16 MHz unit should play about 121 points better than a 5 MHz version with the same program. This table assumes a time limit of 40/2; at faster time limits the value of a speed increase is somewhat greater.

RAM (Random Access Memory) is used by the program to store information used in the calculation of the move. It is normally measured in bytes; 4K means 4,000 bytes of memory. Sometimes advertisers inflate the numbers by quoting "bits"; to convert to bytes divide by 8. It is possible to write a chess program using very little RAM, but very cheap machines using 1K or less must search very inefficiently and are invariably weak. 2K seems to be the minimum for an efficient search, and is adequate to reach class A. Larger RAM than 2K can be used in various ways; it usually allows time saving techniques. My impression is that each doubling of RAM beyond 2K typically brings returns of around 10% in speed, hence

around 10 rating points, although this cannot be measured directly because the program must be modified to use the extra RAM. In general it seems that selective search programs require more RAM than full width; one reason for their generally higher cost. Whether this is worthwhile depends totally on the quality of the programming. Finally, RAM greater than 16K is normally only useful for hash tables (see article).

ROM (Read Only Memory) stores the program. Increased size can be used for features, opening book, or more sophisticated programming. The smallest chess programs are 2K ROM, and while they can sometimes appear to play half-decent chess they have such meagre chess knowledge that they cannot play much above novice level, perhaps at best class D. 4K is adequate to give most casual players a good game; the best are class C. All programs written for tournament players use at least 16K ROM; this is adequate for class A chess but only with very limited opening books. For a deep and varied opening book and expert level chess 32K is necessary. For a program to play not only well but in a human-like style it must have a great deal of very specific chess knowledge, which normally means 64K. Such programs should be relatively immune from making idiotic-looking moves of the type often made by smaller programs, and have the potential to reach master level if run at very high speeds. Increases beyond 64K are apt to relate primarily to huge opening books and features, which together might eat up most of 64K. In general, a doubling of ROM size is vastly more valuable than a doubling of RAM size, although there are limits.

PIECE VALUES

by Larry Kaufman

Most elementary chess textbooks assign relative values to the pieces, based on pawn = 1, as follows: N = 3, B = 3 (or 3+), R = 5, Q = 9 (or 9.5 or 10). Most chess computers use these numbers in their programs; in fact they play a critical role. But there are serious problems arising from relying on these numbers.

The most glaring problem is the exchange of two minor pieces for a rook and pawn. Any tournament chess player should know that the minor pieces are nearly always superior, except in simple endgames. In the middle game they are fully equal (or even superior) to a rook and two pawns, as I learned the hard way in the 1972 U.S. Championship against fellow Senior Master Greg DeFotis. Yet many chess computers, especially Fidelity's, will give up the two pieces for a rook and one pawn at the drop of a hat, and nearly always go on to lose. I discussed this problem with Fidelity's programmers last year, but as the Excel 68000 makes this losing exchange with alarming frequency it is clear that the problem has not been corrected.

Other piece value problems are improper bishop for knight exchanges (a Turbostar flaw), and unsound sacrifices of a knight for two pawns and meagre positional compensation (Mephisto Amsterdam). Fidelity machines tend to give up their queen a bit cheaply, while Novag machines (especially the Super Constellation) sacrifice the exchange too readily.

It is my opinion that many of these problems relate to the fact that the accepted piece value tables were derived from endgame theory, and are not accurate for the middle game, in which pawns are more ex-pendable and minor pieces more valuable. To prove this I ran a series of blitz games, using the autoplay feature on the Mephisto Dallas, in which I removed a white knight and three black pawns (not rook pawns), varying the choice of knight and pawns, before starting the games. Black won 8-0! I raised the compensation to four pawns, and black still won 3-1 (at 5 pawns they split two games). So it seems clear that at least in the early stages a piece is worth at least four pawns, unless king safety or center domination is involved.

Apparently, Mephisto reached the same conclusion. In a major departure from the Amsterdam program as well as all others, piece values were changed for the Mephisto Dallas program to knight = 4, bishop = 4+, rook = 6, and queen = 11. Suddenly, two minor pieces equal rook and two pawns (as they should), the exchange retains its standard two pawn value, and the unsound piece sacrifices of the Amsterdam disappear. The major drawback is a tendency to underestimate sacrifices of a minor piece for two king-protecting pawns, but this may be dealt with in the future by proper heuristics. The endgame is not harmed because passed pawns receive sufficient bonuses in that phase to reduce the effective value of minor pieces to around three pawns. My only criticism is that the queen should probably rate a tad higher or the rook a hair lower, since queen and pawn are usually superior to two rooks. I predict that the Mephisto Dallas piece values will soon be copied by other programmers, and I recommend them to those human players who feel the need for numbers.

BIT-SLICE MACHINES

by Larry Kaufman

In the past year devices have come on the market using esoteric techniques like "bit slice" and "gate array" to upgrade 6502 chess computers to much higher speeds. The principal manufacturer is a German firm, Schaetzle & Besteh. The most available model is a 16 MHz speed-up of the Novag Expert. The device is a separate metal box weighing several pounds which is connected by cable to the Expert board, which must be modified by a technician to accept the so-called "Turbo Box". So far no chess computer manufacturer has offered any chess computer using these technologies to the public, because of the high price and questions of reliability. If one of these manufacturers does offer such a computer to the public, it will be because these difficulties have been largely surmounted.

I tested the Expert 16 MHz at great length. It did play the same moves on fixed depth setting as the 4 MHz Expert in one- fourth the time, as it should. It handles the time controls properly; in other words it searches four times as many nodes on a given level as the 4 MHz version, giving it nearly one extra ply of search depth. My formula (see "RAM, ROM, & MHz" article) predicts a gain of 145 points, about the average difference at 40/2 on the Swedish and English rating lists. My own tests at 30 seconds and one minute levels are fairly consistent with this. It rates about equal with the Mephisto Dallas 16 bit in my tests at the faster speeds, but somewhat below Mephisto on the 40/2 lists. Against human opposition it may even surpass the Mephisto 16 bit (but not the 32) because the Novag style is more aggressive, but the evidence is mixed on this. Both appear to play close to the magic 2200 level. A 20 MHz Expert held a master rating for quite a while, but eventually lost it.

Aside from strength, I had many problems with my unit. It had a reset problem which caused it to ignore pawn captures unless turned off and on repeatedly before each game. It would sometimes go dead or refuse to accept my moves in a game, perhaps due to overheating. On top of this, many Novag features, such as clock, printer, and game memory when turned off are not available.

An 18 MHz Avant Garde Mobile Master also exists, but as it reportedly suffers from even worse overheating problems I don't consider it a commercial unit. Electronic Games, which had the only one I know of, reports that Mephisto Dallas 16 bit beat it 4.5 to 1.5 at 40/2, but the 18 MHz won 17-13 at blitz. Theory and practice indicate these two machines are very close in strength.

With the Mephisto Mondial running faster than the Dallas, and about a quarter of the price of the bit slice machines, it is obvious that they are totally noncompetitive. However, if a bit slice version of the Mephisto MM4 or the Novag Super Expert, the two strongest 6502 programs, becomes available, it should be a solid master and may warrant consideration by some.

HASH TABLES

by Larry Kaufman

"Hash" or transposition tables have been used for years in the mainframe and research chess computers, but 1987 marks their first appearance in commercial machines. Now used only by Fidelity and CXG, these tables will probably become standard in all expert level machines in the next couple years, so it is important for the would-be buyer to understand what they can and cannot do.

We are not referring here to the ability to detect transpositions into the opening book, an unrelated area at which Mephisto and Sci-Sys computers excel. We are talking about storing the evaluation of positions reached during the search to avoid re-analyzing those positions should they arise later in the search by a different order of moves. The idea is to save time so that a deeper search may sometimes be possible in a given time. Experience shows that for full width programs, as long as the search depth is at least four plies the time saved in avoiding re-analysis is generally greater than the time needed to store the positions. The time saved tends to grow with increasing depth and is more pronounced on the even numbered plies. For commercial machines such as Fidelity's this means that the tables are beneficial for all time limits of 15 seconds per move or slower, though they are a hindrance at blitz. Perhaps in future models Fidelity will shut off the tables for blitz chess, or better yet make this a user option.

Because more transpositions (percentage-wise) occur in simple positions, the speed gain from the tables rises sharply as the pieces come off the board. In king and pawn endings, especially those in which the pawns are blocked, the gains can be enormous. There is one classic study of this type, about a dozen moves deep, which the Fidelity 68000 can solve in a few minutes while the older Fidelity models might take years to solve. But with even one piece per side on the board the gains drop to the vicinity of 2-1 or so for "excel 68000", still quite significant.

In the middle game, though, I believe the gains are quite small for this machine, perhaps a few percent. Regrettably I have no way to measure it directly as the tables cannot be turned off. By comparing its speed to the "Excel Display", with a similar program without hash tables running at about half the effective speed, I can see that the middle game gains are modest.

A published study by the Hitech team concluded that for six ply searches (the relevant depth for commercial units at 40 in 2), hash tables nearly double the middle game speed. However, the table size was 1000 times that of the Excel 68000, which can only store about a thousand positions. A million positions would be overkill for this depth (Hitech normally searches at least 8 ply), but as a six ply search is apt to require examing hundreds of thousands of positions it is obvious that a mere thousand positions is not enough, and this explains why the middle game speed-up is so small for the Excel 68000.

The Hitech study also concluded that on average each doubling of the table size brings about a 7% speed-up. Perhaps in recognition of this, Fidelity has come out with the "Mach 2"-- same program as the Excel 68000, but with room in memory for about 16,000 positions. According to the Hitech rule this should bring about a 28% speed increase, and for six ply middle game searches this is reasonably close to what I observed. In the endgame, the gain may be in the range

of 2-1. Overall, I think it is fair to say that the Mach 2 should be roughly comparable to the Excell 68000 running at 16 MHz instead of 12.

One problem Fidelity may be experiencing is that in most middle games, the effect of the hash tables is to permit the sixth ply to be completed at 40/2 while without the tables the ply would be only partially done. This sounds good, and it is, but there is considerable evidence that odd plies are much more valuable than even ones. The machine "Bebe", one of the top five in the world, just skips even plies entirely. So I suspect that the hash tables are very valuable on the 68020 machines which Fidelity uses in tournaments, because they run fast enough to search 7 plies routinely. If Fidelity ever markets a 68020 machine with large hash tables I feel confident that it will be of master strength, but unfortunately at this time 68020 units are very expensive.

The seriousness of and reasons for the above odd/even effect are matters of some controversy and vary with the program. For a true full-width search like Fidelity's I believe that the effect is most pronounced and relates primarily to positional play, not tactics. The reason is that if the computer finishes its search with the opponent's move, as it generally does in an even ply search, and that final move is a good one, the computer will look for a way to postpone that move by making a time-wasting move, perhaps harming its own position without ultimately preventing the opponent's good move. On an odd ply search, it will concentrate on getting its own pieces to good square, a more productive enterprise than stalling the opponent's good moves.

One relatively little explored question is the value of hash tables in a selective search program. The only commercial example is the CXG "Sphinx", which I don't yet have.

The general concensus seems to be that the tables are still valuable, but less so than for a full-width program, which is one factor in Mephisto's reluctance to embrace them. I imagine their are just less transpositions in a selective search.

My overall conclusion is that while hash tables are certainly a plus, they require a lot of RAM memory (say at least 128k, enough to store 16000 positions) to be of substantial benefit outside the endgame. Even then, the quality of the program remains the most important factor along with processor speed. As memory costs drop and speeds increase, we can expect hash tables to grow in importance with each coming year.

SOFTWARE

by Larry Kaufman

For the first time, Computer Chess Reports is now including coverage of PC chess playing software. We have resisted in the past in part because the playing strength of programs depends greatly on what machine they run on. Moreover, versions written for different brands of computers may have different features and may even be totally unrelated programs by different authors, as is the case with "Coffeehouse Chess Monster". Unless otherwise stated, all comments herein refer to the IBM versions. Testing was done on an IBM AT clone at 8 MHz, which is roughly four times the speed of a standard IBM XT or PC at 4.77 MHz. I also ran some spot tests which indicate that if the programs are similar, playing strength on the Apple should be close to the IBM XT, while on an Apple IIGS, accelerated Apple, or Macintosh it should be close to the IBM AT. Finally if you are lucky enough to have a 386 based machine or a <u>MAC II, you can expect performance around a hundred points above the IBM AT level.</u>

Only three programs, PSION, CHESSMASTER 2000, and SARGON III were tested, as the others are generally considered not competitive in terms of playing strength, though they may be of interest for their features. Of the "big three", I can state without reservation that PSION, the least popular (in the U. S.) of the three, is the strongest.

PSION, by Richard Lang, is the predecessor to the Mephisto Amsterdam/Dallas/Roma series. In fact the latest and hence strongest PSION version, PSION II for the Atari ST, is virtually identical to the Mephisto Amsterdam program. As the Atari ST runs at 8 MHz vs. 12 for the Mephisto, the Atari PSION should play about 42 points weaker than the Amsterdam. The latest rating lists from Sweden and England place this spread at 40 and 43 points respectively, an amazingly close agreement between theory and practice. My tests (at one minute level) place the IBM version on my AT about 80 points behind the Amsterdam, which still leaves it about fifty points above the Par Excellence and more than a hundred points above SARGON III on my AT. Of course, on an IBM XT or PC the strength drops about 150 points to the vicinity of 1900, but the gap over other software remains. The relative obscurity of PSION cannot be blamed on features or board display, both of which are excellent. Probably, the reasons are 1)the lack of an Apple version 2)poor marketing 3)The fact that most software purchasers are not strong chess players and cannot appreciate expert level play 4)The style of play is much less enterprising and exciting than Chessmaster 2000, though sounder.

(handwritten margin notes:)
-80
2030
+100
2130
PSION)
MAC II

Sargon III, by the Spracklens (Fidelity's programmers) is a predecessor program to the Excellence. My one minute/move tests on my AT rate it in the mid 1900's, near the old Excellence 3 MHz. This implies a rating of around 1800 on the PC or XT. The Apple version is older and should rate a bit lower than this. Features are good, especially on the IBM version. Sargon 4 already appears on the English rating list of Eric Hallsworth, with (surprisingly) a slightly lower rating than Sargon 3, but it is not clear on what machines they were tested, and I have not yet seen a copy myself.

(handwritten margin notes:)
+100
2000
Sargon III
Mac II

Chessmaster 2000, by David Kittinger (Novag's programmer) and others, is described as an upgrade of the old Novag Constellation program. It appears to be about fifty points weaker than Sargon III on a computer vs. computer basis, but the typi-

cal aggressive Novag style of play may suffice to make it Sargon's equal against human opponents, though data is lacking. At blitz chess I found Chessmaster 2000 to be quite superior to Sargon III, just as Novag machines are superior to Fidelity's at blitz. Of course, if you have a slow machine, don't expect too much. After all, a standard Apple runs about one third the speed of the old Constellation 3.6, and as the programs are similar the strength of Chessmaster on an Apple can hardly be expected to reach class A. Still, the excellent features, bold play, and suitability for fast games makes this program very popular. I believe that Chessmaster 2100 is planned for the Macintosh with a similar program to the Fidelity Excel 68000; if so it may perhaps rival the PSION Mac version, unless PSION is also upgraded. The decision of Software Toolworks to switch from Kittinger to the Spracklens will undoubtedly cause considerable confusion, as the style of play is so different.

To sum up, while PC software is not markedly inferior to that in the dedicated machines (generally lagging by a couple years), unless you own a high speed computer, generally at least around $2000, you cannot expect performance on the level of even the $100 dedicated chess machines.

Finally, I would like to mention Chess Quiz by David Lees as an interesting program which does not play chess but presents, times, and grades solutions to over 1600 chess problems.

ANNOTATED GAMES

by Larry Kaufman

The following game was my only loss to the Mephisto Dallas 68000 in a ten game series at 45/90. I played the Mephisto Dallas 68020 at the same time, winning 6-4, but beat the 68000 8.5-1.5. Except for the two board simul aspect, I treated these games as serious tournament games. Colors were alternated, and no repeat openings allowed. This game impressed me the most.

White: Meph. Dallas 68000(as in Mondial)
Black: Larry Kaufman IM

1 c4 Nf6 2 Nc3 c5 3 Nf3 e6 4 d4 cd4 5 Nd4 Bb4 6 Bd2 b6 7 a3 Bc3 8 Bc3 Ne4 9 Nb5 o-o 10 e3 Bb7 11 Qg4 Nc3 12 Nc3 f5 *(perhaps 12...d6 was better)* 13 Qf4 Nc6 14 Rd1 Ne7 15 Qd6 Bc6 16 Rd2 Ng6 17 Nb5 *(white has outplayed me)* f4 18 e4! Be4 *(a dubious sac, but what else?)* 19 Nc7 Qg5 20 Na8 Ba8 21 Qd7 Kh8 22 f3 Ne5 23 Qd6 Rg8 24 h4 Qf5 25 Bd3 Qf6 26 Be2 Ng6 27 h5 Nh4 28 Kf1 Qg5 29 Bd3 e5 30 h6! gh6 31 Qd7 e4 32 Be4 Be4 33 fe4 Ng2? 34 Qd4 Rg7 35 Qg7! Kg7 36 Rg2 and black resigned.

Next, an impressive win by Novag Forte B over a near-master in an Alabama tournament, played August 22, 1987:

White: Novag Forte B
Black: Moshe Khatena (2190)
1.e4 Nf6 2.e5 Nd5 3.d4 d6 4.Nf3 Bg4 5.h3 Bh5 6.Be2 e6 7.c4 Nb6 8.Bg5 Be7 9.Be7 Qe7 10.O-O O-O 11.b3 Nc6 12. Nc3 Bg6 13.ed6 cd6 14.a3 a6 15.d5 Nd8 16.Bd3 Bd3 17.Qd3 e5 18.Re1 Nd7 19.b4 b6 20.Nd4 Nf6 21.Nf5 Qd7 22.Qf3 g6 23.Nh6

Kg7 24.c5! bc5 25.bc5 dc5 26.Re5 Rb8 27.Qe3 Rb3? 28.Nf5! Kh8 29.Qc5 Rg8 30.Nh6 Re8 31.Rae1 Kg7 32.Re8 Ne8 33.Ng4 Rb7 34.Qd4 f6 35.Re8 and black resigned.

The following two games are from a match of the Fidelity Excel 68000 vs Novag Forte B.

White: Forte B
Black: Excel 68000
1.e4 e5 2.Nf3 Nc6 3.Bb5 a6 4.Ba4 Nf6 5.O-O Be7 6.Re1 b5 7.Bb3 O-O 8.c3 d6 9.h3 Na5 10.Bc2 c5 11.d4 Qc7 12.N(b)d2 Nc6 13.a4 Bd7 14.axb5 axb5 15.Rxa8 Rxa8 16.Nb3 exd4 17.cxd4 c4 18.N(b)d2 d5 19.e5 Ne8 20.Bb1 Nb4 21.Nf1 Ra1 22.N(f)d2 Qb6 23.Re3 Na2 24.b3 Nc1 25.Qc1 Bf5 26.Qb2 Qa5 27.Bxc4 dxc4 28.Ne4 Nc7 29.Ne1 Nd5 30.Nc2 Rb1 31.Qb1 Ne3 32.Ne3 Be4 33.Qe4 Qe1 34.Kh2 Qf2 35.Nf5 Bf8 36.e6 fxe6 37.Qxe6 Kh8 38.Qc8 Qf4 39.Kg1 Qc1 40.Kh2 Qa3 41.d5 Qc5 42.Qc5 Bc5 43.d6 Bd6 44.d7 c3 45.Ne3 Bd8 46.Nc2 Kg8 47.Nb4 Kf7 48.Kg3 Ke6 49.Kf4 Kd7 50.Ke3 Be7 51.Na2 Bc5 52.Ke2 b4 53.Kd3 Bd6 54.Kc2 Kc6 55.Kb3 Kd5 56.Nc1 g5 57.Nd3 Ke4 58.Ne1 Ke3 59.g4 Kf2 60.Nc2 Kg2 61.Ne3 Kh3 62.Kc4 Kg3 63.Kb3 Bc5 64.Nc4 Kg4 (0-1)

White: Forte B
Black: Excel 68000

1.e4 c5 2.Nf3 d6 3.d4 cd4 4.Nd4 Nf6 5.Nc3 a6 6.Bg5 e6 7.f4 Be7 8.Qf3 Qc7 9.O-O-O N(b)d7 10.g4 b5 11.Bf6 Nf6 12.g5 Nd7 13.f5 Bg5 14.Kb1 e5 15.Nd5 Qb7 16.Ne6 fe6 17.Qh5 g6 18.fg6 hg6 19.Qg6 Kf8 20.Qg5 ed5 21.Qd8 kf7 22.Qh8 Nf6 23.Qh6 Bg4 24.Rd5 Qe7 25.Rd2 Qf8 26.Qf8 Rf8 27.Bg2 Ke7 28.c3 Bh5 29.Kc1 Bg6 30.Rf1 Re8 31.Rd6 Kd6 32.Rf6 Re6 33.Re6 Ke6 34.h4

Kf6 35.Kd2 Bf7 36.Kc2 Kg6 37.Bf3 Kh6
38.Bg4 Bg6 39.Kd3 Bf7 40.b3 Kg6 41.c4
bc4 42.bc4 Be8 43.c5 Kf6 44.Kc4 Bf7
45.Kb4 Ba2 46.Ka5 Ke7 47.c6 (1-0)

Below is a reprint of a game between Hi-Tech and Allan Savage (2412) played at the Pennsylvania State Championship (Aug. 30, 1987). Annotation compliments of ICCA Journal vol 10 No. 3, Sept. 1987.

White: Allan Savage (2412)
Black: HiTech

1. e4 e5 2.Nf3 Nc6 3.Bb5 a6 4.Bxc6 dxc6
5.O-O f6 6.d4 Bg4 7.c3 Bd6 8.dxe5 fxe5
9.Qb3 Bxf3 10.gxf3 Ne7 11.Be3 Qd7?!
12.Qxb7 O-O 13.Qb3+ Kh8 14.Nd2 *It is all from the ECO up to here, which appraises the position as "a definite advantage for White". However, HiTech had seen one move further ahead!* 14. ...Rxf3! 15.Kh1! *(if 15.Nxf3 Qg4+ 16.Kh1 Qxf3+ 17.Kg1 Qg4+ 18.Kh1 Qxe4+ 19.Kg1 Nf5 is to Black's advantage)* 15.
...Rff8 16.Rg1 Ng6 17.Qc4 Nf4 18.Rg2 a5
19.b3 *this seems a pointless move. Black is not threatening anything on the Q-side. Better is 19.Rag1.* 19. ..Be7 20.Rag1 Nh3! *A very interesting move that is difficult to meet. After 21.R1g2 g6! 22.f3 (to meet the threat of Bh4), it is still anybody's game. Instead of this line, White gives up the exchange for a Pawn, to reach a position where Black has no more attack and has enough weak Pawns so as to make winning extremely difficult. To me it is ammazing that HiTech is able to manage the technique to convert this very intricate position to a win.*
21.Rxh3 Qxh3 22.Qxc6 Rad8 *Very precise. If now 23.Qxc7 Rxd2! 24.Bxd2 Rxf2 25.Qb8+ Bf8 wins.* 23.Rg2 Qd7 24.Qxd7 Rxd7 25.Nc4 *White's position is very solid, and he is threatening Black's weak Pawns. Given that he already*

has a Pawn for the exchange, it seems that Black's winning is almost to be ruled out. However, HiTech finds the weak spots in White's position. 25. ...Rd3! 26.Nxe5 Rxc3
27.Bd4 Rc2! *With weak Pawns everywhere, it is important to utilize the dynamic possibilities in the position. For this purpose, keeping the Rook's on the board is a good idea.* 28.d7 Rf7
29.Ne5 Rf4 30.Nd3 Rxe4 31.Bxg7+ Kg8
32.Bc3+ Kf8 33.Bxa5 Ba3! *White's attack has led to the temporary win of another Pawn, and the reducing of Black's Pawns to two. However, now the Black pieces take charge. The text move fixes the a-Pawn in place, and prepares to defend the c-Pawn before wiping up the White Queen side. 34.b4 Re7!* 35.Rf3+
Kg7 36.Nc5 Rxa2 37.Na6 Ree2! *HiTech knows about the absolute 7th rank! Now 38.Kg2 Bxb4! would win. This was not possible with the Rook on e7.* 38.Nxc7 Rxf2 39.Ne6+ Kg6
40.Rxf2 Rxf2 41.Kg1 Rb2 42.Nf4+ Kf5
43.Nd3 Rd2 44.Nf2! *The Knight must come to the aid of the King, else Black gets a mating attack.* 44. ...Kf4 45.Kg2 Rb2 46.Bc7+ Kf5
47.Bd6 Bxb4 *Now Black's task has been simplified, although winning this position was something that many masters in the tournament did not think possible. White is well advised not to exchange Bishops, as this makes the win much easier. However, HiTech maneuvers so as to force this exchange.* 48.Bg3 Bc5 49.Kf3
Rb3+ 50.Kg2 Bd4 51.Bd6 *It is also possible to win with 51. ...Bxf7 52.Kxf2 Kg4. However, the text move is more thematic.* 51.
...Be5 52.Bc5 Rb2 53.Be3 h5 54.Bc5 Kf4
55.Ba7 Rd2! *Again threatening to exchange Bishops with Bd4.* 56.Bb6 Bd4 57.Bxd4 *On 57. Bc7+ Ke3 58.Bg3 Bf6 59.h4 Be7 White is in zugzwang and must move his King. There is a little trap worth playing (especially against a computer): 60.Kh2! However, HiTech would just have continued Kf3, and not allowed the drawn ending that occurs after Rxf2+??* 57. ...Rxd4
58.Nh1 Rd2+ 59.Nf2 and White resigns.

PITY THE POOR CHESS COMPUTER BUYER

When our company, Institutional Computer Development Corp. (ICD), decided some time back to use quotes from Computer Chess Reports in our Chess Life ads, we were told by the business office at the United States Chess Federation that those quotes could only be used if a rider were attached explaining the relationship between Computer Chess Reports and I.C.D.

We chose, instead, to withdraw all references to Computer Chess Reports instead of making some veiled, indirect admission of guilt as to having some type of seedy relationship with a magazine supposedly pretending to be objective in the sensitive area of computer chess ratings. It was obvious to us that simply by making a statement of any relationship, we would be planting a seed in the consumer's mind that would invariably taint both ICD and Computer Chess Reports.

Fasten your seatbelts folks! Here comes the admission that the Chess Federation business office thought you should know so that you would be protected from unscrupulous practices. There IS a relationship and ALWAYS HAS BEEN a relationship, and I hope there ALWAYS WILL BE a relationship.

About six years ago when chess computers were beginning to feel their oats, strengthwise, and manufacturers began to see that Fidelity was not necessarily the only game in town, the competition became fierce, to say the least. It seemed as if every chess computer came with a dress box that made some claim to being the very, very, very, very best program in the galaxy. These claims, of course, quickly trickled down (can something both trickle AND do it quickly at the same time !?) to the retailers who, possibly depending upon their product mix, seemed to be constantly diametrically opposed to each other on matters such as playing strength and style of play.

Being one of those who was assigned to man ICD's toll-free line, I was constantly bombarded by customers who were told something or other by some other company and they wanted to know our opinion. Typical questions: "Is it REALLY true that the $99 Supercharged Schvuggie is actually playing 2550 at tournament time controls as I was told by John's Bargain Basement Discount Wholesale Photography Store Mail Order Company?" or "I just spoke to Jeff's Diner and Chess Computer Corporation and he said that the Mating Season Chess Computer can solve typical mates-in-750 moves in 15 seconds, does that sound right to you?" or "I just spent 2 hours on the phone with Mike's Discount Landscaping and Computer Chess,and he said that for just $2000 I could buy a device that would upgrade my current $14 mini, micro to play just slightly better than Garry Kasparov; do you guys sell that?"

No one out there was attempting to objectively put the chess computer market into perspective. It was at this point in time that Dr. Enrique Irazoqui appeared as if by divine intervention. Enrique was a chess computer enthusiast to say the least. He became one of our customer/friends who buy product and call back just to schmooze or give feedback on their computer chess experience. Enrique proved to be invaluable to ICD because he would literally spend 18 hours a day playing computers against each other and analyzing the results and style of play and reporting this

information back to us so we could pass same along to our customers.

His abilities to project accurate chess ratings based upon his personal experiences were uncanny. He had boundless energy and would always look beyond all the hype and be able to come up with recommendations of how programs could be improved. We thought, "What a great idea it would be if we could create a magazine that would make public the findings of Enrique!"

I traveled to Dartmouth College in New Hampshire to meet Enrique for the first time, and I was extremely impressed. Practically his entire living room was covered with computerized chess machines. We reached an agreement on how the magazine would be organized, but the very most important agreement was that Enrique would have TOTAL CONTROL over the editorial content of the magazine. In other words, if ICD did not like, for one reason or another, what Enrique discussed in the magazine, it could choose not to publish the magazine at all. But if the magazine were going to be published, it would be published in its entirety EXACTLY as Enrique wrote it.

It was mutually agreed that since Enrique had absolutely no financial stake in any of the chess computer manufacturers or any of the chess computer retailers, then his magazine would be seen as what it was- an objective source of accurate information on the world of commercial computer chess.

With International Master Larry Kaufman having taken over the reigns in the last two years, nothing has changed. Larry is very much as dedicated to the task of objectivity as was Enrique. In addition, Larry, having chaired the U.S.C.F. human ratings committee and having attained a chess rating of OVER 2500, had already established himself as a highly respected member of the chess community well before he took on the monumental task of editing Computer Chess Reports.

Larry has been truly untiring in his search to uncover THE TRUTH about chess computers. I speak to Larry on a daily basis, and there is never a time when he is not spewing forth data on his own testing, or telling of results from all over the world where he has established contact with those individuals or organizations whom he can trust for reliable information, and he is forever bombarded by all of the chess computer manufacturers for information on how they may improve the performance of their own units. Larry has been to every corner of the United States in the last two years on behalf of Computer Chess Reports to attend this computer chess tournament or that so that you, the reader, could be correctly informed.

We trust Larry implicitly and, even better, it appears that each of the chess computer manufacturers feels the same. And in this field so permeated with paranoia, that is SOME accomplishment. Even OUR competition (even though we, of course, have no competition), other retailers, appear to trust Larry's opinions.

This brings me back to my first point. Why did the business office of the U.S.C.F. request that ICD bring forth its relationship with Computer Chess Reports? Larry was not kind to the U.S.C.F. in the 1986 Reports, but ICD was not in any way responsible for that opinion, and, interestingly enough, some of Larry's fiercest criticisms have been adapted by U.S.C.F. Note how Novag, Mephisto, and SciSys have now gained recognition side by side with Fidelity in the Chess Federation's own 300 pages of advertising of chess computers this year; Larry has now been reinstated on the human ratings committee;

and the Computer Ratings Agency has been taken out of the hands of the U.S.C.F. business office and placed in the hands of Frank Cammarata, one infinitely less politically motivated.

Yes, ladies and gentlemen of the jury- ICD is guilty of owning the publication rights to Computer Chess Reports. We are guilty in the first degree of being associated with Dr. Enrique Irazoqui and I.M. Larry Kaufman. We are, furthermore, guilty of trying to help our customers make the right decision for themselves. And we are also positively guilty of not paying the Senior Editors nearly enough for the incredible number of hours they religiously dedicate to put out the finest magazine of its kind. Many of us at ICD are also guilty of spending uncompensated hours of our own time in helping to get the magazine together and out the door. Computer Chess Reports should also be condemned for losing money on all six issues so far.

So, you ask, why DO you do it? To be perfectly frank, we do it because it creates interest in our field and often, but not always, that interest translates into sales of chess computers. We do it, also, because it saves our sales people endless hours of trying to convince potential customers that the baloney being served by some in our industry should be taken with huge volumes of salt. We do it because this industry needs a voice that is not politically or financially tied to the United States Chess Federation. And we do it because we at ICD are ALL proud to be associated with this publication. We feel good about it, period!

I suppose to abide by the U.S.C.F.'s new rules, we could attach the above rider to any of our future ads that quote from the Reports, but I wonder if the U.S.C.F. would be willing to pick up the expense of the three pages that would be necessary to do so.

There's one more item on the agenda before you are finished with me for this year. We need to discuss the Computer Ratings Agency (CRA). As mentioned earlier, Frank Cammarata is now in charge of CRA, and Larry assures us that Frank is truly interested in making it work the way it was intended. THAT is a tremendous step in the right direction, but the obstacles that remain may yet serve to destroy any attempts to accurately officially rate commercial chess computers.

As you probably know from reading the 1986 Computer Chess Reports, the 2100 official CRA rating for the Par Excellence was a travesty. However, nothing has been done by the U.S.C.F. to correct the misimpression that this rating has created in the minds of the readers of Chess Life. How many of the members of the U.S.C.F. and the general public have purchased the Par Excellence fully expecting it to have played 2100 chess because THE UNITED STATES CHESS FEDERATION SAID SO. This damage has already been done, and short of refunding money to all those who may have been mislead, there is not much that can now be done. However, it is the future damage that has yet to come to light that might REALLY be the unraveling of CRA.

You have probably noticed that since Par's rating, until recently, nobody has used the official rating. Why? because no other manufacturer thought it could overcome the 100-120 point advantage that Par was given. That was pretty much proven when, during the 1986 and 1987 U.S. Opens Fidelity itself could not manage to better the 2100 mark even with units that they thought were substantial improvements over the Par (they received 2066 and aborted 1940 ratings respectively).

And now that technology has taken us to greater heights, machines such as Mephisto Mondial play in a CRA ratings event and wind up with a 2154 rating. So, what would you do if you were in Mephisto marketing. Could you advertise the rating knowing full well that the general, uninformed public would say, "Gee, its only 54 points better than the Par and it costs more than twice as much!" How incredibly frustrating it is!

I look forward to the upcoming ads from Fidelity touting the Los Angeles program. For some reason the CRA is allowing Fidelity to add games on to their California test in order to attempt to receive a master rating. As you know from Larry's report, the unit running in the American Open was a 68020 32-bit machine. However, Fidelity is planning on putting the same program in its 68000 16-bit unit. How much advertising leeway will Fidelity get in promoting the rating for a machine that was not used??? Only time will tell. In addition, we have just learned that at the extension of the CRA given to Fidelity (it took place in Connecticut this past weekend), the Los Angeles 32-bit computer actually LOST points. It appears now that the "official" rating will now be approximately 2183 or only 29 points higher than the much less expensive Mondial. Therefore, it seems unlikely that we will see any outrageous claims on the Los Angeles program after all.

The biggest blow to the CRA may come from Novag. The American Open CRA test of the Super Expert was explained by Larry elsewhere in this issue, but can you imagine if the Super Expert is lucky enough to maintain the 2300 rating after the next five rounds. What will that mean? Number 1, the Super Expert will be put on the same pedestal as the Par Excellence was two years ago, and, secondly, no other manufacturer, including Novag, will EVER want to get another chess computer officially rated.

Then we will get just what we all deserve. We will not be able to advertise any other ratings but Superconstellation, Par Excellence, Los Angeles (if Fidelity does well in its extension), Mondial, and Super Expert (the only units with "official" ratings). So these units will remain viable products into the next century and there will be little incentive for manufacturers to better the abilities of their product lines.

Even if the above scenario should not hold true, there are other impediments. The cost of receiving an official rating is prohibitive. An average of close to $5000 must be spent on entrance fees, prize funds, operator expenses, traveling and food expenses, cost of units used at CRA tests, cost of units given to CRA for validation, and CRA fees. Chess computer manufacturing, contrary to public belief, is not a Fortune 500 business.

We should be encouraging manufacturers to get ALL their products rated. Would it not be wonderful to have an accurate rating for every single chess computer on the market, even the inexpensive ones? But how can we ask a manufacturer who may market 20 different units to pay $100,000 for the privilege. Who do you think will ultimately pay the price? Besides, I know of no company in this business that has that kind of money to devote to such a task.

So what are we left with? We have had close to 200 chess computers introduced into the American market in the last 4 or 5 years since the idea of CRA was developed, and LESS THAN 2% have "official" ratings. And, of those 2%, perhaps 30% to 50% are misleading. Added to this is the fact that no one may publish any ratings estimates other than "official" ratings in Chess Life. This "foolproof" system was developed because someone at the U.S.C.F. was convinced that the readers of Chess Life were being sub-

jected to exaggeration and misinformation by manufacturers and retailers alike (IN-CLUDING the U.S.C.F. itself). Folks, aren't we glad we are all protected from that? It seems to me that the solution is FAR WORSE than the problem ever was.

I have proposed before and I will propose again that chess clubs all over the country be solicited as volunteers in an attempt to achieve mass human testing of chess computers. Checks and balances can be put in place to assure that cheating does not take place. We have seen such an example from the Mobile, Alabama Chess Club, but the results have not been made public because the folks in Mobile are not under the auspices of the CRA- nonsense.

All chess computers would be submitted to testing in at least three different sections of the country to avoid local ratings variations and, perhaps highest and lowest scores could be discarded. Such a system would allow for HUNDREDS of games per computer and a rating that would be vastly more accurate than what we are getting now.

So, there you have it- my views on this publication and the CRA. I have much more to say, but since we are going to need to fill up dead space in the 88-89 Reports, I might as well leave it for then. In the meantime, if you have any horror stories (or pleasantries) to relate on anything having to do with the computer chess field, write me a note in care of I.C.D. Corp., 2951 Merrick Road, Bellmore, NY 11710. It might just make for interesting reading for our growing readership. Natural-ly, if you wish your correspondence to remain anonymous, that is the way it shall be.Thanks for your patience.

COMPUTER RESELLERS 23rd

Chess computers are our specialty

we shall not sell another

It maketh us to buy large quantities of product

It maketh us to sell all brands

It maketh us to discount more than others

It maketh us to test them one against another

the manufacturers sometimes disagree with our test results

their whining and complaining discomfort us

We leadeth our customers down the path of chess knowledge

with toll free lines to assist them

Yea though we test all the machines thoroughly

some of them still breaketh

However our service department repaireth with glee

We preparest our ads with care and run them against our competitors

we knowest our service will be better

and we attempt to beateth all other prices

so that our order basket will runneth over

Surely the madness of this profession will follow us

all the days of our lives

and we will mumble "E2 to E4" forever.

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ABOUT LARRY KAUFMAN - SENIOR EDITOR

Larry Kaufman, one of America's highest rated chess players, took on the position of Senior Editor of Computer Chess Reports, as did Dr. Irazoqui in the case of past issues, with the understanding that no commercial interests; be they manufacturer, retailer or Federation would sway the testing in any manner, shape or form. Larry has spent the past months testing chess computers (sometimes into the wee hours of the night) against each other, bringing them to human tournaments, and gathering information from all over the world in order to create, by far, the most intensive study of the commercial chess market ever put together.

Larry was born on November 15, 1947 and lived in Washington, D.C. until 1975 when he moved to North Miami Beach, Florida where he now lives with his wife Sandy and children Ray and Elise. Larry is a graduate of M.I.T. (1968) where he majored in economics. It was there that he worked on Project Mac and "MacHack", the first chess program to compete in tournaments against humans. His other career, the one that pays an actual living wage, is in trading stock options using computer technology. Larry is a member of the Chicago Board Options Exchange.

As far as Larry's chess experience is concerned, he has attained the following:

1) American Open Champion - 1966

2) Became International Master in 1980

3) Peak Rating - 2512 USCF

4) Peak Rating - 2445 FIDE

5) Best Results:

   a) 11-3 (2nd Place) NY International Tournament 1980

   b) 9 1/2 - 1 1/2 (1st Place) Falls Church Futurity

      Virginia 1981

6) United States Champion and Top Ranked Non-Japanese

   Shogi Player in the World

7) Second Dan player in Go and Chinese Chess

8) Chairman of USCF Ratings Commitee (1981 - 1986)