Can chess machines provide such good games as human adversaries? Before you make any opening moves to buy one, John White runs through manufacturers' gambits in his evaluation of the range of microchess opponents.

THERE ARE far more casual chess players than serious ones. Britain's chess clubs can muster only a few thousand players whereas the BBC's *Master Game* claims an estimated audience of some 1½ million viewers. The distinction between the casual and serious chess player divides the most recently-released chess computers into two classes.

Firstly, there are the relatively-unsophisticated and inexpensive models aimed at a large market — particularly at beginners. No matter how good chess machines may become in the future, there will always be a market for those capable of providing a reasonable level of play for beginners.

Secondly, there are the well-designed, strong-playing and expensive models. To enlarge the potential market for these costly machines, manufacturers tend to keep adding gimmicks to encourage well-heeled, lesser players to buy them. Sadly, there have been no significant improvements in the chess-playing standards of the better machines during the last year.

A welcome development has been the increase in the number of chess programs available in software — tape, disc or ROM — for domestic microcomputers. Outstanding among these is the new Sargon II which is available for Tandy TRS-80, Video Genie and Apple. The older Sargon I can still be bought for TRS-80 and Nascom.

The famous Microchess is also now available for Pet and Apple in the 2.0 version, and this 8K program now includes a few book openings. Another excellent introduction is Gambiet 80, a 10K program for TRS-80 which, at £20, is both fast and very strong — it did well in the 1981 Microcomputer Chess Championship.

Other announcements include "Chess", £8.50, Kansas City Software, which is claimed to be faster and stronger than Microchess, for TRS-80 and Video Genie, and "Chess" for the Sharp MZ-80 — a program best suited to beginners.

My main criticism of all these programs is their often-incomprehensible graphics. I should like to see only moves displayed and the memory saved used to improve the program or to add more book openings.

These days, all the programs in software or in machines offer castling, *en passant*, pawn promotion, the option of playing black or white and the ability to establish a position and watch the computer react.

Yet, not all possess the important facility of random selection between moves of equal merit, a feature which makes each game different, and not all possess book-opening knowledge which is essential against some openings.

Manufacturers place increasing reliance on games between two chess computers to establish the superiority of one type. As long as the machines are not capable of inventive play —
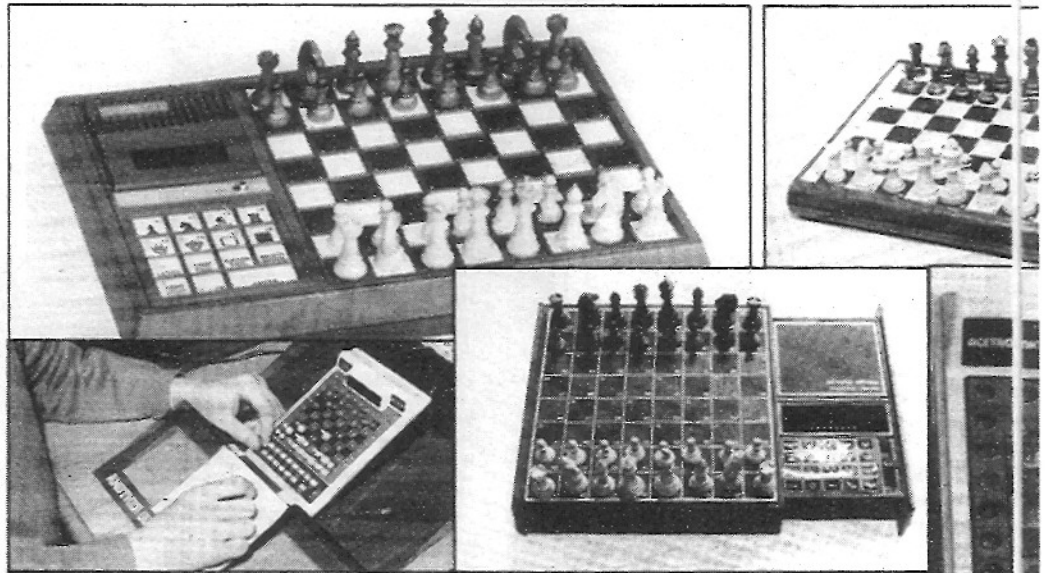
SURVEY CHESS GAMES

that is, as long as they continue to make their moves by re-shuffling their pieces into "better" positions according to their programs — these results will not be of relevance to the ordinary chess player.

The only true test of the machines' strength, at present, is its play against an inventive human opponent. I have generally ignored all levels or response times which exceed an average of five minutes since this represents the absolute maximum that any human should be expected to wait for a move — tournament standard is 2½ minutes a move.

The well-tried Chess Challenger 7 and Voice Challenger — which can now be found in some stationers' branches — have been upgraded by the addition of a sensory board to give respectively the Chess Challenger 8 and Sensory Voice Challenger.

The sensory boards register movement of the pieces by pressure and by lights. Thus, to move your piece from d2 to d4 requires you to press the edge of the piece firmly on square d2, a small light glows, and then on d4. Both lights go out and the computer-thinking light goes on.

The computer then lights up the square of the piece it wishes to move. You press down on that square, causing the square to which the piece is to be moved to light. Pressing the piece on this square causes both lights to go out. The sensory board is very effective and a definite improvement on the original models.

The Sensory 8 has an extra intermediate level compared to the older Challenger 7 which usefully fills a gap between a comparatively weak, but fast level and a stronger, but too-slow level. It is rumoured that the 8's program is slightly stronger than the 7's, but I have not been able to confirm this. The Sensory 8 also possesses a useful library of book openings in its 32K ROM.

The Sensory Voice Challenger offers the voice of its predecessor, but it is now possible to turn the voice down, as well as off altogether. In addition, it can take a player stepwise through 64 pre-programmed games played by grandmasters.

After each move shown by the computer on behalf of the grandmaster, the player is asked for his move. The computer tells you whether you were right or wrong — one hopes that the grandmaster, whom the player is trying to emulate, is always right. These two features are of doubtful value — unless you are blind — and the voice adds considerably to the cost. I wonder how long Fidelity will persevere with it, in the face of almost universal criticism?

Much more useful is a clock display, which is not available on the Sensory 8, that shows the time elapsed for each player and a comprehensive book opening library of 64 openings of widely-variable depth.

Both of the Sensory Challengers offer a random choice between moves which are assessed of near-equal strength, and both can be operated by mains or batteries. Note, however, that at the highest levels, batteries may run out before a game is complete. Printers will also be available to provide permanent records of the game, at a cost of around £170.

The Sensory Voice Challenger is one of the strongest machines on the U.K. market at £280. The Sensory 8, at £130, is almost as strong and represents outstanding value for money — strongly recommended.

The older Challenger 7 and Voice Challenger are still available at reduced prices, respectively £90 and £220. A new model, partly-designed by the Spracklens of Sargon fame, is in the pipeline and will be launched when stocks of the Z-80 microprocessors are exhausted.

The first British chess computer is Intel-

ligent Chess, marketed by Optim games and part-designed by International Master Levy and World Chess Federation (West Europe Section) President, O'Connell. Considerable attention has been paid to user facilities. No chess board is supplied, but the game is displayed on the user's TV set — in colour, if you have a colour set.

A cassette deck is built-in enabling games to be preserved for posterity together with a voice-over commentary for which a microphone is also provided. Alternatively, you can buy cassettes which teach the use of the machine — luckily there is also a manual to tell you how to use the cassette — and to teach the game or the openings, or demonstrate games by famous grandmasters.

The computer has 13 playing levels, with a further four levels for analysis. The setting of the level affects the time spent on a move. A timer is set which decreases to zero at which point the move is displayed. Meanwhile, the machine constantly flashes the move it is considering.

This means that the machine spends the same time thinking regardless of the complexity of the game — an advantage in the end-game where moves can be examined in greater depth, but not so in mid-game.

Many other chess machines share this method of setting levels, but notable exceptions are the Chess Challenger series and the Sargon series of programs which all examine moves to a fixed depth, regardless of the state of play, unless captures are involved.

Intelligent Chess is based on the 6502 microprocessor and provides 64K ROM and 16K RAM. The 16K RAM is needed for storage of 120 positions through which it is possible to back-step in case your blunder was not only fatal, but also very subtle.

The machine offers a widely-varied and

interesting selection of book openings and as well as the usual chess facilities, can also detect draws by repetition of moves or by playing 50 moves without a piece being taken or a pawn moved: the Super System III is the only other machine which does this.

There is no random facility for selection between moves of equal merit; instead, the players can ask the machine to display its next best move, or the next, or the next, and then play on from there.

The display on a colour television is superb, with black and white pieces on sky-blue and pale-green squares — very appealing. When making a move, the piece being moved flashes to and from the target square until enter is pressed. The same occurs when the machine makes its reply.

This to-and-fro occurs three times, presumably to draw the user's attention, but I found it rather tiresome when the computer was making its own move. The board can also be

used as a display for a game between two human players, where no illegal moves will be accepted.

At a price of £300, Intelligent Chess must stand comparison with the best of the other available machines. I have timed the following levels: level 3, one minute; level 6, three minutes; level 9, six minutes, so that it is no faster than most of the competition.

The standard of play is very good, but not, I feel, quite as strong as the Sargon 2.5 or any of the Chess Challenger series with their equal response times up to five minutes. Since it is the most versatile of these machines, I suspect that it may prove to be the best-seller.

Opinions vary as to the standard of play of the Super System III — £155 for main unit; £107 for small black/white board display, £105 for printer. It offers no book openings and thus is muddled by my own favourite opening, the Queen's Gambit — d2-d4; d7-d5; c2-c4 — where it takes a deep search to find that if you accept the gambit, you must not then defend the capture at all costs.

The machine also lacks a random facility to choose between moves of equal merit. However, certain features indicate that a great deal of thought has been put into the machine. For example, it is capable of making arrangements to double its rooks along a file and, after castling on the queen's side, it will often take a further move to tuck its king further behind its pawn screen — a pleasing touch.

Overall, Super System III is clearly one of the better machines, especially at longer response times — good for postal chess — and many club players love it. Personally, I prefer the Sensory 8 which has a clear advantage in the opening because of its library of book openings. I consider the strength of SSIII's play in the middle game to be similar to that of Intelligent Chess — perhaps not surprising, since Philidor Software had a hand in the design of both.

The Sargon 2.5 chess machine, £280, remains the strongest and fastest on the domestic market. It is being superseded by an improved chess cartridge called Morphy at a price of £80 which is discounted to previous owners. Because of Morphy, the Sargon 2.5 chess machine can, therefore, be obtained from some sources at about £200.

The concept is modular: the chess program is on a cartridge which can be replaced by improved versions as they become available — or by other games cartridges — while keeping the main unit.

With a rechargeable battery pack, random selection between moves of equal merit and a reasonable selection of book openings, this machine unquestionably has all that the serious chess player could ask for. Special mention must be made of the unit's ability to retain an uncompleted game in its memory even after switch-off, ready to start again at a more convenient time.

Although the program, which is packed into only 8K ROM and 1K RAM, is not markedly superior to other good machines in mid-game, and its store of book openings is inferior to, say, the Sensory Voice Challenger's, its speed of response is outstanding and its end-game is superior to that of any other commercially-available machine. To do

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Beginners' games and prices

Tandy Chess Machine, £70: eight levels, no book openings, no random responses. Designed to be portable.
Chess Traveller, £60: seven levels, book openings, random responses. Designed to be portable.
Boris Diploma, £70: Timer set between 0 seconds and 99 hours. Random responses. Designed to be portable.
Delta-1, £40: Timer set between 0 seconds and 99 hours. No book openings or random responses.
Texas Instruments Videochess, £45 ROM for TI-99/4: three levels, three styles of play at each level. Full-colour display.

this, its evaluation function must be very well designed. Normally, the end-game is the weakest part of any chess computer's game.

The identical 2.5 program is also available in the Auto-Response Board which additionally has a touch-sensitive board for moving the pieces, similar to that described for the Sensory Challengers. The Auto Response Board also possesses a slightly superior library of book openings. Beautifully finished in wood, this machine is the nearest yet to perfection — at a price — £700.

Sargon 2.5, like the older Boris which has the same manufacturer, occasionally flashes one of about 60 messages across its display, related to the state of the game. These add nothing to its chess-playing ability and the Auto-Response Board does without them. After a time they become boring, but it still amuses me to see the machine plead "I need help" when it evaluates its position as desperate.

Sargon 2.4 would be my recommendation for the serious player. However, club players should note that my estimate of its playing strength falls below the distributor's claims. I cannot accept that its mid-game play, at top level — level 4 — is equivalent to a player rated at BCF 170.

The machine scored BCF 139 for complete games in the recent *Evening Standard* Chess Congress, but London players are notoriously over-rated and I would assess its rating overall at about 130 — which is also the equivalent of a rating which it achieved recently in the U.S.

The machines which follow are all best suited to beginners, and would be unlikely to seriously trouble most club players.

Tandy's chess machine is custom-made in Hong Kong, and is clearly designed as a travelling companion with battery operation — mains is an optional extra — and miniature pegs for playing pieces. At £70, it provides eight levels of play from two seconds to three hours, no book openings and no random responses. Changing levels alter the depth of search and not the time allocated for thinking.

The Chess Traveller, £60, bears a superficial resemblance to the Tandy machine, and is again clearly designed as a travelling companion with battery operation and small pegs as playing pieces. There are seven levels of play and the machine also offers some book openings and random selection between moves — the cheapest in this survey to do so.

The Boris Diplomat contains the same program as the original Boris which is now withdrawn. The original Boris was outdated and overpriced by today's standards at its former cost of £180. The Diplomat is better value at £70 and is again designed as a travelling companion with mains or battery operation and small pegs for playing pieces. The level of play is altered by setting a timer — up to 99 hours — and the machine also offers random selection between moves.

The Delta-1, £40, is marketed by Sci-SysW as a inexpensive alternative to the company's more prestigious Super Sytem III machine. The level of play is altered by setting a timer, and the move being considered is constantly displayed, as is quite usual for this type. There are no book openings and no random responses.

Good value at the price for beginners and very attractively finished, but the manufacturer should do something about the weak response to an opening of e2-e4. The machine replies d7-d5 at all time settings up to five minutes.

Texas Instrument's Videochess owes a great deal to the influence of British Master Levy, who served as a consultant. It is available only in ROM for the TI-99/4 home computer, at £45. The board is displayed on the computer's monitor in full colour and the result is very pleasing.

There are three levels of play, and each level can be set to play in an aggressive, passive or normal mode. Unfortunately, it is rather hard to find in the shops now since the TI-99/4 has not been an unequivocal success and, as I write, several retailers are destocking at cut prices.

Since the program was written for the Texas Instruments microprocessor, the RMS-9900, I fear that Videochess may disappear. This would be a pity, since it is one of the better chess programs available in software.

The Atari chess cartridge at £45 is available for the Atari Videogames System. The display is lost while the machine "thinks" and the graphics are almost incomprehensible. There are no book openings.

Finally, readers considering buying any chess machine will be pleased to hear of their reliabiliity. None of the machines I have tested has been defective — some straight out of the manufacturer's original packing — no retailer I have spoken to has admitted to having received a single unit back for repair, and my faithful Challenger 7 has taken a tremendous keyboard battering without any defects at all.

CONCLUSIONS

- The Sargon 2.5 remains the strongest and fastest chess computer. The best buy for serious players, but the price may be somewhat high.
- Optim's Intelligent Chess, £300, has a superb colour display with many useful user features, including taped tutorials on how to play the game. The standard of chess is good, too — but not as good as Sargon.
- The Super System III is still one of the better chess machines at £155. Forget the costly LCD board and printer — a chess board and paper and pen are much less expensive.
- The Sensory 8 Fidelity is excellent value at £130 — or without the sensory board as the Challenger 7 at £85 — with a strong program.
- The Auto-Response Board at £700 must be the best chess computer available, but the price is beyond most of us and represents poor value in pure chess terms.
- The Sargon program is available in its original version for TRS-80 and Nascom, and in the II version for TRS-80 and Apple microcomputers, at around £15-£30 depending on documentation and supplier. The best program in software of those surveyed.

Grandmaster or novice?

John White presents a chess-rating analysis program in Basic. It has been designed to help you maximise your rating as a player.

As REGULAR CHESS players will know, the British Chess Federation organises a rating system for its league players over a season. The principle is that if you beat an opponent in the league, you take his rating and add 50. If you lose, you take his rating and subtract 50. If you draw, the rating alone is taken.

The results obtained in this way over the season are averaged to give your rating for the new season. Similarly, your opponents take account of your rating and their results against you when determining their own new rating.

Ratings vary from 80 — knows the moves only — to more than 200 — national/international standard. An average club player would be rated at about 130-160.

It is at once evident that it is theoretically possible to devise a strategy which would raise your rating, allowing for the fact that the better your opponent, the more likely you are to lose, while the worse he is, the more likely you are to win.

To take a trivial example, if a player rated at 100 plays a national player with a rating of 200 10 times, then, even though he will lose every game, his new rating will be

$$\frac{(200 - 50) \times 10}{10} = 150$$

On the other hand, the good player's new rating will now be

$$\frac{(100 + 50) \times 10}{10} = 150$$

So, both players will appear of equal strength at the end of the season. Clearly, the good player is well advised to avoid an opponent of such low rating.

In practice, the teams in the leagues are organised in decreasing order of rating, so that players of more nearly equal strength play each other. The program shown in listing 1 explores the possibility of evolving a strategy of selecting your opponent, if possible, to maximise your own rating.

The outcome of a game involves a random element RND(1) = 0.0 to 0.999 which is biased according to the difference in rating between yourself and your opponent. The bias is positive if you have the higher rating, negative if you have the lower. *(continued on next page)*