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Mating Problems

SARGON can solve all mate-in-two or mate-in-three problems, but you'll learn more if you do the solving. An intermediate or advanced player should try to solve the mates without moving the pieces around the board. When you think you have it, then play out the line. If you're wrong, the board can be reset using "Change Board." (See "Setting Up A New Position.")

Winning A Won Game

Getting a won game and actually winning it are two different things. Try producing the victory from the won position. Games which involve mating attacks or pawn promotions are especially instructive.

FOR THE ADVANCED PLAYER

If your rating is over 1600 you will find that you can soon beat SARGON consistently at all time-matched levels. What do you do while you're waiting for an improved SARGON?

Handicapping.—The simplest way to revive the challenge in your games with SARGON is to spot him some material. Odds can be given ranging from a pawn to a queen with the use of "Change Board" before the game begins.

Playing from the down position.—Everyone likes to attack, but how's your defense these days? Depending on how much better than SARGON you are, you might like to take the down side of Master games. In all cases your goal is to equalize, but can you turn the game into a win?

SPECIFICATIONS OF THE AUTO RESPONSE BOARD

Size: Outer Dimension: 21" x 21" (53.5 cm x 53.5 cm)
Chess Playing Surface: 18" x 18" (45.7 cm x 45.7 cm)
Squares: 2" x 2" (51 mm x 51 mm)
Pieces: Handcarved chessmen, 3-1/2" (8.9 cm) King
Weight: 13 pounds (6 kg) with pieces, without A/C Adaptor
A/C Operated—Adaptor included

Factory Service

If your Auto Response Board/SARGON 2.5 does not perform as described and you are following the instructions, try using a different electrical outlet.

Play verification may be made by letting SARGON play against himself by using self-play. Verify that he makes legal moves for both sides. If a problem is still noted, record the events and moves leading to the problem and contact your dealer.

Send inquiries to:

WARRANTY

AVE Micro Systems warrants to the original purchaser of the "Auto Response Board" to the following terms and conditions:

90 Day Warranty on all Parts and Labor
At anytime within the first 90 days from the original date of purchase, AVE will repair the Auto Response Board at no cost to the purchaser.

One Year Warranty on all Electronic Parts
At anytime within one year from the original date of purchase, AVE will repair or replace any defective electronic part (parts). A service charge of $50.00 is to be paid to cover labor and return shipping.

General Provisions
The above warranty does not apply to damage resulting from accidental, unreasonable use, neglect, unauthorized service or other causes not arising from defects in workmanship or material.

Service Requirements
Check with your retailer first for the locale of a local service center. If a service center is not available in your area: Pack the game with the transformer in a strong carton, preferably the original box. Pack with plenty of newspaper or padding.

Enclose a brief note describing the specific problem. Be sure to include your name and address.

Send package insured to:

GUIDE TO THE

AUTO RESPONSE BOARD
WITH THE
SARGON 2.5 CHESS PROGRAM

Our thanks to Kathe and Don Spracklen for their help in preparing this manual.

you want to remove or reposition. The light in its square will come on briefly to acknowledge that the piece has been removed. Place the piece on its new square. The square will remain lit until you identify the piece. First use the two keys labeled 'White' and 'Black' to give the color of the piece, then press the key next to the appropriate piece type. Continue making changes one at a time until the board is arranged as desired. Then press the 'Change Board' key to leave the change mode.

Setting up a new position

Press 'Reset' (Hold 'Reset' and 'Halt' down at the same time) and then set up the board as you want it. Now press 'Change Board'. SARGON will light up the board as you want it. Now press 'Change Board'. SARGON will light each occupied square in turn and ask you to identify the piece on that square. The piece is identified by color and type as above. Then press the 'Change Board' key to leave change mode.

Leaving Change Mode

When you are in change mode you will notice that the 'Change Board' light is always on. Two other lights will also be on: 'White' or 'Black' and 'Your Move' or 'SARGON's Move'. These two lights indicate whose turn it will be to move and what color you are playing when you leave the change mode. The possibilities are:

White Your Move	You are white and it's your turn to move
White SARGON's Move	You are white and it's SARGON's turn to move
Black Your move	You are black and it's your turn to move
Black SARGON's move	You are black and it's SARGON's turn to move

As long as you are still in change mode you can cycle through these possibilities by repeatedly pressing the 'Change Color' key. This allows you to set the pattern you want. To leave change mode, press the 'Change Board' key once.

The 'Change Board' key cancels self-play, monitor and variable play and acts as your method of terminating these modes.

SUGGESTIONS FOR FURTHER USES FOR SARGON

For Beginners—Learning To Move The Pieces

You can start having fun with SARGON from your first encounter, even if you've never played chess before. SARGON himself will teach you how to play. Set up the board for a new game. Plug the board in and press the 'New Game' key. You are now ready to play a training game. The only object of the training game is to make a legal move. SARGON will beep and you win! If you do something illegal, SARGON will honk and you must put the piece back where it was and try again. Finding legal moves is relatively easy during the early part of the game, but can be very difficult when the 'Check' light is on. If you're stumped, press 'Hint'. Between each of your moves SARGON will make a move. Study how he moves each piece. The game is over when SARGON beeps several times in a row.

More books have been written about chess than about any other subject. Two of the best for the beginner are BOBBY FISCHER TEACHES CHESS and LOGICAL CHESS MOVE BY MOVE.

Chess Study Guide

SARGON can be a valuable study aid for the player of any level since positions can be set up so easily.
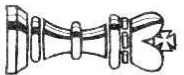
INTRODUCTION

Congratulations! You are now the owner of the revolutionary Auto Response Board and the SARGON 2.5 Chess program. Your new Auto Response Board is the most advanced game system ever made available for home use, while SARGON 2.5 ranks as the world's strongest microcomputer chess program. The SARGON program was written by the world-renowned programmers, Dan and Kathe Spracklen.

The SARGON 2.5 Chess Program is designed to challenge players at all levels of skill, from beginners to experts. This guidebook will familiarize you with the operation of the Auto Response Board and the SARGON module. In minutes you will be playing as if a live opponent were across the table from you, and within a short time you will be using the wide variety of sophisticated features that SARGON has to offer.

Meet SARGON

SARGON 2.5 is by far the most sophisticated microcomputer chess program available today. In March, 1978 SARGON I was shown at the Second West Coast Computer Fair in California. SARGON easily won the tournament for microcomputers with five victories, no draws, no losses.

In December, 1978 an improved SARGON II program participated in the Ninth North American Chess Computer Championship as a microcomputer among giants. On this occasion SARGON II defeated the AWIT program which ran on a five million dollar AHMDAL computer. SARGON, as David among the Goliaths, finished third.

SARGON has also been successful against human competition. An article in the April, 1980 issue of BRITISH CHESS MAGAZINE replayed a SARGON win against a 1500 level player.

SARGON was named for an ancient Mesopotamian king who lived about 2000 B.C. According to Kathe Spracklen, SARGON means 'Proclaimed King.' SARGON had not been born king, he was crowned in adulthood. In a similar way the SARGON Chess Program has ascended to the top of the microcomputer chess world by proving its capabilities in international competition.

SARGON 2.5 has seven levels of play. The difference between the levels is the amount of time the computer spends searching for the best move (see page 8).

Level four is SARGON's tournament level which can make the required 40 moves within 1-1/2 hours. At this level SARGON 2.5 achieved an unofficial USCF rating of 1641. At levels five (moves in 20-40 minutes) and six (moves in 2-4 hours), which give SARGON more time to think, SARGON has an estimated 1800 rating. The five and six levels are useful for correspondence chess or game analysis.

How does SARGON think? The computer works its way through a series of moves and countermoves called a move tree that resembles a pyramid. The number of countermoves possible from any given move increases rapidly. The game level chosen determines how deeply the computer will search the move tree for the best move.

SARGON mathematically evaluates positions based on material and positional factors. Then it chooses the path on the move tree that gives it the greatest scoring advantage over its opponent. To look two moves ahead may mean evaluating two million positions; for three moves, as many as three billion possibilities. SARGON is capable of searching three moves ahead.

The vast number of possibilities would be impossible for SARGON to
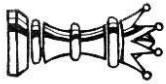
consider were it not for the sophistication of its programming. Two strategies are built into the SARGON program. A full-width search and the selective search. A full-width search investigates every possible move to a specified 'depth' (number of moves ahead). A selective search looks only at the plausible moves to a given depth. The weakness of the individual search methods is that one spends time investigating useless moves, while the other may eliminate good moves that make longer to develop than the depth specified. In combining these strategies in its program, SARGON has achieved a remarkably high level of chess sophistication.

THE AUTO RESPONSE BOARD

The Auto Response Board and the SARGON 2.5 Chess Program have been matched to produce the most handsome and sophisticated chess microcomputer available today. The attractiveness and refined capabilities of the Auto Response Board complement the sophistication of the SARGON 2.5 Chess Program. There's no need to key your move into SARGON's brain. He AUTOMATICALLY senses your move, and responds by lighting small light emitting diodes (LEDs), one light on the square indicating the piece he wants moved and the second indicating where he wants the piece placed.

The Auto Response Board retains the visual relationships of the game without adding the intermediate step of typing alphanumeric moves into the computer, as must be done with other chess microcomputers. Mistakes are eliminated and you can concentrate on the game itself.

The Auto Response Board is a massive board, 21" x 21" (53.5 cm x 53.5 cm), with 2" (51 cm) squares of walnut and maple. Sensors in the board identify moves by means of magnetic elements in the pieces. The LED indicators signal the computer's moves. Additional LED indicators on the right side of the board control the many functions of the unit.

The receptacles for AC power and for the SARGON program module are located on the left sidepanel of the board.

FEATURES OF THE AUTO RESPONSE BOARD AND THE SARGON 2.5 PROGRAM

Balanced Game Strengths—Previous personal chess computers had limited computing capabilities resulting in weak opening, mid or endgame play. Utilizing advanced programming techniques, SARGON has unparalleled strengths throughout the game.

Seven Playing Levels—You can set your playing level from basic teaching through instructional level to tournament level. You can even set it to a playing strength suitable for game analysis.

SARGON Thinks On Opponent's Time—To maximize playing strength, SARGON begins analyzing his next best move while awaiting your response.

Maximum Computer Strength Control—In its 'Variable' mode SARGON will produce varied play by randomly selecting from among several good moves, so he is unpredictable and never plays the same game twice. If you press the 'Hint' key he will always suggest the single best move.

Changing Sides—You may play black or white or change sides at any time during the game.

Handicapping—Any number of pieces may be selected to be spotted (removed) for handicapping. You simply press the 'Change Board' key

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Hint

You can use SARGON as a chess tutor to see what he would do in your place. When it is your turn to move, press the key labeled 'Hint.' SARGON will suggest a move by lighting the 'from' and 'to' squares. You are not obligated to take the hint. You may make any move you choose. If you want to turn off the hint lights, just pick up any piece and set it down. The hint feature is available on levels 1-6 only, not on level 0.

If you have SARGON set to level 1-6 and you press 'Hint,' SARGON assumes that you will make the move suggested in the hint. Thus, SARGON begins to compute his reply. Thus, SARGON may respond instantly if you make the hinted move.

Halt

While SARGON is thinking he blinks the light labeled 'SARGON's Move.' You can halt SARGON's thinking and force him to make the best move he has found so far by pressing the key labeled 'Halt.' The halt feature is useful if you have set SARGON on a high level and are tired of waiting for his move, or if you discover that you have just made an error.

Reset

At any time during the operation of your Auto Response Board you can reset the computer to its power-on state. To do this, press the 'Reset' key and the 'Halt' key at the same time. The two must be pressed at the same time as a safety feature so that you will not accidentally press 'Reset.'

Self-Play

If you want SARGON to play both sides of a game, you can press the key labeled 'Self-Play.' You can press self-play whenever it is your turn to move. SARGON will begin at once to play both sides of the game. You must, of course, move the pieces for him. The self-play feature is especially useful for someone who has never played chess. You can set SARGON in self-play and watch a whole game. To cancel self-play, wait until SARGON has indicated a move; then press 'Change Board' twice.

Monitor

'Monitor' is the opposite of self-play. You can press the key labeled 'Monitor' whenever it is your turn to move. In the monitor mode SARGON will let you play both sides of the game. SARGON will continue to check moves for legality and will not permit an illegal move. SARGON announces 'Check' in this mode as well.

The monitor mode has two uses. First, if two beginners are playing chess against one another, SARGON becomes the perfect referee and trainer. Second, the monitor mode is a great way to set up a position for analysis which arises early in the game. If you want to play from a particular opening line, just go into the monitor mode first and play to the desired position. To cancel monitor, press 'Change Board' twice.
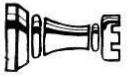
Change Board

The 'Change Board' key places you into a totally different mode of operation which is referred to as the change mode. In change mode you may rearrange the board to suit yourself. Use of the change mode varies according to whether you want to make a few changes to an ongoing game or want to set up a new position for study or play.

If you want to set up for an end game, make thirty moves before doing so. The computer is programmed so that the king becomes more aggressive after thirty moves are completed.

Making a few changes

Wait until it is your turn to move. (You can use the halt key if you are impatient.) Do not press reset! Press 'Change Board' and pick up any piece

and remove the desired pieces.

Position Programming—The 'Change Board' key allows you to set up any board position quickly or to modify an existing board position. The feature is designed to allow you to practice game strategies.

Problem Solving—By using the position programmer, any chess problem may be set up quickly and easily for analysis or problem solving. Mate-in-two and mate-in-three problems are solved with ease; mate-in-two problems are solved in about two minutes.

Halt—The 'Halt' key permits you to halt SARGON's computing analysis at any time. He will display his best move at that point in his search; this allows the player complete control over thinking time.

Hint—Hint mode is used when it's your move. SARGON will instantly indicate your best move at that time.

Position Verification—When any piece is raised from the board, on LED indicates the identity and color of that piece. If the board is upset or if pieces are moved incorrectly, the verifying indicator will correctly locate each piece.

Audio Alert System—A variety of tones indicate various mode functions. Combinations of tones will indicate illegal moves, the end of change modes and checkmate.

Opening Book Library—SARGON is preprogrammed with a wide variety of offensive and defensive responses to popular book openings, plus several unusual book opening moves including variations and transpositions.

Plays by United States Chess Federation (USCF) Rules—SARGON is programmed according to the official rules of chess. He knows and recognizes all the classical moves including en passant, castling and pawn promotion.

Will Never Become Obsolete or Outdated—Updating will be available as new programming advances the playing capabilities. Since the chess and other game programs are modular, the Auto Response Board can readily accept new modules without modification.

OPERATION
Playing A Game With SARGON
1. Plug in your Auto Response Board. The AC receptacle is located on the left sidepanel of the board. Set up the chessboard.
2. Verify that the SARGON module is properly inserted into the left side of the board.
3. Press the key labeled 'New Game'. The green light labeled 'Your Move' will come on. Since SARGON plays black unless you change colors, he is waiting for you to enter a move.
4. To make your move, pick up the piece you want to move and set it down on the square you want to play. The Auto Response Board will sense your move. **Sliding** a piece from square to square may cause the board to miss the move. **If SARGON seems to ignore your move, pick up the piece and set it down again.** If the move is legal, SARGON will briefly light the 'from' and 'to' squares and give a short beep. If for some reason you have entered an illegal move, SARGON will flash the lights in the 'from' and 'to' squares and honk until you retract the illegal move.
   To make a capturing move, pick up the captured piece and move your piece to its square. Again, DO NOT slide the capturing piece onto the square without first removing the captured piece, since SARGON

View of
Sidepanel including
SARGON module
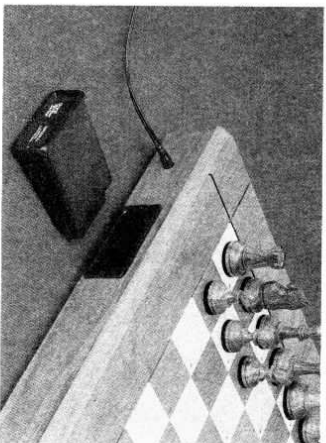
may not be able to sense your move. If SARGON seems to ignore your move, just pick up the capturing piece for a moment and set him back on the same square.

5. When you have completed your move, SARGON will blink the light marked 'SARGON's Move' until he has finished thinking. When SARGON has selected his response, he will light the 'from' and 'to' squares of his move. SARGON will then wait for you to move his piece for him. He will beep when you have correctly made his move.

6. When either king is put in check the LED marked 'Check' will light.

7. When checkmate occurs SARGON will beep several times in a row.

8. The Auto Response Board makes it easy to avoid mistakes. Every time a piece is lifted off the board three lights will glow. The light on the square from which the piece was removed will light, as well as two control panel lights which indicate the color and type of piece. Thus you always have constant verification of the location of all pieces.
   If several pieces are accidentally knocked off the board, it is easy to reestablish their positions. SARGON will start lighting various squares. Place a piece, any piece, on each square until the LED's go out. Now pick up a piece. Two control panel lights will tell you what the piece should be. If you have placed the wrong piece on that square, simply replace it with the correct one. Continue until you have verified that all pieces are correctly located. Then continue your game.

9. If you are in the middle of one game and you wish to start a new game, press the 'Reset' and 'Halt' keys simultaneously. Return the pieces to their starting positions and push the 'New Game' key. SARGON will then signal your move.

Queening—SARGON automatically turns a pawn into a queen when it reaches its far rank. You can override this if you wish; underpromotion can be accomplished using the 'Change Board' procedure.

En passant—Move your capturing pawn and then remove the pawn which you have captured.

Castling—To castle either king side or queen side you **must** move your king first, and then move your rook. If you attempt to castle by first moving your rook, SARGON will take your move as a rook move and begin thinking about his response. After he has decided on his move he will discover that you have moved your king and will honk that the board is not set up properly. So remember, castling is a king move!

Changing Levels

SARGON has several levels of play designed to challenge players of varying strengths and degrees of patience. To set the desired level, press the key labeled 'Change Level.' SARGON will light the indicator next to the level at which he is currently set. To set the level, press any one of the numbered keys 0–6.

Level	Response Time	Description
0	Instantaneous	Usable as a beginner's level or for speed chess. SARGON finds any mate-in-one at this level.
1	10–15 Seconds	At power-on SARGON is set to Level 1. A fast-paced game. Playing strength is about USCF 1000.
2	20–40 Seconds	The whole game should last about one hour (if you move at SARGON's pace). Playing strength is about 1200.
3	45–90 Seconds	SARGON can solve any mate-in-two problems at this level. Playing strength is about 1400.
4	2–4 Minutes	This is SARGON's tournament level. He should have no trouble making 40 moves in 90 minutes at this level. At the 1979 Paul Masson Chess Championships, SARGON earned an event rating of 1641.
5	20–40 Minutes	SARGON can solve any mate-in-three problems at level 5. Approaches the 1800 level.
6	2–4 Hours	This is SARGON's highest playing strength. At this level, SARGON can find some mate-in-four problems.

Changing Color

You may change sides with SARGON whenever it is your move during a game. Press the key labeled 'Change Color.' The color that you are currently playing will be shown by the indicator lights. Then press either the 'Black' key or the 'White' key to switch sides.

To change color at the outset of a game (have SARGON make the opening move). 1) Press 'New Game.' 2) Press 'Change Color.' 3) Press 'Black.' Using 'Change Board' key cancels the opening book, so do not use it before the game begins.

Opening Book

For your enjoyment, an opening book of master moves has been added to SARGON. SARGON selects randomly from a repertoire of over fifty different opening lines. Some lines are played often, others seldom enough to surprise. Included are such favorites as the Ruy Lopez, Giuoco Piano, Four Knight's Game, King's Gambit, Caro-Kann, French Defense, Sicilian Defense, Queen's Gambit, English and Reti openings.

The opening book was designed for maximum variety in the style and character of the opening, and in turn of the whole game.

Variable Play

In normal operation, SARGON always selects his single best move at every turn. Variety can be introduced into SARGON's play by pressing the key marked (Variable). In Variable mode, SARGON will not always make the same response to any given move. Instead he selects a move which he considers one of the best moves, though not necessarily the very best. To cancel variable play, press 'Change Board' **twice.**
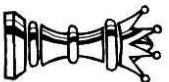
**Auto Response Board
Control Panel**

RESET ●

HALT ●

0	♟	●	New Game
1	♞	●	Change Level
2	♝	●	Change Color
3	♜	●	Change Board
4	♛	●	Self Play
5	♚	●	Monitor
6	●	White	● Variable
	●	Black	● Hint

○ Sargon's Move

○ Your Move

○ Check

○ Change Board