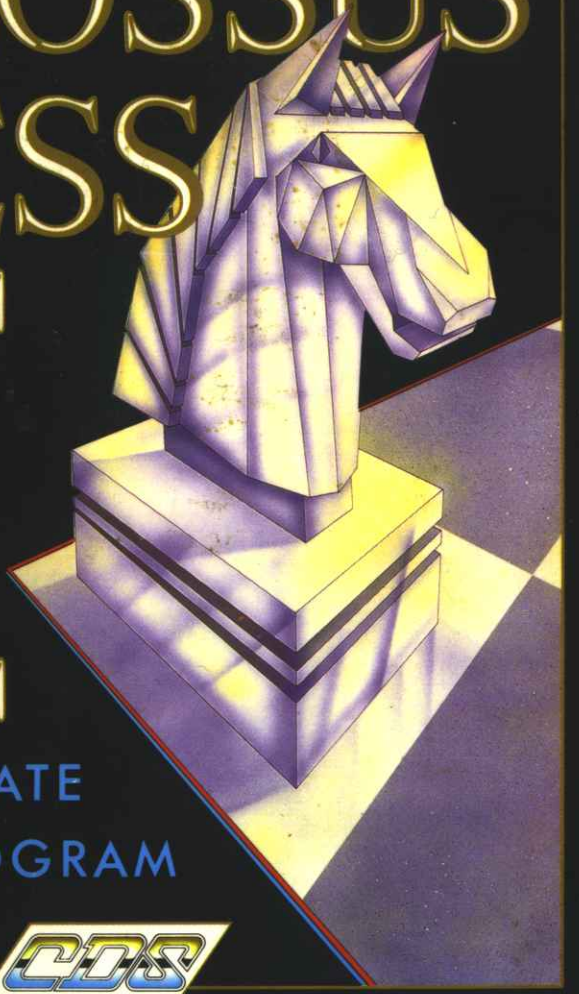
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EmuMovies

COLOSSUS CHESS X



THE ULTIMATE CHESS PROGRAM

Colossus Chess X

Atari ST Manual

The best chess playing program for home computers

The first and only commercially available chess program that learns from its games.

(c) 1988 Mr M P Bryant

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INTRODUCTION

Colossus is the best chess playing program available for home computers, according to scores of independent reviews and test games.

Written by Martin Bryant, a specialist chess programmer of over twelve years experience, it uses all the very latest techniques to maintain its lead over all other programs and has defeated a wide range of them in test games.

Colossus has the widest range of features and options, including many which are both unique and innovative. This version for the Atari ST features the ability to learn new lines of play in order to improve its current play in the light of its playing experience to date. This means that as you play more games Colossus will become a finer, tougher opponent. Colossus Chess X is the first and only program currently available which can learn in this way.

Colossus understands all the rules of chess including; underpromotion; the fifty move rule and 'all draws by repetition'. It can also handle all the standard mates including the very difficult King, Bishop and Knight versus King.

LOADING COLOSSUS

Loading

Colossus Chess X requires an Atari ST computer with a TV or colour monitor connected.

Turn the power on your computer and insert the 'Program' disk in Drive A.

When the desk-top appears, double-click on the file 'COLOSSUS.PRG'. Colossus will then load automatically.

Please note: If you try to load Colossus from the 80 column mode the program loader may force a system reset and require you to double-click again.

Program protection

The Colossus program protection system requires you to consult this manual in order to type a keyboard character from those printed under the page numbers.

In order to make this a little simpler, the characters are printed, fifty per page, in groups of 10 with a space between each group. Only when you have correctly typed the character required will the program begin.

After loading

Once the program has loaded the screen will display the board and the computer will beep. At this stage remove the 'Program' disk and insert the 'Book' disk. If you wish to play without the openings book, you may leave the program disk in the drive.

Please ensure that both disks are always 'Write-enabled'. This is required by the program when saving new playing lines or user settings to the disk.

First use of the disk

On the very first use of the brand-new Colossus disk, the 'Language' option box will be displayed.

You should select the language you wish to use, so that on loading the program on later occasions this will be the default language used. To make this permanent please ensure that the program disk, in drive A is write-enabled - ie not write-protected.

The available options are:

English	(ENGLISH)
French	(FRANCAIS)
German	(DEUTSCH)
Italian	(ITALIANO)
Spanish	(ESPANOL)

Point at the language you require and press the left mouse button in order to change to that language.

On future loading of the program you may still change to any language during play, using the 'Language' option, but this change will not be recorded on the disk, unless you decide to save the User settings (see Section 7.k).

1 OVERVIEW

1.a Manual - Getting Started

Colossus has such a wealth of features and options that the sheer size of this manual may be a little overwhelming. You do not need to read it cover to cover before playing a game!

We suggest that you concentrate on Section 3 'Your Move' and Section 4 'Program control and input'.

You might also need to scan those sections which give details of the most commonly used commands - 'Go (change sides)', 'New Game', 'Type of play' and possibly 'Language' - these can be found from the Contents page.

You should then read the other sections at your leisure and as you wish to fully investigate the features that make Colossus so outstanding.

1.a.i Program input

Most of the features within Colossus can be selected using either the keyboard or the GEM drop-down menus. The convention adopted in this manual is that keyboard input will always be enclosed in square brackets, eg. [SPACE] means press the space bar and menu options in curly brackets, eg {Features - Swap Screen} means select the Swap Screen option on the Features menu.

As the Atari ST uses the very powerful GEM system, this manual assumes that players will want to use the mouse system on most occasions and therefore it takes the drop-down menus as its starting point. Players familiar with earlier versions of Colossus may wish to use the keyboard input system that is common to those games. Where an option can be selected from the keyboard directly this is noted, in square brackets, along side the option name.

1.b Program

The Colossus program uses two display screens to provide clear, comprehensive information on the state of the game, the program's current thoughts and the past moves of the current game.

The main screen shows the chess board and displays all the program messages and prompts, whilst the Information screen shows the past move record, player names, chess clocks and full information on Colossus' thought processes.

To move between the screens simply press the [SPACE] bar {Features - Swap Screen}.

AD5UPICXZ5 HB25ABDCUN EX16BYIHF9 NMV8TS2MCD SJIOWR953D

2 SCREEN DISPLAY

2.a Menus

The control menus are hidden on the normal screen but will be displayed as soon as the mouse pointer is moved onto the top line of the display, ie the title line. The menu options are fully covered later but if you accidentally display the menu line, moving the pointer off the menu area and pressing the left button will clear the menu bar and any menu displayed.

2.b Main screen

2.b.i Board Display

The graphical representation of the board shows the current game position.

The letters and numbers around the edge of the board are those used in the algebraic notation for each square. It is these numbers that are displayed in the past move record on the Information screen.

2.b.ii Prompt & Message line

The bottom line of the main screen is used to issue prompts and messages from the program to the player/s. Messages requiring an input end in a question mark (?).

2.b.iii Championship marker

The top line of this screen initially displays two diamond shaped markers. These remain on the screen unless you use any of the program features which allow you to deviate from normal chess rules, eg backstep, choose next-best move or even look at the hint move on the Information screen.

The Championship marker gives you an incentive to play whole games without 'cheating' and the satisfaction of knowing you beat Colossus in a 'Championship' game.

2.c Information screen

2.c.i Player names

At the head of each column, under the colour, is the name of the player. The program always plays as Colossus and the opponent is initially described as 'Opponent' but this can be changed using the 'Opponents name' option - Section 8.d.

2.c.ii Clocks

Under the player names are the elapsed-time clocks for white and black. They show the total playing time used by each side in the game so far.

Please note that the clocks start as soon as the program is loaded and the board has been displayed. If you wish to reset the clocks at the actual beginning of a game then use the 'New Game' option described later. The program always issues a beep to indicate that the clocks are starting.

7YMVUEFCQL IPWAB2WA02 SDLLMHBIRC 2TJ4FZOK0S QSYMSZOVTZ

The clocks can also be set or reset by using the Elapsed-time clocks option described later in Section 8.e.

2.c.iii Move record

The move record, ie the last seven moves made by each side, is displayed under the clocks.

2.c.iv Moves

The moves are displayed in the normal algebraic notation.

The separator symbol used between the 'From' and 'To' references changes depending whether the move is a capture, shown by an 'x', or not, shown by a '-'. Castling moves are indicated by referring to the King being moved and its 'From' and 'To' square references.

En-passant captures are indicated by the suffix 'EP'. Promotions are indicated by a suffix of '/', followed by a letter to indicate the promoted piece ('N' - Knight, 'B' - Bishop, 'R' - Rook and 'Q' - Queen). Checks are indicated by a suffix of '+'.

2.d Colossus' thinking

The lower part of the Information screen displays information about the way that Colossus is planning moves. This can be used to observe the way that a good computer chess program works and yet still takes only a minuscule fraction of the computer's processing time to display.

There are five items, each displayed next to a symbolic icon.

2.d.i Assumed move - Speaking icon

Colossus can, and normally does, think on the opponents time, just like a human player. In order to make the most of this time Colossus assumes a certain good move and then plans ahead as if the human opponent has made that move. If the program has no move to assume then it will not think ahead at all.

This move may provide a hint for a human player but the value of that move is for the opponent to decide!

After the opponent has moved this display is blank as Colossus considers a response to the actual move played rather than an assumed move. This display is permanently blank when Colossus is playing both sides of a game as then it is impossible to think on the opponents time - Colossus is the opponent!

2.d.ii Current line - Thinking icon

The second line of this display shows the move sequence currently being evaluated by Colossus. This changes rapidly as the search progresses and can be extended or reduced to show more or less of the following moves by pressing the '+' and '-' keys but note that printing longer lines reduces the efficiency of the program quite drastically.

7ZLB9MSLC4 ILSF9HAMRB J2I1KP0LSP 2JV5JIXJ85 96IKXVAPYW

Above this line is the current game stage: Opening, Mid-game or End-game.

2.d.iii Best line - Idea icon

The bottom line of this display shows the best playing line that Colossus has found during its current search.

This may be used to give you a 'hint' not only about the current move but about future good moves too. Most best lines contain a 'null' move which is shorthand meaning a passive non-capturing move.

The line above indicates the score for this line of moves in terms of the number of pawns up or down. If this is positive it suggests that Colossus is winning, whilst a negative figure suggests that the opponent is winning.

2.d.iv Lookahead - Telescope icon

As the program considers its move it displays the depth of search here. This is printed in 'ply' or 'half-moves'. Colossus searches most move sequences to at least this depth and some are searched to a much greater depth.

2.d.v Positions examined - Abacus icon

This displays the total number of positions examined in the tree of move sequences. The display is updated at the end of each iteration and after a new 'best move' is found. During the Mid-game Colossus examines 500 positions per second on average.

3 PLAYING A GAME

3.a New game - (Position - New Game)

When a new game is started the pieces are set-up in their initial positions, the clocks are re-set to 00:00:00 (hours:minutes:seconds), the move display is cleared and you are given the option of moving first. By activating the 'Go' option, (Play - Go (change sides)) - (Control G), Colossus will take white and move first.

3.b Your move

Whenever it is your turn to move the bottom line of the Main screen displays 'Your move?'. You enter moves either by moving the cursor or by using algebraic notation, see Section 4, in the following manner:

1) 'From'

Move the cursor to the square of the piece which you wish to move and press the left mouse button or the (Return) key. The notation for the 'From' square will then be displayed next to the 'Your move?' prompt.

Holding down the left mouse button causes the hand to appear and grab the piece concerned. The piece will then be 'dragged' across the board until this button is released.

If you accidentally enter an incorrect 'From' location this can be cancelled by

a) pressing one of the (Backspace), (Delete) or (Esc) keys,

b) entering the same location again from the keyboard and pressing the (Return) key or left mouse buttonor

c) releasing the left mouse button with the piece on its original location.

2) 'To'

Move the cursor to the square you wish to move to and again press (Return) or the left mouse button. If you are dragging the piece release the left mouse-button when the piece is over the correct square. This causes the 'To' notation to appear on the bottom line next to the 'From' location.

If the move is judged to be illegal then the message 'Illegal' will be displayed and the whole of the move entry line cleared. Return to step 1 to try again.

3) Pawn promotion/Castling/En-passant capture

If this move is a pawn promotion Colossus will automatically display a dialogue box so that you may specify the piece that you wish to promote to.

Castling	Move the king two squares either way.
En-passant capture	Move the pawn as in a normal capture.

3.c Colossus' Move

Whilst Colossus is computing a move the message 'Let me think' is displayed on the bottom line.

The Information screen is constantly updated as this process proceeds and can be viewed by pressing the (SPACE bar).

Pressing (Esc) during the search forces Colossus to abandon searching and make the best move it has found so far.

If Colossus has found a line of moves that leads to checkmate it displays 'Mate in N', where N is the number of moves to the mate. If Colossus believes itself to be hopelessly lost and that things can only get worse it announces its resignation but you are allowed to play on if you so wish.

When Colossus has computed its move a message is displayed at the far right of the Main screen's bottom line showing 'My move' followed by the move in algebraic notation. Then the 'Your move?' prompt appears on the left.

3.d Game Over

At the conclusion of a game the clocks stop and Colossus displays a message to indicate the final game state.

Possible messages are:

'Drawn'

The game has been drawn by a three-fold repetition of position; the 50 move rule or by neither side having enough material to mate the opponent. This occurs in the cases of King, King and Bishop or King and Knight against a lone King.

'Checkmate'

The side which moved last delivered checkmate.

'Stalemate'

The side to move is in stalemate.

'Time up'

The side to move lost 'on-time'. This occurs only if you are playing an 'All-the-moves' game - see Section 8.h on the 'Type of play' command.

The program then displays the 'What now?' prompt and waits for you to enter a program command.

To start a new game select the 'New game' option.

(Position - New game) - (Control N)

4 PROGRAM INPUT

Colossus Chess X has been designed specifically for the GEM environment of the Atari ST and uses the mouse and drop down menu facilities extensively. However, in order to provide compatibility with previous versions of Colossus the keyboard can also be used for input. Expert players and those very familiar with the game may find the keyboard input faster whilst new players will be able to control all aspects of the game from the mouse and menu system.

4.a Cursor shape

The on-screen cursor can take three shapes, depending upon the current position on screen and action being taken.

1) Pointing finger

The normal cursor is a hand shape with a finger pointing upwards. This is used to point to pieces and their locations on the board.

2) Clasping hand

When a piece has been nominated for moving, the hand cursor is replaced by a large hand which picks up the piece and moves it around the board as long as the left mouse button remains depressed.

3) White pointer

When the pointing hand has been moved onto the title line, the normal GEM pointer appears and moves around the menu bars. If the menus have been selected accidentally then moving the pointer off the menus onto the normal background and pressing the left mouse button will cause the menu-bar to disappear.

4.a.i Hand cursor colour

During a game the colour of the hand cursor changes in order to indicate the player who is to move next.

If you leave the game for a period and are unsure which side is to move, simply check the colour of the hand.

4.b Cursor movement

There are three ways of moving the cursor around the screen.

1) Mouse movement

Any movement of the mouse is followed on-screen by the cursor.

2) Cursor keys

The cursor keys, on the central keypad, can be used to move the hand around the board one square at a time. The (Left arrow) and (Right arrow) keys give left/right movement whilst (Up arrow) and (Down arrow) give up/down movement. If the cursor is moved off a board edge it reappears at the opposite edge of the board, ie. it wraps-around.

3) Algebraic keys

Colossus can accept movement input in algebraic notation typed on the keyboard with the (Return) key pressed between the 'From' and 'To' locations.

On the board the cursor will move immediately to the correct file when one of the letters (a) - (h) is pressed and to the rank when a number key (1) - (8) is pressed. This provides very fast input of known moves, eg. the common opening move Pe2-e4 can be entered by typing (e 2 Return e 4 Return).

For even faster input, when the rank or the file of the 'From' and 'To' squares is the same the key sequence can be shortened even more, eg. the example above can be shortened to (e 2 Return 4 Return).

4.c Numeric input - *Important*

Many program commands and option require the entry of numeric data to change the value of parameters.

In order to simplify this process Colossus features an error-proof number entry routine based on the (Up arrow) and (Down arrow) keys.

For most settings there is a maximum and minimum acceptable value and a default or normal setting. When you first select an option which requires a change in parameter values, the dialogue box displays the current setting in the query position.

To increment this value either press the (Up arrow) key or move the cursor to the up arrow box and press the left mouse button, repeating until the desired value appears in the box. This is then confirmed by either pressing (Return) or pointing at the 'O.K.' box and pressing the left mouse button. The value can be decremented by similar actions involving the down arrow box or the (Down arrow) key.

If the value selected is above or below the acceptable limits the display changes to the minimum or maximum possible value respectively, ie there is a wrap-around effect on the values. This can be used to speed entry considerable, for example if you wish to set the sound output from 15 (maximum) to 0 (silent) it is faster to use the up-arrow once rather than use the down arrow 15 times.

5 PROGRAM COMMANDS AND CONTROL

Whenever Colossus is waiting for player input, eg. when waiting for a move or after a game, it is possible to issue control commands to the program.

In most cases these commands can be issued by either selecting an option from a menu bar or by pressing a particular key sequence. These commands and options have been designed specifically to be both easy to use and to increase your enjoyment of the game of chess.

If a control command or option is entered during the playing of a game, then Colossus cannot continue to think on your time and this will be aborted until the next move.

5.a Menu bar

The GEM system uses a series of menus to make command selection using a mouse very simple indeed. To access Colossus' menu system you need to move the pointer onto the title line of either screen.

As soon as the pointer enters this area the menu bar appears and the nearest menu to the pointer 'drops down'. The Colossus menu bar has just four options:

CDS Features Play Position

These are fully described in the following sections.

5.b Drop down menus

As the mouse is moved left or right on the menu bar the GEM pointer causes the option nearest to the pointer to be displayed in inverse video and the full menu to appear.

On each menu is a 'highlight bar', ie. a line of the menu displayed in inverse video - blue on white. As the pointer is moved up and down, by the mouse, this highlight bar moves up and down accordingly.

5.c Option Selection

To select a particular option the left mouse button should be depressed once. This is known as 'Clicking' on an option and in future sections of this manual the text '(click)' will be used rather than the longer phrase 'press left mouse button'.

This will cause one of several possible actions to occur.

1) Direct action

Where the option is a simple toggle or requires no other action, the menu disappears and the command is acted upon. For example: to swap screens you select (Features - Swap screen) and press the left mouse button - the menu clears, the screen changes and the normal hand cursor appears.

2) Further menu bar

When you select (Position - Alter-position) another menu bar will appear.

You then select the next option and the menu item required. This is just like selecting items from the main menu bar

3) Dialogue boxes

When a command requires parameters or direct input from the player 'Dialogue boxes' appear. These boxes, distinctive due to their maroon background, have, in most cases, a 'Query line' and a number of options. By pointing and clicking on the options the parameters will change in the appropriate way.

In certain cases, when typing of a name is required, the query line will be displayed with just an 'O.K.' box. A default entry will be displayed which can be cleared by pressing (Esc) or (Backspace). To accept the currently displayed string you (click) on the 'O.K.' box.

4) Item selector

When selecting a game or position to load from the disk, a GEM style 'Item selector' appears. Use this in the same way as you would any GEM window. You can select a file name from the list displayed just as you would from the GEM desktop but please note that any alterations made to the folder line will be ignored by the program. All games are saved into the 'GAMES' folder, any other settings will be ignored.

In order to select a file name listed quickly, simply (double click) on the file name.

5.d Returning to the game

If you have accidentally selected the Menu bar or a particular menu and wish to return directly to the game, move the pointer off the menus and (click).

If you have selected an item from a menu in error and decide to return to the game then click on the highlighted setting or use the 'O.K.' option to revert to the game.

6 CDS MENU

6.a Adverts - (Control X)

This option displays the various adverts held in the 'ADVERTS' folder of the 'Program' disk.

After each advert has loaded, and is fully displayed, you may:

a) Press (Esc) to return to the main screen

b) (click) or press any other key to display the next screen.

If the current disk is the 'Book' disk, or any other disk, the message '*Not found*' will be displayed.

If you would like to advertise in this way on any of the Colossus programs, over 200,000 have been sold to date, please contact CDS Software on 0302 321134.

7 FEATURES MENU



7.a Swap screen - (SPACE bar)

This option changes the screen display between the Main screen and the information screen. Selecting this option twice will change back to the screen you started from.

7.b Dimensions - (Control V, B, D)

Changes the board display from two to three dimensions and vice versa.

7.c Notation - (Control V, B N)

To remove the algebraic letter and number notation from the edge of the board select this option. Selecting this again returns the display to normal.

7.d Orientation - (Control V, B, O)

The orientation of the pieces on the board can be changed using this option.

The dialogue box displays these selections:
White up the board White left to right Black up the board Black left to right

7.e Blindfold - (Control V, P, B)

If you are a confident player who can keep the current state of play inside your head then this option allows you to play 'Blindfold' as you will see strong players doing on occasions at demonstration matches.

The dialogue box offers:

Both visible	the normal default setting
Black only visible	
White only visible	
Neither visible	a fully blindfold game

It is not possible to use the 'piece dragging' method of move entry when the pieces are invisible - use the 'point and click' or algebraic methods instead!

7.f Piece-set - (Control V, P, P)

Colossus can use four different chess sets and this option allows you to change them at will. All four chess sets are available in both two and three dimensional representations.

The dialogue box offers:

Standard	the usual Staunton design
Futuristic	a set featuring robots and ray guns
Medieval	Knights in shining armour and friends
Oriental	Shoguns and geishas play chess

7.g Language - (Control V, T)

If you wish to have the program display in another language select this option. The dialogue box displays a query line ready for you to type the name of the language required.

Languages available on the Program disk are:

Language	Name
English	ENGLISH
French	FRANCAIS
Gerrnan	DEUTSCH
Spanish	ESPANOL
Italian	ITALIANO

When you have finished typing the Name Colossus will search in the Language folder for your selection. If it finds the files then future messages will be displayed in that language otherwise a "Not found" message is displayed.

It is possible to create custom language files using standard text editing programs. Each language requires two files to be placed in the 'LANGUAGE' folder of the program disk - one with an extension '.TXT' containing the text messages used by Colossus and another with the extension '.RSC' - the resource file used by GEM for its menus/dialogue boxes. In order to simplify this process the file ENGLISH.S contains full customisation instructions. CDS Software would like to hear from anyone who creates new language files which could be contributed for use on future issues of the Colossus disk.

7.h Book - (Control U)

Colossus uses an openings book of over 11,000 records (2000 plus lines of average length 12 ply). This is used by the program to play the first few moves of each game quickly and accurately. Lines of play vary from 2 ply to 35 ply deep. When the book contains a choice of moves from a particular position Colossus chooses between them at random with a slight bias towards those moves which Colossus considers to be the best.

Selecting this option allows you to adjust or update the openings book as required.

The dialogue box displays:

Keeper	an extensive book editor which is fully described in Appendix A
Learn line	add the current line of moves to the openings book. This command can be used to extend the book to meet your requirements - Appendix B gives full details and a worked example.
Usage	allows you to set the manner in which Colossus uses the book. This causes a further dialogue box to open showing:
Off	the book will not be used by Colossus
Maximum variety	Colossus will use a variety of moves from those marked 'Poor', 'Fair' or 'Good'
Normal	Colossus will ignore all moves marked 'Poor' and use only 'Fair' and 'Good' moves.
Best	priority will be given to 'Good' moves
Cancel	exit from this command list and return to the game.

7.i Games - (Control D)

Selecting this option allows you to delete, load or save move records and positions on disk.

The, self-explanatory, dialogue box offers:

Delete game	Load game
Save game	Cancel

If you select one of the first three options, this box clears and a GEM item selector box appears. From this you may delete, save or load any filename within the 'GAMES' folder.

Please note that an error on loading, caused by the disk being faulty, can cause the current move record to be lost.

7.j Printer - (Control W)

The current board position or the move record to date can be printed using this option.

The dialogue box reads:

Print board	Print moves	Cancel

The board print-out is always 'White up the board' orientation as found in all chess literature. The white pieces are represented as capital letters and the black pieces as lower case letters with empty squares as dots.

The move record is preceded by a header for clarity and if you have used the 'Alter position' option then the initial position is printed before the move record itself.

If you select a print option and there is no printer accepting the output, the program waits 30 seconds before returning to the Main screen, issuing an 'Error -99' message and waiting for a command.

7.k Settings - (Control Y)

If you prefer to play with Colossus set to a certain piece set, board orientation, angle and other options then this command allows you save and load these parameters. You need to insert the 'Program' disk in order to store this list.

The dialogue box offers:

Restore CDS settings	the default settings described below
Load user settings	a previously saved list
Save user settings	write the current settings to disk
Cancel	exit this command without change.

The settings are stored in the file COLOSSUS.SET. If this file is found during the initial loading sequence or after issuing a Load settings command this file is used to initialise Colossus's options accordingly.

The CDS settings are:

Board angle:	Maximum left rotation
Board tilt:	Maximum downward
Board display:	3D
Notation:	On
Orientation:	White up the board
Blindfold:	Both visible
Piece set:	Standard
Sound:	Beeps
Replay time:	1 second

When you save your own settings the 'Language' and 'Opponent's name' settings are also saved.

7.l Sound - (Control Z)

This option gives you the chance to alter the style of sound Colossus provides.

The dialogue box contains:

Beeps - leading to a setting of volume box

Music - four classical tunes are offered in the next box:

Off	No music is played
Prelude No. 28	Chopin
Claire de Lune	Debussy
Moonlight Sonata	Beethoven
Ave Maria	Gounod

Speech - Colossus will use speech to prompt play rather than beeps. All moves will be announced in this way too.

8 PLAY MENU



8.a Go (change sides) - (Control G)

This command forces the program to make the next move by changing sides.

This can be used repeatedly to make Colossus play part of a game unaided, to make Colossus change sides in mid-game or to force Colossus to take over a playing role after the 'Supervisor' mode has been selected.

At the beginning of a game selecting this option makes Colossus play White and in this special circumstance the program automatically clears the clocks and sets the orientation to 'Black up the board' so that your pieces face you.

The command is ignored at the end of the game.

8.b Play self - (Control P)

This forces Colossus to play both sides of the game.

This command is ignored if the player has previously set Colossus in either 'Problem' or 'Infinite' mode, see Section 8.h.

To restore the Colossus versus human setting press (Esc) which forces Colossus to make its best move found and allows you to take over the side to move next.

When Colossus is playing both sides the Information screen shows the player name as Colossus in both columns.

8.c Supervisor - (Control S)

If you wish Colossus to supervise a game between two human players this command is used. This gives you the opportunity to verify a move record entered from a book or magazine or play a friend using the board display with each move verified for legality.

When this mode is entered both names displayed on the Information screen are set to 'Opponent'.

8.d Opponents name - (Control O)

The name at the top of the player's column on the Information screen is set using this command. It displays a dialogue box with a query line. The previous setting can be cleared by pressing (Esc) and errors corrected using (Backspace).

8.e Elapsed-time clocks - (Control E)

The clocks on the Information screen can be set to any value from 00:00:00 to 255:59:59 (Hours:Minutes:Seconds).

The dialogue box presents the current settings in the order:
White - hours, minutes and seconds
Black - hours, minutes and seconds
You need to enter data as described in Section 4.c.

As Colossus makes extensive use of these clocks in order to determine how much thinking time it has left, altering this setting during mid-game will change the speed of Colossus' play.

For example, if you wish to change the playing speed, using the (Play - Type of play) option during a game it is a good idea to change the clocks appropriately too. Increasing the elapsed-time on Colossus' clock will cause the program to play more quickly in order to keep its average time within the current set limit.

8.f Legal moves - (Control L)

If you wish to learn how to play chess or wish to teach someone else the game, this option is useful. It causes the program to display all the legal moves for the piece nominated one after another.

You first need to select the piece concerned by pointing and (clicking). Then select the (Play - Legal moves) command or type (Control L). Each legal move for that piece will then be displayed in sequence. If there are no legal moves for that piece then the command will have no effect.

8.g Choose next-best move - (Control C)

You may wish to examine the effect of using alternate moves from a particular position and this option allows such an examination by forcing Colossus, once or repeatedly, to make the next-best move instead of the one currently nominated. If used repeatedly Colossus will play progressively weaker moves until there are no more in its list, when the program will display the message "No more moves" and start to re-examine the play from the beginning.

If Colossus is still using its book then this command chooses the next book alternative, selected at random, to be played. This allows you to examine the operation of the openings book and select a particular line to experiment with or which you prefer to play against.

If Colossus is no longer using the book then it will choose the move it considers to be its next-best, in terms of playing strength from those remaining.

8.h Type of play - (Control T)

The program has six different playing modes, allowing a wide variety of differing speeds and playing styles to be set. Remember that Colossus will play a stronger game the more time you allow it to consider each move.

The first four settings available under this heading are affected by the two 'Thinking parameters' described in detail in Section 8.i.

The dialogue box presents these six options:

1) **Tournament** - allowing full tournament parameters to be set-up. This involves a number of other dialogue boxes asking:

1st control	enter the move number for this control
2nd controls	enter the number of moves for secondary controls

1st time — enter the time of the first time control in the order Hours, Minutes, Seconds

2nd times — enter the time of the secondary controls in the same order

Colossus is not strict about your time controls and will not claim a 'Win on time' if you exceed any of the controls but it will never exceed its own controls!

2) Average - this is really a rather simplified use of the Tournament mode which, instead of requiring all four parameters detailed above, simply asks you to enter a 'Move time'. The program will then control its search routine to use, on average, the time you entered. Colossus plays fastest, and most weakly, when this is set to 0 minutes and 0 seconds.

Note 1: In fact, this mode sets up tournament parameters of 60 moves to each time control, with 60 times the average move-time being allocated for each control.

Note 2: This is the initial mode, with an average of 10 seconds per move.

3) All-the-moves - in many chess club meetings games are played with chess clocks and each player has to aim to complete the game in, say ten minutes, or lose 'on time'. This mode asks you to set the time for the full game and Colossus will then try to play all moves within this period. If either player exceeds the set time the game will be terminated with the message 'Time up'.

If you wish to 'handicap' either yourself or Colossus, you may add time to the particular elapsed-time clock before starting the game. This can be very useful where there is a real skill gap between players and the program.

4) Equal-time mode - in this mode Colossus will try to keep its elapsed-time clock as close to yours as possible - effectively playing at a similar speed to yours.

If you make several quick moves, Colossus will probably have to move more quickly in order to maintain your 'pace'. If, however, you think for a long time over certain moves Colossus, playing an average, will be given longer to improve its play.

5) Infinite mode - this is provided for those problems which involve finding the very best move from a certain set position.

Colossus displays another dialogue box asking:
Search depth? - enter a ply value from 1 to 12

Next a dialogue box appears requesting you to enter the 'Search type'. Setting this to '1' will set Colossus searching in the normal way ie selectively. Changing this to '2' forces Colossus to search 'full width', ie. all combinations, in order that a sacrifice is not missed.

In this mode Colossus continues searching further and further ahead until:

a) you tell it to stop, by pressing (Esc)
b) it finds a forced checkmate for one side or the other
c) it has searched to the depth required
d) there is only one legal move in the position.

This setting is very useful for postal chess games where you can leave the program running overnight, or even longer, to find the best move. When the search begins the clocks are re-set so that you can check the time taken.

NB: This mode does not use the openings book.

6) Problem mode - used to solve mating problems. This option leads to two further dialogue boxes.

The first requires you to enter the 'Problem type'. There are three possible value settings:

'1' Normal mates of the form 'White to move and mate Black in N moves
'2' Self mates of the form 'White to move and force Black to mate White in N moves
'3' Help mates of the form 'White to move and help Black to mate White in N moves

Colossus can, of course, find mates of all types for Black just as easily! Colossus Chess X is the first home computer chess program to be able to solve selfmates and helpmates.

Just as in infinite mode the clocks are reset and show the time taken to find the solution. When a mate is found the move line is printed at the bottom of the screen, the clocks stop and the prompt 'Continue?' is displayed. If you are satisfied with the move line found (Y) will cause this move to be made immediately. If you wish to see other alternatives press (N), the clocks will restart and Colossus will continue the search.

If no further mating moves can be found Colossus will make the last move it found on the board. If no mates can be found the message 'No mate' is displayed momentarily. Colossus enters the 'Alter-position' sequence so that you may amend the board as required.

Colossus is one of the fastest problem solving chess programs in the world!

8.i Thinking parameters - (Control Q)

If you wish to do so, you can change the way that Colossus thinks by selecting this option.

The first dialogue box requests you to select whether Colossus is allowed to think on your time or not. Setting this to 'Off' considerably handicaps the program. The current setting is highlighted.

The second box requires you to select the goal that Colossus is seeking. The standard setting is that Colossus should try to 'Win' but if you are being beaten too easily you may set this to 'Draw' or even 'Lose'.

When told to 'Draw' Colossus tries to stay about level with you. If you play a worse game than Colossus it will give you plenty of chances to equalise but it may still win if you miss those chances!

When playing to lose Colossus will play very badly indeed.

9 POSITION MENU



9.a Alter-position - (Control A)

This command allows you to set-up any legal chess position.

When selected, the current piece type and colour are displayed on the bottom line of the main screen and the menu bar alters to display only 'CDS' and 'Alter-position'.

Selecting (Alter-position) causes a large menu to drop down giving these options:

Side-to-move - (S)

This toggles the colour of the side to move from white to black and back.

Clear - (C), Pawn - (P), Knight - (N), Bishop - (B), Rook - (R), Queen - (Q), King - (K)

Upon selecting one of these options the current piece type is changed. To alter a particular square place the cursor over it and (click) to insert a piece of the current type on that square. You can then use the (left mouse button) dragging technique to alter the position of a piece.

When using keyboard input this system works differently and much more speedily. First position the cursor and then press the appropriate letter for the piece you require. The piece will appear in position and the cursor will move automatically to the next position. This makes setting up whole rows very fast indeed.

'Clear' is used to remove the piece on the current square.

Get initial position - (G)

If you make a mistake as you alter the board selecting this command will return the board to its original position before you made any alterations.

Wipe board - (Control W)

This removes all the pieces from the board, thus allowing positions with few pieces to be set-up more quickly.

Move number - (M)

If you to wish enter a new starting move number in the move record use this option. You will be prompted to enter the move number required.

New game - (Control N)

This is the same option, detailed later, which re-sets the program ready for a new game of chess. This is a simple way of exiting the Alter-position menu when an illegal position is displayed.

Exit -(E)

Allows you to return to the Main screen from the 'Alter-position' sequence when you have completed the set-up.

If you have made any changes from the position when you entered 'Alter position' the move record will be cleared so that 'Back-step' is impossible. Note that changing side to move or move number are considered by the program to be changes and also cause the move record to be cleared.

Remember to set the correct 'Side-to-move' before you select this option.

If the finalised position is illegal for some reason, Colossus issues an 'Illegal' message and you must correct the position before being allowed to exit this sequence.

The following illegalities are checked:

a) Either side has no king

b) Either side has more than one king

c) The side which moved last is in check

d) Either side has a pawn on the first or eighth rank

e) Either side has more than eight pawns or promoted pieces.

9.b Backward-step - (Control B) and Forward-step - (Control F)

A complete move record for the current game is maintained and updated constantly in memory. This allows you to step backward through previous moves and then forward again should you so desire.

This might be used for a number of reasons, eg. you might wish to backstep after the loss of a piece or you might want to try a different move line from an earlier position.

Each time this is selected the game moves back a half move. This means that you must step-back an even number of times in order to still be playing the same side.

9.c New game - (Control N)

This command clears the board, re-sets the clocks and prepares for a new game.

Please note that until the first move of a new game is entered the move record for the last game is still retained, providing you have not used the 'Alter position' sequence. This means that you can still replay the last game by using the Forward-step or Replay game commands.

9.d Replay game - (Control R)

This command causes the board to be re-set and the current game to be replayed step by step for the benefit of a spectator or a play review. You are required to enter the delay between moves as a number of seconds.

The replay can be interrupted by pressing (Esc) during a pause.

10 PROGRAM INFORMATION

Program Author:	Mr M.P. Bryant.
Graphics:	Binary Design, Carl Cropley and Mr M.P. Bryant.
Manual by:	Mr M.P. Bryant and CDS Software.
Publisher:	CDS Software Ltd. Nimrod House,
	Beckett Rd,
	Doncaster,
	England.
	DN2 4AD.
	Phone (0302) 321134
Language:	68000 machine code.
Code Size:	110K
Data Size:	226K
Positions examined:	500 per second (approximate average).
Openings book:	Over 11000 records - over 2000 lines, average length - 12 ply.

11 GAMES & PROBLEMS

Saved on the 'Book' disc in the 'GAMES' folder are a number of games (a selection of the best computer versus human struggles over the years) and several mating problems. These can be loaded with the (Features - Games) command and then viewed, replayed or altered using the (Position) commands.

11.a Games

The final position of each game is stored and it is this position that is displayed upon loading. The complete game move record is also loaded enabling you to see all the moves made using the (Position - Replay game) command.

File	Players/Result (R = Resigns)	Date
G.001	Turing chess program v 'Weak' human (0-1 R)	1951
G.002	Bernstein chess program v 'Skillful' human (0-1 R)	1958
G.003	Mac Hack Six v Human (1510 USCF) (1-0)	1967
G.004	Kaissa v Readers of Komsomolskaia Pravda (Draw agreed)	1972
G.005	Master v IM H. Berliner (2376) (0-1 R)	23/3/1975
G.006	Chess 4.6 v GM M. Stean (0-1 R)	1977
G.007	GM W. Browne v Chess 4.6 (0-1 R)	Summer 1978
G.008	IM D. Levy v Chess 4.7 (Draw agreed)	Autumn 1978
G.009	Chess 4.7 v IM D. Levy (0-1 R)	Autumn 1978
G.010	IM M. Valvo v Belle (0-1 R)	Autumn 1978
G.011	Belle v IM H. Berliner (0-1 R)	Autumn 1980
G.012	GM J.H. Donner v Belle (0-1 Adjudicated)	March 1982
G.013	GM A. Karpov v Mephisto III (Draw agreed)	September 1983
G.014	Cray Blitz v IM D. Levy (0-1 R)	April 1984
G.015	IM D. Levy v Cray Blitz (0-1 R)	April 1984
G.016	Cray Blitz v IM D. Levy (0-1 R)	April 1984
G.017	IM D. Levy v Cray Blitz (0-1 R)	April 1984
G.018	GM V. Korchnoi v Nuchess (0-1 R)	April 1984
G.019	Belle v IM D. Kopec (1-0 R)	October 1984
G.020	GM A. Karpov v Mephisto (1-0 R)	Spring 1985
G.021	GM G. Sosonko v Turbostar 432 (0-1 R)	September 1985
G.022	GM A. Yusopov v Mephisto Amsterdam (Draw agreed)	February1986
G.023	Hitech v WGM J. Miles (1-0 R)	June 1986
G.024	Fidelity v IM D. Strauss (2533) (0-1 R)	August 1986
G.025	Mephisto v IM D. Kopec (0-1 R)	November 1986
G.026	GM J. van der Wiel v Elite Avant Garde (0-1)	November 1986
G.027	Hitech v World U-14 Champion J. Lautier (1-0 R)	February 1987
G.028	A. Savage (2412) v Hitech (0-1 R)	August 1987
G.029	Mephisto Roma v GM S. Mariotti (0-1 R)	September 1987

11.b Problems

The initial position is stored and displayed on loading. The mating sequence, as found by Colossus is also loaded. This can be scanned through using the {Position - Forward-step} or {Position - Replay game} commands, if you get stuck. White is to move unless otherwise stated.

File	Problem description
P.001	Self-mate in 2
P.002	Self-mate in 3
P.003	Self mate in 4
P.004	Self-mate in 5
P.005	Mate in 2
P.006	Mate in 3
P.007	Mate in 4
P.008	Mate in 5
P.009	Help-mate in 2 (Black to move)
P.010	Help-mate in 3 (Black to move)

APPENDIX A THE 'BOOK KEEPER' IN DETAIL

Warning

Colossus Chess X uses its openings book in a unique way. It can learn lines, modify moves and become a better player the more games it plays by using its stored openings book. This book is therefore very important to the playing strength of Colossus.

In order that experts can modify the behaviour of Colossus, in order to play certain openings or practice against certain move lines for example, this book can be modified by using the 'Book-keeper' program. Please note the use of the word 'expert'. In order to be able to use this option effectively you need to be certain that you fully understand the format and operation of the openings book. **If any part of this Appendix is not clear to you then please do not attempt to modify the stored book in any way** - you could destroy the book permanently. For obvious reasons, **CDS Software cannot be held responsible for any corruption in the openings book however caused** and your program disk will not be replaced under any guarantee. If this does occur follow the instructions given in Appendix C in order to recreate an openings book as originally supplied.

If you are in any doubt about your ability to understand this Appendix do not attempt to use the Book-keeper. Colossus will still learn from its playing experience and will still become a stronger opponent as you play more games. It is not essential to understand this section in order to have full enjoyment from the game.

A.a Display

When you activate the 'Book-keeper', by selecting the command {Features - Book}, the screen displays the first section of the openings book.

The top line displays the move numbers of the moves printed underneath.

The first 'line' of moves in the book is:

e2e4! e7e5! f2f4$ e5f4 g1f3! d7d5! +

The '+' at the end of this line means there are further moves in this line, ie moves which follow from d7d5! but which do not fit on the screen.

The next line is: **g8f6 +**

This is showing that there is an alternative move 3 for BLACK (g8f6) to the move (d7d5!) in the 1st line.

The next four lines show other alternative moves for black.

The seventh line of moves is: **f1c4 g8f6 +**

This shows that there is an alternative move 3 for WHITE (f1c4) to the move (g1f3!) in the 1st line. Note that the move (g8f6) after f1c4 is the follow up move to f1c4, and NOT another alternative to the move (g7g5) on the line above it.

This format is followed down the screen.

On the last line of moves we have: **d7d6$ g1f3 e5f4!**

This means the move d7d6$ (2nd move for BLACK) is an alternative to the move f8c5 above it. Note that there is no '+' at the end of the line, meaning that e5f4! is the LAST move in this line. Note also that this line is a TRANSPOSITION of the line e5f4 g1f3! d7d6 at the top of the screen.

Colossus is capable of recognising most line transpositions, so the moves following only need be typed after the main line, and are not needed after the transposition line. (If you come across other lines in the book, which are a lot shorter than those around it, the chances are it transposes into some other line elsewhere in the book.)

Below the moves is a line with some more '+'s. These mean that there are further alternatives to those moves above the '+', which don't fit on the screen.

A back arrow cursor is shown pointing at e2e4! showing this to be the 'selected' move.

The bottom line displays the details of the 'selected' move thus:

Record 1 (1.e2e4!) of xxxxx

This shows that you are currently at Record 1, which is move 1 for white (e2e4!) and that there are xxxxx records in the book. (This number increases as Colossus automatically learns more openings.)

The openings book has a tree-like structure with the root at e2e4, branches (e7e5....), sub-branches (g8f6....) and further sub-branches with sub-sub-branches etc.

The branches are linked together by what we shall call the 'Next' move-number pointer, and the 'This' move-number pointer.

Eg. The 'Next' pointer for 1.e2e4! points to 1....e7e5, and this has its own 'Next' pointer which points at 2.f2f4$ etc.

The 'This' pointer for 1.e2e4! points to 1.d2d4!, and this has its own 'This' pointer which points at 1.c2c4! etc.

A.b Book-Keeper commands

A.b.i Cursor keys - Up, Down, Left, Right

These can be used to move the cursor around the tree of moves. If you try to move along a non-existent branch, the message 'Illegal' is displayed.

Eg. When you are at record (1.e2e4!), pressing the (Right arrow) key will move the cursor to point at the move e7e5!. The bottom line also changes to:- Record 2(1....e7e5!) of xxxxx. (The dots after the move show it is a move for black.)

Pressing (Left arrow) will get you back to Record 1 (1.e2e4!).

Now pressing (Down arrow) will move the cursor to point at the leftmost '+' at the bottom of the move display. The bottom line now changes to:

Record 262 (1.d2d4!) of xxxxx.

This shows that the move d2d4! is an alternative first move for white, to e2e4!. (Note that the disc is often accessed whilst moving around the tree.)

Despite pressing (Down arrow) again, the cursor remains pointing at the '+' (merely showing that it is currently at a move off the screen), and the bottom line changes to: Record 916 (1.c2c4) of xxxxx.

This shows yet another alternative first move for white, to e2e4! or d2d4!.

Pressing (Up arrow) takes you to d2d4!. Pressing (Up arrow) again will get you right back to the top-left of the screen, 1.e2e4!.

A.b.ii Base at move selected - (B)

Redraws the tree with the selected move (the one the cursor points at) becoming the 'base move', ie. the move displayed in the top-left corner of the display.

Eg. With the cursor at e2e4!, press (Right arrow) to move to e7e5! and then press (B). The screen is redrawn one ply deeper into the book (note that move number 4 now appears on the top line). There is also now a '+' to the left of e7e5!, showing that there is a move **before** e7e5!.

If you now press (Left arrow) the cursor will point at that '+' and the bottom line will go back to: Record 1 (1.e2e4) of xxxxx.

Pressing (B) again will restore the display to its original position.

A.b.iii First record - (F)

Moves the cursor, and the display base, back to the first record in the file (ie. 1.e2e4!).

This can be useful if you have wandered a long way into the tree and want to return to the start very quickly.

A.b.iv Home cursor - (H)

Moves the cursor immediately back to the top-left move displayed.

This can only be used if the cursor is currently at one of the displayed moves. If it is off the screen (pointing at a '+') the message 'Illegal' is displayed.

A.b.v Insert move - (I)

Program displays:

'Move?'

ready for you to type the required move.

After typing a move you may then select from the following options and commands:

(D) Delete move and try again

(M) Modify the selected move to the one just entered

(N) Next move-number insert - the move is inserted between the selected move and the one following. If the selected move is the last in a line, the move typed is added at the end

(T) This move-number insert - the move is inserted between the selected move and the one below. If the selected move is the last alternative at this move-number, the new move is added as the new last alternative

(Any other key) Exits from the Insert command without any change being made.

A.b.vi Adjust Flag - (!), ( ), ($), (?)

In order that Colossus can understand the quality of a particular move a single character suffix is recorded after the move detail. This 'Flag' can be adjusted to customise the way that Colossus will play certain lines or moves.

This can be of great value to those players wishing to practice playing against certain openings. By setting the required opening's flags to read as 'Good' and setting the 'Features - Book - Usage' option to 'Best', you can force Colossus to play that particular opening time after time.

(!) A good move

These are the moves which Colossus gives priority to when the Book-usage option is set to 'Best'.

( ) A fair move

($) A poor move

Please note that certain moves are marked poor because they aren't considered to suit Colossus' playing style. The same move might be perfectly acceptable to many chess players.

(?) A bad move

Colossus will never choose a bad move from its book but they have to be included in case an opponent plays them in which case Colossus needs to find a good reply.

You may also see the following suffixes displayed after moves but these are not user selectable.

(O) A move played by the opponent in a line learnt from experience

(L) A move played by Colossus and then learnt. If the cursor selects such a move it is displayed in the 'Record' line with a number after the 'L',

eg.: Record xxxx (7.f3e5L10) of xxxx.

This is the number of seconds that Colossus allocated to the move. If Colossus plays the same opening line again, when it reaches this move and is working at the same speed or faster, it will use this move immediately. If, however, it is on a higher level, ie. taking a longer time to think, it will compute a move again and then learn that, possibly different, move allocating it the higher number of seconds.

A.b.vii Mark selected move - (M)

Allows you to set the 'reference' marker ready used when linking up moves. The marked move is designated by the 'M' suffix.

A.b.viii Clear marker - (C)

Clears a marker set previously.

A.b.ix 'This' level linkup - (T)

Forces the marked move's 'This' move-number pointer to point at the selected move.

If the marked move already had alternatives below it then these may be **irretrievably lost** because there is now nothing pointing to them! However, in those cases where data is in danger of being lost the program will force you to confirm the link-up. Only confirm when you are certain that you are losing nothing of value.

If the selected move is the marked move the 'This' move-number pointer is cleared thus removing any alternatives below it.

The screen is then redrawn to display the new tree structure.

Eg. From the initial display press (Down arrow) until you have selected the move: Record 2872 (1.h2h4?) of xxxxx.

Then press (B) to redraw the screen with 1.h2h4? as the base move.

Move the cursor right to 1....e7e5 and press (M) to mark this move.

Now move the cursor left and down until you get to the bottom alternative - 1.b1a3?

Press (T) and the screen is redrawn with the moves b1a3? and d7d5 shown as an alternative line to the marked move e7e5. This is not a useful linkup but simply serves as an example.

Move the cursor to the marked move - 1....e7e5 and again press (T). This clears the 'This' move-number pointer thus removing b1a3? as an alternative. (Note that you are asked to confirm this link as it would lose the moves b1a3? and d7d5, if they were not already pointed at by the 'This' move-number pointer of 1.g1h3?)

When the screen is redrawn it should be identical to that displayed before you made the first link.

A.b.x 'Next' level linkup - (N)

Acts as described above but affecting the 'Next' move-number pointer.

A.b.xi Print book - (P)

The program requires you to enter the depth of move that you wish to print. Selecting '4' would print out all combinations of the first two moves for each side. Selecting 255, or any number higher than the longest book line, will print the entire book (over 2,000 lines).

A.b.xii Exit Book-keeper - (E)

Leaves the 'Book-keeper' program and returns to the main screen.

Note that the book file is not closed until you exit so any changes you have made may not be saved until this command is issued. You must exit the Book-keeper properly, ie. through this command, before you turn off your computer. Failing to obey this rule could cause the loss of data and file corruption.

APPENDIX B THE 'LEARN LINE' FACILITY - A WORKED EXAMPLE

In this Appendix we will demonstrate how you may add moves to a line which has already been stored in the openings book.

The current line which we will extend is:

1.e2e4! e7e5! 2.f2f4$ e5f4 3.g1f3! g8f6 4.e4e5 f6h5
5.d2d 4d7d6 6.f1c4 b8c6 7.b1c3 d6e5

We will show how the following lines can be added:
8.d1e2! c8g4 9.d4d5 g4f3 and
8.d4d5 c6d4!

First select the (Features - Book - Keeper) command. The screen will show the first five moves of the line we require on the top line. Press (Right arrow) five times in order to skip these moves and select the move 3....d7d5!

This is the first possible move after g1f3! but it is not the one we require. Pressing (Down arrow) selects 3....g8f6 which is our required move.

Press (B) to make this the display base move. The top line of the screen will contain the next four moves that we require. Press (Right arrow) four times to skip these moves.

The selected move will then be 5....d7d5. Press (Down arrow) to select 5....d7d6 which is our required move. Press (B) again in order to make this the display base move.

The screen will then display all the remaining moves along the top line with nothing after 7....d6e5.

This sequence of commands has proved that the original line is already recorded in the book and that move 7 is the end of the line. Press (E) to leave the Book-keeper and return to Colossus.

In order to add moves to the line we need to play a new game entering the first 14 moves exactly as noted above. Select (New-game), enter (Play - Supervisor) mode and then play the moves checking the Information screen in order to verify the position and the moves made to date against the list printed above.

Next enter the four moves:
8.d1e2 c8g4 9.d4d5 g4f3

Select the (Features - Book - Learn) command. The disk will whirr for a few seconds as Colossus adds the new moves to the book.

Then use the (Backward-step) option, Position menu, four times in order to remove the last four moves entered.

Enter two moves:
8.d4d5 c6d4

Select the (Book - Learn line) options again and these moves will be added too.

In order to verify that the moves have been added, select the (Book-keeper) option and follow the line out to 5....d7d6 and press (B) as before.

The screen will now show the moves 8.d1e2 and 8.d4d5 as alternatives after the move 7....d6e5. Some of our added moves are off screen, pressing (Right arrow) three times selects 7.b1c3. Press (B) to redraw the screen from this move and you will see that all six moves have indeed been added to the book.

Note, however, that Colossus adds all moves as 'Fair' ie with a space as the suffix. 'Modern Chess Openings' gives the moves 8.d1e2! and 8....c6d4! as good moves - there is an exclamation mark after them. You need to enter this information manually by pressing the (Right arrow) twice to select 8.d1e2 and then press (!) which will appear immediately after the move. Press the (Down arrow) and (Right arrow) again to get to 8....c6d4 and press (!). All the moves have now been added and their qualities set correctly.

Press (E) to leave the 'Book-keeper' and to close the book properly through GEMDOS by writing the memory buffers to disk.

By working through this example you can see how other favourite openings may be added to Colossus' book. Many users will be happy to use the book as supplied and therefore never use this facility. Serious players, however, will find this command useful in helping to practice against certain openings and to increase Colossus' playing strength in the opening.

Martin Bryant would be very interested to hear from any purchaser who adds very greatly to the book and who might offer to contribute their additions to future production copies of Colossus Chess X. He would also like to hear from users who know any openings tricks or traps which could be incorporated into Colossus' future openings book. Martin can be contacted by writing to him c/o CDS Software at the address given in Section 10.

APPENDIX C THE BOOK FILES AND THE 'MOREBOK.PRG' PROGRAM

On the 'Book' disk are three files related to the openings book.

WORKING.BOK — The file which Colossus actually uses to find its openings moves and learns lines to.

ORIGINAL.BOK — A backup copy of the initial Colossus book. Provided in order that you may recover from any errors made whilst using the 'Book-keeper' incorrectly.

MOREBOK.PRG — A program which expands 'WORKING.BOK' by 5,000 moves each time it is run. The maximum number of moves which can be stored is 65,000.If Colossus ever displays the message 'Book full' when trying to learn a line, run this program to increase the book capacity.

Upon purchase of Colossus, WORKING.BOK and ORIGINAL.BOK contain identical move lines. WORKING.BOK has a capacity of 25,000 moves whilst ORIGINAL.BOK has a capacity of just 15,000 moves. Most users will never exceed the capacity of WORKING.BOK as supplied. If, however, you scramble the contents of WORKING.BOK or develop a disk fault you can erase WORKING.BOK, copy ORIGINAL.BOK to WORKING.BOK and then run MOREBOK.PRG twice, in order to restore the disk to its original state. Please note that any move lines added by the 'Book-keeper' or through the 'Learn-line' command will be lost. If you are making extensive use of the 'Book-keeper' program we suggest that you make regular backups of WORKING.BOK in order to be able to recover from any future errors.

APPENDIX D AUTOMATIC LEARNING BY COLOSSUS

Appendices A & B demonstrate how Colossus can learn by rote from the user. Colossus Chess X is unique in that it can learn from playing experience by 'remembering' parts of previously played games in the openings book.

When Colossus plays a game it will select its first few moves from its existing openings book. After that it will 'remember' upto four moves on the end of an existing opening line. These moves are then available if Colossus plays the same opening line again.

This feature gives Colossus two distinct advantages. Firstly, it saves playing time as the moves are not recalculated on the later occasion they are played straight from book. Secondly, the thinking time taken to calculate the move may have been much greater during the game from which the move was 'remembered' than in the current game, eg. during a 'serious tournament' game at three minutes a move. When this line is played again Colossus may be playing a 'blitz' game making a move every ten seconds. The 'remembered' moves are then played, effectively increasing the playing strength of Colossus during those moves.

Note that when Colossus encounters 'remembered' moves in its book it first checks to see the time taken to calculate that move. If it has a longer calculation time in the current game than that stored with the move then the move will be ignored and a new, possibly better, move will be calculated. This new move will then be added as a further alternative to the book for future use. If the calculation still leads to Colossus playing the same move it previously 'remembered' then the move is upgraded by the recording of the higher level designation. Please note that calculation time is used to indicate the strength level that Colossus is currently playing - the longer allowed for calculation the better an opponent Colossus becomes.

If Colossus is playing a line which ends in moves previously remembered and these are played then a further four moves will be added to the book. In this way commonly played opening lines can be very greatly extended.

Colossus will even learn when playing itself. Thus you could set the program on a high level, allow it to play itself on many games and extend the book in this way.

There are, however, certain conditions under which Colossus will not learn from its games. This ensures that the book is not 'cluttered' up with large numbers of poor moves. These conditions and the reasons for them are:

1) when the level is set below 10 seconds a move - the book space is better used for 'higher level' moves!

2) when it cannot find even one existing book move since the last command was entered - there is no point adding moves when you may have changed playing parameters half way through a game.

3) when it is not playing for a win - this by definition means that the moves aren't likely to be worth remembering.

4) when its thinking has been interrupted - moves won't be the best.

5) when the book usage has been set to Off - you have told Colossus not to learn!