



About this Stack







This stack provides minimal documentation for the

Smart Game Board™.

Fonts To display this stack properly, your system should

include the fonts Geneva 9, 10, 12, and 14.

Note Smart Game Board™, Smart Go Board™ and Smart

Othello Board™ are trademarks by Anders Kierulf.

Smart Chess Board™ is a trademark by Christoph Wirth.

Smart Game Board 4.1 was written with MacApp®:

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About Smart Game Board (1)







The Smart Game Board is a program to support serious game players. For many of the activities they enjoy and value, it makes the computer a better tool than board and paper.

Functions You can play, replay, analyze, annotate, and print games.

With some versions, the computer can be used as an

opponent.

Go, Othello, Four games are currently implemented: Go, Othello,

Chess, Nine chess, and Nine Men's Morris (Mühle). Men's Morris

Most explanations hold for all games.



About Smart Game Board (2)

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Responsibility Anders Kierulf: Smart Game Board, plus Go and Othello.

Martin Müller: Swiss Explorer (Go-playing program).

Ralph Gasser: Nine Men's Morris.

Christoph Wirth: Chess.

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About Smart Game Board (3)







Distribution

• Go

• Othello

Smart Go Board 4.1 and Smart Othello Board 4.1 are

distributed as shareware. This means you can freely

copy the program and give it to a friend; it also means

that you're expected to pay for it if you use it.

Price The price is \$25; less for low-income, more if you think

the program is worth it.

Other Games Other games are NOT shareware. Chess and Nine Men's

Morris sell for \$40 each; Swiss Explorer sells for \$65.

IBM PC? There is no DOS or Windows version of the Smart Game

Board. If you like this program, buy a Macintosh.



About Smart Game Board (4)







References

A. Kierulf: "Smart Game Board: a Workbench for Game-Playing Programs, with Go and Othello as Case Studies". 110 pages. Ph.D. thesis, ETH Zürich, May 1990. (Available for \$8 (+ \$2 shipping) from the author.)

A. Kierulf, K. Chen, and J. Nievergelt: "Smart Game Board and Go Explorer: A study in software and knowledge engineering". Communications of the ACM, vol. 33, 2 (February 1990), 152-166.

A. Kierulf and J. Nievergelt: "Computer Go: A Smart Board and its Applications". Go World, 42 (Winter 1985/86), 62-64 & 53-54.



Hardware / Software







Hardware

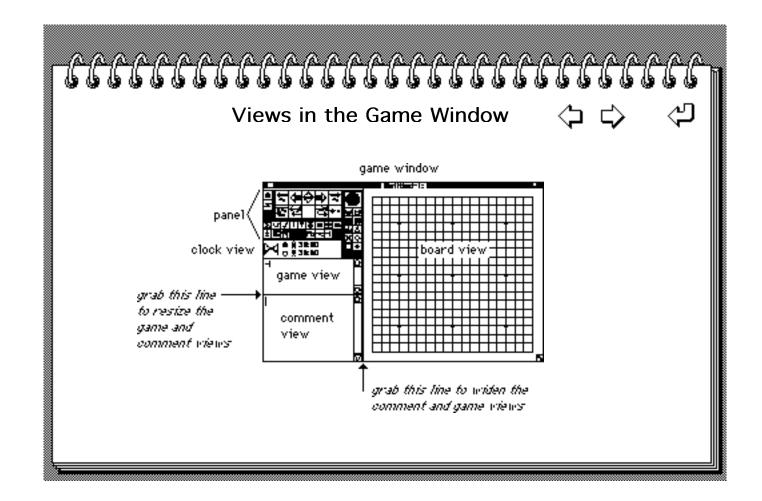
The Smart Game Board runs on any Macintosh. It runs barely in 1 MByte RAM; more memory is highly

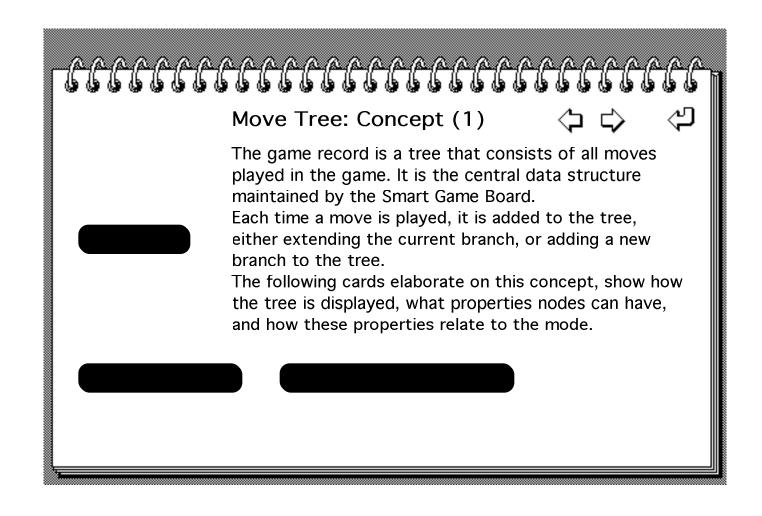
recommended.

A fast Macintosh is recommended for the Go-playing program Swiss Explorer; it needs at least 2 MBytes.

Software

Use System 6.0 or later. The Smart Game Board is compatible with System 7, but does not take advantage of the new features.





root

moves

Move Tree: Concept (2) main branch (game as actually played) This is a detailed view of a small side branches (alternatives tried out) game tree. Each box represents a move in the game tree, as well

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Current position at node c4 means that moves a1, a2, c3, and c4 have been played. There are two next moves in the tree: c5 and d5. as the board position reached after that move has been played.

Moves a1 to a6, connected by a thick black line, are the game as actually played (the "main branch"). At move 3, two alternatives to a3 were played: b3 and c3.



Move Tree: Concept (3)



Moves & Nodes Each of the boxes in the previous figure is called a

"node". Usually, each node contains a move, but there may be nodes in the tree used for other purposes than

holding a move.

Current Your current position in the tree is the node containing

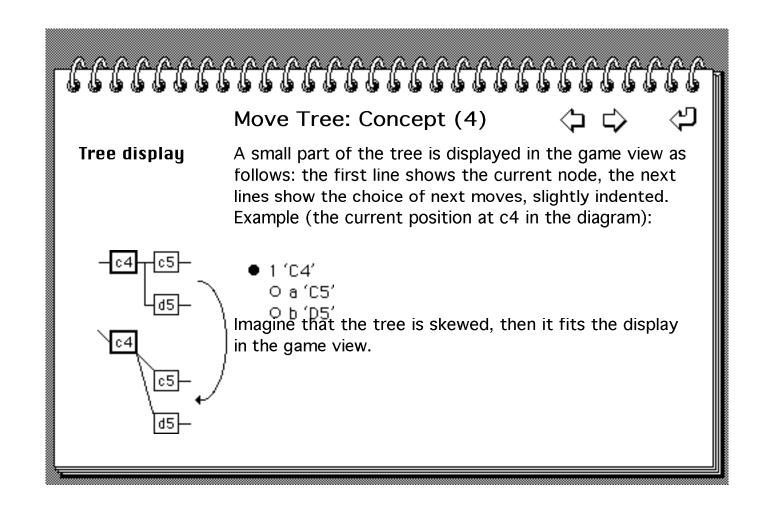
position the most recently played move.

Root node The root is a special node that represents the position

before any move has been played.

Terminal node A terminal node is a node that has no next node (no

descendants) - it is at the end of a branch.





Playing Moves (1)







Legal move

The Smart Game Board enforces the rules of the game; only legal moves can be entered. Each game has its own way of entering moves, e.g. click in Go and click-drag in chess.

Play existing move

If you enter a move that already exists in the current position, you just go to that move; no new node is added to the tree.



Playing Moves (2)







Shift key Hold down the shift key while playing a move to play a

move of the opposite color.

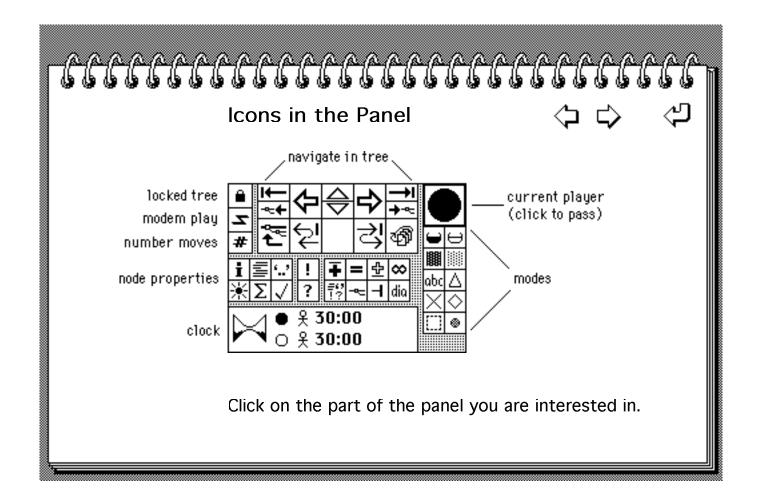
Option key Hold down the option key to add a move to the tree while

staying at the same position. This is useful to quickly

enter several alternative moves.

Grab last move Grab the last move played and drag it around on the

board to modify that move.





Node Properties







Node = Move

Each node has a set of properties associated with it. Many nodes have only one property, the move; other typical properties are comments, names, and marks on the board.

Property types

A property can hold a point, a list of points, a number, or a text. For example, a black-territory property contains a list of points marked as black territory; a name property holds the name of the node.

The following cards explain various properties. Basically, you click on the property icon to add a property to the current node; this is explained in more detail later.



Move Property





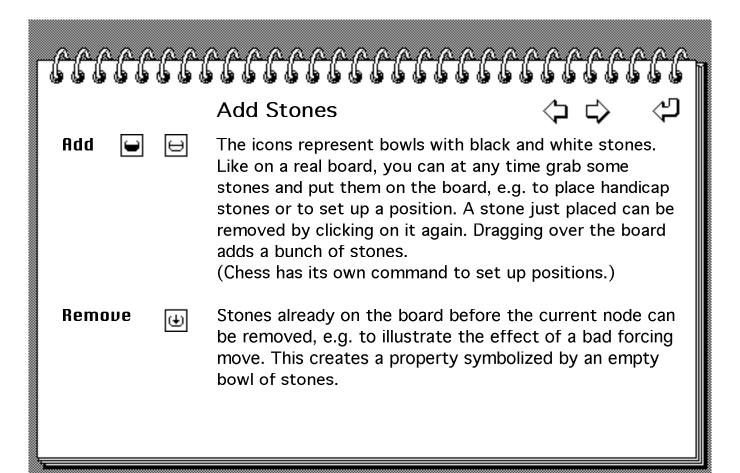


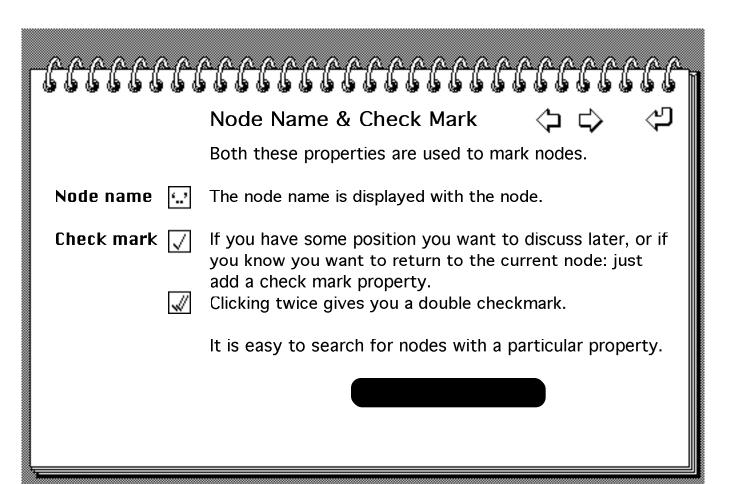
This property is automatically added to a new node when a move is played. It contains the color of the player and the move played.

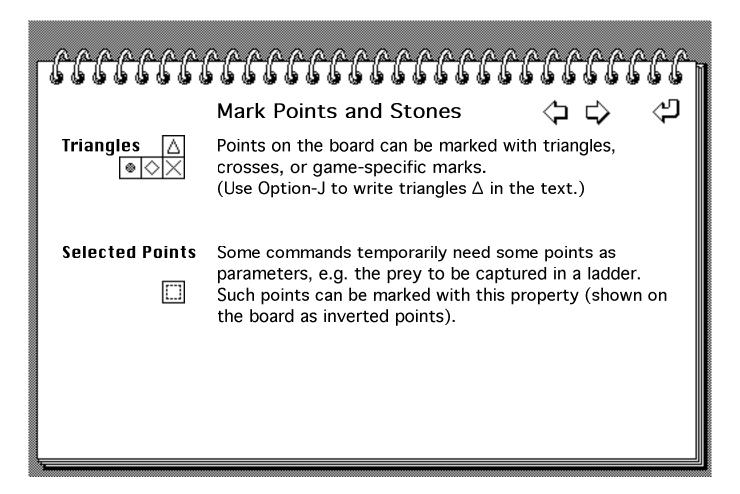
- The move is displayed as a small black or white stone
- followed by a number or letter refering to the point on o a the board where the move was played.

(Nodes without a move can be created with the "Create Node" command.)

(Use the View-command to change the display of the move property.)









Labels









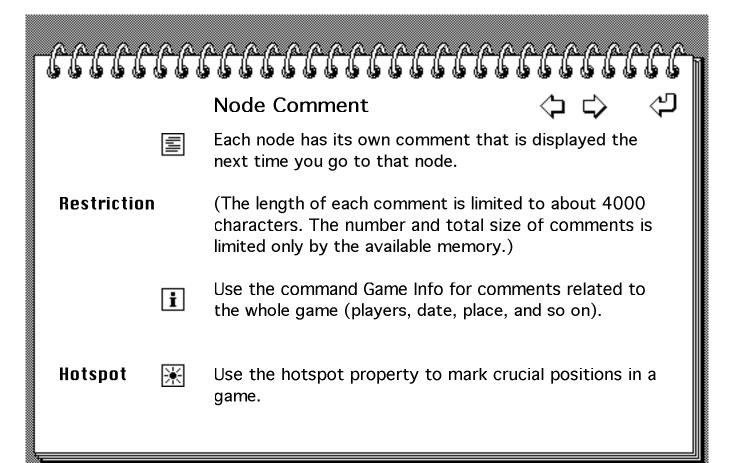
With this property, up to four letters can be displayed on each point on the board. You can use the keyboard to move around:

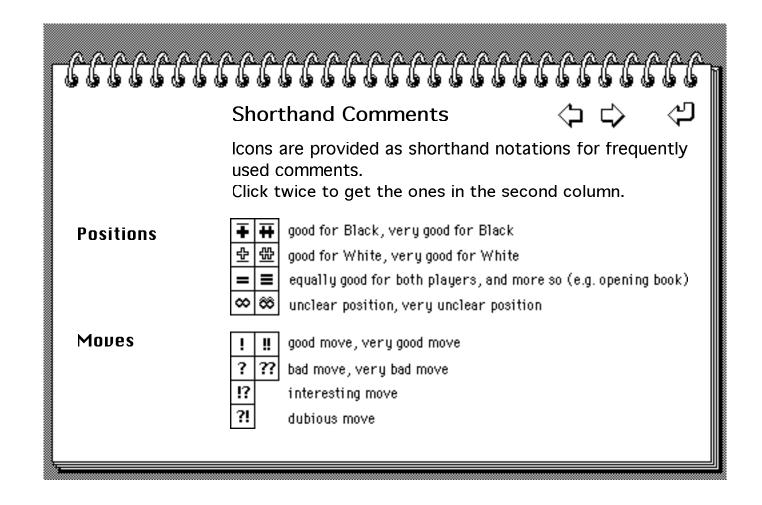
<Enter> = next, <Shift-Enter> = previous, <cursor
up/down> = up/down.

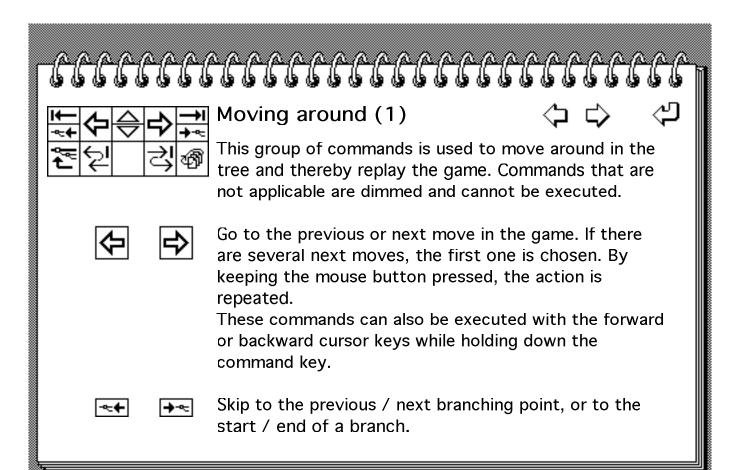
By default, you go to the next empty point. Hold down the option-key to go to an occupied point.

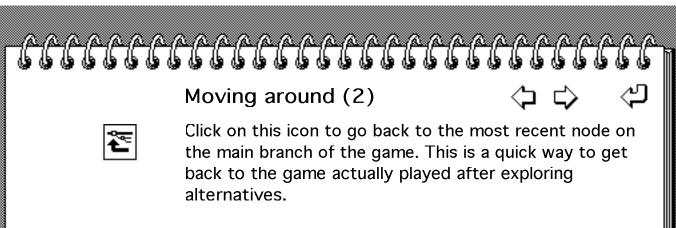
Explicit vs. implicit letters

Letters used to show the next moves are automatically assigned. To avoid that comments have to be changed when moves are added to the tree, any points referred to in the comment should be explicitly marked using the 'abc'-property.













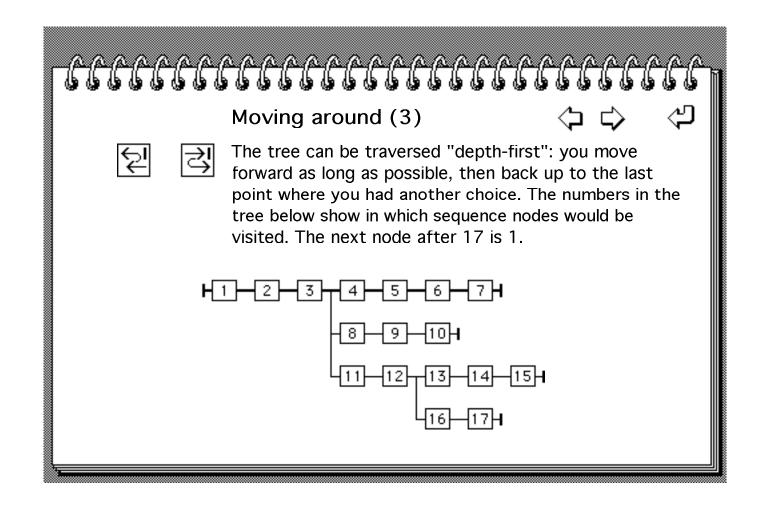
Go to start of game / end of game.



Use these two commands to choose between different moves at the same position (siblings).



Click on this icon to search for moves in all games in a collection, not just in the current game. This is equivalent to the "All Games in Collection" option in the Find and Replace dialogs.



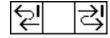


Moving around (4)









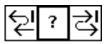
The depth-first tree traversal commands can be modified to a depth-first search for a given property. The property to be searched can be grabbed in the panel and moved to the empty space.

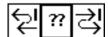


For example, to search for nodes with a question mark property, grab the question mark and move it to the space reserved for the search property. Now instead of going to the next or previous node, depth-first forward / backward will search for the next / previous node with a question mark.

Click on the search property to turn searching off and return to normal depth-first movement.







Normally, searching for a property searches for both single and double properties, e.g. ? as well as ??. To search for only single or only double properties, either drag the property to search for from the game view, or drag the same property from the panel repeatedly. Searching for a specific number of properties is indicated by a frame around the property searched for.



Moving around (6)







Find...

The command "Find..." in the Tree-menu allows you to search for any text property (name, comment, game info) with a specified pattern. If the pattern is found, the current node is set to the first node found containing that property.

In addition, depth-first movement is modified as described on the previous card, allowing you to search for the next occurence of the pattern, forward or backward. That text will be searched is indicated with "txt" as the search property.



Case sensitivity can be turned on or off in the Find dialog.



Moving around (7)







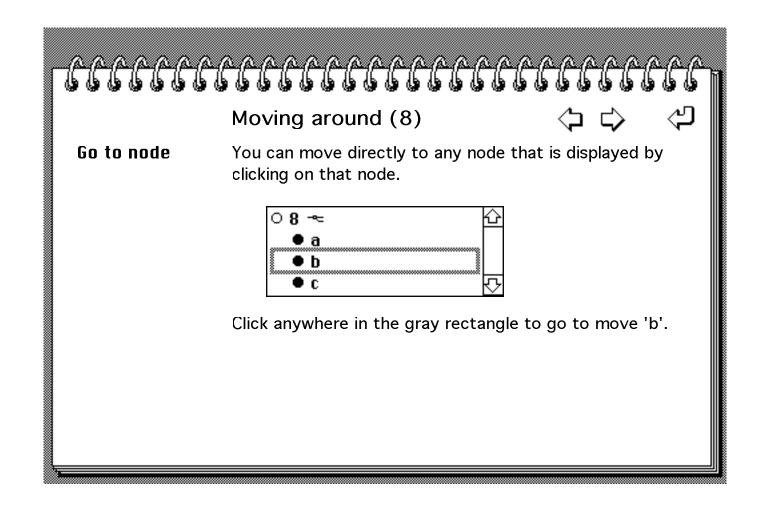
Go to Move Number

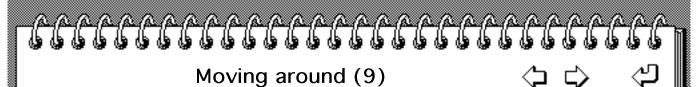
Use "Find..." also to go to a specific move number: just enter the number to go to. Use "+" or "-" in front of a number to go that many moves forward or backward in the game, e.g.:

42: Go to move number 42.

+10: Go 10 moves forward.

-5: Go 5 moves backward.

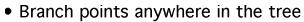




Special properties

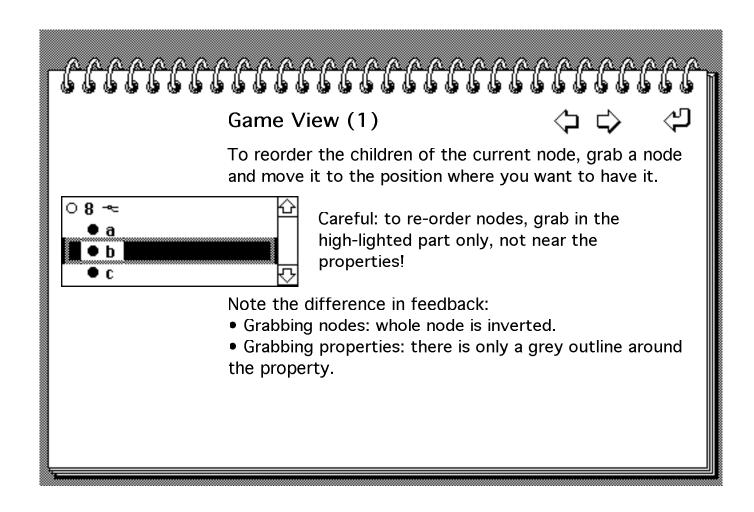
Some special properties in the panel can be used for searching:

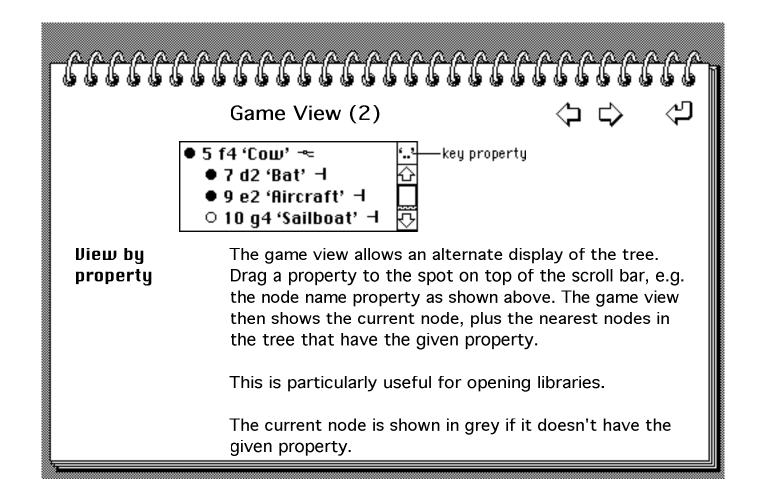


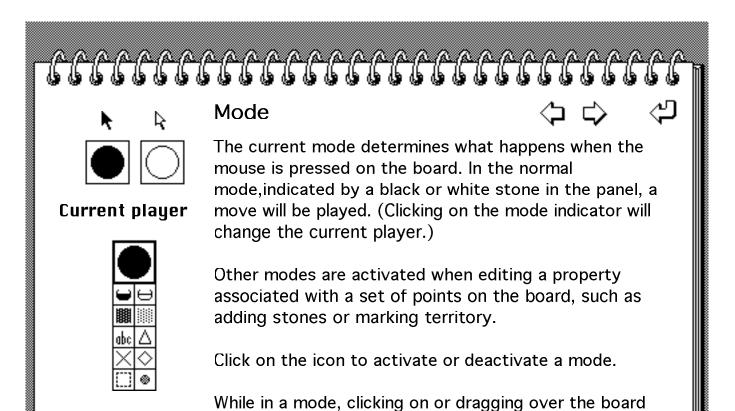


• Terminal nodes

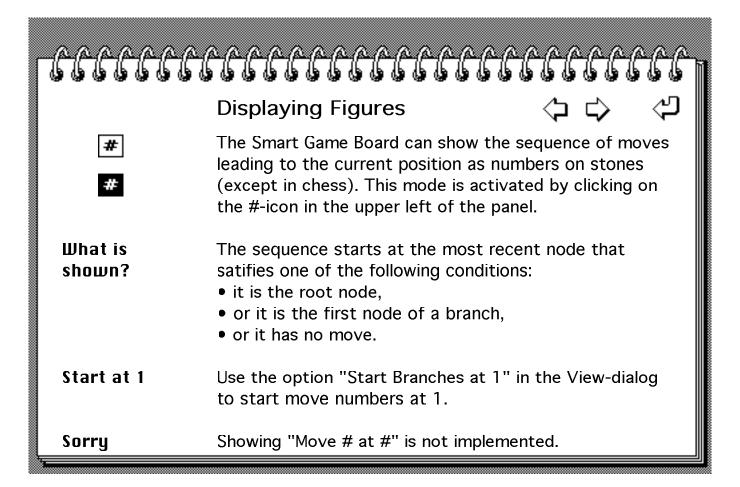
Clicking on these has no effect; you have to drag them to the search area.

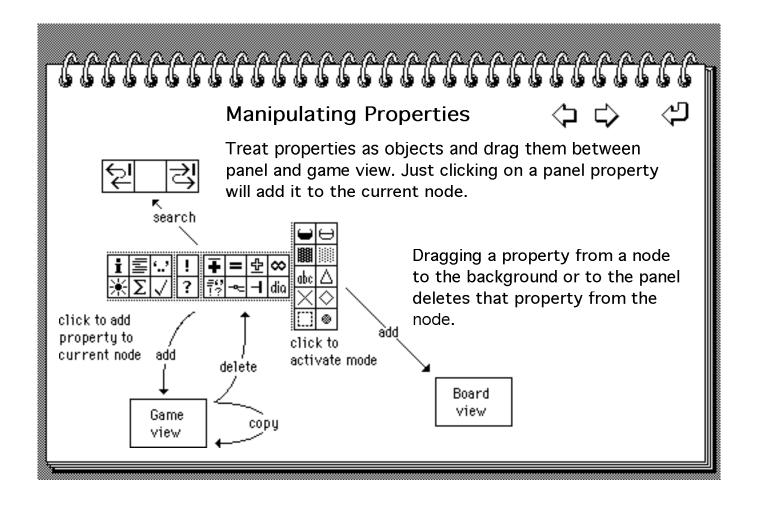






will add or remove points with that property.







Game Collections (1)







Game collection window

Each file can contain a collection of games, not just one game. A game collection is displayed in a window with a grid showing the game identifier, the players, outcome, place and date played. I recommend to keep all games from one tournament as one collection.

Open game

Double-click on a game to open its game window and replay the game, or select games and choose "Game -> Collection" in the View-menu. The window title shows the game ID, or the player names if there is no game ID.

Close

A game collection is closed when the last window belonging to that document is closed; this may be the game collection window or one of the game windows.



Game Collections (2)







Sorting Click on any column label to sort the games

alphabetically according to that column. Hold down the

shift key to get the inverse order.

Game info Choosing Game Info shows the game info for the

selected games (or for all games in the collection if no game is selected). Use the "Next" and "Previous" buttons

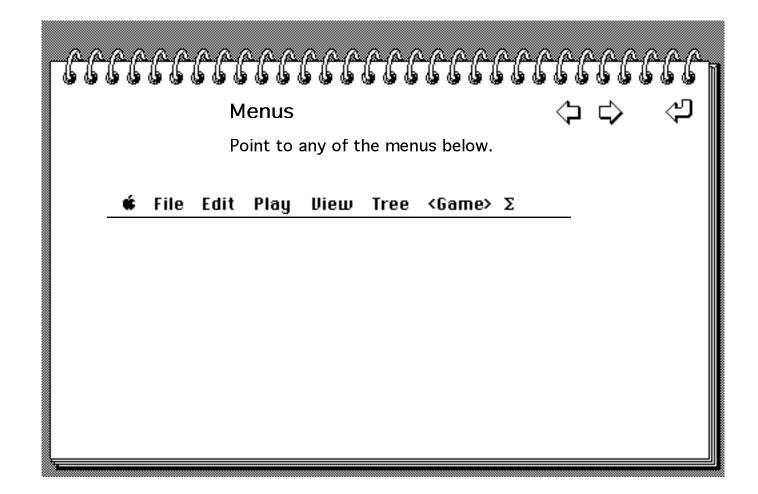
to go from one game to the next.

Careful: "Cancel" only cancels the editing operations for

the currently shown game!

Game "All" Game 0 (named "All") is special: any property set there

is applied to all the selected games.





File-menu (1)





New Game... Starts a new game. A new game window is opened for

that game.

Use the "Options..." command to set up different

players and options for a new game.

New Collection Opens a new, empty game collection. Use

Cut/copy/paste to add games to that collection.

Open Folder Loads all games in a given directory (and its

sub-directories) as a new game collection. This is the best way to initially build a game collection from existing

games.



File-menu (2)





Open... Reads in a single game or a game collection from disk.

(Smart Game Board file format is standard. The most important parts of Go files in Ishi Press format can also

be read.)

Saue The whole game tree is saved, or in the case of game

Save as... collections, all games in the collection.

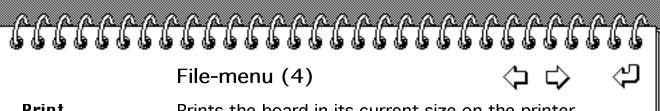
Write as Text Writes the current game or the whole game collection as

a human-readable file. This is useful to write game

annotations.

Note Not all properties are written to the file, so although

games in this format can be read by the Smart Game Board, you should use Save to store games on disk.



Print... Prints the board in its current size on the printer.

(Numbers on stones are printed in the font Helvetica

Narrow.)

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Game Info... Lets you specify game-related information that is stored

together with the game: when it was played, by whom, what the result was, and so on. The game info is stored

as a property at the root node.

• Result The first letter of the result should be "B" or "W" to

indicate the winner, followed by a "+" and the score.

• Date Write the date as YYYY-MM-DD, so that you can sort

games by date.



Edit-menu







Undo Note that Undo is not implemented for all commands.

Cut, Copy, Paste, Clear Cut, Copy, and Paste also work for games when a game

collection is open.

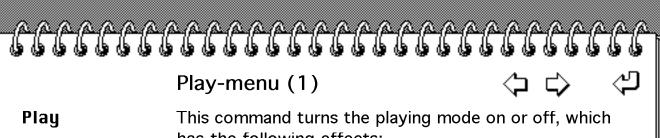
Copy Board Transfers a picture of the board to the clipboard.

Copy Moves Copies the subtree of the current node as text to the

clipboard.

Paste Moves Interprets the text in the clipboard as moves and pastes

them at the current node.



• Play On



• Play Off



has the following effects:

- The clock is running, and moves are generated if you're playing against the computer and it's the computer's turn to play.
- The clock is stopped, the computer does not play even if it's the computer's turn to play.

The playing mode is also indicated by the hour-glass in the clock view. Clicking on those has the same effect as choosing "Play".

Pressing Command-Period is another way to turn the playing mode off. Command-Comma turns it back on.



Play-menu (2)







Play (cont.)

The clock is automatically suspended when you start walking around in the game tree. It is turned back on again when you play a move.

(If the computer doesn't seem to play when it should, it's probably because the playing mode is turned off.)

Hint Suggests a move to be played.

Pass Creates a pass node in the tree.

Options... This brings up a dialog where you can choose various

options: computer play, time to use, and game-specific

options (e.g. board size in Go, handicap).



Play-menu (3)





Clock... Use this command to set the time left for each player,

plus the following options:

• Lose on time If set, a dialog box pops up when your time is negative,

and the clock is turned off.

• Overhead How much time to subtract for each move played (e.g. to

account for the operator at a computer tournament).

• **Overtime** The overtime becomes active when the time on the clock

runs out. You specify a number of moves to be played within a certain period of time. When you've played that

many moves, your time is restored.



Play-menu / Modem play (1)







Modem play The Smart Game Boad uses a communications protocol

developed with Dan Christensen and modified by Bruce Wilcox (as described in "Computer Go"). For Go, it is compatible with Nemesis and Many Faces of Go.

4.1 us 4.0 However, since the protocol changed between Smart

Game Board 4.0 and 4.1, those two versions can not play

against each other by modem.

Game analysis The protocol supports playing a game as well as

discussing it: you can move around in the game tree to show moves to your opponent. Either player can play moves of either color. You both always see the same

board position.



Play-menu / Modem play (2)







Inactive: 🗷

Active:

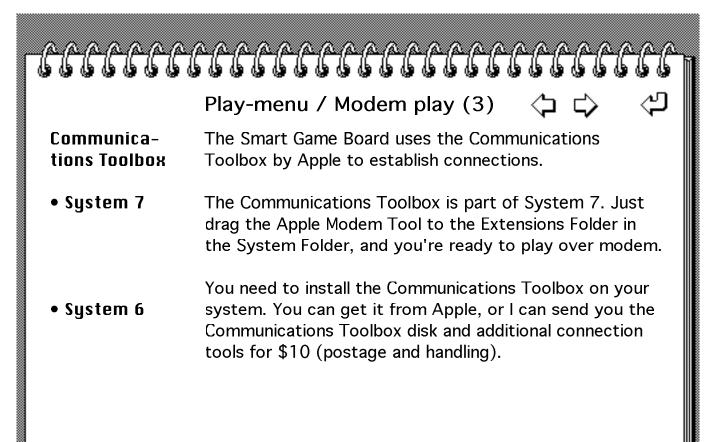
The modem play indicator in the top left of the panel must be turned on to send and receive moves over the modem. It is automatically turned on when you choose Call or Wait for Call.

Window with modem play

Modem play can only be active in one game. When you switch between games, you have to make sure that you and your partner switch to the same board position. Best is to only switch between games when you are at the root node in both games.

Talk window

All text typed in the upper half of your talk window appears in the lower half of the talk window on your opponents computer. This works as soon as a connection is established, even if no game is open.





Play-menu / Modem play (4)





Settings Use this command to set up a connection with your

partner, whether over modem or over the AppleTalk

network.

Call One of the players executes Call, the other executes

Wait for Call. (Exception: if you're directly connected and

are using the Serial Tool, both must Call.)

Hang up Execute Hang up when you're through with a connection.



Modem Play: Notes (1)







Protocol

Only moves and tree movements are transmitted over the modem. Thus handicap setups, new game commands, properties and comments added to a node, and so on, are not sent to the other player.

Not active during modem play

During modem play, the following commands are disabled:

- Undo Move and Redo Move.
- Delete Nodes.
- Rotate Tree.



Modem Play: Problems (1)

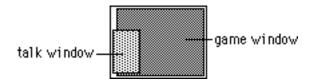






Talk window

On a small screen, it is hard to see a large board and the talk window at the same time. Buy a larger screen, or position the windows as follows:



This way, you can keep the board at the maximal size; switch between talk window and game window when you see new text coming in.



Modem Play: Problems (2)







Potential problem with **ADSP**

Since 4.0.2, the Smart Game Board no longer puts up its own dialogs while establishing a connection. This works well with the Apple Modem Tool, but there is now no way to cancel "Wait for Call" with connection tools that don't display dialogs of their own (e.g. the AppleTalk ADSP Tool).

Problem with cursor position With the Apple Modem Tool, there is still a slight problem with dialogs being sensitive to the cursor position. If a dialog seems to hang for a long time, just move the mouse in or out of the dialog box.



View-menu (1)





Sound Specify whether to use sound or not.

View... Specify manu options regarding the display of board and

game view.

• Colorblind With this option, all stones are displayed as being white -

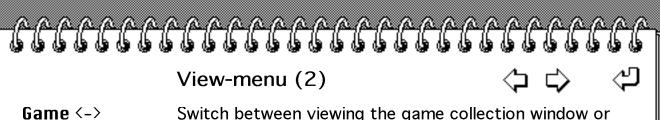
you have to remember which stones are black and which

are white.

Note All these settings are saved in a file in your system

folder called "Smart <game> Preferences", and are

restored the next time you start the program.



Game <->
Collection

Switch between viewing the game collection window or the selected game in that collection.

(A single game is equivalent to a game collection with just one game. Use the collection window e.g. to copy a single game so you can paste it into another game

collection.)

Show Clock Show Search Show Talk Show or hide the clock and search views in a game

window.

Show or hide the talk window used for modem play.



View-menu (3)





Self-Test...

Normal:

The game tree can be locked so that you cannot enter any moves that are not already in the tree. This is useful to test whether you can guess the next move in a professional game or an opening library.

Locked:

You can set/reset the locked tree mode with the icon in the top left of the panel.

Guesses

All your wrong answers are recorded in the tree. After the specified number of guesses, the right answer is shown.

The Self-Test dialog shows a statistic of how many moves you got right the first time, the second time, and so on.



View-menu (4)







Overview

The Overview feature (by Christoph Wirth) gives you a quick overview of the game through several diagrams.

Set Overview... Allows you to set parameters for the Overview.



Tree-menu (1)



Find... Explained elsewhere *.

Find Move Δ Goes to the position where a specific move (marked with

a triangle) was played. (Not possible in chess.)

Count This counts the number of nodes in the subtree of the

current node, both total and the number that have the

search property.

It also allows you to compute statistics of game info

properties in multi-games.

Replace Replace <u>all</u> occurences of a text string in a game or

collection by another text string.



Tree-menu (2)







Insert Move Insert Move Pair If you forgot to enter a pair of moves in a game: just go to the position where you forgot to enter the moves, choose "Insert Move Pair", and play the two moves. They are properly inserted in the tree instead of creating a new branch.

Create Node...

Adds a new node with no properties to the tree, either as father, right sibling, or first or last child of the current node.

Delete Nodes...

Delete the current node, its subtree, or only the branches of the subtree. If the current node is at the end of a sequence, that node is deleted without putting up a dialog box.

Note: Undo Delete is not implemented.



Tree-menu (3)





Rotate Game... You can change the orientation of all moves in the

current game.

Make main branch

Make Main Branch re-orders the whole path leading to the current node such that it is on the main line of play (no ancestor has a left sibling).

The Game View* explains how to reorder children of the current node.



Tree-menu (4)





Install as Key All positions in the current game tree that are marked

with a hotspot property are installed as keys, with the

node name as key name.

For example, a tree with named openings can be used as

a key.

(The game tree used as key can then be closed.)

Classifies Classifies the selected games of a game collection

according to the installed key. The hotspot property and node name is set at the last node that corresponds to a key, and the Opening-field of the game-info is set to that

node name.

Classify Tree Classifies the whole tree, not only the main branch.



Σ-menu







The commands in this menu are provided for the benefit of game programmers rather than game players.

Mark Σ

Use this command to mark or unmark a set of nodes with the Σ -property.

How to use **S**

The recommended use of the Σ -property is to mark positions to be analyzed by another player. He or she can look through the positions marked with Σ , add a comment, and mark the position as analyzed (Σ).



Go







The following cards give a very brief introduction to Go. The American Go Association can tell you where to find the nearest Go club; Ishi Press is a good source for books and equipment.

AGA - American Go Association P.O. Box 397, Old Chelsea Station New York, NY 10113, USA

Ishi Press International 1400 North Shoreline Blvd, Bldg. A7 Mountain View, CA 94043, USA



Computer Go







Publication of "Computer Go" (US \$15/year):

David W. Erbach (ed.) 71 Brixford Crescent Winnipeg Manitoba R2N 1E1, Canada (204) 256-2537

A complete bibliography of computer Go can be found in my thesis.



Rules of Go









- Black and White alternate with playing.
- Play anywhere except where forbidden by repetition (the same board position must not be repeated).
- Stones directly (horizontal or vertical) adjacent to each other form a block.
- Empty points adjacent to a block are called liberties.
- Blocks with no liberties are removed from the board (captured). If two adjacent blocks run out of liberties at the same time, the stones of the last player stay on the board.
- Stones and empty points completely surrounded by a player count at the end of the game; whoever controls more points wins.



Go-menu







Ladder

Calculates whether some marked stones can be captured in a ladder or not. Click on the stone to mark it, then choose "Ladder" in the menu. The solution sequence will be added to the game tree.

(Choose "Show Search" in the View-menu and set the Trace option to see the ladder algorithm in action.)

Insert Figure

Inserts an empty node with the name 'Figure' in the tree. The node name is irrelevant; the computer will divide the game into figures at any node without a move.



Territory Counting







Black



White

The program does not automatically keep track of secure territory, but it allows you to estimate and count what you think each player will get. As the game progresses, that count will become more precise; at the end of the game, the same mechanism can be used to determine the winner.

The Chinese method of counting is used: both stones and spaces are territory. In most cases, this is equivalent to the Japanese method, where enclosed territory and captives are counted. In handicap games, Black gets an additional advantage because the handicap stones count as one point each.

The komi specified in the Game Info is added to the score. The komi may include a half point, e.g. "5.5", or it can be negative, e.g. "-4.5" for reverse komi.



Othello







The following cards give a very brief introduction to Othello. Unfortunately, few people know that there are tournaments and international championships in Othello.

The USOA publishes the "Othello Quarterly" (\$6/year, \$11 overseas).

USOA - United States Othello Association P.O. Box 342 Falls Church, VA 22046, USA



Rules of Othello







- Othello is played by two players (Black and White) on an 8*8 board.
- A move consists of placing a disc on the board and turning the line of opponent discs enclosed between an existing own stone and the newly played stone.
- Discs must be turned in all directions where stones are enclosed.
- The players move alternately; if a player has no legal move, the player has to pass.
- The game is finished when both players have to pass.
- The player with more discs at the end wins.



Othello-menu







Compute Endgame Computes perfect endgame play for the current game,

or for the selected games in the current game

collection. Use Preferences to set the maximal depth

when analyzing the endgames of a collection.

'abc' -> Moves

Converts the move numbers entered with the 'abc'

property to a game record. This is a much faster way of entering written game records than entering them move

by move.

Numeric Keypad For computers lacking a numeric keypad (e.g.

PowerBook), the keys around the "K" are mapped to

digits while the Caps Lock key is pressed in 'abc'-mode.



Othello Strategy







Mobility!

Othello is a game of mobility. Keeping open your options of where to play is the most important factor leading to a win.

Corners?

True, corners are important, but you can only play into a corner when your opponent has played a dangerous move adjacent to the corner. And because your opponent is not going to play a bad move as long as there are other options, you have to force them to play there by reducing their mobility.

Maximize disc-count? In the first three quarters of the game, maximizing your disc-count is often counter-productive, as it tends to build walls around your positions, limiting your access to whole areas of the board.