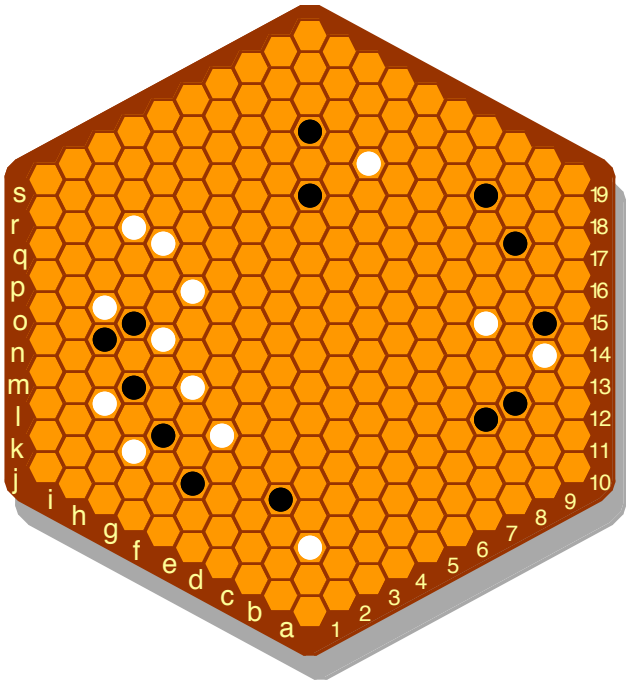
HAVANNAH
&
COMPANY



Connection games

by

Christiaan Freeling

Contents

Preface

Between 1976 and 1984 I was possessed with a spirit that cared a great deal about abstract games of pure strategy. It retired eventually, of lack of ambition, and left me with a legacy of some forty games. Here are three connection games and an alignment game. Havannah and Hexade are featured in R. Wayne Schmittberger's **New Rules for Classic Games** (John Wiley & Sons, Inc. New York; ISBN 0-471-53621-0) and were played extensively at the games club 'Fanatic' at Twente University in Enschede, the Netherlands. Havannah was first published in **Games & Puzzles**, issue 79, winter 1980. Rondo was first published in **Games Magazine** (december 1982). Superstar was one of my last games & I had already quit Fanatic.

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HAVANNAH

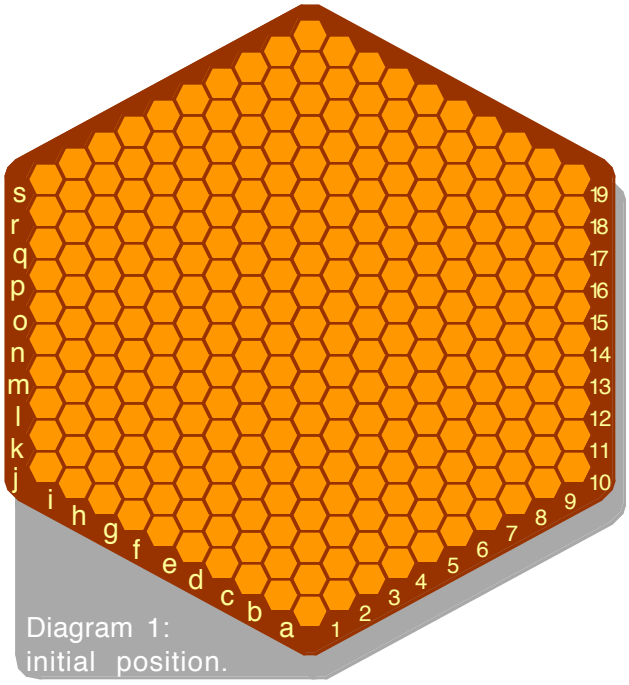


Diagram 1: initial position.

General

Havannah, of all my games, has the simplest rules. It has been played very extensively, not only at Fanatic, but throughout the mathematics department of Twente University, at the Go club and in fact all over the place. It has also been marketed by the german company Ravensburger in 1981 and even became 'game of the year'. But its commercial success remained moderate and it disappeared from the market a few years later.

I never disputed Ravensburger's marketing strategy: they're doing a great job for well over a hundred years. But I didn't agree either: the board was definitely too small and so were the stones. The point is that manufacturers, if at all, prefer *tactical* games with simple rules and a one-dimensional strategy. Take the countless five-in-a-row variants, or even Hexade, Havannah's tactical supporting act. There may be tactical problems in such games and they may not lack depth. But there's no strategical dilemma. Havannah's image, taken from the box, was just that: a nice fifteen minutes game & don't make a meal of it. I should have offered them Hexade, but I hadn't invented it yet.

Havannah is very much a *strategical* game. You can learn the rules in less than a minute, but it may take you more than a year to develop comfortable strategical concepts. Its tactics, though not as manifold and profound as those of Go, are beautiful and can be mastered up to perfection, but only in the context of its double-edged strategy.

The game had already been played for over a year on a daily basis in the mathematics department's canteen, using what would later be coined 'snake strategy', with the emphasis on speed.

Then Roelof Moll, a local Chess player who had played only for a few weeks, came and started winning consistently by following his Chess instinct and taking the center. He didn't care for speed, he cared for safety. His reasoning was this: Havannah, of all games that can end in a draw, has the smallest margin (which is true). Therefore a consistently good defence *must at some time turn into an attack.* He was so very right! His contribution to Havannah, 'spider strategy' was a breakthrough that finally showed us the strategic dilemma: safety versus speed.

Rules

>>> The game starts on an empty board, see diagram 1. Players move in turn to place one stone on an empty point. White moves first.

>>> The game is won by the first player to complete a ring or a bridge or a fork. All of these are 'chains': closed connections of one colour.

- **>** A ring is a chain around at least one point.
- **>** A bridge is a chain linking two corners.
- **>** A fork is a chain linking three sides. Corners do not belong to sides.

That's it. In 'New Rules for Classic Games', Wayne states that a ring should surround at least one *vacant* point. This is not the case: the point may be occupied by either player.

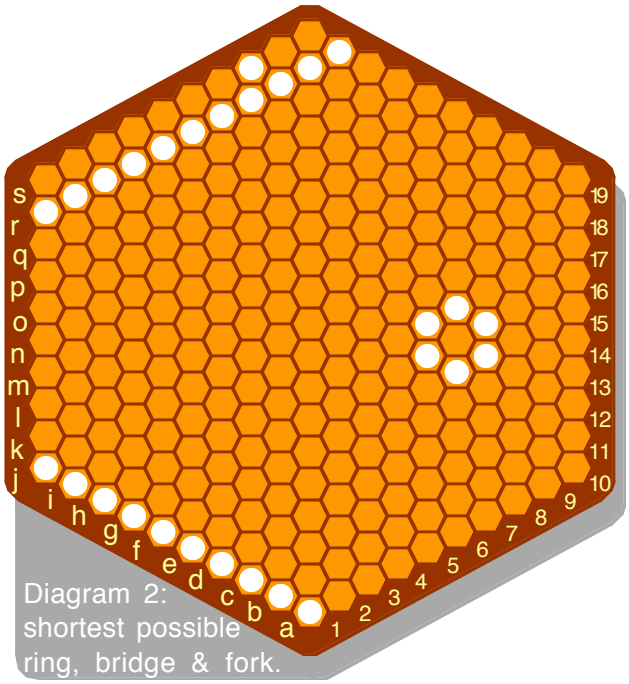


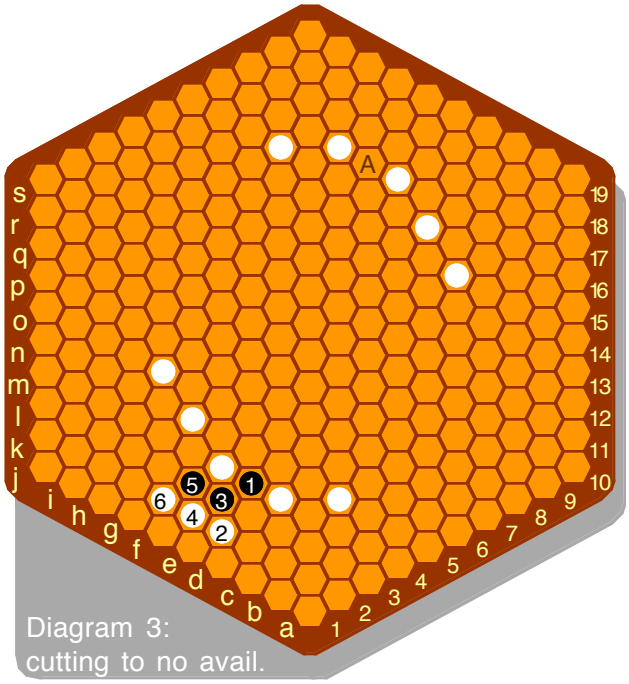
Diagram 2: shortest possible ring, bridge & fork.

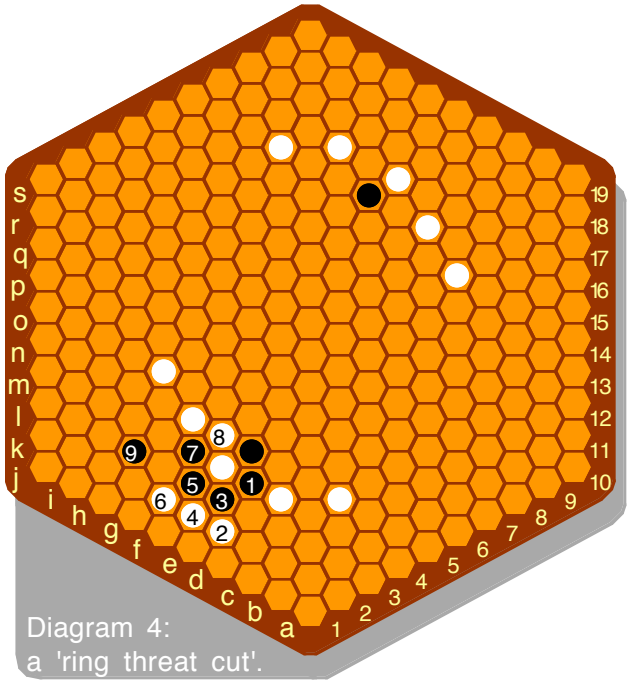
Diagram 2 shows the shortest possible chains to satisfy the definitions. They hardly ever materialize this way. Note again the point inside the ring: it doesn't matter whether or by whom it is occupied, nor does it matter in general what is connected to a chain, as long as it satisfies one of the definitions.

Strategy & Tactics

A frame

One of the first strategic goals in Havannah is is the establishment of a 'frame', a connection aiming at a ring, bridge or fork, that, though still incomplete, cannot be broken by the opponent. Consider diagram 3.





The five white stones are hovering above the top sides and the right side and black cannot prevent white from reaching these sides. There seems to be a cutting point at A however, and indeed, black *can* prevent a connection between the two stones on the left and the three on the right. But in doing so he pushes white straight into victory. In the lower part of the diagram this is illustrated in the rotated position. White 2 on black 1 is called a 'cup'. The stones 2, 4 and 6 not only threathen to connect up with the existing stones but worse: if black insists on preventing this, they threaten a fast fork on their own! Black's 'cut' has made his situation worse than it was. Therefore the initial five stones do in this situation constitute a frame.
But not in any situation: in diagram 4, one black stone is added and now a cut is possible: black 7 is a ring threat that requires an answer, allowing black to jump with 9, effectively cutting and denying white access to the left side and bottom left corner.

> Generally, whether a particular incomplete connecion is a frame, depends on tactics. You've just seen an example.

> If it is a frame, and it's not yours, attacking it makes things worse. The best defense is having a faster frame. If that's not the case you're in trouble.

> The number of moves needed to turn a particular frame into a chain, also depends on a variety of tactics, usually involving ring & bridge threats.

To Illustrate the last point, consider the same five stone frame, diagram 5. How many moves does it take to complete the fork? The frame is three steps from both top sides and four from the right side. There are also four gaps to fill in. This adds up to fourteen, but by filling in smart, white can force black to answer ring threats, like 1 on white 4, because a white stone on that very point frames a ring that needs only two stones to complete.

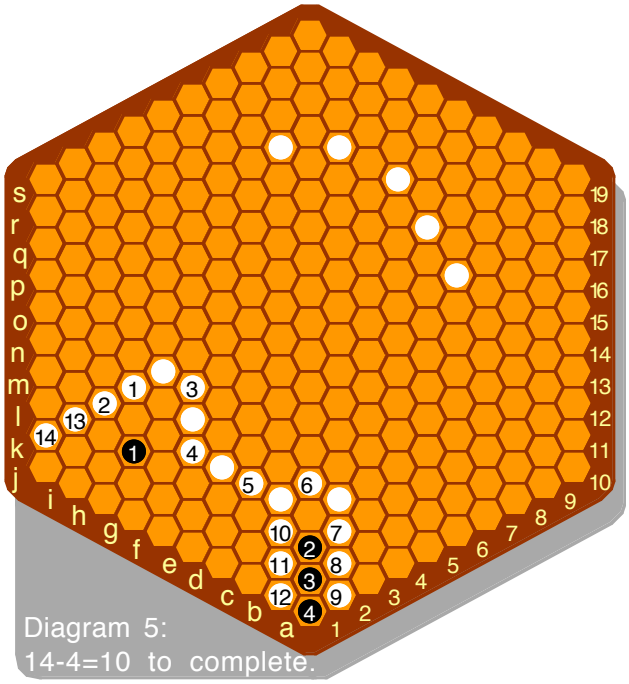


Diagram 5:
14-4=10 to complete.

Black's 2, 3 and 4 are also answers to immediate ring threats. Note that this kind of threat always must be faster than the frame itself: a ring threat in three is useless when the fork itself needs no more than three. Timing can be crucial. Meanwhile no more than ten moves are needed to complete white's fork.
If, for argument's sake, we assume that black also has a frame, white should of course make a similar count: if black can do no better than ten, white can go ahead. If black needs only nine, white should try *very hard* to see if he hasn't overlooked a possible tempo. The sequence of diagram 5 is just one of many ways to do it in ten, so chances are there's a hidden tempo somewhere.

The roles of ring, bridge and fork

In the previous examples, a fork frame plays the main strategic role, whereas the ring is used for tactical threats to make tempo. This is due to their different character.

> Although a fork takes at least twelve stones, a frame takes less than half this number.

> Although a ring takes no more than six stones, a frame takes at least seven!

The latter may come as a surprise, yet it's easy to check, see the two 'frames' of diagram 6.

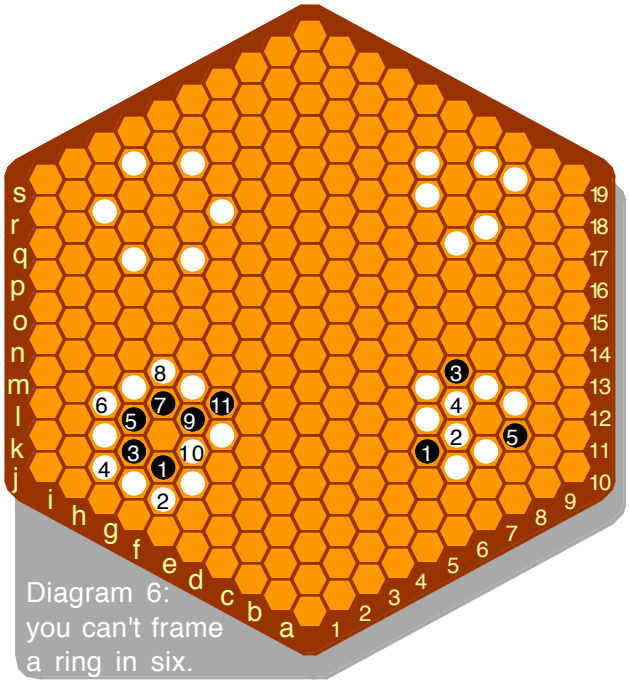


Diagram 6: you can't frame a ring in six.

The first one is cut from the inside with a combination called a 'mill', the second is crushed from the outside.
This difference in character makes that the prime strategical goal is a fork frame, whereas the ring finds its main application as a tactical tool: easy to threat, but hard to frame.

Unlike sides, corners are mutually exclusive. Since there are only six, the possibilities to make a bridge are limited. Their application is mainly tactical and often crucial!
A corner's additional danger is that it is a connection between two sides. Three stones on b1, a1 and a2 are part of the shortest possible ring, bridge and fork, and if a connection containing such a trio comes out, it may connect almost anywhere successfully.

To see how a bridge threat can be the pointe of a winning combination, see diagram 7.

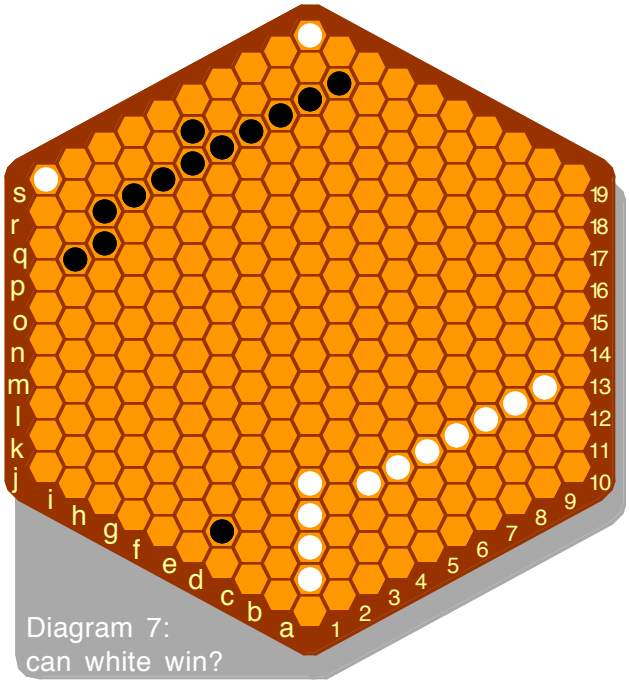


Diagram 7:
can white win?

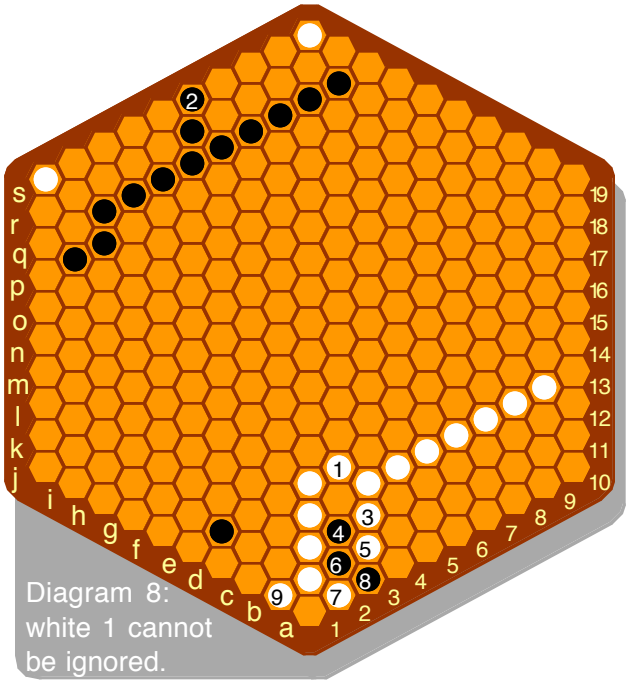


Diagram 8:
white 1 cannot
be ignored.

This clearly is not a game position but it allows a focus on essentials. It represents the kind of problems one may encounter if both players have an about equally fast frame. In this case black's position is very clear: he needs three stones. Nothing he can do to make it less, nothing white can do to make it more. It's white's move. Can he win? Since black needs three moves, white must with his move create a threat in two. The only threat in three he has is the small ring around d5, and the only point that simultaneously creates a connection is white 1 at e6.
Diagram 8 shows an easy win if black disregards this move, but black has better, see diagram 9.

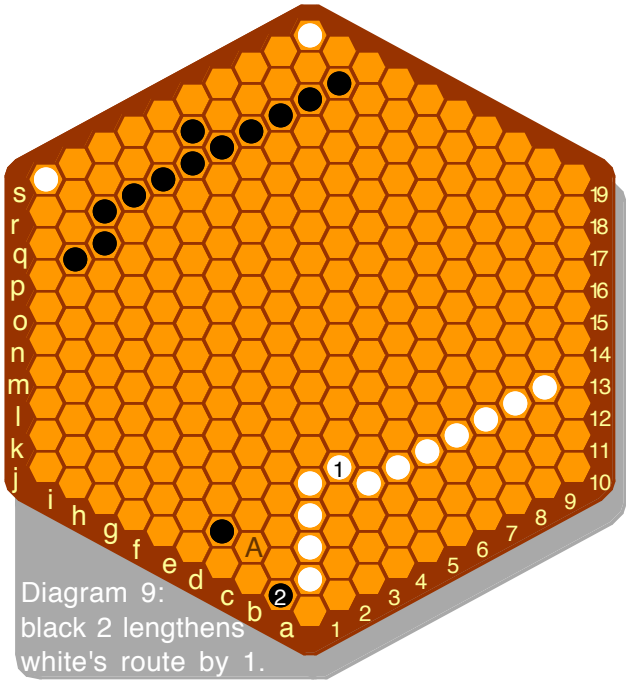


Diagram 9: black 2 lengthens white's route by 1.

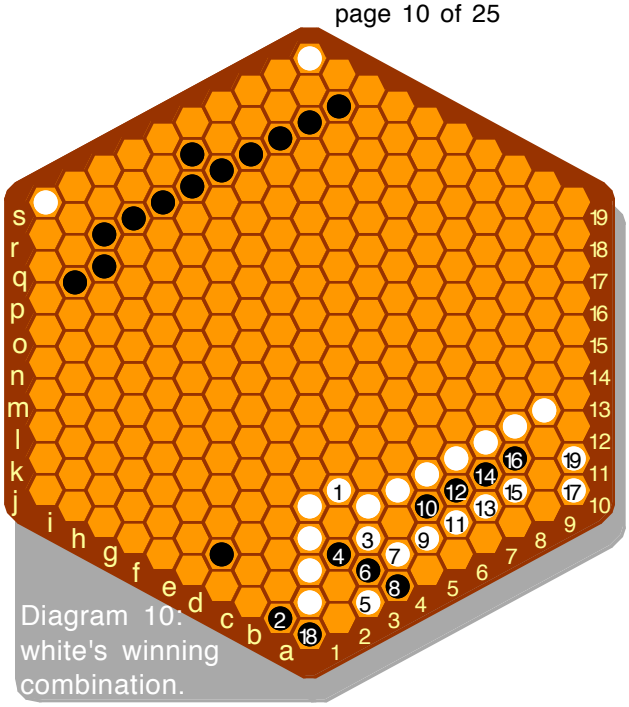


Diagram 10: white's winning combination.

Black 2 is an interesting move and illustrative of the safety-speed dilemma. White can secure the side at A, but that leaves two holes to fill, so this move is 'safe', but too late. Playing at c2 is fast enough, but of course black anwers c1 and after d2-d1; e3-e4 (ring threat); f3, white still has two holes to fill.
Apart from being interesting, black 2 is wrong, see diagram 10. Throughout the combination white maintains direct threats in one or two moves. The pointe is of course white 17, which uses a bridge threat to frame a ring with 19. This is the essential kind of resource you should be looking for in situations where both have a frame. In this case you can't do without it: play white 5 at 7 and you are threatening to frame a ring at 5. But there's the safety-speed dilemma again: you must frame before filling in. That's three. So black can attack as in diagram 8 and win.

Before framing

Till now the focus has been a 'frame', and how to count and include tactics in the filling-in process if both have one. But the game starts on an empty board, so obviously strategy should be to build a frame while at the same time preventing the opponent to do the same, or to build a faster frame. The novelty of 'spider strategy' was it's disregard of speed. The 'snake' players would start securing two sides near a corner and jump to a third side at an adjacent corner. An opponent's cut would result in yet another jump. Throughout opening this strategy would aim at speed, but players adapting to the new strategy proved it to be unsafe. They were patient in the knowledge that draws, though theoretically possible, never occur in Havannah. So if you succeed in cutting your opponent's groups in such a way that no group has access to more than two sides and one corner, the result, in the long run, must be a win. Eventually the snake player is forced out into the center where the spider strategist is dominant.

Now this doesn't make either strategy right or wrong. In fact play went up in more than one sense: the focus of the opening used to be the third line and spider strategy proved that this is too low. Nowadays the better players (still some around) roughly focus on the fifth. But a player's inclination may go either way. Where possible I'm still a nut for speed.

Glossary

Here are some technical terms that evolved around basic tactics. Terms not yet explained, but included in the glossary, appear **bold** the first time they are used.

Anchor A white move at A in diagram 11. It kills the black group. Characteristic of the extension is that its influence is perpendicular: black at B is followed by white at C. Killing the black group is by no means trivial: a blunt attempt like white 1 at B makes it very much alive, as the 120° rotated situation on the left shows. Crawling along the inside of its enclosure black develops one ring threat too many.

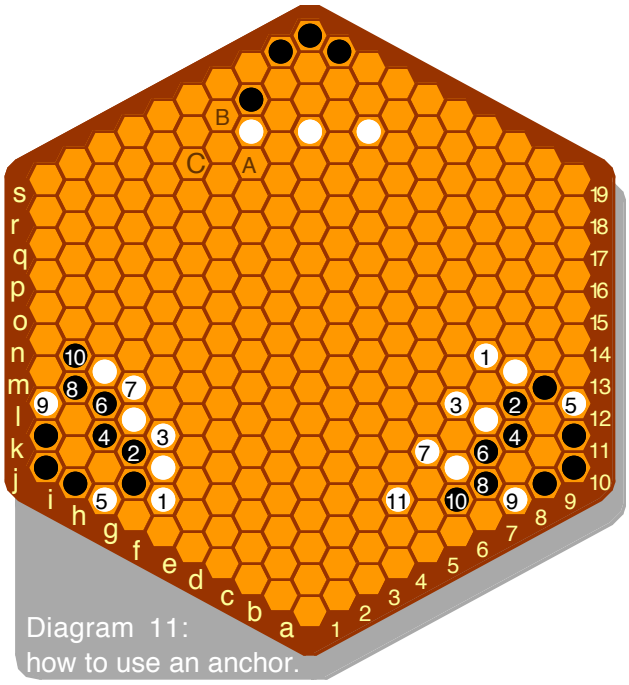


Diagram 11:
how to use an anchor.

White 1 on the right is the way to do it. It allows a series of anchors: 1, 3, and 7. The black group is **dead** as a doornail.

Block Black 1 in diagram 12. Its aim is to snatch the side from white. The upper example shows how white can take the corner in **sente**, because black is in danger of getting killed. This is a solid strategy. However, if white wants some influence towards the center, he can play 8 at A, threathening to kill at B. If black plays 9 at B, white can keep up the threat to kill by pushing along the o-line. But white should not push too far! For the moment black must follow, but the lower example shows how he can take initiative with 19 on the corner. There are other scenarios up to and beyond this point, but the fact is white must react. The most obvious way to eliminate the bridge threat is by taking the other corner. Black comes out with two sides and a corner. White has a huge influence towards the center, but only one side and no initiative at all.
Of course white should not have pushed that far: after 8 and 10, maybe even 12 and 14 (depending on circumstances: black is still in danger of getting killed and thus unable take the corner) he should have taken the corner himself.

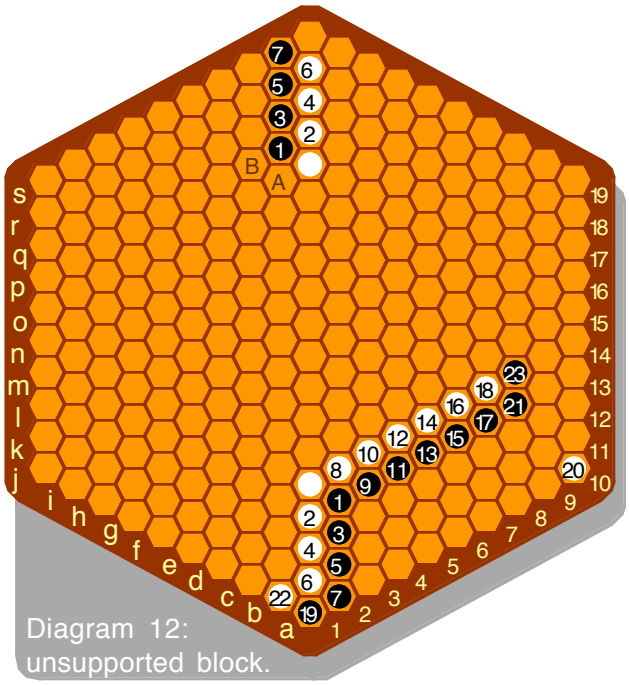


Diagram 12: unsupported block.

If black plays 21 at b1, does he live? See **running game**.

Cup White 2 on black 1 in diagram 3. It threatens at a low frame under higher placed stones if the opponent insists on preventing the connection.

Dead group A group is dead if it is trapped inside an enclosure with insufficient means to make a winning structure. Diagram 11 shows an example.

Dropping In diagram 12 black is running the d-line from 9 up to 17. Dropping means running lower, usually on tactical grounds, for instance 13 at c8, 15 at b9.

Gote A term borrowed from Go & the opposite of sente. It means having to play last in a tactical encounter.

Jumping Extending farther than the next point. Diagram 13 shows various jumps.

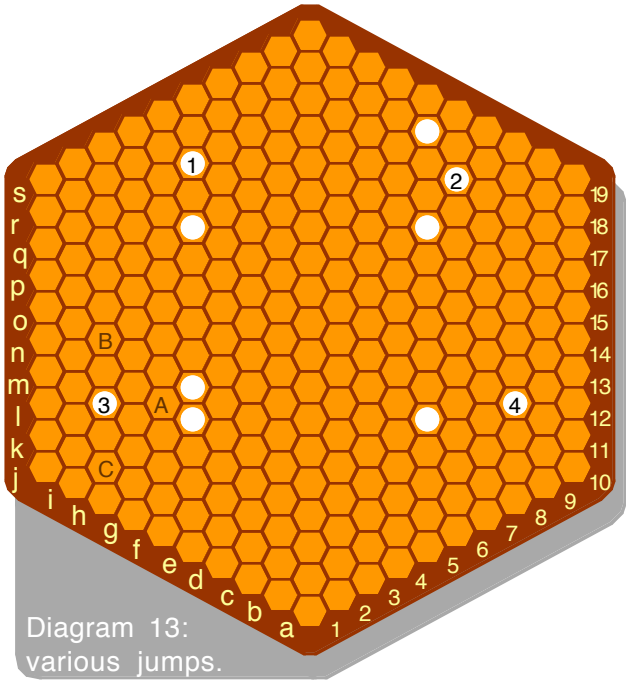


Diagram 13: various jumps.

1 is a 'one-point-jump'. It usually is fast but it leaves a cutting point.

2 is a diagonal jump or 'kite' away from both stones. In this case it constitutes a safe connection between them. But in terms of speed there's no progress: white still has two holes to fill. A one-point jump would not have this disadvantage, but it would leave a cutting point. This is the safety-speed dilemma in a nutshell.

3 is a 'magnet'. There's a cutting point at A, but if black takes it, threatening to connect brings white up to B or C, which is usually the purpose of the move.

4 is a 'knight's move', not as strong as a magnet, but sometimes very useful.

Miai A term borrowed from Go. Two points are miai if a player can handle a situation by taking the other point, should his opponent take one of them. The simplest example are the two points that may connect a kite. Another example is shown in the **split** of diagram 16.

Mill A combination that cuts an opponent's concave kite structure by threatening to frame or complete a ring, see diagram 6 where a 'full mill' is shown.

Running Game

In diagram 12 the question arose whether black lives with 21 at b1.

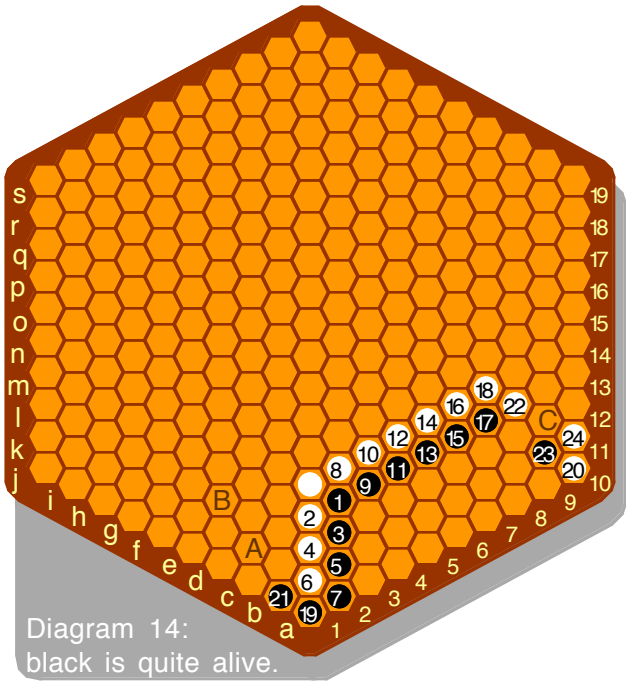


Diagram 14: black is quite alive.

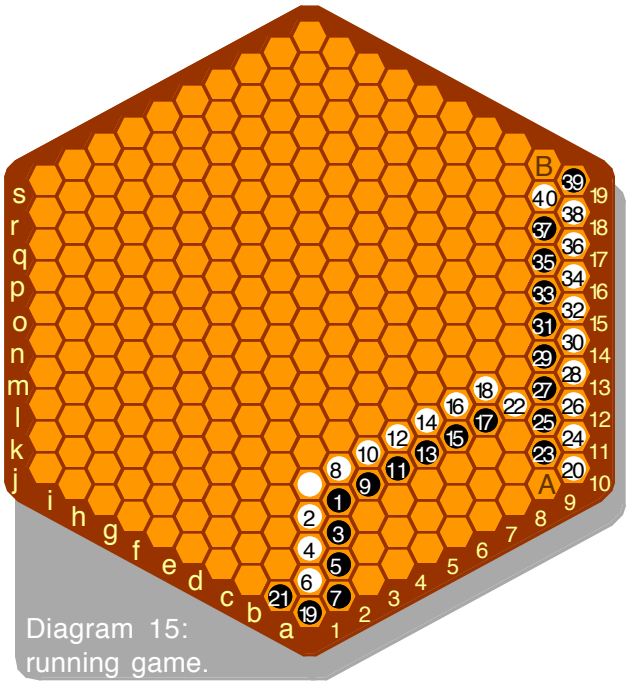


Diagram 15: running game.

Well, he does. Since the move brings him the second side, white must prevent him from reaching a third, in this case the right side. Obviously 22 in diagram 14 is the move.

Now for one thing black has an escape on the left at A, because a white play at B does not as yet contain black. But this can wait because after 23 white cannot prevent the connection of this stone to the rest. Thus black can start pushing at C and white has gote with 24 up to 38 which is gote and sente at the same time. This is called a running game. In a corner it may continue with switched roles. After 40 in diagram 15 for instance, white threathens both A and B. If black cares to play 41 at B, white may start pushing with black crawling the edge up to a sente move because of the implicit bridge threat.

Running games are not necessarily limited to bottom- and second line situations: they may run higher up. Needless to say that the outcome of any running game is dependent on what it's running towards.

Sente

A term borrowed from Go & the opposite of gote. A move is sente if it calls for an answer. A player has sente if he has the initiative.

Split A combination using a simultaneous threat on two or more cutting points, like white's 1 and 3 in diagram 16. A and B are miai.

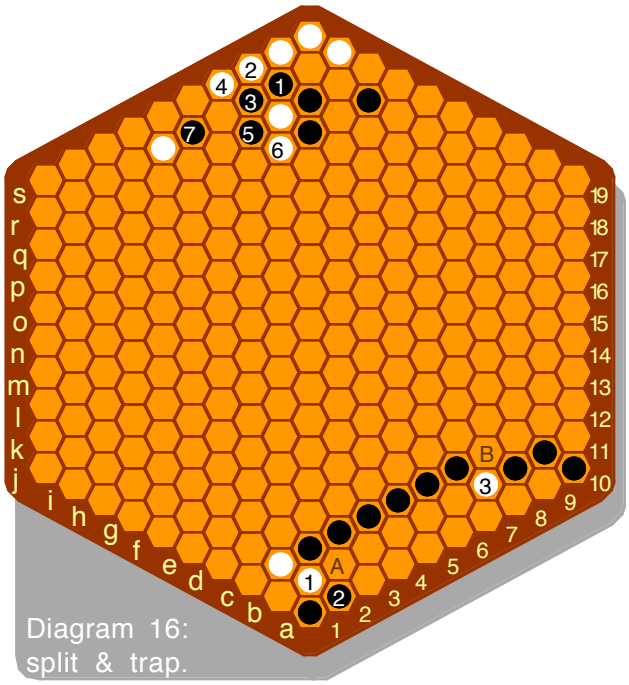


Diagram 16:
split & trap.

Trap A combination to stop a low running chain, like black's 1 to 7 in diagram 16.

Finally

Havannah is very complex, but with the examples given here you'll have a head start. Regarding programmability I don't even see an outline of an evaluation function. I think it's next to impossible. I hope someone proves me wrong.

HEXADE

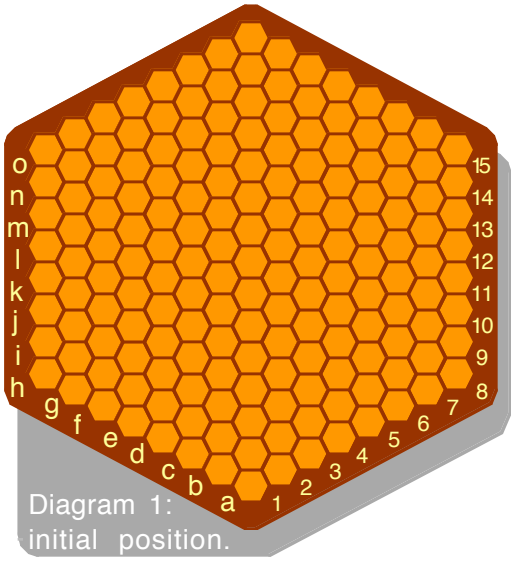


Diagram 1: initial position.

General

Hexade is Havannah's tactical support act. It's very easy to learn, because its strategy is a fairly straightforward 'five-in-a-row' type of affair. Tacticians will find it very rewarding.

Rules

>>> The game starts on an empty board, see diagram 1. Players move in turn to place one stone on an empty point. White moves first.

>>> Between white's first move and his second, there must be at least a two-cell distance. Diagram 2 shows the forbidden area for white's second move. Black has no such restriction.

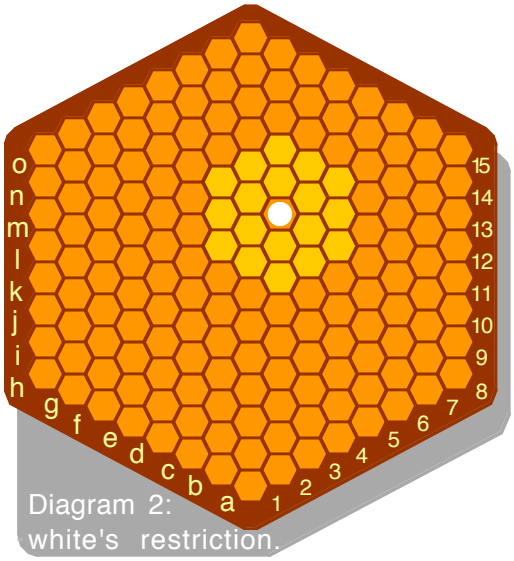


Diagram 2: white's restriction.

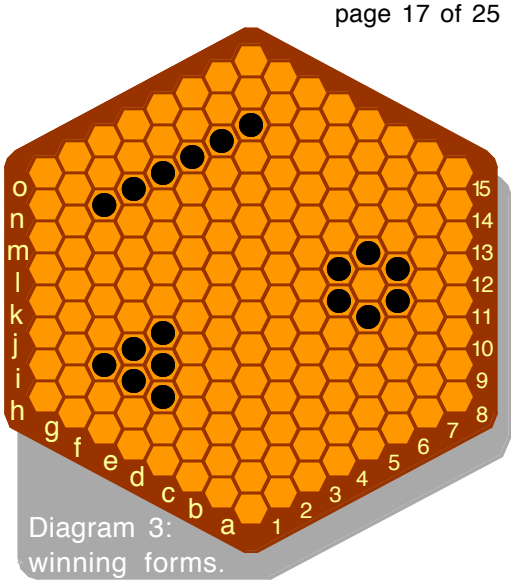


Diagram 3: winning forms.

>>> The game is won by the first player to complete:

> Six stones in a straight row.
> Six stones in a triangle.
> Six stones in a hexagon.

It's irrelevant whether or by whom the center of a hexagon is occupied.

Capture

>>> Two adjacent stones of like colour are called a 'pair'. If the placement of a stone results in one or more opponent's pairs being enclosed the custodian way (sandwiched between two opponent's stones), these pairs are captured and taken from the board in the same turn.

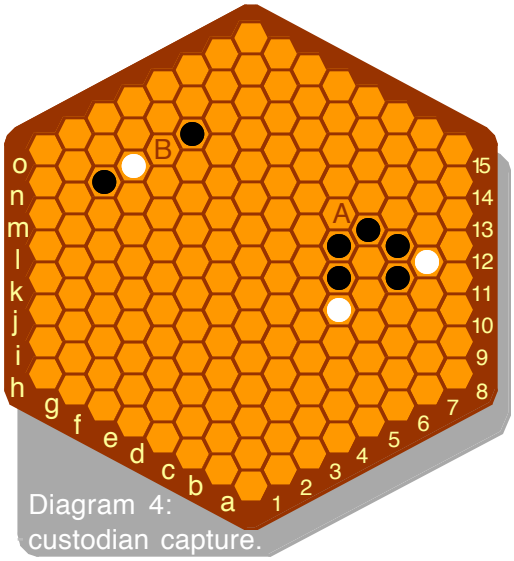


Diagram 4: custodian capture.

In diagram 4 a white play at A captures two black pairs. A white play at B makes the white pair save (for the moment), because it is the act of enclosure that makes the capture. Pairs already enclosed cannot be captured. Of course the capture of an enclosing stone makes the pair vulnarable again.

SUPERSTAR

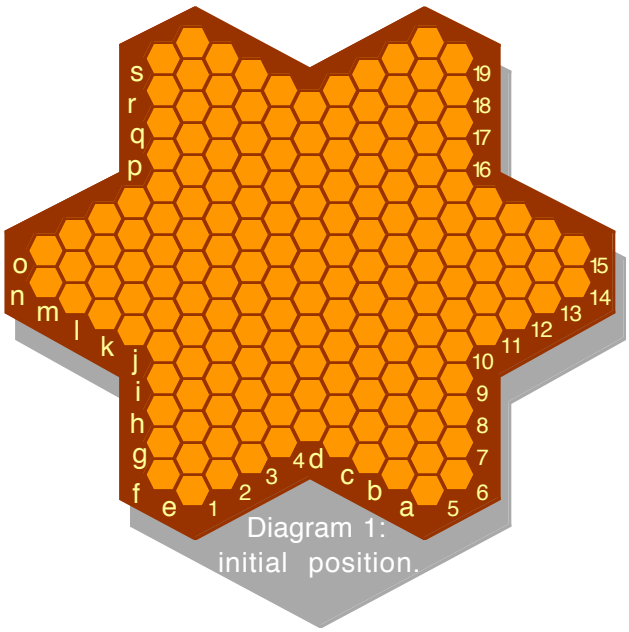


Diagram 1: initial position.

General

Superstar is one of my last games, invented when I had already quit Fanatic. I completely trust the game's inner balance, but having hardly ever played it, I know very little about strategy and tactics. Like Havannah & Hexade it has three separate goals, but unlike these games it awards pointvalue for them, adding a Go-like flavour.

The sides & the edge

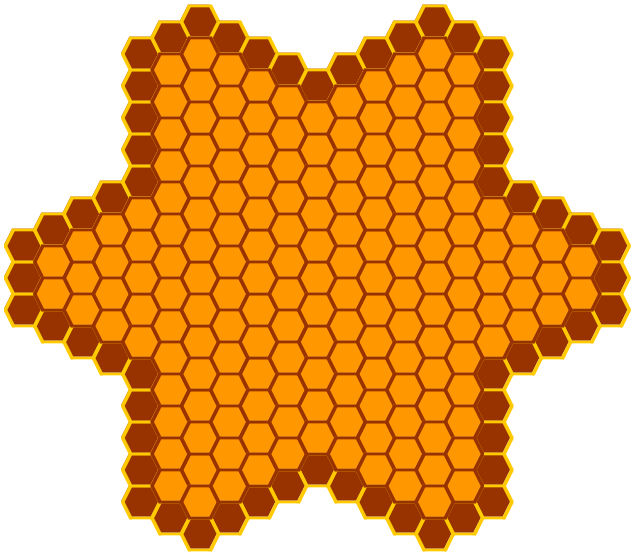


diagram 2

The board has twelve sides. A side is formed by 5 cells: an inward corner, an outward corner and the 3 cells in between. Thus the six inward corners each belong to two sides.

The ring of 60 cells surrounding the actual board is called the edge (diagram 2). It plays a role in defining a 'star'. The edge is not part of the playing area.

Rules

>>> The game starts on an empty board, see diagram 1. Players move in turn to place one stone on a vacant cell. White moves first. Moving is not compulsary. The game ends when both players pass on successive turns, after which the counting takes place.

Object

>>> The object of the game is to score more points than the opponent. Points are awarded for creating stars, superstars and rings.
All of these are 'groups', connected stones of one colour.

- **>** A star is a group touching at least 3 cells of the edge. The value of a star is two less than the number of cells of the edge it touches.

- **>** A superstar is a group connecting at least 3 sides. The value of a superstar is 5*(S-2), where 'S' is the number of sides it connects.

- **>** A ring is a group surrounding at least one cell that is vacant or occupied by the opponent. The value of a ring is one point for every empty cell it surrounds and 5 points for every opponent's stone caught in it.

>>> A group may be a star, superstar and ring at the same time. Of course seperate counts are made in each quality.

From the first definition follows:

> that a single stone on an outward corner (touching 3 cells of the edge) is a one point star in itself, and

> that a connection between two previously disconnected stars makes the new star worth 2 points more than the sum of its previous parts, thus making connections pay off.

From the second definition follows:

> that a single stone on an inward corner already 'connects' two sides, so that linking up with a third side will result in a 5 point superstar, and

> that a connection between two previously disconnected superstars that don't share a side, makes the new superstar worth 10 points more than the sum of its previous parts. Thus these connections pay off even more.

From both definitions follows that a superstar usually will also be a star. An exception is a group that connects two inward corners without occupying other cells of the sides: this constitutes a 10 point superstar without being a star. An example is the seven stones black group in diagram 3.

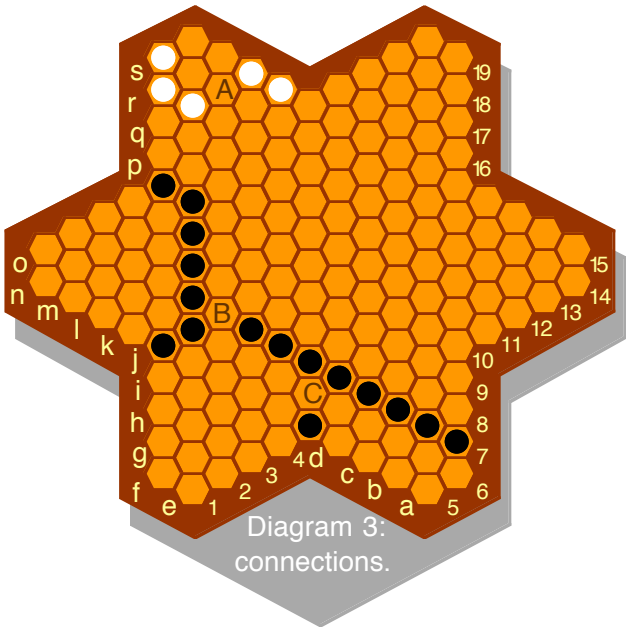


Diagram 3: connections.

Diagram 3 illustrates the value of connections. The white groups are a 2-point and a 1-point star respectively, but connecting at 'A' makes one star touching seven cells of the edge and thus worth 5 points, two more than the sum of the seperate parts. A group doesn't even have to be a star to add thus if connected: if the rightmost white stone is deleted, the other one is no longer a star, but connecting at 'A' will still bring two extra points.
The same can be seen at 'B', where a 10-point superstar is linked to a chain that touches only one side. The connection nevertheless brings 5 points. A further connection at 'C', to a stone that touches two sides but again without point-value in itself, even creates a 25-point superstar.

Komi

>>> The player moving second gets a number of points beforehand to compensate for the disadvantage of not moving first.

Accurate komi has not yet been established but I suggest 3 for starters.

Strategy & Tactics

I've very little experience with this game because I invented it shortly before I more or less stopped playing boardgames altogether. Superstars and connections between them obviously are prime strategic goals. Occupying two adjacent inward corners can hardly be wrong for starters. Rings are more dependent on a game's development and evolve later in the game when tactics come into play. Stars grow along the edge and are important in he endgame when the bigger issues have been settled. The center clearly is the area where the all important connections are made.

RONDO

A game of circular reasoning

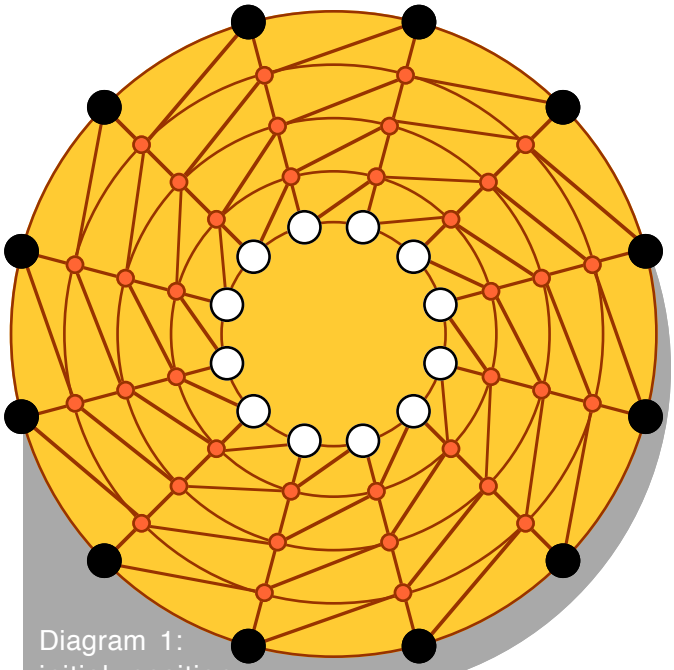


Diagram 1:
initial position.

General

Rondo is a tactical connection game. It was first published in Games Magazine (december 1982). The board consists of five circular tracks with twelve points each, connected via 'lines' as depicted in diagram 1. One player starts on the inner track working clockwise and outward, the other on the outer track working anti-clockwise and inward. Topologically their positions are equivalent.

Rules

>>> Diagram 1 shows the initial position. Each player has 12 men in his colour. Players move - and must move - in turn. White moves first.

>>> On his turn a player, unless he must 'jump', moves one step with one man.

For white such a step must be
- **>** clockwise on a circle, or
- **>** straight outward, or
- **>** clockwise outward along the diagonal.

For black such a step must be
- **>** anti-clockwise on a circle, or
- **>** straight inward, or
- **>** anti-clockwise inward along the diagonal.

Jumping

>>> Jumps are restricted to circular tracks! White jumps only clockwise, black only anti-clockwise. A player jumps by leapfrogging an adjacent opponent's man on the same track to the point immediately beyond, which must be free for the jump to take place. If the player can proceed in a similar fashion, he must do so: jumping is compulsory, as is seeking out the longest possible jump beforehand. Note that there's no capture.

Object

>>> A player wins by

> forcing his opponent into an 'eternal jump' over six of his man on a circle, or

> making a closed connection of any length along the lines of the board - clockwise outward for white and anti-clockwise inward for black - between the inner and outer circle.

> blocking the opponent completely.

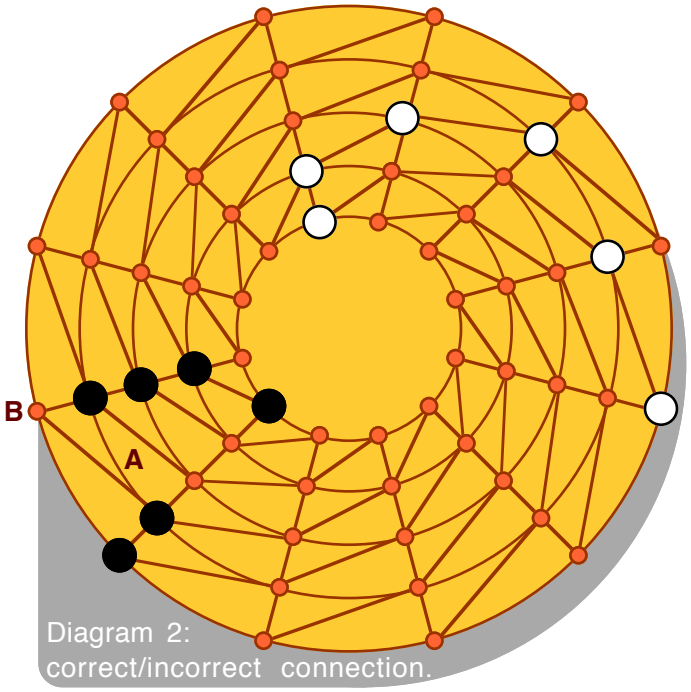


Diagram 2: correct/incorrect connection.

In actual play tactics revolve around the first two objects: no-one ever got himself blocked. Note that jumps must be performed completely: a connection only counts at the end of a move, not 'during' a jump. Note also that black's connection in diagram 2 is incorrect: he moves inward, so at **A** it runs clockwise. A black stone at **B** would constitute a correct connection. White's connection is OK.

BY THE SAME AUTHOR

I have published the best of my work as an inventor of abstract games in a similar fashion.

If you like Chess games, look in the same archive for **freeling-grandchess.hqx**, which features Grand Chess, Chad, HexChad, Sjakti, Caïssa, Dragonfly, Loonybird, Rotary, Yari Shogi, Chakra and Congo.

If you like games that have elimination as their object, **freeling-emergo.hqx**, **freeling-bushka.hqx** and **freeling-hexdame.hqx** are in the same archive as this one, providing dazzling combinations in a simple environment. Be sure to download them. You won't be disappointed.

If you like territorial games, look out for **freeling-medusa.hqx**, which features three Go variants, Medusa, Lotus & Dominions, a hexagonal Othello named MacBeth and Phalanx, a multi-player territorial game.

Finally, **freeling-glassbeadgame.hqx** features the Glass Bead Game, MiniMancala and the twin bead capturing games Swish & Morro.

Seven of the games in these compilations have also been published in R. Wayne Schmittberger's 'New Rules for Classic Games'. If I may quote him on the Glass Bead Game: 'Christiaan Freeling has created a mancala-type game that may make you want to forget all the previous ones you've seen'. I hope you'll find that too.

On a very different note, if you're interested in *and* familiar with the I Ching, be sure to download **i-ching-connexion.hqx** from the info-mac/applications archives or from the Solar Software Website (see preface). It not only features the complete text based on the Legge translation, but also introduces the 'Connexion' and the 'Mediator'. The Connexion is an ever-changing but always consistently interlocking graphic representation of the way the 64 hexagrams interrelate. The program, written by Ed van Zon and compiled by me, generates connexions very vast, indicating the actual hexagram, the future hexagram and the Mediator, and giving waning and waxing influences. There are many display options in both user mode and screensaver mode. There's an astro section featuring a floating I Ching clock and allowing you to quickly establish your 'natal hexagram'.
The program has BalloonHelp literally everywhere (system 7 minimal requirement).
It throws the coins too.

Enschede, january 1, 1996