

k n  w

*some rules for the game*

BEING AN ELABORATION OF A PARTICULAR RECREATIONAL ACTIVITY  
AND DIVERSE CONVENTIONS, PRINCIPLES, AND PRESCRIPTS  
PERTAINING THERETO.

Version 0.03

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Dan, for the Significant Errand and for the sheer staying power required to prove that the Solipsistic Path is in fact sometimes the only alternative to stasis.

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# 1 Administrivia

## 1.1 Legal Stuff

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## 1.2 New Versions of This Document

This document describes **kn<sup>o</sup>w** version 0.03. New versions of this document are available free of charge for electronic download at the **kn<sup>o</sup>w** website<sup>1</sup> .

If it ever gets completed, the computer version of the game **kn<sup>o</sup>w** will also be available for free download from the **kn<sup>o</sup>w** website.

## 1.3 Change History

- **Version 0.03, December 2001**
  - Minor changes and corrections.
- **Version 0.02, November 2001**
  - Computer-generated images of the **kn<sup>o</sup>w** board made available.
  - Rulebook ported to L<sup>A</sup>T<sub>E</sub>X.
  - New logo. Whee-hee.
- **Version 0.01, 1995**
  - Initial release.
  - Rulebook (HTML) and scanned board image made available via <http>.

## 1.4 Feedback and Corrections

If you have questions or comments about this document, please feel free to email or write me, Bryan Jurish. I readily welcome any suggestions or criticisms. If you find any mistakes with this document, please let me know, so that I can correct them in the next revision. If you have a rule you would like to see in future revisions, or if you would like to contribute to a future revision (including “*wonk*”, the computer version of **kn<sup>o</sup>w**), drop me me a line.

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<sup>1</sup><http://www.ling.uni-potsdam.de/~moocow/know>

## 2 Concerning the Playing Board

kn<sup>w</sup> is played on a board constructed from sixteen points evenly distributed about the circumference of a circle by connecting certain pairs of points. Appendix B contains a version of the kn<sup>w</sup> board.

### 2.1 Spaces and Borders

The kn<sup>w</sup> board is divided into exactly one hundred **spaces**, each of which **borders on** a number of spaces of the opposite color. A space is said to “border on” another space if the two spaces share a common *side*. Spaces sharing only a single common *corner* do not border on one another. In particular, the center of the board itself is a corner rather than a space.

As a consequence of this definition and the coloring conventions for spaces, any unfilled (white) space will border only on filled (black) spaces, and any filled space will border only on unfilled spaces.

### 2.2 Dimensions and Directions

There are four main **dimensions** (or “axes”) which can be identified on the kn<sup>w</sup> board. In terms of these dimensions, eight **directions** may be defined. Some of these terms might even be used later in this document.

The four axes and their associated directions are as follows:

- **Horizontal Axis**

- *Forward*

- Proceeding from the player’s corner-space to the opposing player’s corner-space.

- *Backward*

- Proceeding from the opposing player’s corner-space to the player’s corner-space.

- **Vertical Axis**

- The vertical axis is (intuitively) perpendicular to the horizontal axis. It is not particularly useful.

- **Radial Axis**



- *Hubwards*  
Proceeding from the outer edge of the board towards the center of the board, or “hub”.
- *Rimwards*  
Proceeding from the center of the board towards the outer edge, or “rim”.

- **Rotational Axis**

- *Turnwise*  
Proceeding from left to right while remaining a fixed distance from the hub – also known as “clockwise”.
- *Widdershins*  
Proceeding from right to left while remaining a fixed distance from the hub – also known as “counter-clockwise”.

The directions listed above are not always mutually exclusive – for example, one movement may be understood as proceeding in both a forward and turnwise direction. The differences between the various directions can be understood as stemming from the distinction between player-relative directions (such as “forward”) and board-absolute directions (such as “hubwards”).

## 2.3 Tiers

The board is divided into four **Tiers** (or “levels”), each of which constitutes an implied square on the playing board. The descriptions in the rest of this section refer to Figure 1 on page 5.

### 2.3.1 Center Tier

A space is said to be in the **Center Tier** if the center of the board is one of its corners. The Center Tier contains sixteen spaces.

### 2.3.2 Second Tier

Any space which is not in the Center Tier, but which shares all of its corners with some space sharing at least one corner with a space in the Center Tier is said to be in the **Second Tier**.

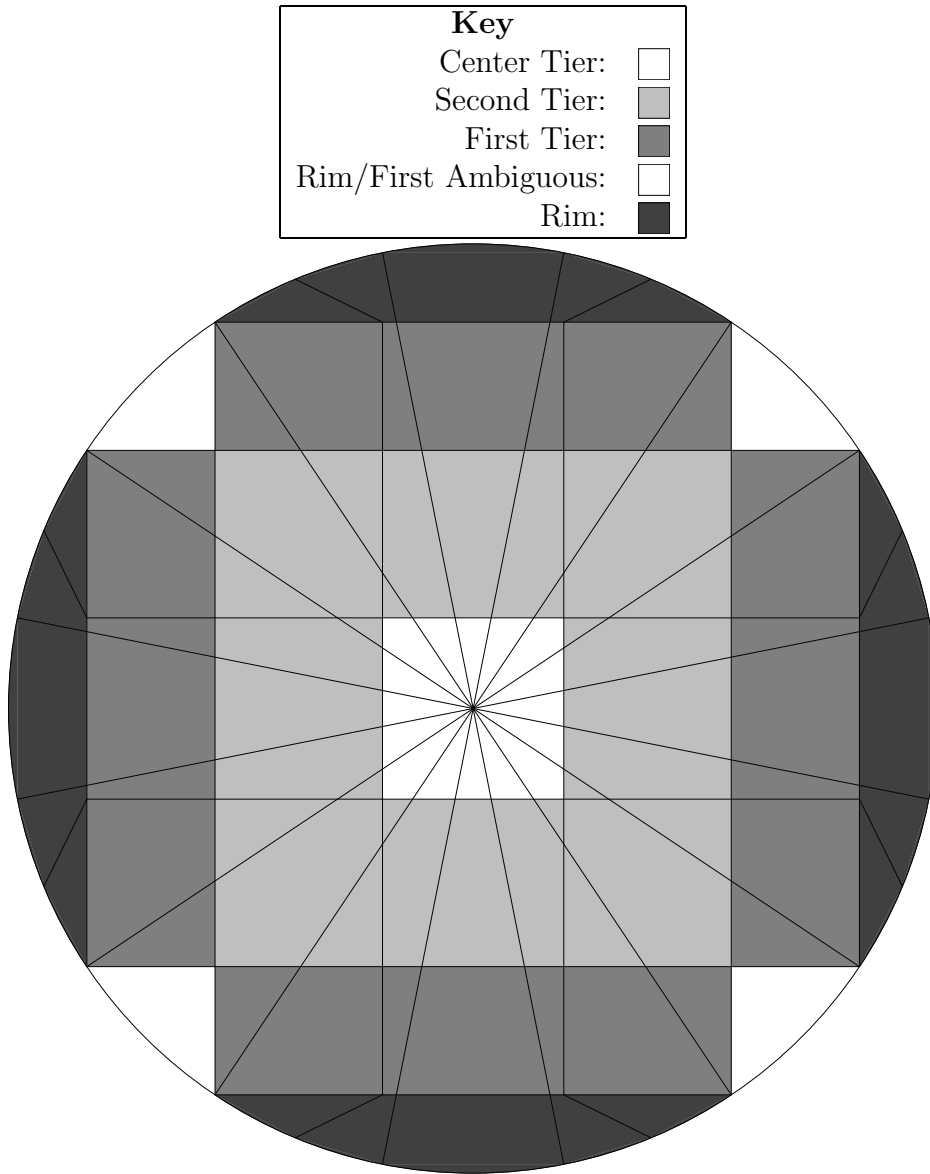


Figure 1: An Illustration of the Game's Four Tiers

Formally, for a space  $S$ ,  $S$  is in the Second Tier if and only if for every point  $p$  which is a corner of  $S$ , there exists a point  $p'$  and spaces  $S_p$  and  $S'_p$  such that  $p$  is a corner of  $S_p$ ,  $p'$  is a corner shared by both  $S_p$  and  $S'_p$ , and  $S'_p$  is in the Center Tier. In most cases,  $S_p = S$ .

The Second Tier contains thirty-two spaces.

### 2.3.3 First Tier

A space is said to be in the **First Tier** if it is neither in the Center Tier nor in the Second Tier, and if it shares at least one corner with some space in the Second Tier. The First Tier contains thirty-two spaces.

### 2.3.4 Rim

A space is said to be a member of the **Rim Tier**, or “on the Rim” if one of its borders is an edge of the board itself. The Rim contains twenty-four spaces, four of which also belong to the First Tier. These four triangular spaces are known as “ambiguous” spaces.

## 3 Concerning the Playing Pieces

### 3.1 Naming Conventions

Twelve pieces are required for a game of **know**, six per “alignment” (or “color” or “side”). The two sets of six pieces are divided into three types, so that each alignment (i.e. each player in a two-player game) has two representatives of each of the three classes of game piece. The three classes of game piece are:

- **Bards**



A less wealthy mode of nobility, Bards are the pieces with the strongest initial position. They are represented as cups, spheres, or unmarked stones.

- **Fools**



High-ranking clergy of general silliness, Fools are represented as bells, cones, or stones marked with a zero (“0”).

- **Heralds**



Non-violent victims of the medieval military establishment, Heralds are represented as flags, cylinders, or stones marked with a one (“1”).

The two pieces of the same type and color may be distinguished from one another by the presence or absence of a *stripe*. That is, each player has the following set of pieces:

- Bard (striped)
- Bard (unstriped)
- Fool (striped)
- Fool (unstriped)
- Herald (striped)
- Herald (unstriped)


### 3.2 Initial Placement

At the opening of each game, each player’s pieces should be arranged into two main **clusters**, each of which consists of one Bard, one Fool, and one Herald, and which should be arranged symmetrically on the Rim Tier nearest the player as shown in Figure 2 on page 8. Player 1’s pieces are shown in **white**, and Player 2’s pieces are shown in **black**.

Bards begin the game on the ambiguous spaces. On the first shaded space behind (*backwards* of) each bard’s position, a fool should be placed. The Heralds begin the game on the unshaded Rim spaces behind the Fools’ initial positions.

## 4 Concerning Movement

### 4.1 Dice

The standard version of **kn**w requires at least one six-sided (cubical) die to play.

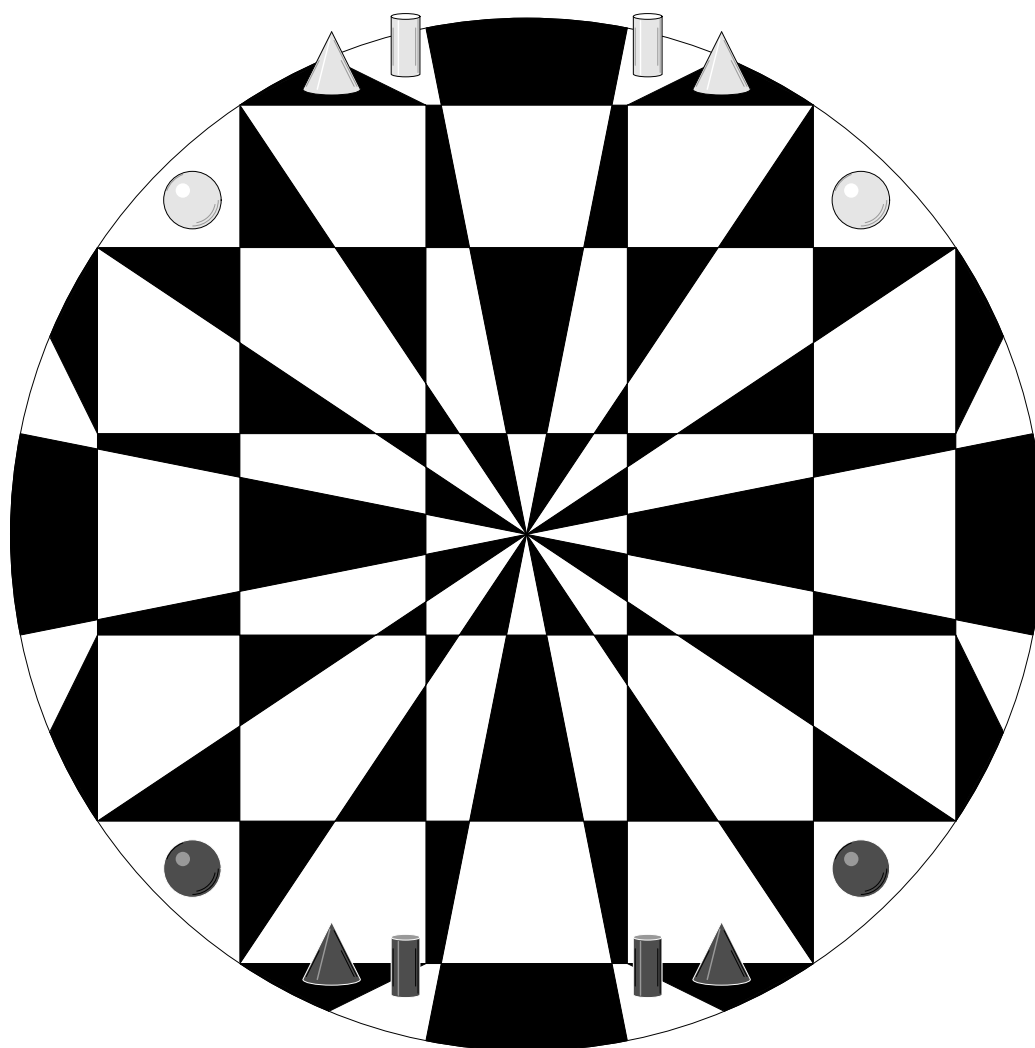


Figure 2: Initial Placement of Pieces

## 4.2 Turns

### 4.2.1 Initiation

A player's turn begins when he or she receives the die (or dice) from the opposing player.

### 4.2.2 Conclusion

A player's turn has officially ended when he or she removes his or her dice from the board or equivalent rolling surface.

## 4.3 Rolling

In some special cases, such as the Significant Errand or the Solipsistic Path a player must announce his or her intention to invoke an exceptional movement rule before the die is cast. Normally, however, a player may roll as soon as his or her turn begins. See Section 4.8 for details on exceptional movement rules.

## 4.4 Jumps

For each die rolled, a player must move exactly one piece. Some variants of **kn<sup>w</sup>** require the player to roll more than one die per turn, but in this Section I will assume that each player rolls exactly one six-sided die per turn, and consequently moves exactly one piece per turn.

The piece which is chosen to be moved must make exactly as many **jumps** as the die roll indicates. From any space on the board, a piece may "jump" once to any of the spaces which border<sup>2</sup> on the space it is currently occupying.

Since bordering spaces are necessarily of opposite color to the space occupied, it is often more important for determining a move whether the die roll is even or odd. With an even die roll, the piece moved must upon ending its move occupy a space of the same color as the space on which it began its move. With an odd die roll, the piece moved must occupy a space of the opposite color at the end of its move.

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<sup>2</sup>See Section 2.1 for a definition of "borders"

## 4.5 Redundant Paths

A piece may not occupy the same space more than once in the course of one movement. This means that no space may be jumped into or out of more than once in one movement. In other words, a piece cannot go back on its own path in one turn, nor can a piece make a loop on the board, ending its movement by jumping into the same space which it occupied at the beginning of that turn. Such movements are known as *redundant paths*.

## 4.6 Mandatory Movement

If any piece can be jumped the exact number of spaces indicated by a player's die roll, then some move must be made – a player cannot choose to “pass” his or her turn, but must move some piece if at all possible.

## 4.7 Influence

A piece is said to **influence** every space bordering on that space which it currently occupies. No piece of another player may jump either into or through such an **influenced space**, except in the exceptional cases of the Exceptional Movement Rules, as described in Section 4.8.

Under no conditions may a piece jump either into or through a space occupied by another piece, even if that piece belongs to the same player. This restriction applies even to moves falling under the Exceptional Movement Rules of Section 4.8.

### 4.7.1 Points of Contention

A **point of contention** is a space on the board influenced by two pieces of opposite color. Movement through points of contention is possible by means of the Exceptional Movement Rules described in Section 4.8, but is otherwise not allowed.

Under no conditions may any piece occupy a point of contention at the end of its movement.

## 4.8 Exceptional Movements

### 4.8.1 The Significant Errand

If a piece is entirely surrounded by points of contention – that is, if there are no moves possible for that piece, it is said to be “locked out”. In this case, the player belonging to that piece may, when his or her turn comes, roll the die (or dice, as the case may be) and request a **Significant Errand**, based on his or her die roll for that turn. Resolution of Significant Errands proceeds as follows:

1. The player with the locked out piece rolls the die as usual at the start of his or her turn.
2. If the roll is such that the locked out piece could move exactly that number of spaces, disregarding all points of contention and spaces influenced by pieces of the opposing color, the player with the locked out piece may at this point request a **Significant Errand**.
3. The opposing player rolls the die.
4. If the opposing player’s die roll is greater than the locked out player’s initial roll, the locked out player must move some other piece, with the normal rules regarding points of contention and influenced spaces still applying.
5. If the locked out player’s roll is higher, then he or she must move his or her locked-out piece, provided that the piece, on completing its move of the player’s initial die roll, finds itself in a space not controlled by the opposing player, and not on the same space as any other piece.

### 4.8.2 The Solipsistic Path

It often happens that at least one color will manage to build a “wall” of influenced spaces across one and/or both sides of the board, effectively preventing the other player from moving his or her pieces through to the opposite side (which is necessary to achieve Resolution – see Section 5).

Although it is possible to play entire games without invoking this rule, if it is entirely impossible for pieces to move through points of contention, then there is also the possibility that the game will never be Resolved. So, if a player wants very much for one of his/her/its/their beloved pieces to



reach the opposite half of the board, and if the opposing player has built a wall of influence across the board such that the piece which is to be sent on its way must pass through at least one point of contention to reach its intended destination, then the player who wishes to venture across the point of contention may invoke the **Solipsistic Path**, by the following procedure:

1. The player who wishes to pass through the Point of Contention declares their intention to do so before they roll the die, and point out which space is being contended.

The Point of Contention being challenged must have existed for at least one roll of both players' dice before either player may invoke the **Solipsistic Path**. The rationale here is that each player should have had a chance to "back down" before this rule is invoked.

2. The mover (the player of the piece which is attempting to move through a Point of Contention) and the contender (the player whose piece(s) is/are blocking the mover's intended path) roll one six-sided die each.
3. Both the mover and the contender count the number of spaces influenced by any of their pieces whose influence also extends over the Point of Contention to be traversed, discounting any points of contention among those influenced spaces, and add these numbers to their die rolls.
4. If the contender's tally from Step 3 is greater than the mover's tally, then the mover's turn is forfeit: none of the mover's pieces may be moved on this turn, and the die gets passed to the contender.
5. If the tallies are equal, the players should roll again until one player's tally is higher.
6. If the mover's tally is greater than the contender's, then the mover must move the piece for which the Solipsistic Path was declared exactly the number of spaces indicated by his/her die roll, (ignoring the addition of influenced spaces which were used to determine the outcome of the Solipsistic Path), moving first into the Point of Contention which was challenged, and passing through any number of points of contention, provided that the piece, on finishing its move, occupies a space which is not influenced by a piece of the opposite color, or occupied by any other piece.

7. If the mover's tally was greater, but movement of the Solipsistic Piece was impossible (i.e. there was no possible destination under that die roll which was not influenced by a piece of the contender's), then the mover's turn is forfeit.

## 5 Concerning Connections and Resolution

### 5.1 Connections

Two pieces are said to be **connected** if the following conditions all apply to the positions of those pieces on the board:

1. The pieces occupy “corresponding spaces” on opposite sides of the center of the board.
2. The pieces are the of the same **type** – only Fools can be connected with Fools, only Bards with Bards, etc.
3. The pieces belong to the same player.

#### 5.1.1 Correspondence

The board contains exactly fifty pairs of *corresponding spaces*. Two spaces are said to “correspond” if and only if:

1. At least one side of each piece's occupied space is collinear with exactly one line which passes through the center of the board.
2. The occupied spaces are on the same Tier of the board.

Phrased differently, two spaces correspond if they are mirror-images separated by 180 degrees. See Figure 3 for an example.

### 5.2 Resolution

To make and maintain connections on each of Rim, First Tier, and Second Tier is the primary goal of a game of **know**. The player who first achieves all three of these simultaneous connections is said to have **Resolved** the game.

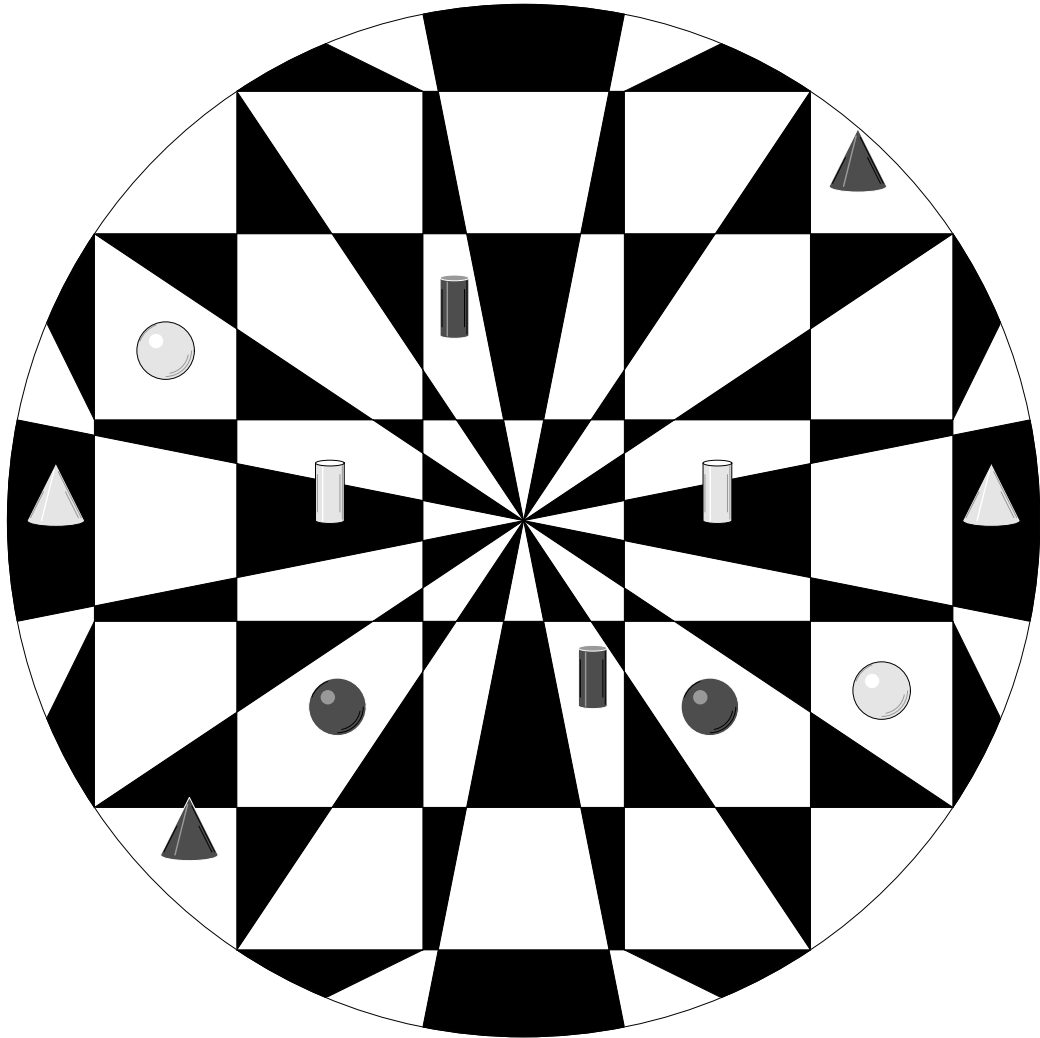


Figure 3: Resolving and Non-Resolving Connections

For beginners, the suggested rules for determining if a pattern of three connections is a **resolved** pattern are simply these: a resolved pattern must consist of one connection on Rim, one connection on First Tier, and one connection on Second Tier. Connections on the Center Tier cannot be resolving connections.

The following discussion of *Connections* and *Resolving Connections* refers to Figure 3 on page 14.

In Figure 3, most of the pieces shown are *connected*, except for the black Bards. Only the black Bards are not connected because, although there is a certain symmetry between the spaces they occupy, the line of symmetry does not pass through the center of the board. In terms of the formal definition of a connection, they are not connected because none of the line-segments which form any of their spaces' sides are, in fact, on the same line themselves. In terms of the less formal definition of connections, the black Bards are separated by less than 180 degrees on the board.

The white pieces in Figure 3 show a Resolving pattern: the Fools are connected on the Rim, the Bards are connected on the First Tier, and the Heralds are connected on the Second Tier. Since the black Bards are not connected, black cannot be Resolved. Nonetheless, the black player could achieve resolution by establishing a connection between his or her Bards on either Rim or on First Tier, since the black Heralds are connected on the Second Tier, and the black Fools are connected on ambiguous spaces.<sup>3</sup>

### 5.3 Post-Resolution

Once one of the players has Resolved a game (or round), his or her pieces may not move again in the course of that game/round. Since the player who resolves the game may well owe this fact to pure chance, the non-resolved player receives a post-resolution chance to complete his or her own resolution pattern. The procedure for post-resolution play, in which only the player who is not resolved moves his or her pieces, is as follows:

1. If the Unresolved player already has three connections at Resolution, then the game (or round) is ended. Otherwise, if the Unresolved player has fewer than three connections, he or she should roll the die as usual, immediately following Resolution.

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<sup>3</sup> See Section 2 for details on ambiguous spaces.

2. If it is possible to move any currently unconnected piece the exact number of spaces indicated by the die roll, allowing movement through but not into any Points of Contention and make a connection, the Unresolved player may do so.
3. If the Unresolved player made a connection on the Post-Resolution roll, then he or she may roll the die again, moving another as yet unconnected piece according to the above Post-Resolution movement rules, earning another die roll if a connection is made on that move.
4. This process continues until the Unresolved player either cannot make a connection with the die roll he or she received, or until the Unresolved player has three connections.

### 5.3.1 Scoring

To determine the winner of the game (if you must), each player should tally up the number of spaces influenced by connected pieces of his or her color, excluding any points of contention from this tally, and any player whose pieces are in a Resolved pattern adds an extra six influence points for the balanced pattern of three connections between six pieces he or she has achieved. The rationale behind the six-point *Resolution Bonus* is that player with a Resolved pattern receives influence points not only for the spaces his or her pieces influence, but also for the spaces they occupy.

Note that spaces influenced by pieces which are not connected are not added to this tally.

Note also that the tallies should reflect the number of **spaces** influenced by pieces of that player, which is not necessarily the sum of the number of spaces influenced by all of that player's pieces. If, for instance, a player's connections were such that more than one of his or her connected pieces influenced the same space, that player would add that space only once to his or her tally, since the tally is of total spaces influenced. Of course, if this same space were also a point of contention, neither player would not be allowed to add it to his or her tally at all.

## 6 Versions of the Game

### 6.1 Two Player Versions

#### 6.1.1 Standard Version

In the standard two-player version of **kn<sup>o</sup>w**, each player adopts one color of pieces and one side of the board as his or her own. Each player rolls one six-sided die per turn, and moves exactly one piece exactly the number of spaces indicated by his or her die roll per turn. This is the basic version of the game, for which most of the movement rules in this document were formulated.

#### 6.1.2 Symmetric Version

In this version of **kn<sup>o</sup>w**, each player rolls two six-sided dice per turn, and must move two separate pieces: exactly one piece per die roll (except in the cases of Resolution and the Solipsistic Path, of course). The two pieces moved on one turn must be of the same type – i.e. a player must move two Bards, or two Fools, or two Heralds, but not a Bard and a Herald.

The pieces moved in the course of one turn may be of differing types on one condition only: if the first piece moved makes a connection (not necessarily a Resolution-type connection – any connection will do) with that move, then the player may move a different type of piece for the second die roll.

A player may move only one piece per turn only in the case of a Solipsistic Path, for which the rules do not allow movement of more than one piece.

In the case of a Significant Errand, which a player may declare after he or she rolls the dice, the player with the locked out piece must choose which die roll he or she wishes to use to contend the lockout before the opposing player rolls (alternately, of course, an opposing player may choose to allow free passage through any Point of Contention at any time), and before the moving player moves any pieces.

This **kn<sup>o</sup>w** variant progresses faster than the “standard” version described above, and happens to be the author’s personal favorite.

## 6.2 Four Player Versions

The four-player versions correspond directly to the two-player versions, except for the fact that in a four-player version, each player is assigned three pieces instead of six: one of each type, and the **players** of the two-player version (i.e. the two colors of pieces) are replaced by **Conjunctions** of two players. Each player is responsible for controls one Bard, one Herald, and one Fool of a given color + stripe combination.

In the Standard Version, play proceeds turnwise (counter-clockwise) around the board, with no restrictions on piece-type movement.

In the Symmetric Version, players of one Conjunction roll their dice simultaneously, and both must move the same type of piece, each moving exactly his or her die roll. Players of a single color alternate conjunction-initial movements.

## 6.3 Three Player Versions

In the three-player version of **kn~~o~~w**, each player is assigned exactly one type of piece. Initial placement differs from that shown in Figure 2. Resolution is achieved when a player's pieces are connected on both the First and Second Tiers.

## 6.4 Eternal Versions

For two- and four-player games, **kn~~o~~w** can be made eternal<sup>4</sup>. Resolution (followed by post-resolution, and scoring if desired) ends not the game itself, but only a *cycle* of the game.

The initial placement for the next cycle is then achieved by exchanging all of the striped pieces on the board: bards for bards, fools for fools, and heralds for heralds.

The player who first achieved Resolution is the first to move in the following cycle.

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<sup>4</sup> at least, as eternal as the players are willing to put up with

## 7 Some Hints

### 7.1 Threads

It is often helpful to think of two pieces of the same color and stripe (pieces which can make connections) as attached by an invisible “thread” running through the center of the board. Ideally, the angle of this “thread” at the center of the board should be brought closer to  $180^\circ$  (a straight line) by a movement of one or both of these pieces, since such an angle is a prerequisite for a connection, and thus for resolution. At the beginning of the game, this generally means that moving “forward” (towards the opposing player’s starting positions) is desirable.

### 7.2 Walls

A common strategy is for a player (or color) to build a “wall” accross the board with his or her pieces and their influences. Doing so will typically hinder the other player from moving one piece of a given type to the opposite side of the board, in effect “isolating” two pieces of the same type on one half of the board, so that no connections between those pieces are possible unless one of them is to move through a point of contention. In this case, the player with the isolated pieces should probably consider using a Solipsistic Path to get one of his or her pieces through to the opposite side of the board.

## A Bonus Rules

### A.1 Conservation of Randomness

The outcome of a game of **kn<sup>o</sup>w** often depends largely on chance, as manifested by die rolls. For this reason (among others), the principle of *Conservation of Randomness* was introduced. By this principle, every die roll cast in the course of a game of **kn<sup>o</sup>w** **must** be moved by some piece. Some situations where Conservation of Randomness has been applied include the following:

- On casting dice to determine which player will initially begin the game, the initiating player does not re-roll the dice for his or her initial move, but rather moves the rolls as cast.



- When a **Solipsistic Path** is attempted and fails (case 6), the contender does not re-roll the dice for his or move, but rather moves the rolls as cast for the attempted solipsistic path.
- For the Eternal Version, if a player achieves three connections during post-resolution movement with a die roll left unmoved, this roll must be moved by the player who first achieved resolution in his or her initial turn of the following cycle.

## A.2 Nets

Two pieces are said to be in a **Net Relation** to one another when the following conditions apply:

1. The pieces are of the same type
2. The pieces occupy correspondent spaces on different quadrants of the board.

In other words, a Net Relation between two pieces is very similar to a connection relation, except that the Netted pieces need not be members of the same color-alignment, and that the Netted members need not be on opposite **sides** of the board (as with connections), but rather only on different quadrants. For each space on the board, there are exactly three other spaces on the board in which a sibling piece, regardless of alignment, might stand to produce a “netted” relation. (Recall that an alignment is a group of six pieces as played by a single player in the two-player version of the game.)

A **Polar Net** occurs when the Netted pieces are in adjacent quadrants: when a Connection relation could *not* exist between the spaces occupied by the Netted pieces. A **Balanced Net** occurs when the Netted pieces are not in adjacent quadrants: when a Connection relation *could* exist between the spaces occupied by the netted pieces.

The **Duration** of a Net is the span of time during which at least one piece of the Net Type (the type of the Netted pieces - bards, fools, or heralds) finds itself in a species of Net Relation (polar or balanced) with some other piece of the Net Type at the beginning or end of a piece’s move, similar to Connections.

### A.2.1 The Conduit and the Conversation

A Netted piece may act as a **Conduit** for another piece of the same type, to allow its sibling piece to perform a type of move known as a **Conversation**. A Conduit is said to be Polar or Balanced, depending on the flavor of Net in which it is participating.

The Conversation bears some resemblance to the Solipsistic Path or the Significant Errand, in that it can allow a piece to move through spaces influenced by a piece of the other alignment. A Conversation differs from a Solipsistic Path or Significant Errand, however, in that no die rolls are required in order to determine whether or not such a move is possible. A Conversation is said to be **two-sided** if the piece acting as Conduit is a member of a Balanced Net, **one-sided** otherwise.

A One-Sided Conversation allows free movement by pieces of the Net Type through spaces influenced by any pieces of the Net Type, for the duration of the Conversation. Effectively, all spaces influenced by pieces of the Net Type are “turned off” for all pieces of that type for the duration of a balanced net.

A Two-Sided Conversation allows all pieces of the Net Type to move freely through spaces influenced by any pieces *not* of the Net Type, for the duration of the Conversation, i.e. as long as there is a Balanced Net relation between two of the Net-type pieces.

Note that for pieces not of the Net Type, spaces continue to be influenced as usual.

## B The Game Board

