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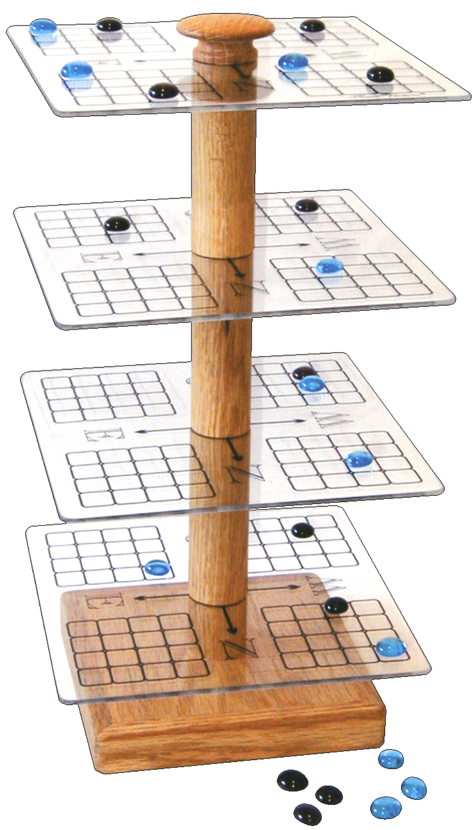
JDB Games

Time Vectors® Game Manual



With First-move Equalization Protocol

Time Vectors®

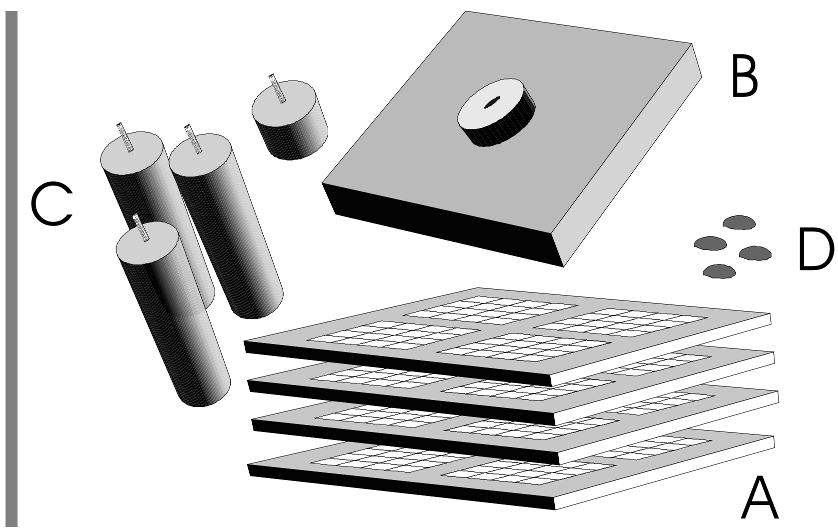
The strategy game of the new millennium.

The Game Board

Parts List:

- **A.** 4 - square clear plastic boards
- **B.** 1 - square wooden base
- **C.** 3 - 4” wooden posts & 1 - 1” wooden top
- **D.** 105 - colored tokens (35 each of three different colors)

WARNING! THESE TOKENS MAY CONSTITUTE A CHOKING HAZARD TO CHILDREN AGES 3 AND UNDER.



Assembly Instructions

1. Peel the paper backing off of the plastic game boards (A).
2. Place a square plastic game board (A) on top of the base (B) with the holes lined up.
3. Place a 4” wooden post (C) on the plastic board so that the screw goes through the center hole. Screw the post in firmly. It may help to set the plastic board on its edge while you tighten the post to the base.
4. Place a square plastic game board (A) on top of the 4” wooden post (C) with the directional markings aligned with the other board, and the holes lined up.

5. Place a 4” wooden post (C) on the plastic board so that the screw goes through the center hole. Screw the post in firmly. Again, it may help to set the plastic boards on their edges while you tighten the post. This also helps align the boards.
6. Repeat instruction #4.
7. Repeat instruction #5.
8. Repeat instruction #4.
9. Screw the top 1” wooden cylinder (C) on to the top through the hole on the last plastic board. Again it may help to lay the whole thing on its side to keep the game set aligned as you tighten the top piece.
10. Put the board upright on its wooden base. The plastic boards (A) should all be arranged so that the markings (N, S, E, and W) are all aligned vertically.
11. Separate the game pieces (D) into separate colors, each player with all of one color.
12. Read further into this manual “***Time Vectors Game Manual”*** to learn how to play.

Terms to Know

Grid: Each 4X4 square grid is referred to as a **grid**. There are four **grids** on each *tier* and sixteen **grids** total on the game board.

Tier: Each plastic board on a different vertical level with four *grids* on it is a **tier**.

Dimension: **TIME VECTORS** uses a representation of the four known **dimensions**: height, width, depth, and time. See the section titled ***Explanation of Dimensions*** to learn more about how the idea of **dimensions** is integrated into the game. The first, second, and third dimensions are actual graphic representations of dimensions. The fourth is an abstract graphic representation of *time*.

Quadrant: Directions marked on each *tier* (N, S, E, and W) are used to identify each different **quadrant** (NW, SW, SE, NE) of the game board. Each **quadrant** spans the same ¼ of each tier and they are used as a way of distinguishing areas used to identify *time* periods (the 4th dimension). See the section titled ***Explanation of Dimensions*** to learn more about **quadrants**. The directional markings are also used to provide the orientation of the *grids* in traversing the 4th-dimension.

Point: Each small square space on each *grid* is called a **point**. A move is made by covering a **point** with a game piece.

Vector: A **vector** is the winning construct. To establish a **vector**, you must have four of your game pieces forming a line within one or more *dimensions* (see the section ***Examples of Vectors***). The term “line” is used but the *dimension* “*time*” is not apparently linear on the game board, as are the other *dimensions*.

Time: Actual **time** is not a factor in the game. A 3-D graphic representation of **time** is accomplished by equating the different *quadrants* to instances of **time**. Adjacent *quadrants* are sequential. Starting in any *quadrant*, incremental linear movement is actually clock-wise or counter-clock-wise to an adjacent *quadrant*. A *vector* in **time** will cover all *quadrants* and will progress from one *quadrant* in either a clock-wise or counter-clockwise direction through all the others. *Points* on *grids* are similar respective to the direction markings.

Explanation of Dimensions

Most board games use a two dimensional board. ***Tic-tac-toe*** is an example of a game much like **TIME VECTORS**, only it requires placing three game pieces in a row on a two-dimensional board. Each grid on the **TIME VECTORS** game board is a two-dimensional game board in itself (*see* ***Figure 1***). ***3-D Tic-tac-toe***® expands the common 3X3-space game board by another factor of 3 to a 3X3X3-space board. By stacking the boards 3 high, another dimension is integrated into the old game. Not only is it possible to get three in a row on any one level, but also vertically as well. **TIME VECTORS** has a similar structure among the four *grids* in the same quadrant on each of the four *tiers* (see ***Figure 2***). Each of the four quadrants spanning all the tiers contains a 4X4X4-space game board. Where **TIME VECTORS** becomes different and challenging, is in its integration of yet another dimension—the fourth dimension. Four complete 4X4X4 game boards exist, one in each of the four *quadrants* to make a full 4X4X4X4 matrix.

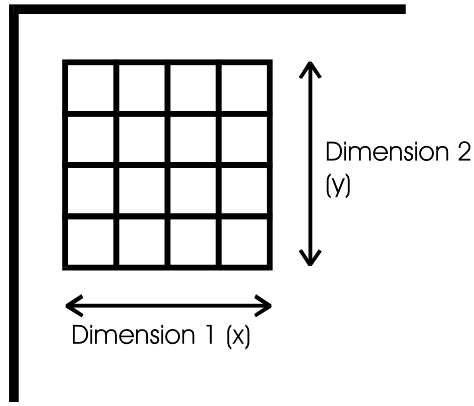


Figure 1. A grid showing the first two dimensions.

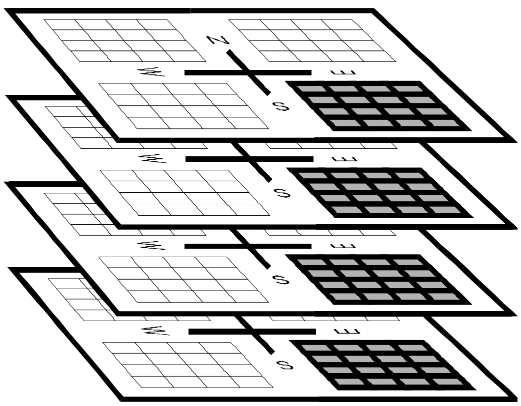


Figure 2. 3rd dimension-- all grids of one quadrant, vertically aligned.

In utilizing the 4th dimension, game board orientation is kept the same with respect to actual directions (N, S, E, and W). For instance, the furthest NW-most point on the grid in the NW quadrant on a tier corresponds to the furthest NW-most point on the grid in the other quadrants on the tier (see ***Fig. 3***). The quadrants can be thought of as describing the same 4X4X4 game board at different instances of time. <u>Consecutive instances are adjacent quadrants</u>. For instance, a linear sequence of quadrants may be NE, NW, SW, SE; or the reverse: SE, SW, NW, and NE. A fourth-dimension linear sequence may start on any quadrant and go either way, but must go through every quadrant and not skip any quadrant in the sequence. A vector of the fourth dimension will have one point in each quadrant.

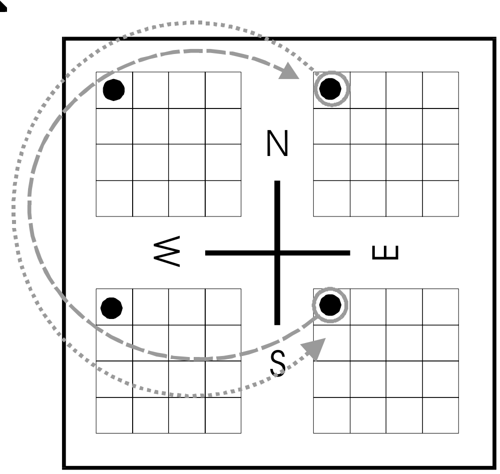


Figure 3. Arrow showing fourth-dimension movement, also four chips forming a vector of the fourth dimension.

To Play the Game

Two players each choose a different color of game piece to use, then separate the game pieces giving each player all the game pieces of his/her chosen color. Decide who goes first, and alternate turns. On each turn, the player moves by putting one of his/her own unused game pieces on any one unoccupied point. Advanced players may wish to refer to the ***Beginning Equalization Moves*** section at the end of this manual. The game pieces placed on the board remain where they are placed throughout the duration of the game. The object of the game is to be the first to establish a vector. A vector is established when a player has four of his/her game pieces in a line in one or more dimensions (see the section ***Examples of Vectors*** for an explanation and examples of vector constructs). This game is similar to ***tic-tac-toe*** on a comparatively grandiose scale. Turns are alternated until someone wins. Moves should be to either build your vector, or block an opponent by placing your game piece on a point that is needed by your opponent to construct a vector. A vector does not need to be built in sequence (i.e. an end-point of the vector placed first, the second point in the line covered next, etc.). As long as four game-pieces form a legal vector, the objective is satisfied. A player's subsequent moves do not need to be connected to previous moves, nor according to any rule other than placing his/her own unused game piece on any unoccupied point.

Additional players may participate in teams. Turns are rotated among team members as well as teams alternated. For instance, four players (teams 1 & 2 each having player A & player B) would rotate in this manner: team 1 player A; team 2 player A; team 1 player B; team 2 player B; repeat. Additional players on teams would go in the same sequence: team 1 player C; team 2 player C, etc. Players of the same team use the same color game pieces.

Although twenty game pieces of each color have been provided, the maximum number needed in a game so far has been fifteen. When a large number of pieces are on the game board, it is difficult to see all the possibilities, and the addition of more pieces makes it more likely that an unseen or accidental winning vector could already be on the board. In such a case, the owner of the winning construct had better identify it before the other player establishes a vector to win. The winner is the first to build and *identify* a vector.

Examples of Vectors

A legal vector has a starting point (actually either end of the vector can be the starting point), and three other points incrementally describing a line. Incremental change along a dimension means that the game pieces must form a linear sequence. Within the first three dimensions the linear sequence is visibly apparent. When the fourth dimension is integrated into the linear sequence, some mental place keeping is necessary to view the linearity. The lack of visual cues, compounded by the cyclical nature of the representation of time, creates a mind-boggling barrier, especially when first learning the game—practice gives one the mental tools to view the game board more easily. Time is the only dimension on the game board which does not have naturally imposed end-points, so visually scanning the board becomes the first technique one needs to acquire to play the game effectively.

Incremental change must take place along one or more dimensions to have a legal vector. The best way to explain this is to show examples of the fifteen different possible types of vectors.

Vectors of the first two dimensions closely resemble the winning constructs of a tic-tac-toe game. In ***Fig. 4***, examples of 1st & 2nd-dimension vectors show the most easily recognizable types of vectors. These types of vectors can be built on any one grid on the game board.

1st-dimension vectors occupy any row on a grid. 2nd-dimension vectors can occupy any column. Vectors of the combined first and second dimensions can occupy either one of two possible diagonal constructs on a grid.

With vectors of the first two single dimensions, there are 64 possible different constructs each: 4 possible on each grid X 4 tiers X 4 quadrants. With diagonal vectors of the combined-first-two dimensions, the number of constructs is half that (32), because only two on each grid are possible. The count of possible 1 & 2 dimension constructs is 160.

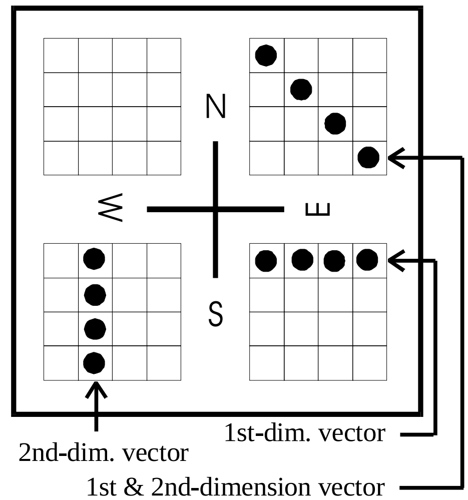


Figure 4. Examples of vectors of the 1st & 2nd dimensions.

In these 1 & 2 dimensional vectors, the only change represented happens in the 1st, 2nd, or both dimensions, the third and fourth dimensions are constant because there is no change—it all happens on one grid. If the entire game were to be played on this level, the initial player (much like in tic-tac-toe) could decide the outcome.

To create more interest for players, we integrate another dimension into the game—the third dimension. Because the fourth dimension still remains constant, each of these constructs remains bound to one quadrant, and can exist in any one quadrant. Also, because the third dimension is now integrated, there must be a game piece on each tier.

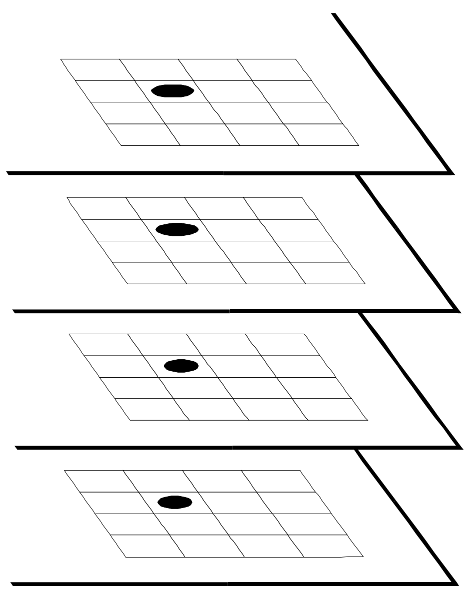


Figure 5. A vector of the third dimension.

With the integration of the third dimension, the possibility of non-linear mistakes in vector construction becomes a concern. Henceforward, examples of what is <u>not</u> a legal vector must not be confused with examples of legal vectors.

Figure 5 shows a vector of the third dimension. A vector of this type is still visually recognizable as linear. The vector in ***Fig. 5*** is made up of game pieces occupying the same point on each different grid on each different tier. Dimensions 1, 2, and 4 are constant, so the same row and column on each grid, and the same quadrant are kept uniform against the change in tiers.

A third dimension vector can exist on any of 16 points on a grid multiplied by 4 quadrants to make 64 different possible constructs of this type.

Figure 6 is an example of a vector of the combined 1st & 3rd dimensions. Since the 2nd and 4th dimensions are not used, the row and quadrant exhibit no change, while the columns and tiers change incrementally.

Combined 1st & 3rd or 2nd & 3rd-dimension vectors each have 32 different possible constructs. There are eight possible per quadrant multiplied by four quadrants.

Figure 7 is an example of a vector of the 2nd & 3rd dimensions combined. It is similar to ***Fig. 6***, but the column stays static while the rows and tiers change. It also is contained within one quadrant. These types of vector constructs can be on any row, in any quadrant.

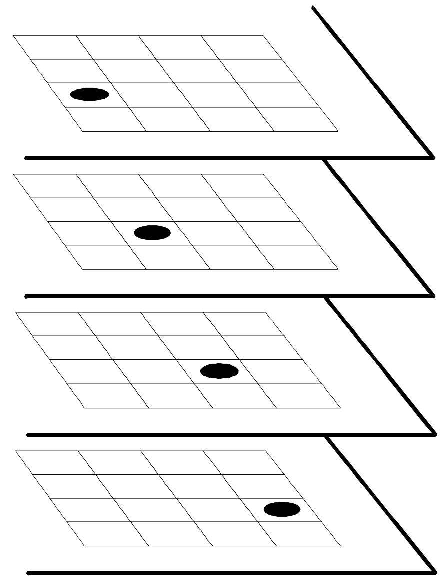


Figure 6. A vector of the 1st & 3rd dimensions combined.

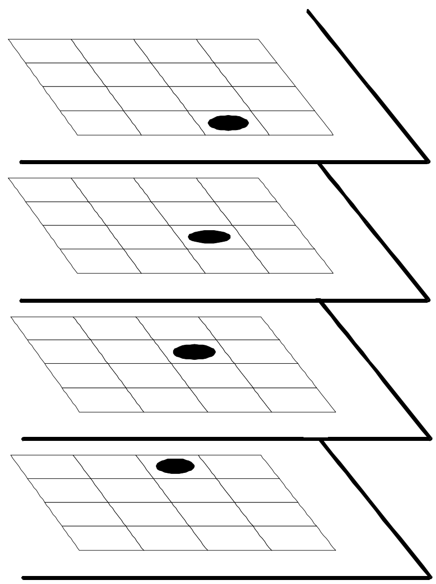


Figure 7. A vector of the 2nd &3rd dimensions combined.

So far we have only integrated two different dimensions into the vector constructs. Even though the previous constructs mixed with the vertical (3rd) dimension look as if all three dimensions are changing, they are still two dimensional turned on their side. Next, we look at our first actual 3-D vector construct.

Figure 8 is an example of a vector of all of the first three dimensions, combined. With each different point the row, column, and tier change to the next increment. The quadrant remains the same, as there is still no change in the 4th dimension. This type of vector can also be built in any one quadrant.

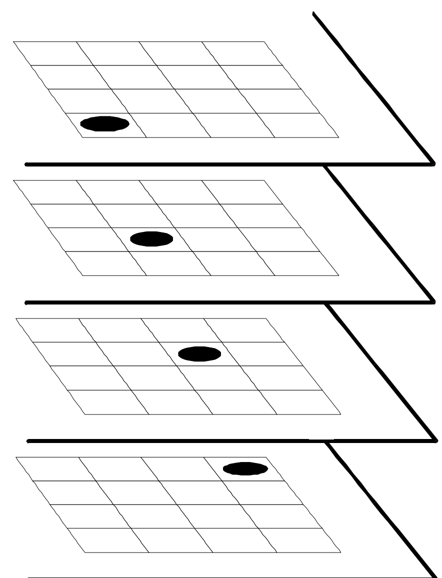


Figure 8. A vector of the 1st, 2nd, and 3rd dimensions combined.

Vectors of the combined first three dimensions have four different constructs possible per quadrant, times four quadrants, or sixteen possible different constructs on the game board.

As was mentioned before, now that so many dimensions have been integrated into the game, the difficulty of keeping the linearity consistent among moves increases. Though it is still visually apparent to some degree, mistakes involving non-linearity begin to appear at this level. Skipping increments in any dimension results in an illegal construct not considered a vector.

Figure 9 is an example of an illegal construct. Although the points covered by game pieces lie on a diagonal, and on different tiers, it is not linear. It would be correct if the second and third tiers were exchanged with one another. Then the points would all be sequential.

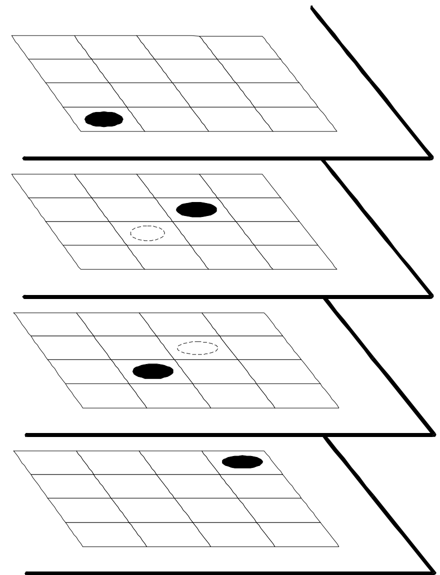


Figure 9. A construct sometimes mistaken for a vector. Dashed outlines represent the points connecting the end points in a vector of the 1st, 2nd, & 3rd dimensions.

The order of the game pieces becomes even more of a concern as the complexity increases. Just playing on the first three dimensions so far might make an interesting game. It is still too determinable for our tastes, so we integrate yet another dimension into the game of **TIME VECTORS**—the fourth dimension! The first real challenge of the game is just to be able to understand and use the final dimension.

The previous lesson about non-linearity may be common sense to most people, but it becomes more difficult to check the sequential correctness of 4th dimensional constructs. The points don't line up visually.

The Fourth Dimension

This is where the mind-bending part of **TIME VECTORS** begins. Vectors of the fourth dimension are not graphically apparent as are the first three dimensions. The fourth dimension uses the N, E, S, and W directions to partition the game board into four quadrants. <u>Each grid of the same quadrant spanning all vertical tiers (e.g. all the SE grids from top to bottom as in ***Figure 2***) is seen as a three-dimensional game board at one particular instance in time</u>. Any one quadrant can be a starting point, but the vector must travel through all quadrants in incremental steps between adjacent quadrants. An example of a vector of the 4th dimension is in ***Figure 10***. <u>Note that the same point with respect to N, S, E, and W directions is played</u>. This orientation is kept while traversing the 4th dimension from grid to grid and tier to tier.

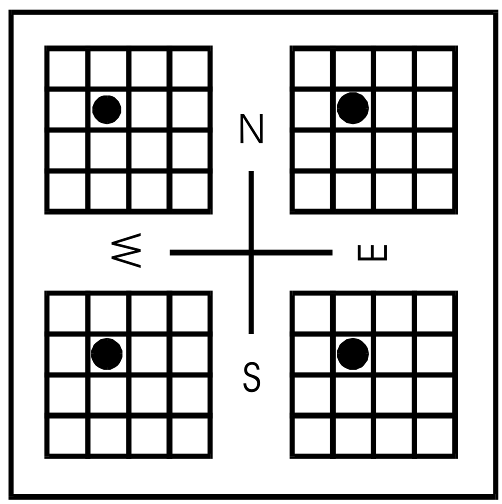


Figure 10. A vector of the fourth dimension.

You shall see the importance of seeing this in vectors integrating the fourth dimension with the other dimensions. <u>One common mistake is to reference the points of the grid with respect to the center post</u>. This is commonly the greatest hurdle in gaining a solid understanding of the mechanics of the game.

Figure 11 shows a vector of the 1st & 4th dimensions combined. End-points are in the NW and SW quadrants. To trace the vector start in the NW quadrant, go clock-wise to the next quadrant (the NE quadrant) and see that the game piece is placed on the point one over from the end-point, along the first row of the grid. Then see that in the next quadrant (SE) the next point of the first row is covered. Last, in the SW quadrant (next in the clockwise series) the other end-point of the first row is covered. It is as if each quadrant in the series is a snapshot of one grid at different incremental times. The chip would move in a straight line in time from east to west along the southern row of the grid.

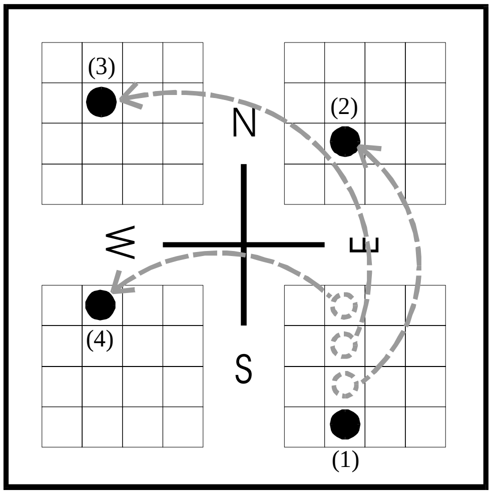


Figure 12. A vector of the 2nd & 4th dimensions combined.

A vector showing the combination of dimensions 1 & 2 with the 4th dimension is in ***Figure 13***. Starting at the NW quadrant and proceeding clockwise, a diagonal line is ascribed running from the SW corner of the grid to the NE corner of the grid, ending in the SW quadrant. It may also be viewed as starting in the SW quadrant and proceeding counter-clockwise.

This can be the most difficult concept of the game to understand. Many people tend to reference the grids by the center post of the game board. It is a natural tendency to want to continue the vector on the diagonal line radiating out from the center post in each quadrant.

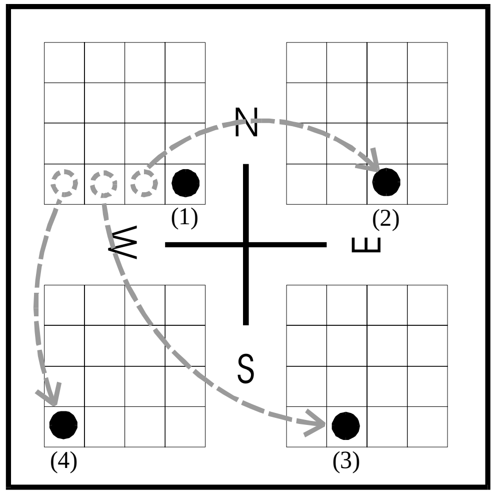


Figure 11. A vector of the 1st & 4th dimensions combined.

Starting in a different quadrant and going the other way (counter-clockwise) ***Figure 12*** shows a vector of the 2nd & 4th dimensions combined. Starting in the SE quadrant, the southern point of the second column west-to-east is covered. Then moving counter-clockwise, the next quadrant (NE) shows the next point northward in the second column west-to-east is covered. Then in the next counter-clockwise quadrant (NW), the next point of the same column is covered. Then the end-point is covered in the last quadrant of the series (SW) on the northern-most point of the second column west-to-east.

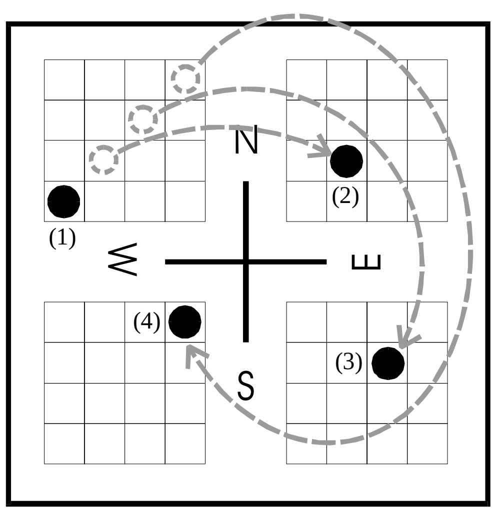


Figure 13. A vector of the 1st, 2nd, and 4th dimensions combined.

Figure 14 shows a common error in dark game-pieces. What seems to happen is that instead of referencing the grids to N-S-E-W orientation, the player references the grid with respect to the center post of the game board.

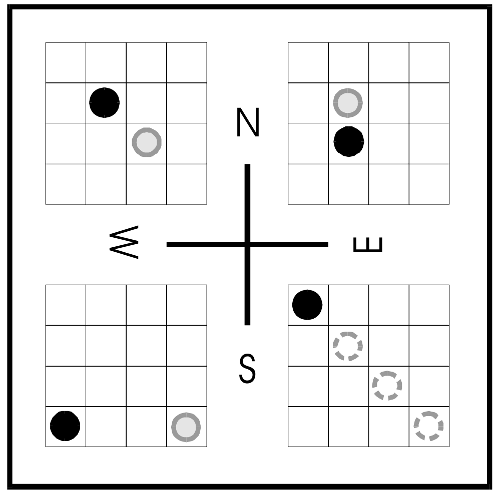


Figure 14. <u>A common ERROR is shown in dark game-pieces</u>. The correct moves are shown in light game-pieces.

The next integration is to combine the 3rd and the 4th dimensions. This entails combining moving in incremental steps up or down the tiers with incremental steps moving through the quadrants. A vector of the 3rd & 4th dimensions combined is in ***Figure 15***. Note that the grids still must be viewed with respect to the N-S-E-W directions for the vector to be correct.

Starting in the SE quadrant on the top tier, the vector progresses in a counter-clockwise and downward movement. Progressing one tier and one quadrant at a time, the vector ends on the bottom tier and in the NE quadrant. With each successive move, the same point on each grid is covered because the first two dimensions are constant and unchanging. Because of the greater distance between points and the non-linear aspect of the fourth dimension, the player must develop a skill in mentally keeping track of the line being constructed. This does not take a genius, just practice. If you find it daunting, just remember to take each dimension a step at a time (one down, one over, one down, one over, etc.) and you will naturally develop the skill. The same one-step-at-a-time process when working with vectors integrating the first two dimensions with the third and fourth dimensions is necessary until the mind becomes naturally adept at this.

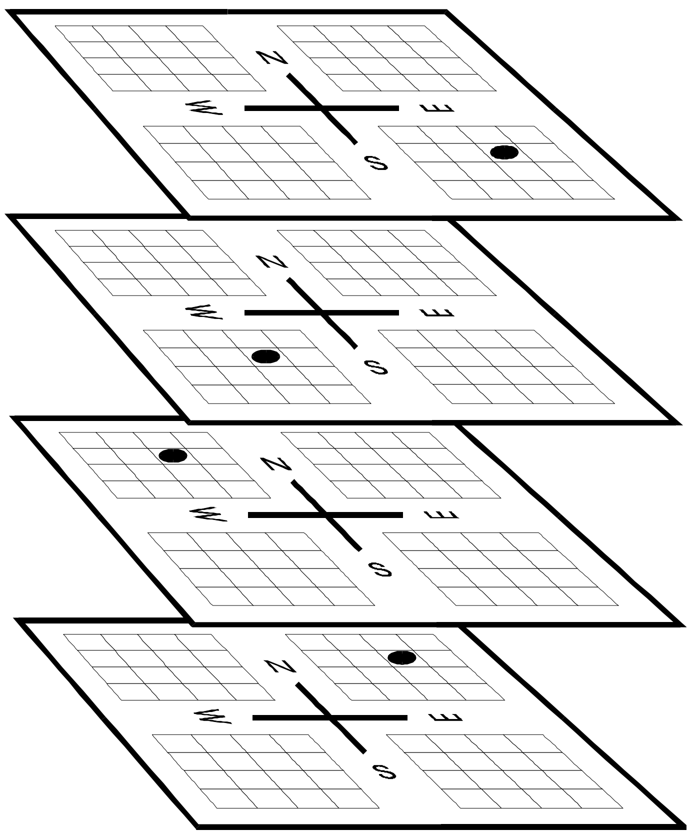


Figure 15. A vector of the 3rd & 4th dimensions combined.

Figure 16 is an example of a vector of all the dimensions combined. Beginning at the bottom in the NE quadrant, the NW corner point of the grid is covered. From there the line runs in a diagonal to the SE corner of the last grid. The points are also interspersed along the tiers and quadrants in increments. The second tier up and the second quadrant going clockwise the second point of the diagonal line is covered. The next tier up and the next quadrant clockwise, the third point of the diagonal line is covered. The last point is covered on the top tier, the NW quadrant, and the end point of the diagonal line being constructed. Although this is a straight line by definition, it takes analyzing the game board one step at a time to realize it. Start at the first point, find the next point on the 1st & 2nd-dimensional diagonal, then go one tier up, then the next quadrant clockwise. From there go to the next point in the two-dimensional diagonal line, the next tier up, and the next quadrant clockwise. One more series of steps and you arrive at the top end-point of the diagonal. When you have played with the game board building and spotting vectors for a while, it will become more natural if you take the one-step-at-a-time approach. Remember to check the orientation to make sure you are referencing each grid to N, S, E, and W not the center post.

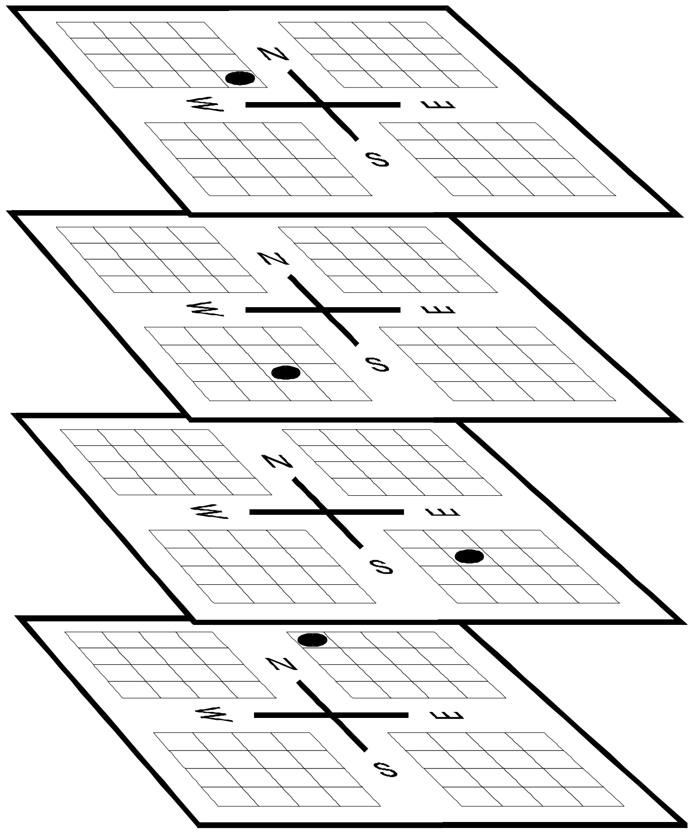


Figure 16. A vector of the combination of all four dimensions.

Have fun and teach your friends. You will feel like Einstein when they are having trouble with the fourth dimension, and you can whip out the moves on them. Once you have these game skills mastered, you need to think about strategy. **Hint:** In **tic-tac-toe** it is always a good idea to place moves on points which can be used in more than one line. The same holds true for **TIME VECTORS**. Points common to more possible vectors are good strategic moves.

Once you have mastered this game, you might want to try the game GRYB® also by JDB Games. It is similar and can be more challenging, but easier to wear on your head.

Beginning Equalization Moves

As with other n-in-a-row style connection games, advanced players feel it is necessary to include beginning moves which negate a first move advantage in Time Vectors. Most beginning and intermediate players are not going to be affected by a first move advantage, but expert players feel that these opening move protocols may help to give the second player of a two-player game less of a disadvantage. Two different initial moves are included here for that reason. Our gratitude goes to Richard Reilly, Cameron Browne, and David Bush for their assistance in this development.

In synopsis; the first player may make a move using either one or three tokens (two of one color and one of another). The second player elects which of the colors to assume playing on the board, and moves or not accordingly.

First Move Swap

In a two-player game, the second player has the opportunity of swapping the first move of the first player. This must be the first move of the second player. The second player removes the first player's token and replaces it with his own token. This token is returned to the first player, who may now move again. Alternately, the groups of unused tokens may be switched between players to represent the change in color and new play position. Richard Reilly and Cameron Browne first suggested this as an opening move equalization protocol. David Bush concurred that at least this was needed to balance the game, and that the three-move equalization protocol (below) may be a better equalization of first-move advantage.

Three-Move Equalization

In the three-move equalization protocol (3MEQ for short), the first player (of a two-player game) places two tokens of one color, and one of another color on the game board wherever he wishes. The second player then chooses which color of tokens to play and the game continues. If the second player chooses the two stones, it becomes the first player's turn, if the second player chooses to play the single stone, it is his turn to move. David Bush suggested this opening move.

Thank you for purchasing Time Vectors™!