

## Proposed Betza Extended Notation (BEX Notation)

This notation is based on Ralph Betza's original "Funny Notation" (also referred to as Betza Notation). Some extensions have been added to allow for a wider range of move-option expression, and also for easier visual parsing. Betza Notation was chosen as the basis for this proposed standard because it is well-known and well-established. Older documentation which uses the original Betza Notation should still be valid (for the most part) under this new extension.

In Betza notation, a move component is expressed as an optional string of lower-case letters (which serve as modifiers to one of the "base" moves shown in the table below) followed by a single upper-case letter. So a move component is expressed as  $mX$ , where  $m$  is a modifier (lower-case letters), and  $X$  is a single upper-case letter. Move component strings may be concatenated together to express "either-or" move component options (i.e. a piece may move as  $X$  or as  $Y$ , but not both in a single turn). So the expression  $WF$  would indicate that a piece may move as a (0,1) leaper, or as a (1,1) leaper (i.e. a commoner, or non-royal king).

### *Base moves*

O	(0,0) Leaper (new!)
W	(0,1) Leaper
F	(1,1) Leaper
D	(0,2) Leaper
N	(1,2) Leaper
A	(2,2) Leaper
H	(0,3) Leaper
L	(1,3) Leaper
J	(2,3) Leaper
G	(3,3) Leaper
(N,M)	(N,M) Leaper

### *Shortcut base moves*

R	(0,1) Rider
B	(1,1) Rider
Q	R+B
K	W+F

### *Modifiers*

#### **Directional modifiers**

f	The owning player's forward direction
b	The owning player's rearward direction
r	To the owning player's right
l	To the owning player's left
s	To the right or to the left (r+l)
v	In the forward or rearward direction (f+b)

## Move/Capture modifiers

m	A non-capturing move
c	A must-capture move

## Other modifiers

y	Confers royalty (new!) Xiangqi king = yW
e	Confers leaping to an otherwise non-leaping move (new!) Shogi horse = e(mfW-F)
n	Denies leaping to an otherwise leaping move. Shortest path must be used. If multiple paths are available, any may be taken. Moo (Mao+Moa) = nN Xiangqi elephant = nA
i	Restricts the move to the piece's initial move (e.g. the orthochess pawn's initial 2-square move) Orthochess pawn = imfW2+mfW+cfF
j	Jump (a leaper that must jump over a single hurdle) Mao-hopper = j(mW-F)
p	Hop (must jump over a single hurdle) Xiangqi cannon = mR+cpR
g	grasshopper (must jump over a single hurdle, landing on the square directly after the hurdle) grasshopper = gQ
z	Crooked Crooked bishop = zB
q	Circular rider Rose = qN

## Promotion

Promotion is denoted by an equal sign followed by one or more move components separated by commas. So for example, an orthochess pawn might be represented as  $imfW2+mfW+cfF=Q,R,B,N$

Note that the circumstances of promotion are not conveyed.

## ***Extensions to Betza Notation***

### **The Grouping operator:**

This operator is used to group together move components by placing parenthesis around them. (A) indicates move component A. It is the same as A, but visually easier to parse when longer notation strings are required. For example, the orthochess pawn move option may be represented using the original notation as imfW2mfWcfF, but now may also be represented as (imfW2)(mfW)(cfF).

### **The Same General Direction Sequencing operator (-):**

A-B indicates move A followed directly by move B in the same general direction. For example the Mao (non-leaping knight) from Xiangqi would be represented as mW-F.

### **The General Sequencing operator (--):**

A--B indicates move A followed directly by move B (not necessarily in the same general direction). For example the Double knight (which makes a non-capturing knight move, followed by another knight move) would be represented as mN--N.

### **The Combining operator (+):**

A+B indicates the piece can move as A or move as B. This means the same as AB, but may be easier to visually parse. For example, the orthochess pawn may now be represented as imfW2+mfW+cfF as opposed to the original form imfW2mfWcfF.

### **The Riding operator (\*):**

The Riding operator is a suffix to the move component. X\* indicates an X-Rider. For example, a Nightrider would be represented as N\* (or NN using the older style). The Riding operator is necessary for more complex riders, such as the Mao-rider, which would be represented as (mW-F)\*.

### **The Limited-Riding operator (2-N):**

The Limited-Riding operator is a suffix to the move component, and is a number 2 or greater. It indicates the move is a Riding move up to the number of iterations indicated. For example, the orthochess pawn's one square and initial 2-square non-capturing moves would be represented as mfW2.

### **The Exact Limited-Riding operator (02-0N):**

The Exact Limited-Riding operator is a suffix to the move component, and is a number 2 or greater prefixed with a 0. It indicates the move is a Riding move of exactly the number of iterations indicated. For example, the orthochess pawn's initial 2-square move would be represented as mfW02.

## Exotica

### The exotic operator []

The exotic operator allows the expression of various exotic effects (e.g. immobilizing, ranged capture, etc.). Obviously, this section will have to be expanded to cover the many and varied exotic effects currently in use. The suggestions below are only a small start.

#### Exotic capture [c]:

This allows the expression of various types of exotic capture (capture by approach, ranged capture, etc.). Note that this operator does not imply replacement capture. Replacement capture must be explicitly specified.

[ca] = Capture by approach

[cw] = Capture by withdrawal

[cj] = Capture by leaping over (single piece)

[cl] = Capture by leaping over (any number of pieces)

[ci] = Imitative capture (captures in the way the captured piece captures)

[ccM] = Custodial capture (the piece between the just moved piece, and the friendly piece that could be reached moving as M).

[cu] = Self capture

[crM] = Ranged capture of the piece that could be reached by moving as M.

#### Exotic effect [x]:

This allows expression of various exotic, but non-capturing effects, such as immobilization, position swap, etc.).

[xiM] = Immobilization of all enemy pieces that could be reached by moving as M.

[x!iM] = Un-Immobilization of all enemy pieces that could be reached by moving as M.

[xwM] = Swaps position with opposing piece that could be reached by moving as M.

[xo] = Return to original starting square.

### Examples

Ultima:

Immobilizer: [x!iK]--mQ--[xiK]

Withdrawer: mQ+[cw]Q

Long Leaper: mQ+[cl]Q

Chameleon: mQ+[ci]

Pincer Pawn: mR+mR--[ccD]

Rococo:

Swapper: mQ+[xwQ]+([crK]--[cu])

Cannon pawn: mK+j(AD)

Chu Shogi:

Lion: K+(DAN)+(K-K)+[crK]+(mK--[xo])

Note that in Chu Shogi, there are special rules (regarding lion-lion capture) which are too specialized to conveniently express in a brief notation.

--David Howe, January 14, 2012

References:

<http://www.chessvariants.com/d.betza/chessvar/pieces/notation.html>

<http://www.chessvariants.com/piececlopedia.dir/betzanot.html>