

Title: Proposal to Encode Heterodox Chess Symbols in the UCS

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Introduction The UCS contains symbols for the game of chess in the Miscellaneous Symbols block. These are used in figurine notation, a common variation on algebraic notation in which pieces are represented in running text using the same symbols as are found in diagrams. While the symbols already encoded in Unicode are sufficient for use in the orthodox game, they are insufficient for many chess problems and variant games, which make use of extended sets.

1. Fairy chess problems The presentation of chess positions as puzzles to be solved predates the existence of the modern game, dating back to the *mansūbāt* composed for *shatranj*, the Muslim predecessor of chess. In modern chess problems, a position is provided along with a stipulation such as “white to move and mate in two”, and the solver is tasked with finding a move (called a “key”) that satisfies the stipulation regardless of a hypothetical opposing player’s moves in response. These solutions are given in the same notation as lines of play in over-the-board games: typically algebraic notation, using abbreviations for the names of pieces, or figurine algebraic notation.

Problem composers have not limited themselves to the materials of the conventional game, but have experimented with different board sizes and geometries, altered rules, goals other than checkmate, and different pieces. Problems that diverge from the standard game comprise a genre called “fairy chess”. Thomas Rayner Dawson, known as the “father of fairy chess”, popularized the genre in the early 20th century. He invented many pieces and conditions, and was the editor of the *Fairy Chess Review*, an offshoot of the British chess problem magazine *The Problemist*.

Fairy chess problems that differ from orthodox chess only in rule set, stipulation, or board do not require any symbols not also used for orthochess. For example, a cylindrical board is shown as a standard square but the leftmost and rightmost files are treated as adjacent; “Circe chess” differs only in what happens when pieces are captured. Unconventional pieces are another story, as there must be some way of representing additional types of pieces alongside the standard ones.

Most fairy pieces are conventionally represented by rotating the standard chess piece symbols. In the days of hot metal typography, this enabled composers and publishers to

9 - Petko A. Petkov
(Schach-Echo 1975)
1. ♔b5? blocus
1... ♖ç4(♖ç3) 2. ♕×ç4(♕d1)#
mais 1... ♖a5!

1. ♕ç2? blocus
1... ♖ç4(♖ç3) 2. ♕d2(♕é4)# mats changés
1... ♔d5 2. ♕d3#
mais 1... ♖b1!

1. ♔ç6! blocus
1... ♖ç4(♖ç3) 2. ♕é3(♕d5)# mats changés
Thème Zagorouiko (au moins deux mats sont changés deux fois)

Figure 1: Excerpt from the solutions to a solving competition on the website of the French chess problem magazine *Phénix*, with turned queens representing grasshoppers: <http://www.phenix-echecs.fr/divers/telechargement_concours_solutions/concours_solution_s_phenix_01_ESR.pdf>

use easily available chess typefaces for fairy problems, without the added hassle and expense of designing and cutting new type for each and every new kind of piece. Unlike the standard upright symbols, which always correspond to the orthodox pieces, there is no strict one-to-one correspondence between rotated symbols and particular piece types: the number of fairy pieces in use is uncountable, and the number of possible pieces is infinite. Instead, rotated symbols are assigned to pieces as needed, and the composer has wide latitude in choosing which ones they feel are appropriate, with only a few very common ones fixed by convention: the grasshopper is almost always ♗, and the nightrider ♞. Beyond that, the particular assignments are usually motivated by perceived similarity, e.g. a piece that leaps obliquely would probably use one of the rotated knights, while one that moves mostly diagonally might use a rotated bishop.

All six piece symbols can be found in 180°, clockwise 90°, and counter-clockwise 90° rotations. Less commonly, since there are a great many possible pieces moving in oblique directions and composers sometimes wish to use more than four of them, the knight symbol can also be found in the four intermediate, 45° increment rotations. While intermediate rotations of the other piece symbols are theoretically possible, and can occasionally be found in fonts and image sets, they do not appear to be in regular use.

6. Preis: F871 C.J. Feather

1. ♞g6 hxg6-h8=♔ 2. ♚e5 ♔xe5-h5#; 1. ♚g6 hxg6-g8=♔ 2. ♞h8 ♔xh8-h5#; 1. ♞g6 hxg6-e8=♔ 2. ♞b8 ♔xb8-h5#.

Herrlicher schwarzer Figurenzyklus und drei Rundläufe des ♖h5, mit sparsamsten Mitteln aufs Brett gezaubert. Im zyklischen Wechsel opfern sich Nactreiter, Turm und Grashüpfer dem ♖h5 und der umgewandelten weißen Dame, während Take&Make dafür sorgt, dass er das Umwandlungsfeld erreicht und im Mattzug im neuen Kleid nach h5 zurückkehren kann. Ein perfektes Minimal.

Figure 2: Excerpt from the October-December 2012 issue of the Dutch chess problem magazine *Probleemblad*, showing turned knights (circled in green) and queens (circled in red), here representing the nightrider and grasshopper, respectively, in figurine notation.

The solver will soon see that the Mao c1 is pinned by the Pao g1, and that moves by the ♖e1 would give check, simultaneously unpinning the Mao (a curious effect that is, of course, quite impossible with orthodox force). The set checks with unpins are: 1... ♖xf3+ 2 ♖a2; and 1... ♖xd3+ 2 ♖e2. Why can the mating moves not be played the other way round? With the black knight on f3, 2 ♖e2? is not mate, because of 2... ♖d2!, closing the Mao's check-line. Similarly, if the black knight is on d3, 2 ♖a2? fails to 2... ♖b2!.

Figure 3: Excerpt from the book *Chess Wizardry: The New ABC of Chess Problems*, showing the clockwise rotated knight representing a mao (xiangqi horse)

2. Neutral pieces are among Dawson's popular innovations. These are pieces that do not belong exclusively to either white or black but may be moved or captured by both. In older publications, these were represented by rotated white symbols, but current practice is to use symbols that are white on one side and black on the other, which has the advantages of greater clarity and flexibility.

All four cardinal rotations of the six piece symbol shapes, including the king, may be found in this half-filled form. Upright and 180° turned symbols are usually split across the vertical center line into left and right sides; 90° rotated pieces are usually split across the horizontal center line. Which half is white and which black depends on the font and is not used to distinguish pieces. Knights in intermediate

rotations may also be neutral; these may simply be 45 or 135 rotations from the upright neutral forms, or they may be split across the vertical or horizontal center line.

F977 Dietrich 1.b8=♗ 2.♗c6 3.♗d8 4.c8=♗ 5.♗b8 6.exd8=♗ 7.f8=♗ 8.♗b7 9.♗d6 10.♗d8 11.♗f7 12.♗g5 13.d8=♗ 14.♗d2 15.♗xg2 16.♗xe5#. Neutrale AUW, gecompliceerd door een extra paardpromotie die uitsluitend dient om pion e7 kwijt te raken. *Excellent Alphabetical play with promotion (RL). Fünf Umwandlungen, sehr gute Ökonomie (WS).*

Figure 4: Excerpt from the October-December 2013 *Probleemblad*, showing neutral equivalents of the orthodox pieces in figurine notation.

F900 Vysotska 1.♗f5 ♗f7-e7+ 2.♗c7-f7 ♗e7-e1 3.♗e1-d1 ♗d5xd1#; 1.♗e4 ♗d5-c5+ 2.♗c7-c4 ♗c5-f5 3.♗f5-f1 ♗f7xf1#. “Play of specific Chinese neutral battery with two front pieces: ♗d5 and ♗f7. Umnov theme by black Grasshopper. A specific transformation of the initial Chinese battery using the black Grasshopper (with one Pao as front piece). Blocking of black Grasshopper after the key moves. Reciprocal Zilahi in play of neutral Paos combined with Cannibal theme”

Figure 5: Excerpt from the October-December 2012 *Probleemblad*, showing a neutral counterclockwise-rotated rook (representing a pao, or xiangqi cannon) and black turned queen (as a grasshopper) in figurine notation.

3. Geometric shapes are sometimes used to represent pieces that do not behave similarly to conventional pieces, for example white or black circles used for the orphan, which moves like any piece attacking it. In general, the range of shapes used for this purpose is already well covered by Unicode:

U+25CB WHITE CIRCLE

U+25CF BLACK CIRCLE

U+25D0 CIRCLE WITH LEFT HALF BLACK OR U+25D1 CIRCLE WITH RIGHT HALF BLACK

U+25C7 WHITE DIAMOND

U+25C6 BLACK DIAMOND

U+2B16 DIAMOND WITH LEFT HALF BLACK OR U+2B17 DIAMOND WITH RIGHT HALF BLACK

U+2606 WHITE STAR

U+2605 BLACK STAR

and occasionally U+25EF LARGE CIRCLE OR U+2B24 BLACK LARGE CIRCLE

The only notable exception is a neutral form of the five-pointed star, but since the star is already vanishingly rare as a chess symbol, and half-filled stars may be found in other contexts (such as entertainment rating scales), it is not requested in this proposal.

4. The equihopper, invented in the early 20th century by G. Leathem, is a piece that slides in a straight line until it reaches another piece, hops over that piece, and continues to slide in the same direction until the distance from the hurdle to its destination is equal to the distance from its starting square to the hurdle; if either slide is impeded, the move is not allowed. It is an exception to the rule that fairy pieces are represented by rotated standard piece symbols, as it receives a distinct symbol of its own: ♞. This symbol may have originally been a simple arrangement of geometric shapes probably meant to evoke its move: a slender vertical rectangle flanked by two triangles pointing inward. Later fonts have added details to make it harmonize with the standard Staunton-style piece symbols (such as adding rectangular “bases” to either end, or “collar” lines), to the point where its basic shape is sometimes obscured.

The equihopper has its own variations, such as the non-stop equihopper (also known as the French equihopper or equileaper), which leaps over all pieces on the line and not just the hurdle in the center. These may also use the same symbol. When multiple types of equihoppers are present, a 90° rotated

equihopper symbol is used to distinguish between them. Since the equihopper symbol has 180° rotational symmetry, there is no 180° turned equihopper symbol and no distinction between clockwise and counter-clockwise rotations. Equihoppers in intermediate rotations are not attested. The rotated equihopper in some fonts bears a slight resemblance to an hourglass, but does not depict one, and neither U+231B HOURGLASS nor U+23F3 HOURGLASS WITH FLOWING SAND would be acceptable substitutes. The mathematical symbols U+29D6 WHITE HOURGLASS and U+29D7 BLACK HOURGLASS are similar to the simplest form of the rotated equihopper, but lack the central rectangle, and the more ornate versions of the rotated equihopper symbol would likely not be acceptable forms of those symbols for use in mathematics.

The symbol for a neutral equihopper is half-white and half-black like the other neutral pieces. In some fonts, the neutral basic equihopper is split across the horizontal center line while the rotated equihopper is split across the vertical, which is the opposite arrangement from the standard symbols.

5. The florette is an uncommon symbol found in some fonts, such as the Good Companions font set; the Mat Plus forums, which allow embedding of a set of chess symbol graphics, also include it. The Yet Another Chess Problem Database site uses it for a piece known as the rose, and closely related pieces such as the rosehopper, rose-lion, and rao. Graphically, it consists of a central circle surrounded by and connected to six circles or teardrop shapes, which do not touch each other in any known examples; the black florette may resemble either U+2749 BALLOON-SPOKED ASTERISK OR U+273D HEAVY TEARDROP-SPOKED ASTERISK with the addition of a central circle, turned 90°. It has no standard name; "chess florette" is used in this proposal due to its use for the rose, though it does not appear to represent a literal rose (which has five petals rather than six), and the Mat Plus forum instructions call it a "flake".

Rotated chess florettes are not attested; presumably they are not considered sufficiently distinctive due to the symbol's 60° rotational symmetry. The symbol for a neutral chess florette may be split into left and right halves like the other upright neutrals, or it may feature alternating black and white "petals" and a split center.

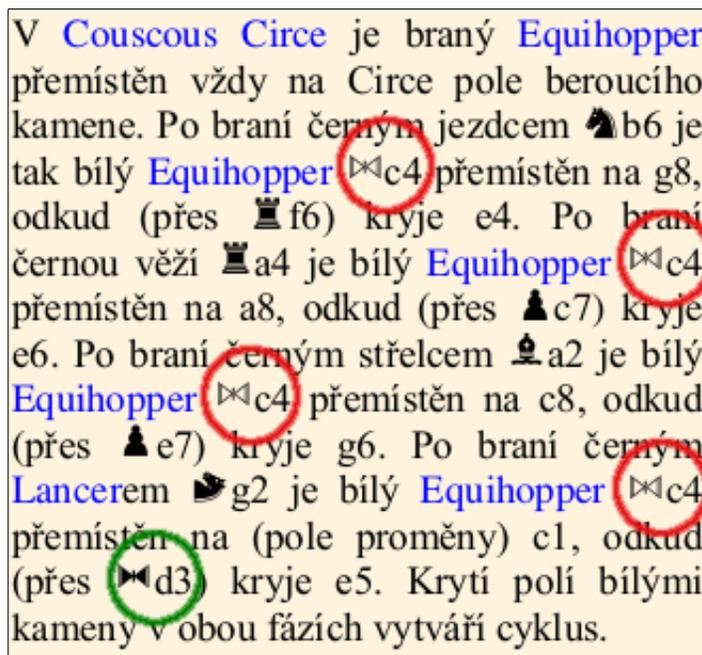


Figure 6: Excerpt from *Fairy Twomovers 2008-2010* by Václav Kotěšovec, showing the white (circled in red) and black (circled in green) equihoppers in an explanation of a problem.

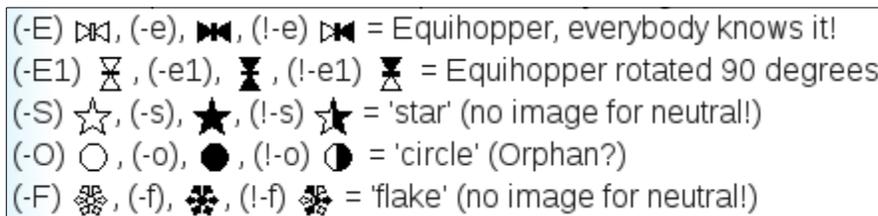


Figure 7: The equihopper, rotated equihopper, five-pointed star, circle, and florette or "flake", from instructions on the Mat Plus forum.

6. The joker is a fairy piece that borrows the movement abilities of the last piece to be moved. When given its own symbol, it is depicted as a jester's cap and bells. Several chess variants also use pieces called "joker", "jester", or "fool", ranging from the medieval German game of Courier Chess to modern variants such as Jester Chess and Omega Chess Advanced. These pieces may have little in common with the joker of fairy chess problems beyond similar names, but usually use the same symbol.

Turned joker symbols can be found in a Good Companions font, but do not appear to be in use and their purpose is obscure. Rotated jokers are unattested. Neutral jokers are also unattested, though there is no obvious reason why a fairy chess joker could not be neutral.



Figure 8: Excerpt from the Wikipedia article on Omega Chess showing the white and black fool represented by joker symbols <https://en.wikipedia.org/wiki/Omega_Chess>

7. The knighted compounds are pieces that have been reinvented several times in the history of chess, and consequently have gone by many names. The first known appearance of the knight-rook and knight-bishop compounds is in 1617 with the publication of D. Pietro Carrera's *Il Gioco delgi Scacchi*, which described a variant to be played on a 10×8 board, where they were named the Champion and Centaur respectively. In the 1920s, the Grandmaster José Raúl Capablanca, while he was world champion, proposed his own 10×8 variant using the rook-knight (which he first called a Marshall, then later changed to Chancellor) and the bishop-knight (first called a Chancellor, then changed to Archbishop). His stature helped to popularize them, and variants that add those pieces to the standard array are now commonly referred to as Capablanca variants. Other notable variants in this category include: Grand Chess, a 10×10 variant by Christian Freeling that uses the terms Marshall and Cardinal; Gothic Chess, a 10×8 variant by Ed Trice using the terms Chancellor and Archbishop, which was awarded a U.S. patent in 2002; and Seirawan Chess, a variant on the standard 8×8 board invented in 2007 by Grandmaster Yasser Seirawan and Bruce Harper, using the terms Elephant and Hawk. The game of Janus Chess, a 10×8 variant that counts some Grandmasters among its proponents, also features bishop-knight compounds under the name Janus, but not the rook-knight compound. Fairy chess problemists know these pieces under the names Empress (for the rook-knight) and Princess (for the bishop-knight) by analogy with the Queen, which is itself a compound of rook and bishop. The most common names among variants are Marshall and Chancellor for the rook-knight, and Archbishop and Cardinal for the bishop-knight.

The queen-knight compound has also had many names, including Terror, Omnipotent Queen, and Superqueen, but is best known as the Amazon. It also has a long history. In some parts of Europe in the late middle ages, the Queen was allowed to leap like a knight as well as slide like a rook or bishop; this rule died out in most places as modern chess developed and became standardized, but reportedly was known in Russia as late as 1772. Its first known appearance as a piece distinct from the Queen, and alongside the bishop-knight and rook-knight, is in a game from an 18th century Indian manuscript (though sometimes referred to as "Turkish Great Chess"), where it is called a giraffe. In modern times it is best known from the game Maharajah and the Sepoys, in which white's sole piece is a royal (that is, subject to



Figure 9: The starting array of Grand Chess. Marshalls (rook-knights) are at f2 and f9, and Cardinals (bishop-knights) on g2 and g9, circled in green. Source: brainking.com

check and checkmate like a king) amazon pitted against black's orthodox chess army.

The symbols used for these compound pieces among players vary in design (see Table 1, 2 & 3), but in general they are transparent combinations of two component symbols, either through superimposition or fusion of elements. An uncommon but notable exception is the use of a stylized mitre or biretta for the bishop-knight compound in games where it is referred to as an archbishop or cardinal. The use of distinct symbols for these pieces is more common among players of the aforementioned variants than among problem enthusiasts; the latter tend to prefer rotated symbols, though 1Echecs-style “half-symbols” (see below) are occasionally found in the literature. Neutral versions of neither superimposed/fused compound symbols, nor the archbishop mitre, are attested; neutrals built from “half-symbols” are possible but not known to be in use.



Figure 10: The starting array of Amazon Chess, with Amazons (queen-knights, circled in red) replacing queens on d1 and d8. Source: brainking.com

7.1 Alternative proposal 1: The popular fairy chess font 1Echecs takes an unusual approach to compound pieces. Instead of dedicated compound symbols, it provides left and right “half-symbols” of some pieces, which can be mixed and matched as needed: the queen and its three rotations, the rook, the bishop (right half only), the knight (left half only), and the turned knight (right half only), in black and white. If this arrangement were to be followed by Unicode, fonts containing fused knight-bishop and knight-rook symbols could treat them as ligatures.

This is potentially a powerful mechanism, but it has some drawbacks from a character encoding standpoint. It would make two-character lookalikes of already encoded characters possible, e.g. a left half white rook followed by a right half white rook would look identical to U+2656 WHITE CHESS ROOK. It would be an awkward match with mitre-style variants of the bishop-knight symbol, which are not visually ligatures of the knight and bishop symbols. Some pairs are meaningless, such as the left half clockwise-rotated queen and right half anticlockwise-rotated queen, or redundant, such as the left half rook and right half bishop (the compound of rook and bishop already exists as the queen) or any combination of queen with rook or bishop. Pairs without explicit OpenType ligatures may break if embedded in vertical CJK text. Finally, while flexible in theory, it does not appear to be widely used for anything but the three compounds listed above.

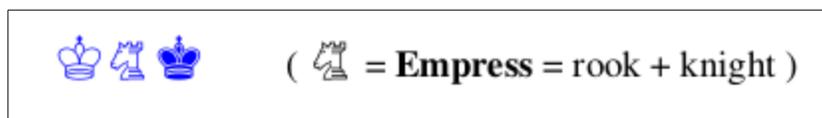


Figure 11: Section heading from *Fairy chess endings on an n x n chessboard* by Václav Kotěšovec, using the 1Echecs font's left half knight and right half rook glyphs for the rook-knight compound

7.2 Alternative proposal 2: Another possibility for compound pieces would not require any new characters to be encoded at all. The ZERO WIDTH JOINER could be used between chess symbols to request a combined symbol, in a similar manner to the various emoji family groupings. This could be even more flexible than the half-symbol mechanism, as it would not be limited to a somewhat arbitrary subset of symbols.

However, the ZWJ can only suggest, not demand, that a ligature be used, and if no ligature exists the fallback would be a sequence of two symbols, which would not be acceptable as that would be unlikely to

be read as representing a single piece. The components of a compound do not have a canonical sequence, so it is unclear whether the proper spelling of a piece such as a bishop-knight compound should be <bishop, *zwj*, knight> or <knight, *zwj*, bishop>; allowing both to be equivalent could cause unexpected behavior in string comparison. And the mitre-style bishop-knight is not visually a ligature of its component pieces.

8. Shatranj symbols represent the pieces used in medieval chess, from which the modern game evolved. While the modern forms of chess pieces, and therefore the symbols used for them, derive from the shatranj forms, they are very different and some shatranj pieces are not recognizable to the average modern chess player.

Chess is generally believed to have descended from an Indian game called *chaturanga*, meaning “four divisions” and referring to the four divisions of an ancient Indian army: chariots, elephants, cavalry, and infantry; the pieces represented those units as well as the king and his chief military adviser. This game spread to the Sassanid Empire, where the name was borrowed into Middle Persian as *chatrang*, which became *shatranj* in Arabic after the Islamic conquest of Persia. It spread quickly throughout the Islamic world, and it was at this time that the originally figurative pieces became simple abstract shapes.

The *shah*, or king, is usually a cylinder with an indentation, representing a throne; the *fers*, or vizier, is a shorter version of the same. The *alfil* had a pair of forward protrusions representing tusks—these were reinterpreted in Europe as the lappets of a bishop's mitre, or as a jester's cap and bells, hence the French name *fou*. The *faras*, or knight, had a single forward protrusion for the horse's head. The *rukh* had a symmetrical pair of “wings” or “horns” at the top, originally representing the heads of two horses drawing the chariot, and could be as simple as a vertical rectangle with a triangular wedge cut in the top (this may have later been reinterpreted as the crenellation of a castle tower, leading to the modern form, though there are other theories); the more elaborate horned variant is found in heraldry as the “chess-rook”. Pawns (*baidaq*) were usually short, round-topped cylinders. Pawns always promoted to fers, but some diagrams use a distinct symbol for the promoted pawn.

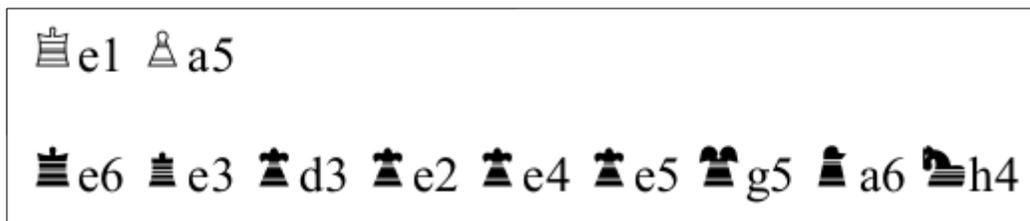


Figure 12: Shatranj pieces from a problem, in "Los Libros de Acedrex Dados e Tablas: Historical, Artistic And Metaphysical Dimensions of Alfonso X's Book of Games" by Sonja Musser Golladay. Top row: white king and pawn. Bottom row: black king, fers, four promoted pawns, rook, alfil, and knight

Since they represent essentially the same pieces as their modern counterparts, the medieval king, knight, rook, and pawn may be considered glyph variants. They are not known to be used contrastively with the modern symbols. The alfil and fers, however, moved very differently from the pieces that evolved from them, and may be used alongside modern pieces in variants. For that reason they are sometimes given modernized forms that harmonize with the Staunton-style modern chess symbols. These forms may not resemble the traditional shapes: the alfil, for instance, may be represented by a more figurative elephant's head by analogy with the knight's horse head. The promoted pawn is obscure: very few manuscripts use a distinct symbol for promoted pawns, and then not always consistently; it is not present in any freely available fonts and no modernized form exists. Neutral shatranj piece symbols are not attested and would not be expected: neutral pieces were invented long after modern chess symbols had

become standard, and while neutral ferses and alfils may be found in fairy chess problems, they are invariably represented by rotated modern symbols in that context.

Medieval style symbols may be found in the free Chess Alfonso font, based on those found in diagrams in the *Book of Games* of King Alfonso X of León and Castille. Modern style symbols may be found in several image sets such as Alfaerie and in the Quivira font.

8.1 Alternative proposal: The shah, rukh, faras, and baidaq can be visually very different from their modern equivalents, to the extent that they may be unreadable to modern players. It may make sense to disunify them from the modern piece symbols. However, the piece shapes in medieval manuscripts exist on a continuum between the shatranj forms and modern forms (see Figure 27). For example, the knight and pawn are very recognizable in the Alfonso manuscript, but the other pieces are not. In some manuscripts the king is topped with a cross, making it more easily identifiable to modern players as a king.

9. Future considerations: The 1Echecs font includes a combining conjoined cross above for marking pieces as royal (that is, subject to the same rules of check and checkmate as the king) by analogy with the cross on the king's crown in most forms of the king symbols. This is uncommon in practice and may be an idiosyncrasy of that one font; the more common method is simply to say that the piece is royal in the legend, e.g. “♘♚ = royal knights”.

Omega Chess, a commercially available variant played on a 10×10 board with four additional squares, introduces two original pieces: a “wizard” represented by a crescent moon, and a “champion” represented by a symbol that may be a medieval knight's helm seen from the front. The white wizard symbol may be unifiable with U+1F319 CRESCENT MOON, and the black potentially with U+23FE POWER SLEEP SYMBOL. The wizard and champion symbols are used in Wikipedia articles, but Omega Chess is a proprietary product and it is unclear what the intellectual property status is of the champion symbol, so it is not proposed here.

The Quivira font's Private Use Area includes Westernized symbols for pieces in xiangqi, shogi, and the historically important large shatranj variant *shatranj al'kabir*, also known as Tamerlane Chess. It also contains several compounds of basic pieces, and some miscellaneous variant pieces. Xiangqi and shogi traditionally use CJK ideographs rather than pictographic symbols, but the latter are appropriate for hybrid variants that combine them with Western pieces. The symbols for Tamerlane Chess are modern inventions since diagrams in manuscripts did not use symbols (piece names were written on board spaces in Arabic instead) and no surviving physical sets are known. The Nishiki-teki font takes a similar approach to Quivira but with a much more limited set of pieces, comprising pieces for Westernized xiangqi and Tamerlane Chess (with the exception of differentiated pawns).

10. Current practice: Most dedicated chess fonts are currently dingbat fonts placing chess symbols in the Basic Latin and sometimes Latin-1 ranges using a variety of incompatible allocations. Often the orthodox pieces are assigned to letters according to the algebraic notation conventions of the font creator's native language, with other pieces (and sometimes board diagram elements or Informator symbols) assigned more or less arbitrarily to the remaining printing characters. A notable exception is the freeware Quivira font, which is a Unicode font with several heterodox chess symbols assigned to the Private Use Area.

In LaTeX, chess symbols are handled by packages such as Diagram, Chessfss, and Skak. The Diagram package—which, despite its name, handles figurine notation as well as board diagrams—provides a means of specifying “upside-down” (turned 180°), “left” (counter-clockwise 90°), and “right” (clockwise 90°) versions of the standard piece symbols, with “grasshopper” and “nightrider” shorthand

forms for the turned queen and knight, and commands for the equihopper and rotated equihopper symbols.

Proposed characters

	xx0	xx1	xx2	xx3	xx4	xx5
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
A						
B						
C						
D						
E						
F						

Heterodox chess pieces

- xxx00 WHITE CLOCKWISE-ROTATED CHESS KING
- xxx01 WHITE CLOCKWISE-ROTATED CHESS QUEEN
- xxx02 WHITE CLOCKWISE-ROTATED CHESS ROOK
- xxx03 WHITE CLOCKWISE-ROTATED CHESS BISHOP

- xxx04 WHITE CLOCKWISE-ROTATED CHESS KNIGHT
- xxx05 WHITE CLOCKWISE-ROTATED CHESS PAWN
- xxx06 WHITE 45 DEGREE CLOCKWISE-ROTATED CHESS KNIGHT
- xxx07 WHITE CHESS EQUIHOPPER
- xxx08 WHITE TURNED CHESS KING
- xxx09 WHITE TURNED CHESS QUEEN
= white grasshopper
- xxx0A WHITE TURNED CHESS ROOK
- xxx0B WHITE TURNED CHESS BISHOP
- xxx0C WHITE TURNED CHESS KNIGHT
= white nightrider
- xxx0D WHITE TURNED CHESS PAWN
- xxx0E WHITE 135 DEGREE CLOCKWISE-ROTATED CHESS KNIGHT
- xxx0F WHITE ROTATED CHESS EQUIHOPPER
→ ☹ 231B hourglass
→ ☹ 23F3 hourglass with flowing sand
- xxx10 WHITE ANTICLOCKWISE-ROTATED CHESS KING
- xxx11 WHITE ANTICLOCKWISE-ROTATED CHESS QUEEN
- xxx12 WHITE ANTICLOCKWISE-ROTATED CHESS ROOK
- xxx13 WHITE ANTICLOCKWISE-ROTATED CHESS BISHOP
- xxx14 WHITE ANTICLOCKWISE-ROTATED CHESS KNIGHT
- xxx15 WHITE ANTICLOCKWISE-ROTATED CHESS PAWN
- xxx16 WHITE 135 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT
- xxx17 WHITE CHESS FLORETTE
= white flake
- xxx18 WHITE CHESS QUEEN-KNIGHT COMPOUND
= white amazon
- xxx19 WHITE CHESS ROOK-KNIGHT COMPOUND
= white chancellor, marshal, empress
- xxx1A WHITE CHESS BISHOP-KNIGHT COMPOUND
= white archbishop, cardinal, princess
• may have the form of a mitre or biretta
- xxx1B WHITE CHESS JOKER
- xxx1C WHITE CHESS FERS
= white firzan
- xxx1D WHITE CHESS ELEPHANT
= white alfil

xxx1E		WHITE 45 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx1F		(This position shall not be used)
xxx20		BLACK CLOCKWISE-ROTATED CHESS KING
xxx21		BLACK CLOCKWISE-ROTATED CHESS QUEEN
xxx22		BLACK CLOCKWISE-ROTATED CHESS ROOK
xxx23		BLACK CLOCKWISE-ROTATED CHESS BISHOP
xxx24		BLACK CLOCKWISE-ROTATED CHESS KNIGHT
xxx25		BLACK CLOCKWISE-ROTATED CHESS PAWN
xxx26		BLACK 45 DEGREE CLOCKWISE-ROTATED CHESS KNIGHT
xxx27		BLACK CHESS EQUIHOPPER
xxx28		BLACK TURNED CHESS KING
xxx29		BLACK TURNED CHESS QUEEN = black grasshopper
xxx2A		BLACK TURNED CHESS ROOK
xxx2B		BLACK TURNED CHESS BISHOP
xxx2C		BLACK TURNED CHESS KNIGHT = black nightrider
xxx2D		BLACK TURNED CHESS PAWN
xxx2E		BLACK 135 DEGREE CLOCKWISE-ROTATED CHESS KNIGHT
xxx2F		BLACK ROTATED CHESS EQUIHOPPER
xxx30		BLACK ANTICLOCKWISE-ROTATED CHESS KING
xxx31		BLACK ANTICLOCKWISE-ROTATED CHESS QUEEN
xxx32		BLACK ANTICLOCKWISE-ROTATED CHESS ROOK
xxx33		BLACK ANTICLOCKWISE-ROTATED CHESS BISHOP
xxx34		BLACK ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx35		BLACK ANTICLOCKWISE-ROTATED CHESS PAWN
xxx36		BLACK 135 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx37		BLACK CHESS FLORETTE = black flake
xxx38		BLACK CHESS QUEEN-KNIGHT COMPOUND = black amazon
xxx39		BLACK CHESS ROOK-KNIGHT COMPOUND = black chancellor, marshall, empress
xxx3A		BLACK CHESS BISHOP-KNIGHT COMPOUND = black archbishop, cardinal, princess • may have the form of a mitre or biretta
xxx3B		BLACK CHESS JOKER
xxx3C		BLACK CHESS FERS

		= black firzan
xxx3D		BLACK CHESS ELEPHANT = black alfil
xxx3E		BLACK 45 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx3F		(This position shall not be used)

Neutral chess pieces

xxx40		NEUTRAL CLOCKWISE-ROTATED CHESS KING
xxx41		NEUTRAL CLOCKWISE-ROTATED CHESS QUEEN
xxx42		NEUTRAL CLOCKWISE-ROTATED CHESS ROOK
xxx43		NEUTRAL CLOCKWISE-ROTATED CHESS BISHOP
xxx44		NEUTRAL CLOCKWISE-ROTATED CHESS KNIGHT
xxx45		NEUTRAL CLOCKWISE-ROTATED CHESS PAWN
xxx46		NEUTRAL 45 DEGREE CLOCKWISE-ROTATED CHESS KNIGHT
xxx47		NEUTRAL CHESS EQUIHOPPER
xxx48		NEUTRAL TURNED CHESS KING
xxx49		NEUTRAL TURNED CHESS QUEEN = neutral grasshopper
xxx4A		NEUTRAL TURNED CHESS ROOK
xxx4B		NEUTRAL TURNED CHESS BISHOP
xxx4C		NEUTRAL TURNED CHESS KNIGHT = neutral nightrider
xxx4D		NEUTRAL TURNED CHESS PAWN
xxx4E		NEUTRAL 135 DEGREE CLOCKWISE-ROTATED CHESS KNIGHT
xxx4F		NEUTRAL ROTATED CHESS EQUIHOPPER
xxx50		NEUTRAL ANTICLOCKWISE-ROTATED CHESS KING
xxx51		NEUTRAL ANTICLOCKWISE-ROTATED CHESS QUEEN
xxx52		NEUTRAL ANTICLOCKWISE-ROTATED CHESS ROOK
xxx53		NEUTRAL ANTICLOCKWISE-ROTATED CHESS BISHOP
xxx54		NEUTRAL ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx55		NEUTRAL ANTICLOCKWISE-ROTATED CHESS PAWN
xxx56		NEUTRAL 135 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx57		NEUTRAL CHESS FLORETTE = neutral flake • may have alternating black and white petals
xxx58		NEUTRAL CHESS KING

xxx59		NEUTRAL CHESS QUEEN	xxx5D		NEUTRAL CHESS PAWN
xxx5A		NEUTRAL CHESS ROOK	xxx5E		NEUTRAL 45 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT
xxx5B		NEUTRAL CHESS BISHOP	xxx5F	(This position shall not be used)	
xxx5C		NEUTRAL CHESS KNIGHT			

Character Properties

These characters should have identical properties to the chess symbols in the Miscellaneous Symbols block.

```
xxx00;WHITE CLOCKWISE-ROTATED CHESS KING;So;0;ON;;;;;N;;;;;
.
.
.
xxx5E;NEUTRAL 45 DEGREE ANTICLOCKWISE-ROTATED CHESS KNIGHT;So;0;ON;;;;;N;;;;;
```

Line Breaking

Chess symbols are typically immediately followed by a letter and number to designate a board square in algebraic notation, and sometimes additional letters, punctuation, and symbols. These are treated as units and should not break between the chess symbol and following letter. The default line breaking class for alphabetic and symbol characters would have the correct behavior.

Collation

There is no well-established collation order for heterodox chess symbols. While orthodox chess symbols are typically ordered by the traditional point values used for evaluating exchanges, heterodox chess pieces do not have traditional values and most heterodox chess symbols do not have fixed piece identities. For convenience it may be preferable to sort heterodox piece symbols directly after the orthodox piece symbols found in the Miscellaneous Symbols block.

Emoji

None of the already encoded chess piece symbols are currently classified as emoji, and these symbols would likewise not be expected to have emoji behavior. Even if the orthodox symbols were to become emoji, the same would not necessarily be expected of the heterodox symbols. The rotated symbols are part of an abstract system of notation and do not literally represent chess pieces turned upside down or on their sides. Similarly, the equihopper and florette symbols do not represent physical pieces that could be rendered as full color images. The joker, compound, and shatranj symbols do sometimes represent real physical chessmen, but are probably too specialized to be in demand as emoji.

Vertical Orientation

All characters proposed here should have a vertical orientation property of U (not rotated in vertical layout), the same as the existing chess symbols, since orientation is semantic.

Bibliography

Rice, John, *Chess Wizardry: The New ABC of Chess Problems*, © 1996, International Chess Enterprises
 Dickins, Anthony, *A Guide To Fairy Chess*, © 1969, 1971, Dover
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 Hooper, David and Kenneth Whyld, *The Oxford Companion to Chess*, © 1996, Oxford University Press
<http://www.theproblemist.org/trd-cplay.html> Dawson, T. R., "Caissa's Playthings" (in English)
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[http://en.wikipedia.org/wiki/Amazon_\(chess\)](http://en.wikipedia.org/wiki/Amazon_(chess)) (in English)
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<http://christian.poisson.free.fr/problemesis/problemesis.php> (in French and English)
<http://www.kotesovec.cz/> (in English and Czech)
<http://www.probleemblad.nl/> (in Dutch)
<http://www.phenix-echechs.fr/> (in French)
<http://juliasfairies.com/> (in English)
<http://www.variantim.org/> (in English and Hebrew)
<http://chess-kopyl.com.ua/ua/> (in Ukrainian)

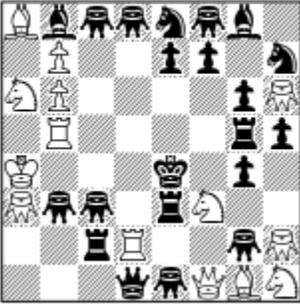
Figures

than one man. The most popular of all fairy pieces, the grasshopper is represented by the symbol G or the figurine ♁.

nightrider, a LINE-PIECE invented by W. S. Andrews in 1907 and first used in FAIRY PROBLEMS in 1925 by DAWSON, who named it (perhaps after Nightrider Street, adjacent to the place where he attended problemists' meetings). It is represented by the symbol N or by the figurine ♞. (For players N means knight, but problemists use S as a symbol for that piece.) The nightrider can make, in one move, one knight's move or more in a straight line. On an

Figure 13: Excerpts from *The Oxford Companion to Chess*

G40. Jacques Rotenberg & Jean-Marc Loustau
 2nd Pr. *Rex Multiplex* 1983
 (v)



#2 14+21
 Grasshoppers ♛♚

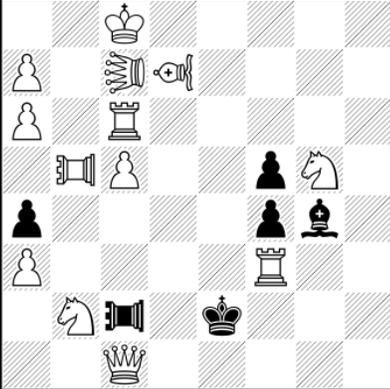
1...♞e5 a 2.♖g3 A #
 1...♞f5 b 2.♞b4 B #
 1...♝xf3 c 2.♝c4 C #
 1...♞e5 d 2.bxc8=♝ D #
 1...f5 e 2.♖c5 E #
 1...♞xf3 f 2.♖f2 F #

1.♖e5! [2.♝f4#]
 1...♞xe5 a 2.♞b4 B #
 1...♞f5 b 2.♝c4 C #
 1...♝f3 c,♞f3 2.bxc8=♝ D #
 1...♞xe5 d 2.♖c5 E #
 1...f5 e 2.♖f2 F #
 1...♞f3 f 2.♖g3 A #
 1...♞d6 2.♞xe7#

This is the first realization of 6-fold Lacny.
 Themes: Lacny 6x2

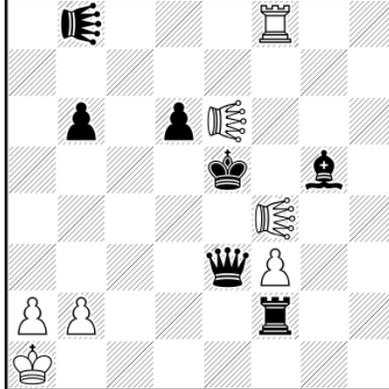
Figure 14: Sample problem and solution in figurine algebraic notation from the book *Israeli Chess Problem Art 1932-2010*, with white and black turned queens representing grasshoppers

Klaus Wenda
 2e Prijs *Probleemblad* 2011



Z#9 (13+6)
 ♛ = dubbelsprinkhaan / double Grasshopper
 ♞ = dubbele loperhopper / double Bishop
 ♖ ♚ = dubbele torenhopper / double Rookhopper

Petko Petkov
 - in memory of my mother
 Danka Petkova -
 3e Prijs *Probleemblad* 2011



HZ#2½ (7+7)
 2 oplossingen / 2 solutions
 Take&Make
 Anti-Andernachschach
 ♛ ♚ = dubbelsprinkhaan / double Grasshopper

Figure 15: Diagrams from the October-December 2012 *Probleemblad*. Different fonts are used for the diagrams and captions, but the symbols retain their identities.

	Normal	Leo Family	Muslim Type	Supernumerary and Combined	General Purposes
ALFIL (2—2)			A or		
BALLOON					Reflecting Bishop, Archbishop, etc.
BISHOP					
CAMEL (1—3)			C or		
COMBINED PIECE				QS, PS, etc.	
DABBABA (0—2)			D or or		
EDGEHOG					
EQUIHOPPER	E or				
FERS (1—1)			F or		
FILERIDER					Vertical Riders, Hoppers, etc.
GIRAFFE (1-4)			GF or		
GRASSHOPPER					
HUNTER				R/B, B/R, etc.	
IMITATOR				or	
IMITATING JOKER				or	
JOKER				or	
KING					Protean, Joker, etc., Kings
LEAPER					Angular, unnamed Leapers, etc.
LOCUST					Lion, Orix, Magnetic Queen, etc.
LEO					
MAO					
NIGHTRIDER					
00,000					
PAWN					Neutral, Berolina, Reversible, etc.
PAO					
QUEEN					
ROOK					
RANKRIDER					Lateral Riders, Hoppers, etc.
KNIGHT					
TRIZEBRA			N or		
UNICORN					Diagonal Riders, Hoppers, etc.
VAO					
WAZIR (0-1)			W or or		
X-MOVER					
Y-CAPTURER					
ZEBRA (2—3)			Z or		
				R-B, B-R, etc.	

Figure 16: Frontispiece to *A Guide to Fairy Chess* by Dickens, showing a range of fairy pieces and the author's preferred assignment of symbols. Dickens's writing predates the invention of dedicated neutral symbols and the equihopper symbol.

1.5.1 Chess pieces within normal text

Sometimes you may need symbols of chess pieces within your normal text, e. g. to show the *Viele-Väter-Stellung* ♖c8, ♗b6, ♘a8, ♙a7. This is possible by `{\wK}c8`, `{\wB}b6`, `{\sK}a8`, `{\sB}a7`. Additionally you may use some of these symbols:

`\swL` ♖ a white bishop on a black square
`\ssL` ♗ a black bishop on a black square
`\wNr` ♞ a white nightrider
`\nNr` ♟ a neutral nightrider
`\sNr` ♞ a black nightrider
`\wGh` ♟ a white grasshopper
`\nGh` ♟ a neutral grasshopper
`\sGh` ♟ a black grasshopper
`\Imi` ● an imitator, you may also use the **Circle** notation:
`\wC` ○ a white circle
`\nC` ◐ a neutral circle
`\sC` ● a black circle
`\wE` ♞ a white equihopper
`\sE` ♞ a black equihopper
`\nE` ♞ a neutral equihopper
`\wX` ♞ a white rotated equihopper
`\sX` ♞ a black rotated equihopper
`\nX` ♞ a neutral rotated equihopper

Figure 20: Commands for turned pieces and equihoppers in figurine notation, using the LaTeX Diagram package. Excerpt from the Diagram manual.

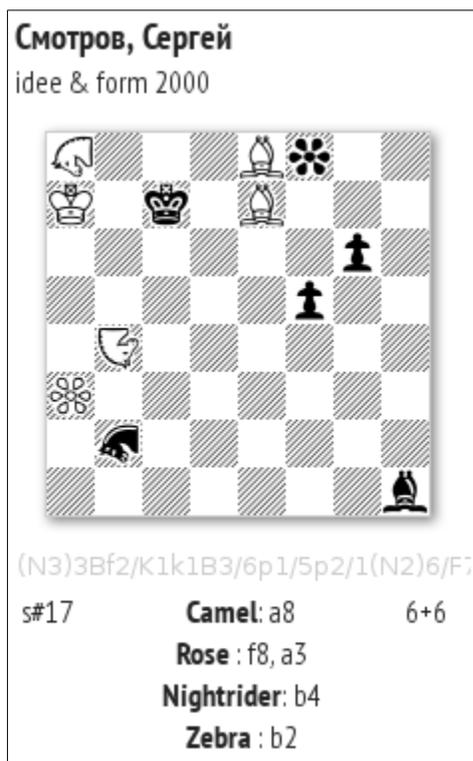


Figure 24: Problem from the Yet Another Chess Problem Database using the black and white florette symbols to represent Roses

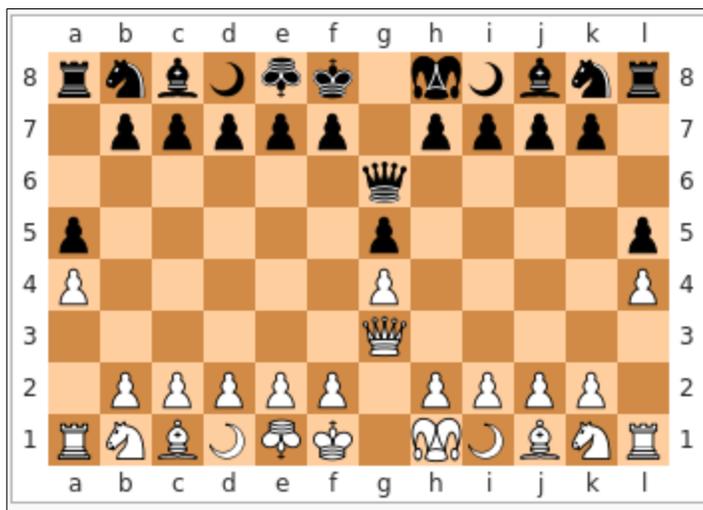


Figure 25: A game of Courier Chess after the obligatory opening moves. The joker symbol represents the *Schleich* (spy or fool). The crescent moon represents the *Currier*, and the turned king the *Rath* or *Mann*. The bishop and queen represent their medieval predecessors. From the Wikipedia article on Courier Chess <https://en.wikipedia.org/wiki/Courier_chess>

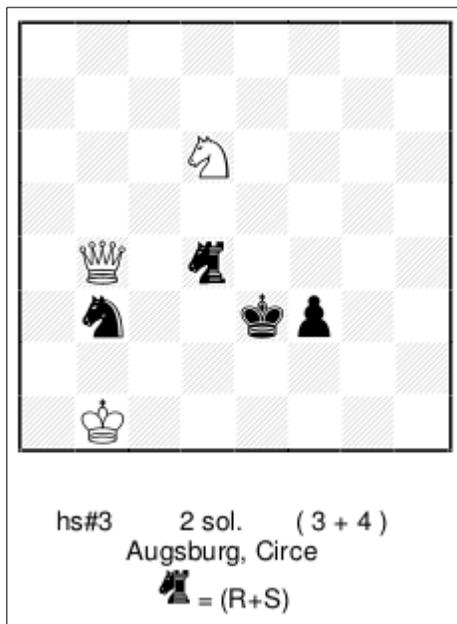


Figure 26: A winning problem in the 2014 Tzuica Tourney in Berne using a compound knight-rook symbol both in the diagram and in the caption

Table 1: Bishop-knight compounds and their components in various fonts and symbol sets

Knight	Bishop	Bishop-knight compound	Source
			Chess Berlin (font)
			Quivira (font)
			1Echecs (font)
			Wikimedia
			Motif (gif set, chessvariants.org) ¹
			Alfaerie (gif set, chessvariants.org)
		 ²	
			Gothic Chess patent

1 The Alfaerie and Motif sets at chessvariants.org are GIF collections based on the Chess Alpha and Chess Motif fonts, respectively, extended with a variety of variant pieces.

2 The Alfaerie set includes mitre-style cardinal symbols as an alternative to the explicitly compound knight-bishop symbols. They are not known to be used contrastively.

Table 2: Rook-knight compounds and their components in various font and symbol sets

Knight	Rook	Rook-knight compound	Source
			Quivira (font)
			1Echecs (font)
			Wikimedia
			Alfaerie (gif set, chessvariants.org)
			Motif (gif set, chessvariants.org)
			Gothic Chess patent

Table 3: Queen-knight compounds and their components in various fonts and symbol sets

Knight	Queen	Queen-knight compound	Source
			Quivira (font)
			1Echecs (font)
			Alfaerie (gif set, chessvariants.org)
			Motif (gif set, chessvariants.org)

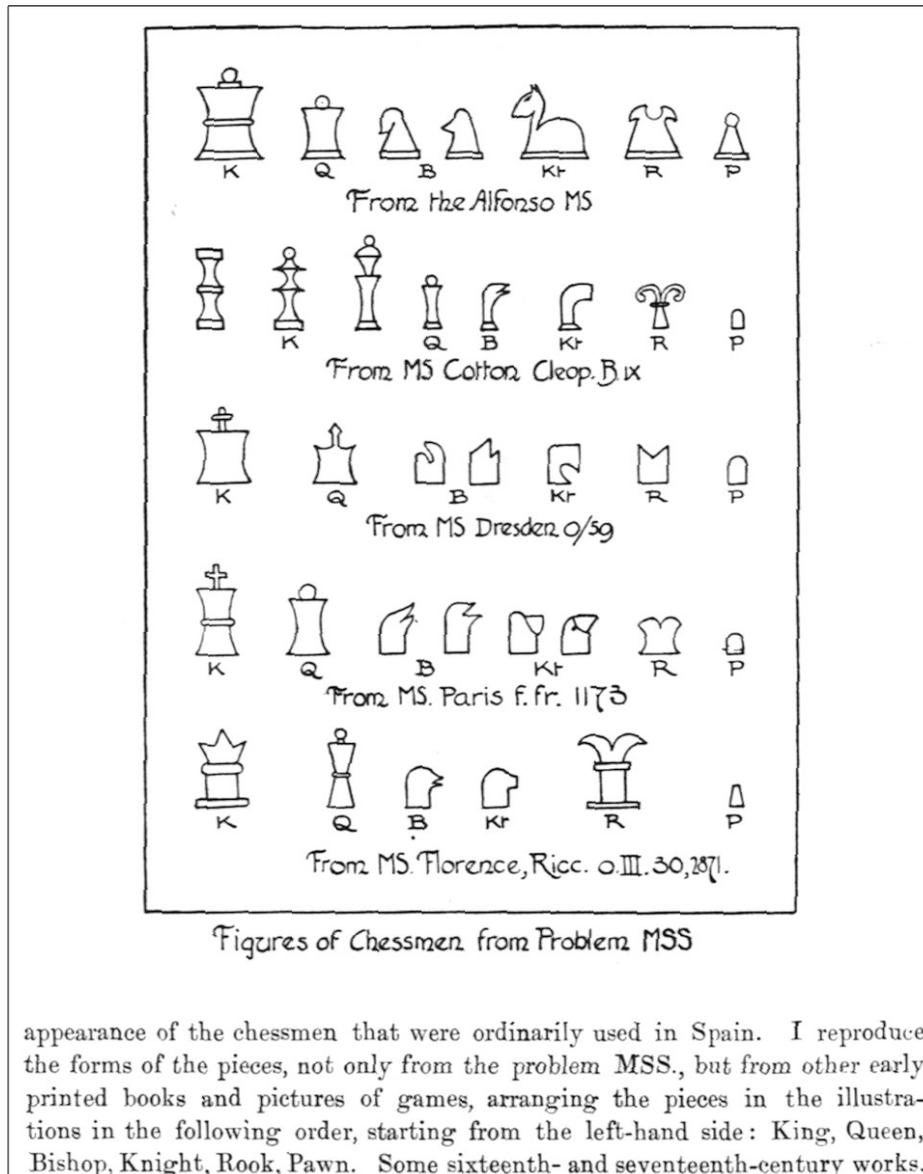


Figure 27: Shatranj/medieval chess piece shapes as found in various medieval manuscripts. From Murray's *History of Chess*

Table 4: Shatranj pieces in various fonts and symbol sets

Fers	Alfil / Elephant	Source
		Chess Alfonso-X (font)
		Quivira (font)
		Nishiki-teki (font)
		Alfaerie (gif set, chessvariants.org)

Inventory and solution:

$\text{♖d1 } \text{♗g2 } \text{♘e6 } \text{♙c7 } \text{♚e7 } \text{♛a3 } \text{♜d3 } \text{♝d8 } \text{♞g1 } \text{♟f6 } \text{h2} \tag{11}$

$\text{♠h8 } [\text{♡e5}^{342}] \text{♢g8 } \text{♣a2 } \text{♤e2 } \text{♥d6 } \text{♦e4 } \text{♧b3 } \text{c3 } \text{d4 } \text{f2 } \text{h4} \tag{12}$

1. ♙[e7]-h7+ , $\text{♚}^{343}[\text{g8}] \times \text{♙[h7]}$ (forced); 2. ♞[d8]-f7+ , ♠[h8]-g8 ; 3. ♙[c7]-c8+ , ♠[d6-f8] (forced, to cover); 4. ♞[f7]-h6+ , ♠[g8]-h8 ; 5. $\text{♙[c8]} \times \text{♠f8+}$, ♠[h7-g8] (forced, to cover); 6. ♞[h6]-f7+ , ♠[h8]-h7 ; 7. ♛[d3]-f5+ , ♠[h7]-g6 ; 8. $\text{♙[f8]} \times \text{♠g8+}$,

Figure 28: Medieval chess pieces in a modified figurine notation, from "Los Libros de Acedrex Dados e Tablas: Historical, Artistic And Metaphysical Dimensions of Alfonso X's Book of Games" by Sonja Musser Golladay

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646³.
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from <http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html> for
guidelines and details before filling this form.
Please ensure you are using the latest Form from <http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.
See also <http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

A. Administrative

1. **Title:** Proposal to Encode Heterodox Chess Symbols in the UCS

2. Requester's name: Garth Wallace

3. Requester type (Member body/Liaison/Individual contribution): Individual contribution

4. Submission date: 2016-10-25

5. Requester's reference (if applicable): _____

6. Choose one of the following:

This is a complete proposal: YES

(or) More information will be provided later: _____

B. Technical – General

1. Choose one of the following:

a. This proposal is for a new script (set of characters): YES

Proposed name of script: Heterodox Chess Symbols

b. The proposal is for addition of character(s) to an existing block: NO

Name of the existing block: _____

2. Number of characters in proposal: 93

3. Proposed category (select one from below - see section 2.2 of P&P document):

A-Contemporary B.1-Specialized (small collection) B.2-Specialized (large collection)

C-Major extinct D-Attested extinct E-Minor extinct

F-Archaic Hieroglyphic or Ideographic G-Obscure or questionable usage symbols

4. Is a repertoire including character names provided? YES

a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? YES

b. Are the character shapes attached in a legible form suitable for review? YES

5. Fonts related:

a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard? Michael Everson

b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): Michael Everson

6. References:

a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? YES

b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? YES

7. Special encoding issues:

Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? NO

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related

³ Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

information. See the Unicode standard at <http://www.unicode.org> for such information on other scripts. Also see Unicode Character Database (<http://www.unicode.org/reports/tr44/>) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? If YES explain _____	NO
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? If YES, with whom? _____ <i>World Federation for Chess Composition (WFCC)</i> If YES, available relevant documents: _____	YES
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Reference: _____	NO
4. The context of use for the proposed characters (type of use; common or rare) Reference: _____	common
5. Are the proposed characters in current use by the user community? If YES, where? Reference: _____	YES
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? If YES, is a rationale provided? _____ If YES, reference: _____	NO
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	YES
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? If YES, is a rationale for its inclusion provided? _____ If YES, reference: _____	NO
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? If YES, is a rationale for its inclusion provided? _____ If YES, reference: _____	NO
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? If YES, is a rationale for its inclusion provided? _____ If YES, reference: _____	NO
11. Does the proposal include use of combining characters and/or use of composite sequences? If YES, is a rationale for such use provided? _____ If YES, reference: _____ Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? _____ If YES, reference: _____	NO
12. Does the proposal contain characters with any special properties such as control function or similar semantics? If YES, describe in detail (include attachment if necessary) _____ _____ _____	NO
13. Does the proposal contain any Ideographic compatibility characters? If YES, are the equivalent corresponding unified ideographic characters identified? _____ If YES, reference: _____	NO