Chess fonts and chess macros for chess games and puzzles

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Introduction

Well known and available on CTAN chess macros CHESS.STY (by Piet Tutelaers) and BDFCHESS.STY (by Frank Hassel) are excellent but do not work well with russian language without manual correction of the original macro. Moreover, after issuing new Babel package (versions 3.6 and 3.7) CHESS.STY and BDFCHESS.STY cannot recognize the presence of Babel and hence cannot support the multilanguage chess notation as it should be. The other reason to issue new macro is that CHESS.STY and BDFCHESS.STY deal with the classical chess game only — such things as the non-standard figures and non-standard chess boards are not supported.

New macro package UCHESS.STY partially described here should correct these gaps. It follows the scheme suggested in CHESS.STY and BDFCHESS.STY and is more the extension of the ideas suggested in these packages than the original macro package. It includes the support of the multilingual chess notation in a more robust way (including the support of the russian notation). It supports multiple chess boards and positions simultaneously and contains special macros which simplifies the presentation of chess problems. It also has special commands which help to represent non-standard chess puzzles with unusual boards and rules. It is based on the extended chess font which enables to represent chess and checkers on non-standard boards and with non-standard figures (like the hexagonal chess [6] and Ω-chess [7] games), to draw the arrows showing the moves, etc.

Problems with foreign language support

One of the most powerful features of CHESS.STY by Piet Tutelaers is the support of chess notation for foreign languages. But since that part of LaTeX changed greatly since the style file CHESS.STY was issued, it became its weak point step by step. Let us consider this effect in more details.

First of all, the support of foreign languages in CHESS.STY is based totally on BABEL package. But the presence of BABEL is recognized by the existence of macro `\babel@core@loaded` — which is obsolete since BABEL 3.6a (1996/11/02), as it is explained in BABEL manual. As a result the style file CHESS.STY downloads the file `english.sty` even if BABEL is already loaded. (And if by opportunity it reads the obsolete version of `english.sty` included among other files into CHESS.STY, the result may be rather strange.)

Second, the CHESS.STY support of foreign languages analyzes the current BABEL language each time you switch to the chess mode and redefines the chess notation as specified by this language unconditionally. So it is impossible without numerous language switching to use the input chess notation in English and the main text — in German, French, Dutch or Russian. Moreover, if the corresponding language is not supported by CHESS.STY at all (current version 1.2 recognizes only `english`, `french`, `german` and `dutch` as valid foreign languages), you'll see that your chess notation disappeares without any warning or error message — or you should switch the language to some known one before each chess fragment.

(This defect is corrected in BDFCHESS.STY, but only partially — namely, you can specify one language for chess notation and another language for the main text. But if the language selected for chess notation is not supported by CHESS.STY, you'll still see the disappearing of all your chess figures from your document without any warning.)

You can correct this defect by adding the support of the desired language in CHESS.STY manually. But if you would like to do it, you'll need to correct the original file `chess.sty` or to redefine totally its internal macro `\select@pieces` — both operations are not too difficult for TEX experts (especially taking into account the that this procedure is described in the documentation supplementary to CHESS.STY). But for ordinary User it is not so clear how to do it, and there is no ready-to-use intrinsic mechanism how to add a new language in CHESS.STY with minor efforts and in a standard way. (And strange behaviour of CHESS.STY is quite annoying for an ordinary User because he/she cannot understand what happens and what is wrong with the document.)

Finally, CHESS.STY supports foreign language notation in the assumption that in *any* language one-letter notation is used. It is true for English, French, German, Dutch, Italian, etc., but, say, in Russian it is not so where *two-letter* notation is used to distinguish *King* ('Kp') from *kNight* ('K'). Taking into account that for Russian language there is no unified input encoding (different platforms uses different encodings for russian letters) the problem how to support the russian chess notation in unified way becomes even more difficult.

Foreign language support in UCHESS.STY

The support of the foreign language notation is the main component which is different in UCHESS.STY and CHESS.STY (honestly saying, correct support of russian chess notation was the main reason to substitute CHESS.STY by UCHESS.STY). You may control the language used for chess notation independently from the language used for main text by the command `\chesslanguage`. And although your chess language is synchonized with the main text if you specify the chess language as `babel`, it is not obligatory.

The procedure how to add new languages into UCHESS.STY is modified as well. First, when a special language is required for chess notation, it is checked that some characteristic macro command based on its name already exists. If it does not exist, the warning message is issued and the chess notation is switched to English (the default notation built-in for UCHESS.STY). Second, if you need to add a new language for UCHESS.STY, you just define the macro command with a special name — this is enough to extend the set of languages supported by UCHESS.STY, and you do not need to change something inside original UCHESS.STY commands. Finally, when you load the package UCHESS.STY by the LATEX 2_ε command `\usepackage`, you can define the list of supported languages as its options — for each unknown option *name* the file *name*.cld is loaded (.cld stands for *chess language definition*). (UCHESS.STY also checks that the macro with the desired name is really defined in this file. For all main languages the corresponding .cld-files are included into the package UCHESS.STY as well.)

But the problem with Russian language and its numerous encodings still remains. To solve it we added additional (optional) parameter which helps the language switching macro to select the appropriate input encoding. Additionally, to simplify the User' work on defining the language switching macro there are the standard commands which help to define one-letter and two-letter abbreviations for chess figures. And if by opportunity the language switching mechanism misbehaves (like it is for CHESS.STY where the chess figures just disappear from your text if there are no standard chess abbreviations for your language), the User can always use macro commands with fixed names.

The UCHESS.STY support of other languages enables also to switch flexibly between alphanumeric notation and the 'figurine' notation in your document without serious changes of input file (where the alphanumeric notation is in agreement with your language). Special precautions are performed to adapt properly other special symbols used by chess notation when the language is switched as well (for example, the symbols used for international *Chess Informant* notation and notation traditionally used in Russia, Poland, etc., differ strongly as concerns the symbols used for check, checkmate, etc.).

Non-standard chess games

Ω-chess board and its rules It is nice that there is the support of classical chess game in LATEX, but in our days more and more popular the non-standard chess games are becoming [7, 8]. While the chess game for 4 players [8] seems to be just a self-made joke for the home enertainment, Ω-chess [7] is a more serious game, and its support by LATEX is a desirable feature. The support of Ω-chess board requires two additional figures (*wizard* and *champion*), non-standard chessboard with 104 fields (10×10 plus four separate corner squares) and the support of non-usual moves and non-usual field notation in a way it is already done for classical chess game in CHESS.STY. You also need to mark what game with what rules is played on your current chess board.

Hexagonal chess boards and their rules In addition to Ω-chess board there are two hexagonal chess boards [6] (at least) with specific chess rules. These boards are composed from haxagonal fields colored in three colors (white, gray and black), and although *standard* chess figures are used, the initial positions and the rules how to move the figures

Polska Grupa Użytkowników Systemu TEX, 2000 (http://www.GUST.org.pl)

over the board are far from being standard. Similarly to Ω-chess it is not too difficult to add the support of hexagonal chesses into UCHESS.STY, but serious modifications of the internal representations used for chess boards in CHESS.STY are necessary.

Chess problems Classical chess game is separated into two relatively independent branches. There is the chess game itself where two people fight for victory, and there is the solution of specially prepared chess problems. (Actually there is the third branch as well — i.e., the computer chess game and computer chess analysis, but these are not too different from other two branches as concerns the chess typesetting.)

While the support of an ordinary chess game is done in CHESS.STY in a user-friendly manner, and while BDFCHESS.STY supports playing chess games by post in the same way, the support of chess typesetting for chess problems is not so flexible. To assist the User working in this specific field UCHESS.STY contains the support of several boards and positions simultaneously, storing and copying the board content, transformation of boards, adding/removing individual chess pieces, etc. There are also special chess environments used to typeset the main stream of the solution, its side streams and the alternative variants — see section *Additional environments* for more details.

Puzzles, fairy chess games, checkers, etc. Except classical chess games and chess problems there are so-called unusual (fairy) chess games and problems — i.e., with non-standard rules, boards, figures, etc. While the typesetting of chess diagrams with non-standard rules is more or less covered by macros designed for ordinary chess diagrams, it is not so when we deal with non-standard (for example, non-rectangular) chess boards and unusual chess figures.

Macros included in UCHESS.STY extends the set of states available for a rectangular chess board. In CHESS.STY each field may be black or white, occupied by corresponding chess figure or not, but in UCHESS.STY two more variants are included:

- empty field which is outside the board (drawn as empty square),
- empty field which is a hole inside the board (drawn as a square filled by solid black color).

While both fields cannot be occupied by some figure, they are drawn in a different style for a clear reason: it is not worth to fill by black all the region outside the non-rectangular board, and it is difficult to distinguish the hole inside non-rectangular board from the white field if it is just empty without additional marker.

The other aspect essential for fairy chesses is the existence of non-standard figures. While there are no strict rules how to represent these figures graphically (Ω-chess game is the exception [7]), it is more or less clear that they should be different from the ordinary chess figures. To satisfy the needs of this group of users, UCHESS.STY supports additional pictograms (crosses, bullets) to represent unusual chess figures, and the big bold circle which can modify the meaning of an ordinary chess figure if it is necessary. And except these chess-like figures it is necessary to note, that *checkers* and *checker-like* board games can be considered as the fairy chess game as well — so, it is natural to include the support of checkers in UCHESS.STY also.

Extended chess encoding

As the output of our attempt to cover all these contradictory requirements a special chess font (or, more strictly, chess encoding) was developed. It includes all classical chess figures (black and white) where some special-purpose figures (wizard, champion, checker, double-checker, crosses and bullets) are added as well. Non-symmetrical figures exist in two variants, straight and mirrored (hopefully there are just two figures of that kind, *knight* and *wizard*) — because, for example, it is recommended to use the horse with the head rotated to the left when it represents the knight on chess board, and to the right when it represents the knight in chess text [2].

Each figure exists as the text character, as the figure placed over black or over white square field, and as the figure placed over the white, black or gray hexagonal field. In addition there are the empty square and hexagonal fields of corresponding color, the fields filled by a solid black color, the lines used to surround the square field or the hexagonal field by a frame (or to make the solid frame around the whole board), the solid circle used to modify the meaning of the chess figure.

Final chess encoding is represented on Fig. 1. In principle it is also possible to force the fantasy and to add even more objects into chess font — say, chess figures colored by more than two colors, rotated by 90°, 180° and 270°, placed over triangular fields or square/hexagonal fields rotated by some degree, etc. But:

- we have no information that such objects are really used in practice,
- the limit of 256 characters is already exhausted by chess objects already included in chess font.

At this moment UCHESS.STY and corresponding chess fonts are under development. As a result, there are just *two* various chess fonts with this encodings: one based on classical design by Piet Tutelaers [1], and the other based on the original polish design reconstructed by Tomasz Przechlewski [5]. Nevertheless, there are plans to add more chess families, more font sizes and more font shapes (primarily, the **bold** chess fonts) to that collection.

Chess Informant' notation

Except chess figures there are many special symbols used to annotate real chess games in abbreviated manner. The most famous is the international *Chess Informant* system, but there are also other symbols locally accepted in national chess publications. Since these symbols can be used in text only, there is no reason to put them in the same font as ordinary chess figures. Moreover, these symbols should be visually compatible with the ordinary Computer Modern text and, hence, change their style as soon as the style of the main text is changed. Hopefully, LaTeX 2$_\varepsilon$ has a sophisticated but user-friendly NFSS-system which controls such behaviour nearly automatically. All what we need to do is to fix the list of necessary symbols and the font encoding, to create the fonts for all necessary variants (size/shape/series/family) and, finally, to prepare corresponding .def- and .fd-files and to define macros.

Since the style file UCHESS.STY is under preparation now, it doest not contain the symbol fonts which is compatible with Computer Modern and European Modern and enables to represent the notation of *Chess Informant* to a full extend, but there are the definite plans to extend the support of the international chess notation to the level when *Chess Informant* notation and national notations are supported as well to full extend.

Arrows, borders, etc.

Chess figures and chess symbols described in section *Extended chess encoding* and *Chess Informant' notation* are enough for nearly any professional chess typesetting. But what about textbooks? Quite often it is necessary to draw the arrows showing the moves of particular figures, to emphasize some fields by special markers, to draw special border around chess diagram, to mark explicitly the boundary between two chess fields, etc. — and there are no such elements in our fonts and such macro commands at our disposal!

But it just means that such elements and such macros should be addded. Hopefully, there is a good predecessor on this way — namely, the LaTeX `picture` environment based on restricted LR-mode which enables to construct from discrete elements arbitrary two-dimensional mosaics by explicit specification of individual two-dimensional coordinates. Our environment allowing the User to annotate by arrows, markers, borders, bounding lines, etc., for textbook chess diagrams is organized in the same manner.

Although just now there is no special font with arrows, etc., used by UCHESS.STY for that purpose (and, consequently, there are no macros to draw arrows over the chess board), we have the plans to add necessary extensions.

Additional environments

Is it true that now we have *everything* we need for ccurate chess typesetting? Not at all — we need specialized *environments* to mark up chess-oriented text fragments and to mark up logically different chess-oriented material as well. A very good example can be found in documentation for CHESS.STY — namely, the case where the main stream of the annotated chess game is typed in bold while the alternative variants of the chess game are typed as the ordinary text. While these environments for logical mark-up are outside the main style created by Piet Tutelaers, they are the intrinsic component of our package UCHESS.STY.

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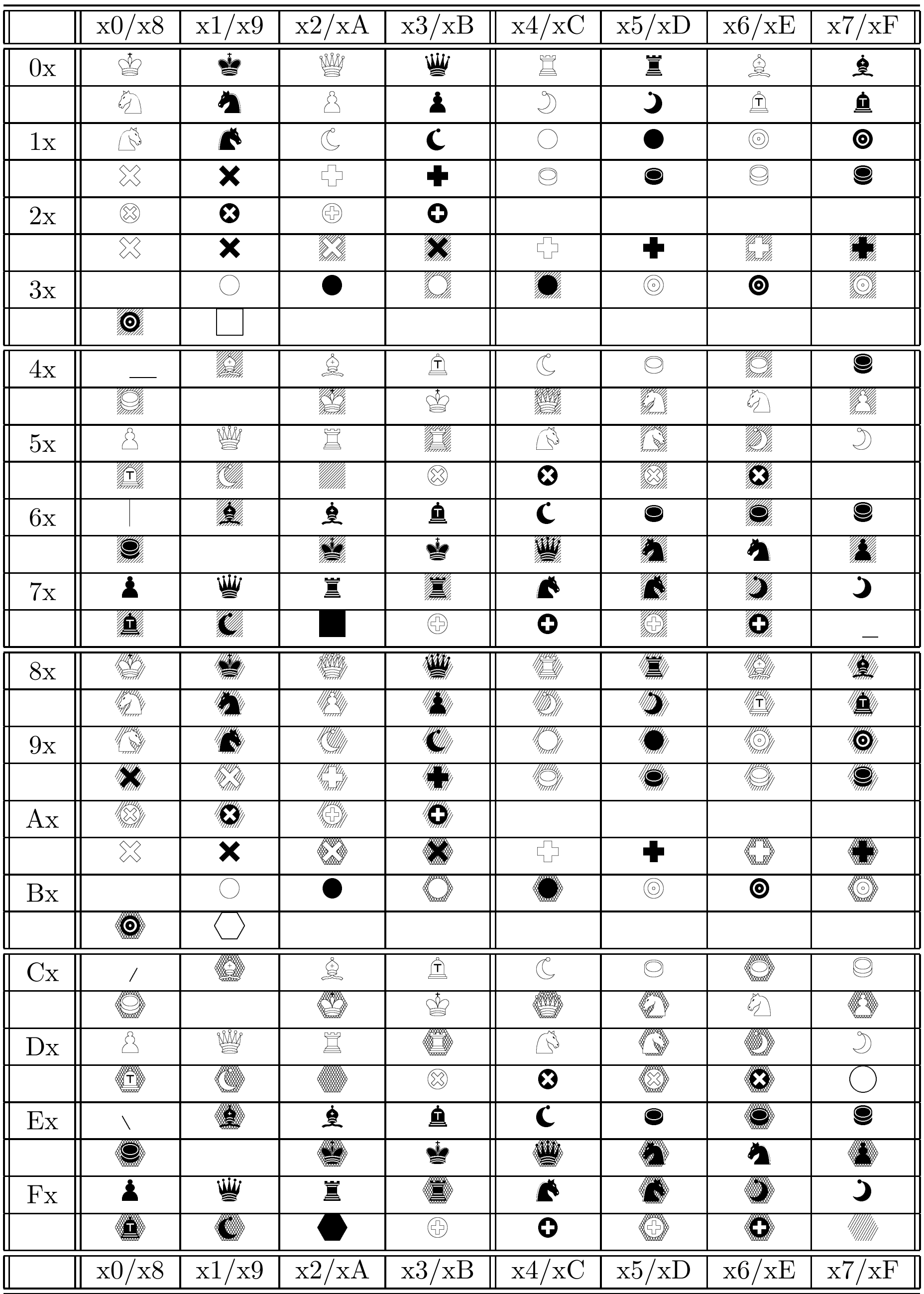

Figure 1: Chess encoding as used by UCHESS.STY

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[8] Chess game for 4 players: `www.4playerchess.com`

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