Typesetting Bridge via TEX

Kees van der Laan

Hunzeweg 67, 9893 PB Garnwerd
cgl@rug.nl

Abstract

Enhanced plain TEX macros and a bidding environment for typesetting bridge card distributions and bidding sequences are given. As a follow-up of the LATEX macros given in [12]. Moreover, macros for annotated printing of the course of the play are provided. Examples of use are included.

Introduction

After the publication of [12] Bernard Gaulle among others, asked for similar plain TEX macros. This article concentrates on

a. Translation into plain TEX of LATEX macros for printing card deals and bidding sequences as published in [12], i.e., emulated `\hand`, `\crdima` macros and NESW-figure, as well as a flexible (`\bbid`, `\ebid`) environment.
b. (new) TEX macros — (`\bplay`, `\eplay`) environment and `\showgame` — for handling the course of the play, in the same spirit as how chess is 'played' in print, see [2, 16], i.e., with annotations and preserved data-integrity; no retyping of the hands! This starts in section How the play goes.

The translated macros are enhanced with respect to both language as well as application flexibility. The language flexibility is in the spirit of the 'international' DUTCH-sty-option activity, see [4]. Names are provided, via (grouped) macros, which can be redefined easily. Within the context of bridge this means redefinition of the four hands

```
\def\FIH{North}% FIrst  Hand
\def\SEH{East} % SEcond Hand
\def\THH{South}% THird  Hand
\def\FOH{West} % FOurth Hand
```

and redefinition of `\N`, `\E`, `\S`, `\W`, `\EW`, `\NS`, `\TRICK`.

In several books, e.g. [13], the players are personalized into: Partner, RHO, YOU, LHO, where R/L-HO mean Right/Left-Hand Oponent. In newspaper columns the names of the players are sometimes given. This, as well as language variations, can be realized easily by redefinitions of `\FIH` etc. It must be admitted though, that editing source texts is in general not that difficult, just cumbersome.

As long as card values are represented by digits and letters we don't need control sequences for them. They can just be typed in, with the representation you like. We have A(ce), K(ing), Q(ueen) and J(ack), in English and A(s), R(oi), D(ame), V(alet), in French, while in Dutch they read A(as), H(eer), V(rouw), B(oer), along with T(en) — D(ix), respectively T(ien), or generally 10 — 9, 8, 7, 6, 5, 4, 3, 2.

Card deals

`\hand` prints the cards a player holds. `\crdima` (CaRD IMAge) prints all the cards given for every hand in a suitable way. The argument sequences of `\hand` and `\crdima` are similar to the LATEX argument sequences given in [12].

Arguments. `\crdima` takes six arguments:
first argument: text, in particular who is the dealer and what is the vulnerability. For example: N/None, for North dealer and vulnerability none.
second parameter: text. For example, indication of deal as in `Deal 1` or in

```
\vtop{\hbox{Deal:}
      \hbox{demo }}
```

next four arguments: the four hands N, E, S, W, clockwise. Each hand is a call of the `\hand` macro with four arguments: the ♠, ♡, ♢, ♣ cards.

Assumed is a box register, `\NESW`, which contains the central figure.

Presented at GUTenberg 90, and reprinted from TUGboat, 11, 2, 265–276.

As example,

```
$$\crdima{N/None}{\vtop{\hbox{Deal:}
                         \hbox{demo}}}%
  {\hand{J74}{AJ}{QJT2}{Q874}}%N
  {\hand{K86}{T9542}{874}{T3}}%E
  {\hand{QT952}{Q83}{AK5}{A6}}%S
  {\hand{A3}{K76}{963}{KJ952}}%W
$$
```

yields

N/None	♠ J74 ♡ AJ ♢ QJT2 ♣ Q874	Deal: demo
♠ A3 ♡ K76 ♢ 963 ♣ KJ952	N W E S	♠ K86 ♡ T9542 ♢ 874 ♣ T3
	♠ QT952 ♡ Q83 ♢ AK5 ♣ A6	

Bidding

The bidding environment is not based on tabbing, but `\halign` is directly used. This means that the bidding sequences are lines within `\halign`, with four columns, and have to obey its syntax. The given card deal takes the following ACOL bidding

North	East	South	West
1♣^{A}	? no	1♠	...no
2♠	no	4♠	a.p.

^{A} means Alert, conventional bid
? means explanation asked
...means think pause

obtained via

```
{\smallskip\narrower\noindent
\bbid
1\c\alert& ? no& 1\s&\think no\cr
      2\s&   no& 4\s&     a.p.\cr
\noalign{\vskip.5ex}
\alert\ means Alert,
   conventional bid\hidewidth\cr
? means explanation
             asked\hidewidth\cr
\think means think
             pause\hidewidth\cr
\ebid                \smallskip}
```

Remarks. One has to have a nodding knowledge of TEX. A more user-friendly `\annotation` command can be written, in the same spirit as a footnote or endnote.†

Another issue is whether we should test upon illegal biddings. I did not do this because it will restrict the use of the macros, e.g., illegal biddings are needed in arbiter courseware.

The above is natural and will suffice for simple applications. The given `\crdima` and `\hand` macros as well as the bidding environment can be used in a similar way as the LATEX predecessors. So 'drivers' — e.g., in my (Pascal) deal program, for prints of tournament plays — hardly need to be adapted.

Furthermore, LATEX users can also make use of these enhanced versions at the expense of `\halign`'s syntax for the bidding sequences.

In order to handle other bridge typesetting usages‡ elegantly and consistently, we have to think more thoroughly about how to pass information from one macro to another.

Variables and parameters vs. control sequences and arguments

Knuth, [11, p.211], names the possibilities:

> "It is sometimes desirable to pass information from one macro to another, and there are several ways to do this: by passing it as an argument, by putting it into a register, or by defining a control sequence that contains the information."

It is not straightforward to me what to provide via arguments, what via registers and what via control sequences from one macro to another. The above is the TEX terminology and well-defined, while in Pascal-like programming we call the possibilities:

- transfer via parameters (by name, reference or value),
- via global variables, and
- via procedures.†

† A simple approach could be a command with two arguments where the first argument contains the annotation symbol(s) and the second argument contains the explanation and are passed on to (toks) control sequences. `\ebid` must be redefined such that the annotation(s) will appear.

‡ In practice simpler techniques are used, e.g., Meulenbroek edits the previous column with the word processor at hand.

† In numerical mathematics we also have what is called reverse communication.

In command languages (and also in ADA^{TM}) we distinguish between parameters bound to a position and bound via keywords in free order along with defaults.

In `\crdima` the texts and hands, and in `\hand` the cards for every colour, are provided via arguments. Another approach is to provide all this information via control sequences, i.e., control sequences for

- the vulnerability and dealer information,

  `\def\LFTINF{N/None}% LeFT INFo`
- general information,

  `\def\RGTINF{Demo}  % RiGhT INFo`
- cards per colour and player, i.e., `\Ns`, for North's ♠'s, etc.

One could then introduce something like `\showgame`, with *no* arguments, which uses these control sequences. This is done in the section on How the play goes.

So, there is essentially one 'variable' left, the representation of the NESW-figure. One could use the optional parameter mechanism, see e.g. [3], with the disadvantage of supplying this parameter for every deal once a personalized layout, different from the default, has been chosen. In my opinion this kind of variability which is no longer there once personalized, can best be provided via a register, e.g., a box register in this case, and not via an optional parameter. When no figure is wanted, just 'empty the box', and when you like one of your own use `\setbox\NESW\hbox{...}`. The notation for the players used in the NESW-figure is contained in control sequences, `\N` etc.

In the bidding environment the notation for the players is also contained in control sequences, `\FIH`, etc. This provides language as well as order flexibility. Annotation commands are, e.g., `\alert`, `\think` (think pause), ? (before the bid: explanation is asked for; after the bid: questionable bid), whatever you like to add, and various combinations, such as question followed by think pause.

In the play environment the lead can be specified by `\LEADN`, `\LEADE`, `\LEADS`, or `\LEADW`. These control sequences set the definitions of `\FIP%FIrst Player`, `\SEP`, `\THP`, and `\FOP`. Furthermore, the cards played have to be given in (English) natural notation, e.g., h8 for ♡8. The (`\bintermezzo`, `\eintermezzo`) environment is a more user-oriented disguise for `\noalign`.

Remark. It is tempting to ponder about where keyword parameters come in (see e.g., [1]). Think of modifying the contents of a register or redefinition of a control sequence. The functionality is already there, for example see the section on application flexibility.

Notation

For the names of the control sequences for the hands and the left and right information I adopted upper case letters `\FIH`, `\SEH`, `\THH`, `\FOH`; `\N`, `\E`, `\S`, `\W`, `\NS`, `\EW`; `\LFTINF`, `\RGTINF`, and for the colours of the cards and for the annotation commands I used lower case letters `\s`, `\h`, `\d`, `\c`; `\alert`, `\think`. For the lead indication and FIrst SEcond etc Player I also used upper case letters: `\LEADN`, `\LEADE`, `\LEADS`, `\LEADW`; `\FIP`, `\SEP`, `\THP`, `\FOP`. Language commands are also in lower case; supplied are `\english` (default), `\dutch`, and `\french`. This naming convention also holds through for name combinations in the control sequences for the cards per hand per colour, i.e., `\Ns`, etc. Note that we have `\NS` and `\Ns`, denoting respectively the North-South combination and North's ♠'s.

Remark. With respect to choosing another language I adopted that the result *in print* will be in the specified language; the control sequences remain in English. Data which will be printed — card values — have also to be supplied in the other language. Note that the card *colours* have to be denoted in English: ♡'s are always denoted by h (in play environment) or `\h` (in bidding environment).

Application flexibility

a Another language. In the following the French language is used.

N/Personne	♠ V74 ♡ AV ♢ DV102 ♣ D874	
♠ A3 ♡ R76 ♢ 963 ♣ RV952	N O E S	♠ R86 ♡ 109542 ♢ 874 ♣ 103
	♠ D10952 ♡ D83 ♢ AR5 ♣ A6	

takes the following ACOL bidding

Nord	Est	Sud	Ouest
1♣^{A}	pas	1♠	...pas
2♠	pas	4♠	pas
pas	pas		

obtained via

```
{% Local change,
\french
{\smallskip\narrower\noindent
\crdima{N/Personne}{}%
  {\hand{V74}{AV}{DV102}{D874}} %N
  {\hand{R86}{109542}{874}{103}}%E
  {\hand{D10952}{D83}{AR5}{A6}} %S
  {\hand{A3}{R76}{963}{RV952}}  %O
\smallskip}
\noindent takes the following ACOL
bidding
{\smallskip\narrower\noindent
\bbid
 1\c\alert& pas& 1\s& \think pas\cr
       2\s& pas& 4\s&        pas\cr
       pas& pas\cr
\ebid            \smallskip}
}% end local change
```

b Changing order. If for some reason one likes to start with another player, e.g. West, in the printing of the bidding sequences, with the same dealer and vulnerability, this yields

West	North	East	South
–	1♣^{A}	no	1♠
. . . no	2♠	no	4♠
a.p.			

and is obtained via

```
{% Local change, note that the order
% of the defs is free
\def\FIH{West}\def\SEH{North}
\def\THH{East}\def\FOH{South}
%
\smallskip\narrower\noindent
\bbid
       --& 1\c\alert& no& 1\s\cr
\think no& 2\s      & no& 4\s\cr
     a.p.\cr
\ebid               \smallskip
}% end local change
```

Another adaptation is using a different naming, e.g., first hand is Partner via `\def\FIH{Partner}` etc., see section on Endplay analysis, where `\N` etc., are personalized.†

c Natural notation on input. Natural notation is bound to a language. This gives complications if one likes to specify the card colours. For example in the French language we have carreaux and cœurs, which both abbreviate to c, and D(ame) and D(ix).

Furthermore, one can think of hiding TEXnicalities. The latter means that one could omit `&` and `\cr` and use, respectively, a space and a carriage return instead. I decided not to hide & and `\cr`.

One can also think of denoting the colours via the first character of the colour names in the bidding environment instead of the corresponding control sequence. I decided to have control sequences in the bidding environment for the colours, because this makes it possible to supply any prefix. In the play environment I decided in favour of the colour abbreviation, s, h, d, or c, because there is no need for prefixes.

Remarks. Note the keyword functionality in the examples a and b.

> The general disadvantage of flexibility is the need for discipline; no consistency is forced upon. The advantage is freedom, and the question is how to use it.

Macro texts

The provided NESW-figure is implemented via a 'ruled' table. The N, E, S, W symbols are provided via control sequences. The positioning obeys `\haligns` rules.

Source texts. `\hand`, `\crdima`, `\NESW`, and (`\bbid`, `\ebid`)

```
%Date: Tue, 8 Oct 1991 16:00 MET
%From: CGL@RUGR86.RUG.NL
%Subject: bid.tex nodig in bridge TeX artikel
%To: vannes@ecn.nl

\def\hand#1#2#3#4{%
%Example: \hand{AKJ765}{AK9}{--}{T983}
\vtop{\hbox{\strut\s\enspace#1}
\hbox{\strut\h\enspace#2}
\hbox{\strut\d\enspace#3}
\hbox{\strut\c\enspace#4}}%end \vtop
}%end \hand
%
\def\crdima#1#2#3#4#5#6{%
%purpose: layout bridge hand
%#1 left upper text
%#2 right upper text
%#3, #4, #5, #6: N, E, S, W hands
\vbox{\halign{              &##\quad\cr
            #1&            #3&     #2\cr
 $\vcenter{#6}$&$\vcenter{\copy\NESW}$&
                          $\vcenter{#4}$\cr
```

† This modification can be simplified when the NESW-figure is not put in a register, i.e., `\def\NESW{\hbox{\NESWfig}}` and `$\vcenter\NESW$` are used.

```
                  &           #5&       \cr
                 }%end \halign
         }%end \vbox
}%end \crdima
%
\def\NESWfig{%
\vbox{\font\small=cmr9
\def\str{\vrule height2.2ex%
    depth.75ex width 0pt}
\offinterlineskip\tabskip0pt\hrule
\halign{\vrule\hskip2pt\relax
##\hfil\tabskip3pt&  \str\hfil##\hfil&
##\hskip2pt\relax\hfil\vrule
                         \tabskip0pt\cr
  &      \hbox to 0pt{\hss\N\hss}&  \cr
\W&                   \phantom{N}&\E\cr
  &  \str\hbox to 0pt{\hss\S\hss}&  \cr
       }%end \halign
\hrule}%end \vbox
}% end \NESWfig
\setbox\NESW\hbox{\NESWfig}
%
\def\ebid{\errormessage{%
   bbid command is missing}}
%
\def\bbid{\bgroup%
 \def\ebid{\egroup\egroup\egroup}
 \def\alert{$^A$}
 \def\think{$\ldots$\thinspace}
 % etc.
 \vtop\bgroup
 \halign to\bidwidth\bgroup \tabskip2ex
      plus 1ex minus 1ex&    ##\hfil\cr
    \FIH\hfil& \SEH\hfil&
                 \THH\hfil&\FOH\hfil\cr
}%end \bbid
```

Remark. Plain TEX macros for nicely rounded frames, LATEX's 'ovals', have been published, see [8]. They can be used for another frame representation in NESW.

Some more examples

a. In order to illustrate general bidding theory from the viewpoint of one hand only, the `\hand` macro can be used. The following layout, heavily used in [7],

	North	East	South	West
♠ AKJ42	1♠	no	1NT	2♣
♡ AK9	?			
♢ T832				
♣ T				

is obtained via

```
{\smallskip\narrower
\hbox to \hsize{\hss
\hand{AKJ42}{AK9}{T832}{T}%
\quad\hfil
\bbid
1\s& no& 1NT& 2\c\cr
  ?\cr
\ebid
\hss}          \smallskip}
```

b. For issues related to defense play one often displays only the dummy hand and your own hand. The following example is borrowed from [5].

♠ AJ632
♡ 43
♢ KQ7
♣ A85

N
W E
You

♠ 985
♡ 852
♢ AJ5
♣ KQT3

North	East	South	West
–	–	–	1♠
no	2♡	no	2NT
no	4♡	a.p.	

Against 4♡ South starts ♣K, taken with ♣A. Leader continues ♡AKQ. On the third round of ♡'s, partner discards ♢9 (indicates interest in ♠). Leader continues with ♢2, how do you continue?

The example is obtained via

```
{\def\S{You} % local change
\setbox\NESW\hbox{\NESWfig}
\smallskip\narrower\noindent
\crdima{}{}%
    {}{}{\hand{985}{852}{AJ5}{KQT3}}%S
        {\hand{AJ632}{43}{KQ7}{A85}}%W
\smallskip
}%end local change NESW-figure

{\smallskip\narrower\noindent
\bbid
 --&  --& --& 1\s\cr
 no& 2\h& no& 2NT\cr
 no& 4\h& a.p.\cr
\ebid    \smallskip}
```

Remark. In a similar way W–N, N–E, E–S hands, or W–E, N–S hands, or one hand only, with NESW-diagram, can be displayed simply by a suitable call of `\crdima`.

c. In discussing endplays only a few cards are left. The following endplay is taken from [10].

	♠ AJ ♡ K ♢ – ♣ –		S leads ♣A, W is squeezed
♠ KQ ♡ A ♢ – ♣ –	N W E S	♠ 7 ♡ 9 ♢ T ♣ –	
	♠ 2 ♡ 4 ♢ – ♣ A		

The example is obtained via

```
{\smallskip\narrower\noindent
\crdima{}{\vtop{\hbox{S leads \c A,}
              \hbox{W is squeezed}}}%
       {\hand{AJ}{K}{--}{--}}%N
       {\hand{7}{9}{T}{--}}  %E
       {\hand{2}{4}{--}{A}}  %S
       {\hand{KQ}{A}{--}{--}}%W
\smallskip}
```

d. Finally, a bidding competition. It illustrates how the (`\bbid`, `\ebid`) environment can be used for this application. We have taken only two partnerships: Sjoerd&Martijn and Tsjip&Janski. The material is borrowed from [17].†

W/All; Bidding competition

♠ AJ8 ♡ AKT94 ♢ 8 ♣ KT98	N W E S	♠ – ♡ J8 ♢ AKQ54 ♣ AJ7543

On the above hands, and given that South will intervene with 4♠, the partnerships bid as follows,

West	East	West	East
Sjoerd	*Martijn*	*Tsjip*	*Janski*
1♡	2♣	1♡	2♢
(4♠ by South)		(4♠ by South)	
no[1]	5♠[2]	dbl	6♣
7♣	no	no	

[1] Forcing pass
[2] Grand slam try

obtained via

```
$$\crdima{ W/All;
  Bidding competition  \hidewidth\cr
  \noalign{\vskip.5ex}}{}%
  {}{\hand{--}{J8}{AKQ54}{AJ7543}}%E
  {}{\hand{AJ8}{AKT94}{8}{KT98}}  %W
$$
```

† Normally, the set of West-hands is separated from the set of East-hands.

```
\noindent On the above hands, and given
that South will intervene with 4\s,
the partnerships bid as follows,
%
{\smallskip\narrower
\hbox to \hsize{\hss
{%Sjoerd&Martijn (Local mods)
\def\FIH{\vtop{\hbox{West}
         \hbox{\it Sjoerd\/}}}
\def\THH{\vtop{\hbox{East}
         \hbox{\it Martijn\/}}}
\def\SEH{}\def\FOH{}
\def\bidwidth{3\wr}
\bbid
\noalign{\vskip.5ex}
   1\h&            &2\c\cr
(4\s\ by South)\hidewidth\cr
no$^1$&          &5\s$^2$\cr
   7\c&             &no\cr
\noalign{\vskip.5ex}
$^1$ Forcing pass\hidewidth\cr
$^2$ Grand slam try\hidewidth\cr
\ebid}%end Sjoerd&Martijn
\quad\hfil
{%Tsjip&Janski (Local mods)
\def\FIH{\vtop{\hbox{West}
         \hbox{\it Tsjip\/}}}
\def\THH{\vtop{\hbox{East}
         \hbox{\it Janski\/}}}
\def\SEH{}\def\FOH{}
\def\bidwidth{3\wr}
\bbid
\noalign{\vskip.5ex}
1\h&               &2\d\cr
(4\s\ by South)\hidewidth\cr
dbl&               &6\c\cr
 no\cr
\ebid}%end Tsjip&Janski
\hss}%end \hbox
\smallskip}
```

How the play goes

Explanatory schemes of a play are used for instance on viewgraphs instantly along a match, in books about play technique, or in newspaper columns when discussing interesting matches or puzzles. In order to do this systematically and unambiguously something similar to the 'algebraic' notation in chess, see [2, 16], is needed.

Agreed, reading a book filled mostly with (algebraic) notation tables is quite dull and we can never replace the literary gifted commentator. So, this reduces the practical value of the exercise, but for solutions of puzzles it might be quite efficient, although I don't expect that many solutions will be sent in using TEX, in spite of quite numerous bridge unions, e.g., NBB (75,000 members), [5], to name but one union. On the other hand the systematic approach eliminates misprints in shown phases, while discussing a play.

Anyhow, it was great fun, and I learned a lot from it.

What we need is a compact unambiguous notation which contains per trick the information about the cards played and who led. Who gained the trick† can be deduced from the general knowledge of the contract and the lead. In print one generally starts every trick with the lead; every card that is played is given by the card colour and card value, followed eventually by commentary symbols like !, or ?.

To print all this information I used basically a table with four columns — the players — and thirteen rows — the tricks. Each row starts with the lead.‡ Apart from printing the cards played (along with trick number), the cards in every hand — the (toks register) control sequences `\Ns`, etc. — are updated. The use is illustrated below.

Let us play a game

The following appeared in 'Meulenbroek's column' last Christmas.†

Puzzle	♠ KQ76 ♡ J98 ♢ J942 ♣ 65	6NT, by East
♠ AJ3 ♡ K653 ♢ AK3 ♣ AQT	N W E S	♠ T9 ♡ A2 ♢ T5 ♣ KJ9xxxx
	♠ 8542 ♡ QT74 ♢ Q876 ♣ 2	

Problem. How must NS defend in order to guarantee 1 trick?

† On viewgraphs underlining is commonly used; this can be implemented, but because of entailed inflexibility I refrained from it.

‡ The lead indication can be hidden for the first lead in something like `\contract`, `\leader` or explicitly `\lead`, and for the next tricks along with the automation of who gained the trick.

† Borrowed from [6].

Solution. Start with a ♡ lead in order to break communication. N must discard ♡'s and S must discard ♠'s.

Trick					NS	EW
1.	♡4!	♡K	♡8	♡2	–	1
2.	♣A	♣5	♣x	♣2	–	2
3.	♣Q	♣6	♣x	♠2	–	3
4.	♣T	♡9	♣K	♠4	–	4
5.	♣J	♠5	♠3	♠6	–	5
6.	♣9	♠8	♡5	♠7	–	6
7.	♣x	♢6	♠J	♢2	–	7

On lead of the next ♣ neither South nor North can be squeezed as can be seen from

Puzzle	♠ KQ ♡ J ♢ J94 ♣ –	NS squeezed on ♣ continuation?
♠ A ♡ 63 ♢ AK3 ♣ –	N W E S	♠ T9 ♡ A ♢ T5 ♣ x
	♠ – ♡ QT7 ♢ Q87 ♣ –	

with continuation

8.	♣x	♡7	♡6	♡J	–	8
9.	♢T	♢7	♢A	♢4	–	9
10.	♢K	♢9	♢5	♢8	–	10
11.	♡3	♢J	♡A	♡T	–	11
12.	♠T	♡Q	♠A	♠Q	–	12
13.	♢3	♠K	♠9	♢Q	1	12

Input. The above is obtained by

```
\def\LFTINF{Puzzle}
\def\RGTINF{\vtop{\hbox{6NT,}
            \hbox{by East}}}
%
\Ns={KQ76}\Es={T9}\Ss={8542}\Ws={AJ3}
\Nh={J98} \Eh={A2}\Sh={QT74}\Wh={K653}
\Nd={J942}\Ed={T5}\Sd={Q876}\Wd={AK3}
\Nc={65}\Ec={KJ9xxxx}\Sc={2}\Wc={AQT}
%
\showgame
%
\subhead *Problem*
How must NS defend in order to
guarantee 1 trick?
%
\subhead *Solution* Start with a \h\
lead in order to break communication.
N must discard \h's
```

```
and S must discard \s's.
\smallskip\noindent
\LEADS
\bplay
h4! & hK & h8 & h2 & -- & 1\LEADW\cr
cA  & c5 & cx & c2 & -- & 2\cr
cQ  & c6 & cx & s2 & -- & 3\cr
cT  & h9 & cK & s4 & -- & 4\LEADE\cr
cJ  & s5 & s3 & s6 & -- & 5\cr
c9  & s8 & h5 & s7 & -- & 6\cr
cx  & d6 & sJ & d2 & -- & 7\cr
\bintermezzo
On lead of the next \c\
neither South nor North can be
squeezed as can be seen from%
\def\RGTINF{\vtop{\hbox{NS squeezed on}
             \hbox{\c\ continuation?}}}
\showgame
with continuation
\eintermezzo
cx & h7 & h6 & hJ & -- & 8\cr
dT & d7 & dA & d4 & -- & 9\LEADW\cr
dK & d9 & d5 & d8 & -- & 10\cr
h3 & dJ & hA & hT & -- & 11\LEADE\cr
sT & hQ & sA & sQ & -- & 12\LEADW\cr
d3 & sK & s9 & dQ & 1  & 12\cr
\eplay
```

Remark. The cumulative tricks can be suppressed by deleting columns 5 and 6 and a priori emptying the head texts via `\def\NS{}` and `\def\EW{}`.

Macros for annotated play

The (`\bplay`, `\eplay`) environment is aimed at printing schematically the cards played. Interleaving remarks, showing the phase of the play etc., can be supplied within the (`\bintermezzo`, `\eintermezzo`) subenvironment.

`\pc` does two things: it prints the card played and deletes the card from the appropriate hand.

`\strip` essentially strips out one symbol from a string.

`\showgame` is just a call of `\crdima` with the current values of `\Ns` etc.

Explanation. The problem is to determine dynamically with which colour from which player we are dealing. In each column of `\bplay` the player is known via the control sequences `\FIP`, `\SEP`, `\THP` and `\FOP` (these are eventually adjusted by `\LEADN`, `\LEADE`, `\LEADS`, or `\LEADW`) and passed on to `\pc`, as first argument (see template line of `\halign` in `\bplay`). From the typed in information, within the (`\bplay`, `\eplay`) environment, the card colour and card value are passed on as second and third arguments to `\pc`. Symbols after that are handled as text, and influence `\halign`'s columns positioning.†
`\strip` is called by `\pc` to delete a symbol. The symbol which has to be located in the string is used as argument separator.

Source texts.

```
%Date: Tue, 8 Oct 1991 16:01 MET
%From: CGL@RUGR86.RUG.NL
%Subject: play.tex nodig in bridge TeX artikel
%To: vannes@ecn.nl

\def\eplay{\errormessage{%
   bplay command is missing}}
%
\def\bplay{\bgroup\global\trno=0
                       %Version 21/3/90
\def\eplay{\egroup\egroup}
\def\bintermezzo{\noalign\bgroup
                  \smallskip\noindent}
\def\eintermezzo{\smallskip\egroup}
\tabskip1ex plus 1ex minus 1ex
\halign to7\wr\bgroup
 \global\advance\trno by 1
 \hbox to\wr{\hss\the\trno.\hss} %
 \pc\FIP##\hfil&
 \pc\SEP##\hfil&
 \pc\THP##\hfil&
 \pc\FOP##\hfil&&
 \hfil##\hfil\cr    %Template line
 \omit\hbox to\wr{\TRICK\hss}&
 \omit&\omit&\omit&
 \ \NS&\ \EW\cr     %Headline
}% end \bplay
%
\def\pc#1#2#3{%     Version 3/3/90
%Function: prints card #2#3 and
%          deletes it from player #1
%#1 the hand N, E, S, W(uppercase)
%#2 colour s, h, d, or c
%#3 card value A K Q ... 2, or x
%(or your (consistent/language) choice)
%%%% 1. Update hand \#1#2; e.g. \Ns %%%
\xdef\hnd{\csname #1#2\endcsname}
\strip{#3}{\hnd}%
%%%% 2. print card in table        %%%
\xdef\colour{\csname #2\endcsname}
\colour\thinspace #3%
% %Needed for immediate postfix mark(s)
```

---

† Of course use of `\ ...lap{` *symbol* `}` will not affect the columns positioning, but possibly spoil your print.

```
}% end \pc
%
\def\strip#1#2{%        Version 3/3/90
%Function: deletes card value #1
%           from #2, i.e., \Ns, or ...
  \def\wis##1#1##2\wis{%
  %Function: #1 is deleted from argument
  %           in \wis ... \wis and result
  %           is assigned to \hnd;
  %         (last card is replaced by --)
      \global\hnd={##1##2}
      \xdef\pa{##1} \xdef\pb{##2}
      \ifx\pa\empty {\ifx\pb\empty
         \global\hnd={--}% void colour
      \fi}\fi
   }% end \wis
   \expandafter\wis\the #2\wis
}% end \strip
%
\def\showgame{
%Purpose: Shows all cards still active
%       in the play, via \Ns, ..., \Wc,
%  (note use of upper case for players)
%Used: \crdima, \hand, \LFTINF, \RGTINF
%      \Ns, ..., \Wc
$$\crdima{\LFTINF}{\RGTINF}%
   {\hand{\the\Ns}{\the\Nh}{\the\Nd}%
         {\the\Nc}}%
   {\hand{\the\Es}{\the\Eh}{\the\Ed}%
         {\the\Ec}}%
   {\hand{\the\Ss}{\the\Sh}{\the\Sd}%
         {\the\Sc}}%
   {\hand{\the\Ws}{\the\Wh}{\the\Wd}%
         {\the\Wc}}%
$$}% end \showgame
```

Remarks. Use is made of `\halign`, with a counter for the tricks, and of `\noalign` for the intermezzo. One can also use a third, fourth, etc. symbol, after the colour and card value, in order to denote something special, e.g., !, for a well-played card. I added the reader-friendly feature of printing the cumulative number of tricks gained by each side in extra columns.

One abstraction I consider particular useful is the notation of `x` for cards which don't matter. (Because of the freedom in representation of card values nothing extra had to be done.)

Another question is what to do when the card is not in the hand? This will yield a TEX error message.

Flexibility: Endplay Analysis. The analysis below is due to [15] and shows the elegant use of `\showgame` with (global) control sequences.

Analysis	♠ A8653 ♡ A4 ♢ AJT ♣ A54	7♡, by South
♠ T2 ♡ 3 ♢ Q987652 ♣ T86	Anton Rens Dick Frans	♠ KQ94 ♡ T82 ♢ 43 ♣ QJ92
	♠ J7 ♡ KQJ9765 ♢ K ♣ K73	

♢2 lead is taken with the K, followed by ♠ to A, ♢A (leader discards a ♠), ♠ trumped, ♡K, ♡ to A, again ♠ trumped, followed by all but one trump. The leader arrived at

Squeeze 1	♠ 8 ♡ – ♢ J ♣ A5	♡5 will squeeze: W (positionally) E (automatically)
♠ – ♡ – ♢ Q ♣ T86	Anton Rens Dick Frans	♠ K ♡ – ♢ – ♣ QJ9
	♠ – ♡ 5 ♢ – ♣ K73	

Other squeezes can be envisioned, e.g., (Note central figure is suppressed)

Squeeze 2	♠ A8 ♡ – ♢ J ♣ –	W squeezed in ♠/♢
♠ KQ ♡ – ♢ Q ♣ –		♠ ♡ not ♢ important ♣
	♠ J7 ♡ 5 ♢ – ♣ –	

This squeeze works whenever West holds ♠KQ (or 5^+♠) ànd ♢Q, etc.

Remark. However interesting other squeeze possibilities — after a trump or ♠ lead — might be, they don't contribute further to 'bridge in print.' The above is meant as an illustration of the use of the macros within the context of a less rigid way of description. Because of the informal way the endplays are arrived at, we edited the hands. General play commands, which will update the hands, are once again not that difficult to write.† For the moment I stopped.

Input for Endplay Analysis. The above is obtained via

```
{%local adaptation variables in NESWfig
\def\N{Anton}\def\E{Dick}
\def\S{Frans}\def\W{Rens}
\setbox\NESW\hbox{\NESWfig}
\def\LFTINF{Analysis}
\def\RGTINF{\vtop{\hbox{7\h,}
             \hbox{by South}}}
\Ns={A8653}\Es={KQ94}\Ss={J7}  \Ws={T2}
\Nh={A4} \Eh={T82} \Sh={KQJ9765}\Wh={3}
\Nd={AJT}\Ed={43}  \Sd={K}\Wd={Q987652}
\Nc={A54}\Ec={QJ92}\Sc={K73}  \Wc={T86}
%
\showgame
%
\d2 lead is taken with the K, followed by
\s\ to A, \d A (leader discards a \s),
\s\ trumped, \h K, \h\ to A, again
\s\ trumped, followed by all but one
trump. The leader arrived at
\Ns={8} \Es={K}  \Ss={--} \Ws={--}
\Nh={--}\Eh={--} \Sh={5}  \Wh={--}
\Nd={J} \Ed={--} \Sd={--} \Wd={Q}
\Nc={A5}\Ec={QJ9}\Sc={K73}\Wc={T86}
\def\LFTINF{Squeeze 1}
\def\RGTINF{\vtop{
             \hbox{\h5 will squeeze:}
             \hbox{W (positionally)}
             \hbox{E (automatically)}}}
\showgame
%
Other squeezes can be envisioned, e.g.,
(Note central figure is suppressed)
\Ns={A8}\Es={}   \Ss={J7}    \Ws={KQ}
\Nh={--}\Eh={not}\Sh={5}     \Wh={--}
\Nd={J}\Ed={important}\Sd={--}\Wd={Q}
\Nc={--}\Ec={}   \Sc={--}    \Wc={--}
\def\LFTINF{Squeeze 2}
\def\RGTINF{\vtop{\hbox{W squeezed}
                  \hbox{in \s/\d}}}
%
{%Sublocal mod: empty figure
\setbox\NESW\hbox{}
\showgame
}%end sublocal mod empty figure
%
This squeeze works whenever
West holds \s KQ (or 5$^+$\s) \'and
\d Q, etc.
}%end local change \NESWfig
```

† Informal notation is characterized by incompleteness. In bridge, while discussing the course of a play, it is assumed that the reader knows which player played a card. One could write a general `\strip` command, with a suitable name, which locates the appropriate hand and subsequently strips and prints the card.

Looking back. I refrained from introducing case insensitivity in the card values, and from automatically counting the gained tricks, which is cumbersome but not too difficult to implement, once a suitable representation of the ordering of the cards is chosen.

The above features as well as more natural input can best be considered when the macros are targetted for a particular application, e.g., for typesetting (in a specified language) tournament reports, puzzles and answers, or whatever.

Because of the history of `\crdima` and `\hand`, and because I did not much ponder a priori about the 'data structure,' I started with a natural approach. Looking back I could have started from a 13∗4-matrix, where the rows denote the card values and the columns the colours. The value of an array element represents the status, e.g., the card belongs to either N, E, S, W, or has been played, not to mention 'penalty' cards. Updating this structure can be done via the 'array addressing' technique given in [9]. `\showgame` (and `\crdima`) as well as `\hand` will become more complicated, however. To be honest, I started in my deal program with 52 numbers for shuffling; these 52 numbers could be generalized into 52 memory locations, suitably adressed.

Looking ahead. What about using these macros interactively, e.g., in bridge play programs, or by commentators on TV? Not only to delete a card will be needed but also the reverse, to insert a card, in order to demonstrate variants.† Of course, some fancy graphics will be indispensable, like showing real card faces instead of symbols and playing the cards, i.e., let them *move.* Animation. Multi-media information exchange. How exciting! My case rests.

Availability macros. This article, with macros included, will be available on TeX-NL@HEARN. The previous LATEX article is also there. I welcome

† Perhaps best implemented via a conditional delete?

copies of any publication using these macros, or derivatives thereof. Comments are appreciated.

Conclusions

The author claims that bridge publications with respect to card distributions and bidding sequences can be typeset with high quality via LATEX, see [12], or via TEX and the macros given. Furthermore, it is possible to explain the course of a play in print systematically and unambiguously, where updating of the hands is done automatically when a card is 'played', i.e., when within the (`\bplay`, `\eplay`) environment the colour and card value are given, obeying `\halign`'s rules. The display of the course of the play can be interrupted with the intermezzo (sub)environment, for among others showing the cards still active in the play via `\showgame`.

Proofreading of deals not generated and typed by computer is error-prone and remains tiresome.

TEX programming differs from 'structured programming' not in the least

- in terminology — (positional, keyword) parameters vs. arguments; variables vs. registers and control sequences— and
- in its attitude — proving programs vs. knowing what one is doing.

Roughly three columns were needed for the (commented) macros; TEX is a powerful tool!

Acknowledgements

The author is grateful to Bernard Gaulle for his interest in the macros. Johannes Braams, who enlarged the LATEX macros into a bridge style file, is kindly acknowledged for emphasizing language flexibility. Victor Eijkhout suggested to use an argument separator for locating a symbol in a string. He also carefully read the manuscript and proposed improvements to my English. Phil Taylor and Amy Hendrickson, whom I met at the Stanford TUG89 conference, and have had TEX contacts with since, contributed a lot, not in the least helping me 'onward and upward' with the for me unusual way of TEX programming. Last but not least I like to thank the Groningen bridge community for the inspiring discussions and the first class examples.

References

1. Appelt, W. (1987): Macros with keyword parameters. TUGboat, 8#2, 182–184.
2. Appelt, W. (1988): Typesetting Chess. TUGboat, 9#3, 284–287.
3. Bechtolsheim, S. von (1988): Tutorial on `\futurelet`. TUGboat 9#3, 276–278.
4. BRIDGE. Monthly of the NBB (Dutch Bridge Union).
5. Coffin, G. S. (1954): Bridge Plays: Four classics. Faber and Faber. London.
6. Crowhurst, E. (1986): ACOL in competition. Pelham. London.
7. Braams, J., V. Eijkhout, N.A.F.M. Poppelier (1990): The development of national LATEX styles. TUGboat 10#3, 401–406.
8. Glendown, G. (1990): Round boxes for plain TEX. TUGboat, 10#3, 385–386.
9. Greene, A.M. (1989): TEXreation — Playing games with TEX's mind. TUG89 conference, TUGboat, 10#4, 691–705.
10. Kelder, J., B. van der Velde (1986): Dwangposities tegen één tegenstander. Becht. A'dam. (Dutch). Translated from: Kelsey, H.W. (1985, paperback): Simple squeezes. Gollancz. London.
11. Knuth, D. E. (1990): The TEXbook. Addison-Wesley.
12. Laan, C.G. van der (1989): Typesetting bridge via LATEX. TUGboat 10#1, 113–116.
13. Lawrence, M. (1988): The complete book on hand evaluation. Max Hardy. ISBN 0-939460-27-0.
14. Meulenbroek, D. (1989): Nieuwsblad v/h Noorden. December. (Dutch)
15. Paternotte, R. (1989): Dwangneurose. De **E**nige **G**oede **B**ridge **C**ourant. December. (Dutch)
16. Rubinstein, Z. (1990): Printing annotated chess literature in natural notation. TUGboat, 10#3, 387–389.
17. Vries, H. de (1990): Biedwedstrijd. De **E**nige **G**oede **B**ridge **C**ourant. Maart. (Dutch)

Appendix. Registers and control sequences used

```
%Date: Tue, 8 Oct 1991 16:02 MET
%From: CGL@RUGR86.RUG.NL
%Subject: dec.tex nodig in bridge TeX artik[redacted]l
%To: vannes@ecn.nl

%Card definitions
\def\s{$\spadesuit$}
\def\h{$\heartsuit$}
\def\d{$\diamondsuit$}
\def\c{$\clubsuit$}
%(Toks register) control sequences
%for hands used by play macros:
%showgame, pc, strip
\let\NT\newtoks
```

```
\NT\hnd%Dynamically one of:
\NT\Ns\NT\Es\NT\Ss\NT\Ws
\NT\Nh\NT\Eh\NT\Sh\NT\Wh
\NT\Nd\NT\Ed\NT\Sd
      \NT\Wd %Beware! Already
%in TUGboat.sty in lower case
\NT\Nc\NT\Ec\NT\Sc\NT\Wc
%
\def\english{
%In central figure NESW
\def\N{N}\def\E{E}\def\S{S}\def\W{W}
%In heading bplay
\def\NS{NS}\def\EW{EW}
\def\TRICK{Trick}
%Definition of hands
%used by bbid
\def\FIH{North}\def\SEH{East}
\def\THH{South}\def\FOH{West}
}% end \english
\english%default
%
\def\LEADN{\gdef\FIP{N}\gdef\SEP{E}%
          \gdef\THP{S}\gdef\FOP{W}}
\def\LEADE{\gdef\FIP{E}\gdef\SEP{S}%
          \gdef\THP{W}\gdef\FOP{N}}
\def\LEADS{\gdef\FIP{S}\gdef\SEP{W}%
          \gdef\THP{N}\gdef\FOP{E}}
\def\LEADW{\gdef\FIP{W}\gdef\SEP{N}%
          \gdef\THP{E}\gdef\FOP{S}}
%Definition  of counters
%used by bplay
\newcount\trno%trick number
%Definition of dimensions
%used in bbid
\newdimen\wr %width column
\wr=7ex \relax
\def\bidwidth{4\wr}
%used in crdima
\newbox\NESW
%
\def\dutch{
\def\FIH{Noord}\def\SEH{Oost}
\def\THH{Zuid}\def\FOH{West}
\def\N{N}\def\E{O}\def\S{Z}
\def\W{W}\def\EW{OW}\def\NS{NZ}
\def\TRICK{Slag}
\setbox\NESW\hbox{\NESWfig}
}%end \dutch
%
\def\french{
\def\FIH{Nord}\def\SEH{Est}
\def\THH{Sud}\def\FOH{Ouest}
\def\N{N}\def\E{E}\def\S{S}
\def\W{O}\def\EW{EO}\def\NS{NS}
\def\TRICK{Lev\'ee}
\setbox\NESW\hbox{\NESWfig}
}%end \french
```