

The `magicnum` package

Heiko Oberdiek
<oberdiek@uni-freiburg.de>

2009/04/10 v1.1

Abstract

This packages allows to access magic numbers by a hierarchical name system.

Contents

1	Documentation	2
1.1	Introduction	2
1.2	User interface	2
1.2.1	<code>\magicnum</code>	2
1.2.2	Properties	2
1.3	Data	3
1.3.1	Category <code>tex.catcode</code>	3
1.3.2	Category <code>etex.grouptype</code>	3
1.3.3	Category <code>etex.iftype</code>	4
1.3.4	Category <code>etex.nodetype</code>	4
1.3.5	Category <code>etex.interactionmode</code>	4
1.3.6	Category <code>luatex.pdfliteral.mode</code>	4
2	Implementation	4
2.1	Reload check and package identification	5
2.2	Catcodes	6
2.3	Check for previous definition	6
2.4	Without <code>LUA_TE_X</code>	6
2.5	With <code>LUA_TE_X</code>	7
2.6	Data	7
2.6.1	Plain data	7
2.6.2	Data for <code>T_EX</code>	9
2.6.3	Lua module	11
3	Test	14
3.1	Catcode checks for loading	14
3.2	Test data	15
4	Installation	16
4.1	Download	16
4.2	Bundle installation	17
4.3	Package installation	17
4.4	Refresh file name databases	17
4.5	Some details for the interested	17
5	History	18
	[2007/12/12 v1.0]	18
	[2009/04/10 v1.1]	18

1 Documentation

1.1 Introduction

Especially since ε -TeX there are many integer values with special meanings, such as catcodes, group types, ... Package `etex`, enabled by options, defines macros in the user namespace for these values.

This package goes another approach for storing the names and values.

- If L^AT_EX is available, they are stored in Lua tables.
- Without L^AT_EX they are remembered using internal macros.

1.2 User interface

The integer values and names are organized in a hierarchical scheme of categories with the property names as leaves. Example: ε -TeX's `\currentgrouplevel` reports 2 for a group caused by `\hbox`. This package has choosen to organize the group types in a main category `etex` and its subcategory `grouptype`:

`etex.grouptype.hbox = 2`

The property name `hbox` in category `etex.grouptype` has value 2. Dots are used to separate components.

If you want to have the value, the access key is constructed by the category with all its components and the property name. For the opposite the value is used instead of the property name.

Values are always integers (including negative numbers).

1.2.1 `\magicnum`

`\magicnum {⟨access key⟩}`

Macro `\magicnum` expects an access key as argument and expands to the requested data. The macro is always expandable. In case of errors the expansion result is empty.

The same macro is also used for getting a property name. In this case the property name part in the access key is replaced by the value.

The catcodes of the resulting numbers and strings follow T_EX's tradition of `\string`, `\meaning`, ...: The space has catcode 10 (`tex.catcode.space`) and the other characters have catcode 12 (`tex.catcode.other`).

Examples:

```
\magicnum{etex.grouptype.hbox} ⇒ 2
\magicnum{tex.catcode.14} ⇒ comment
\magicnum{tex.catcode.undefined} ⇒ ∅
```

1.2.2 Properties

- The components of a category are either subcategories or key value pairs, but not both.
- The full specified property names are unique and thus has one integer value exactly.
- Also the values inside a category are unique. This condition is a prerequisite for the reverse mapping of `\magicnum`.
- All names start with a letter. Only letters or digits may follow.

1.3 Data

1.3.1 Category `tex.catcode`

<code>tex.catcode.escape</code>	0
<code>tex.catcode.begingroup</code>	1
<code>tex.catcode.endgroup</code>	2
<code>tex.catcode.math</code>	3
<code>tex.catcode.align</code>	4
<code>tex.catcode.eol</code>	5
<code>tex.catcode.parameter</code>	6
<code>tex.catcode.superscript</code>	7
<code>tex.catcode.subscript</code>	8
<code>tex.catcode.ignore</code>	9
<code>tex.catcode.space</code>	10
<code>tex.catcode.letter</code>	11
<code>tex.catcode.other</code>	12
<code>tex.catcode.active</code>	13
<code>tex.catcode.comment</code>	14
<code>tex.catcode.invalid</code>	15

1.3.2 Category `etex.grouptype`

<code>etex.grouptype.bottomlevel</code>	0
<code>etex.grouptype.simple</code>	1
<code>etex.grouptype.hbox</code>	2
<code>etex.grouptype.adjustedhbox</code>	3
<code>etex.grouptype.vbox</code>	4
<code>etex.grouptype.align</code>	5
<code>etex.grouptype.noalign</code>	6
<code>etex.grouptype.output</code>	8
<code>etex.grouptype.math</code>	9
<code>etex.grouptype.disc</code>	10
<code>etex.grouptype.insert</code>	11
<code>etex.grouptype.vcenter</code>	12
<code>etex.grouptype.mathchoice</code>	13
<code>etex.grouptype.semisimple</code>	14
<code>etex.grouptype.mathshift</code>	15
<code>etex.grouptype.mathleft</code>	16

1.3.3 Category etex.ifttype

etex.ifttype.none	0
etex.ifttype.char	1
etex.ifttype.cat	2
etex.ifttype.num	3
etex.ifttype.dim	4
etex.ifttype.odd	5
etex.ifttype.vmode	6
etex.ifttype.hmode	7
etex.ifttype.mmode	8
etex.ifttype.inner	9
etex.ifttype.void	10
etex.ifttype.hbox	11
etex.ifttype.vbox	12
etex.ifttype.x	13
etex.ifttype.eof	14
etex.ifttype.true	15
etex.ifttype.false	16
etex.ifttype.case	17
etex.ifttype.defined	18
etex.ifttype.csname	19
etex.ifttype.fontchar	20

1.3.4 Category etex.nodetype

etex.nodetype.none	-1
etex.nodetype.char	0
etex.nodetype.hlist	1
etex.nodetype.vlist	2
etex.nodetype.rule	3
etex.nodetype.ins	4
etex.nodetype.mark	5
etex.nodetype.adjust	6
etex.nodetype.ligature	7
etex.nodetype.disc	8
etex.nodetype.whatsit	9
etex.nodetype.math	10
etex.nodetype.glue	11
etex.nodetype.kern	12
etex.nodetype.penalty	13
etex.nodetype.unset	14
etex.nodetype.maths	15

1.3.5 Category etex.interactionmode

etex.interactionmode.batch	0
etex.interactionmode.nonstop	1
etex.interactionmode.scroll	2
etex.interactionmode.errorstop	3

1.3.6 Category luatex.pdfliteral.mode

luatex.pdfliteral.mode.setorigin	0
luatex.pdfliteral.mode.page	1
luatex.pdfliteral.mode.direct	2

2 Implementation

```
1 (*package)
```

2.1 Reload check and package identification

Reload check, especially if the package is not used with L^AT_EX.

```
2 \begingroup
3 \catcode44 12 % ,
4 \catcode45 12 % -
5 \catcode46 12 % .
6 \catcode58 12 % :
7 \catcode64 11 % @
8 \catcode123 1 % {
9 \catcode125 2 % }
10 \expandafter\let\expandafter\x\csname ver@magicnum.sty\endcsname
11 \ifx\x\relax % plain-TeX, first loading
12 \else
13 \def\empty{}%
14 \ifx\x\empty % LaTeX, first loading,
15 % variable is initialized, but \ProvidesPackage not yet seen
16 \else
17 \catcode35 6 % #
18 \expandafter\ifx\csname PackageInfo\endcsname\relax
19 \def\x#1#2{%
20 \immediate\write-1{Package #1 Info: #2.}%
21 }%
22 \else
23 \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
24 \fi
25 \x{magicnum}{The package is already loaded}%
26 \aftergroup\endinput
27 \fi
28 \fi
29 \endgroup
```

Package identification:

```
30 \begingroup
31 \catcode35 6 % #
32 \catcode40 12 % (
33 \catcode41 12 % )
34 \catcode44 12 % ,
35 \catcode45 12 % -
36 \catcode46 12 % .
37 \catcode47 12 % /
38 \catcode58 12 % :
39 \catcode64 11 % @
40 \catcode91 12 % [
41 \catcode93 12 % ]
42 \catcode123 1 % {
43 \catcode125 2 % }
44 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
45 \def\x#1#2#3[#4]{\endgroup
46 \immediate\write-1{Package: #3 #4}%
47 \xdef#1{#4}%
48 }%
49 \else
50 \def\x#1#2[#3]{\endgroup
51 #2[#{#3}]%
52 \ifx#1\@undefined
53 \xdef#1{#3}%
54 \fi
55 \ifx#1\relax
56 \xdef#1{#3}%
57 \fi
```

```

58     }%
59   \fi
60 \expandafter\x\csname ver@magicnum.sty\endcsname
61 \ProvidesPackage{magicnum}%
62 [2009/04/10 v1.1 Magic numbers (H0)]

```

2.2 Catcodes

```

63 \begingroup
64   \catcode123 1 % {
65   \catcode125 2 % }
66 \def\x{\endgroup
67   \expandafter\edef\csname magicnum@AtEnd\endcsname{%
68     \catcode35 \the\catcode35\relax
69     \catcode64 \the\catcode64\relax
70     \catcode123 \the\catcode123\relax
71     \catcode125 \the\catcode125\relax
72   }%
73 }%
74 \x
75 \catcode35 6 % #
76 \catcode64 11 % @
77 \catcode123 1 % {
78 \catcode125 2 % }
79 \def\TMP@EnsureCode#1#2{%
80   \edef\magicnum@AtEnd{%
81     \magicnum@AtEnd
82     \catcode#1 \the\catcode#1\relax
83   }%
84   \catcode#1 #2\relax
85 }
86 \TMP@EnsureCode{34}{12}% "
87 \TMP@EnsureCode{40}{12}% (
88 \TMP@EnsureCode{41}{12}% )
89 \TMP@EnsureCode{42}{12}% *
90 \TMP@EnsureCode{44}{12}% ,
91 \TMP@EnsureCode{45}{12}% -
92 \TMP@EnsureCode{46}{12}% .
93 \TMP@EnsureCode{47}{12}% /
94 \TMP@EnsureCode{60}{12}% <
95 \TMP@EnsureCode{62}{12}% >

```

2.3 Check for previous definition

```

96 \begingroup\expandafter\expandafter\expandafter\endgroup
97 \expandafter\ifx\csname newcommand\endcsname\relax
98   \expandafter\ifx\csname magicnum\endcsname\relax
99     \else
100       \input infwarerr.sty\relax
101       \@PackageErrorNoLine{magicnum}{%
102         \string\magicnum\space is already defined%
103       }\@ehc
104     \fi
105   \else
106     \newcommand*{\magicnum}{}%
107   \fi

```

2.4 Without LuaTeX

```

108 \begingroup\expandafter\expandafter\expandafter\endgroup
109 \expandafter\ifx\csname directlua\endcsname\relax
\magicnum
110 \begingroup\expandafter\expandafter\expandafter\endgroup

```

```

111 \expandafter\ifx\csname ifcsname\endcsname\relax
112   \def\magicnum#1{%
113     \expandafter\ifx\csname MG@#1\endcsname\relax
114       \else
115         \csname MG@#1\endcsname
116       \fi
117     }%
118   \else
119     \begingroup
120     \edef\x{\endgroup
121       \def\noexpand\magicnum##1{%
122         \expandafter\noexpand\csname
123           ifcsname\endcsname MG@##1\noexpand\endcsname
124           \noexpand\csname MG@##1%
125             \noexpand\expandafter\noexpand\endcsname
126             \expandafter\noexpand\csname fi\endcsname
127         }%
128       }%
129     \x
130   \fi
131 \else

```

2.5 With LuaTeX

```

132 \begingroup\expandafter\expandafter\expandafter\endgroup
133 \expandafter\ifx\csname RequirePackage\endcsname\relax
134   \input luatex.sty\relax
135 \else
136   \RequirePackage{luatex}[2009/04/10]%
137 \fi

```

\magicnum@directlua

```

138 \ifnum\luatexversion<36 %
139   \def\magicnum@directlua{\directlua0 }%
140 \else
141   \let\magicnum@directlua\directlua
142 \fi

```

\magicnum

```

143 \def\magicnum#1{%
144   \magicnum@directlua{%
145     require("oberdiek.magicnum")%
146     oberdiek.magicnum.get(%
147       "\luaescapestring{#1}",\number\CatcodeTableString
148     )%
149   }%
150 }%

151 \magicnum@AtEnd
152 \expandafter\endinput
153 \fi
154 \</package>

```

2.6 Data

2.6.1 Plain data

```

155 \<data>
156 \tex.catcode
157   escape = 0
158   begingroup = 1
159   endgroup = 2

```

```

160  math = 3
161  align = 4
162  eol = 5
163  parameter = 6
164  superscript = 7
165  subscript = 8
166  ignore = 9
167  space = 10
168  letter = 11
169  other = 12
170  active = 13
171  comment = 14
172  invalid = 15
173  etex.grouptype
174  bottomlevel = 0
175  simple = 1
176  hbox = 2
177  adjustedhbox = 3
178  vbox = 4
179  align = 5
180  noalign = 6
181  output = 8
182  math = 9
183  disc = 10
184  insert = 11
185  vcenter = 12
186  mathchoice = 13
187  semisimple = 14
188  mathshift = 15
189  mathleft = 16
190  etex.ifttype
191  none = 0
192  char = 1
193  cat = 2
194  num = 3
195  dim = 4
196  odd = 5
197  vmode = 6
198  hmode = 7
199  mmode = 8
200  inner = 9
201  void = 10
202  hbox = 11
203  vbox = 12
204  x = 13
205  eof = 14
206  true = 15
207  false = 16
208  case = 17
209  defined = 18
210  csname = 19
211  fontchar = 20
212  etex.nodetype
213  none = -1
214  char = 0
215  hlist = 1
216  vlist = 2
217  rule = 3
218  ins = 4
219  mark = 5
220  adjust = 6
221  ligature = 7

```



```

222 disc = 8
223 whatsit = 9
224 math = 10
225 glue = 11
226 kern = 12
227 penalty = 13
228 unset = 14
229 maths = 15
230 etex.interactionmode
231 batch = 0
232 nonstop = 1
233 scroll = 2
234 errorstop = 3
235 luatex.pdfliteral.mode
236 setorigin = 0
237 page = 1
238 direct = 2
239 </data>

```

2.6.2 Data for T_EX

```

240 <*package>

\magicnum@add

241 \begingroup\expandafter\expandafter\expandafter\endgroup
242 \expandafter\ifx\csname detokenize\endcsname\relax
243   \def\magicnum@add#1#2#3{%
244     \expandafter\magicnum@@add
245       \csname MG@#1.#2\endcsname
246       \csname MG@#1.#3\endcsname
247     {#3}{#2}%
248   }%
249   \def\magicnum@@add#1#2#3#4{%
250     \def#1{#3}%
251     \def#2{#4}%
252     \edef#1{%
253       \expandafter\strip@prefix\meaning#1%
254     }%
255     \edef#2{%
256       \expandafter\strip@prefix\meaning#2%
257     }%
258   }%
259   \expandafter\ifx\csname strip@prefix\endcsname\relax
260     \def\strip@prefix#1->{%}%
261   \fi
262 \else
263   \def\magicnum@add#1#2#3{%
264     \expandafter\edef\csname MG@#1.#2\endcsname{%
265       \detokenize{#3}%
266     }%
267     \expandafter\edef\csname MG@#1.#3\endcsname{%
268       \detokenize{#2}%
269     }%
270   }%
271 \fi

272 \magicnum@add{tex.catcode}{escape}{0}
273 \magicnum@add{tex.catcode}{begingroup}{1}
274 \magicnum@add{tex.catcode}{endgroup}{2}
275 \magicnum@add{tex.catcode}{math}{3}
276 \magicnum@add{tex.catcode}{align}{4}
277 \magicnum@add{tex.catcode}{eol}{5}
278 \magicnum@add{tex.catcode}{parameter}{6}
279 \magicnum@add{tex.catcode}{superscript}{7}

```

```

280 \magicnum@add{tex.catcode}{subscript}{8}
281 \magicnum@add{tex.catcode}{ignore}{9}
282 \magicnum@add{tex.catcode}{space}{10}
283 \magicnum@add{tex.catcode}{letter}{11}
284 \magicnum@add{tex.catcode}{other}{12}
285 \magicnum@add{tex.catcode}{active}{13}
286 \magicnum@add{tex.catcode}{comment}{14}
287 \magicnum@add{tex.catcode}{invalid}{15}
288 \magicnum@add{etex.grouptype}{bottomlevel}{0}
289 \magicnum@add{etex.grouptype}{simple}{1}
290 \magicnum@add{etex.grouptype}{hbox}{2}
291 \magicnum@add{etex.grouptype}{adjustedhbox}{3}
292 \magicnum@add{etex.grouptype}{vbox}{4}
293 \magicnum@add{etex.grouptype}{align}{5}
294 \magicnum@add{etex.grouptype}{noalign}{6}
295 \magicnum@add{etex.grouptype}{output}{8}
296 \magicnum@add{etex.grouptype}{math}{9}
297 \magicnum@add{etex.grouptype}{disc}{10}
298 \magicnum@add{etex.grouptype}{insert}{11}
299 \magicnum@add{etex.grouptype}{vcenter}{12}
300 \magicnum@add{etex.grouptype}{mathchoice}{13}
301 \magicnum@add{etex.grouptype}{semisimple}{14}
302 \magicnum@add{etex.grouptype}{mathshift}{15}
303 \magicnum@add{etex.grouptype}{mathleft}{16}
304 \magicnum@add{etex.ifttype}{none}{0}
305 \magicnum@add{etex.ifttype}{char}{1}
306 \magicnum@add{etex.ifttype}{cat}{2}
307 \magicnum@add{etex.ifttype}{num}{3}
308 \magicnum@add{etex.ifttype}{dim}{4}
309 \magicnum@add{etex.ifttype}{odd}{5}
310 \magicnum@add{etex.ifttype}{vmode}{6}
311 \magicnum@add{etex.ifttype}{hmode}{7}
312 \magicnum@add{etex.ifttype}{mmode}{8}
313 \magicnum@add{etex.ifttype}{inner}{9}
314 \magicnum@add{etex.ifttype}{void}{10}
315 \magicnum@add{etex.ifttype}{hbox}{11}
316 \magicnum@add{etex.ifttype}{vbox}{12}
317 \magicnum@add{etex.ifttype}{x}{13}
318 \magicnum@add{etex.ifttype}{eof}{14}
319 \magicnum@add{etex.ifttype}{true}{15}
320 \magicnum@add{etex.ifttype}{false}{16}
321 \magicnum@add{etex.ifttype}{case}{17}
322 \magicnum@add{etex.ifttype}{defined}{18}
323 \magicnum@add{etex.ifttype}{csname}{19}
324 \magicnum@add{etex.ifttype}{fontchar}{20}
325 \magicnum@add{etex.nodetype}{none}{-1}
326 \magicnum@add{etex.nodetype}{char}{0}
327 \magicnum@add{etex.nodetype}{hlist}{1}
328 \magicnum@add{etex.nodetype}{vlist}{2}
329 \magicnum@add{etex.nodetype}{rule}{3}
330 \magicnum@add{etex.nodetype}{ins}{4}
331 \magicnum@add{etex.nodetype}{mark}{5}
332 \magicnum@add{etex.nodetype}{adjust}{6}
333 \magicnum@add{etex.nodetype}{ligature}{7}
334 \magicnum@add{etex.nodetype}{disc}{8}
335 \magicnum@add{etex.nodetype}{whatsit}{9}
336 \magicnum@add{etex.nodetype}{math}{10}
337 \magicnum@add{etex.nodetype}{glue}{11}
338 \magicnum@add{etex.nodetype}{kern}{12}
339 \magicnum@add{etex.nodetype}{penalty}{13}
340 \magicnum@add{etex.nodetype}{unset}{14}
341 \magicnum@add{etex.nodetype}{maths}{15}

```

```

342 \magicnum@add{etex.interactionmode}{batch}{0}
343 \magicnum@add{etex.interactionmode}{nonstop}{1}
344 \magicnum@add{etex.interactionmode}{scroll}{2}
345 \magicnum@add{etex.interactionmode}{errorstop}{3}
346 \magicnum@add{luatex.pdfliteral.mode}{setorigin}{0}
347 \magicnum@add{luatex.pdfliteral.mode}{page}{1}
348 \magicnum@add{luatex.pdfliteral.mode}{direct}{2}

349 \magicnum@AtEnd
350 \end{package}

```

2.6.3 Lua module

```

351 \lua
352 module("oberdiek.magicnum", package.seeall)

353 local data = {
354   ["tex.catcode"] = {
355     [0] = "escape",
356     [1] = "begingroup",
357     [2] = "endgroup",
358     [3] = "math",
359     [4] = "align",
360     [5] = "eol",
361     [6] = "parameter",
362     [7] = "superscript",
363     [8] = "subscript",
364     [9] = "ignore",
365     [10] = "space",
366     [11] = "letter",
367     [12] = "other",
368     [13] = "active",
369     [14] = "comment",
370     [15] = "invalid",
371     ["active"] = 13,
372     ["align"] = 4,
373     ["begingroup"] = 1,
374     ["comment"] = 14,
375     ["endgroup"] = 2,
376     ["eol"] = 5,
377     ["escape"] = 0,
378     ["ignore"] = 9,
379     ["invalid"] = 15,
380     ["letter"] = 11,
381     ["math"] = 3,
382     ["other"] = 12,
383     ["parameter"] = 6,
384     ["space"] = 10,
385     ["subscript"] = 8,
386     ["superscript"] = 7
387   },
388   ["etex.grouptype"] = {
389     [0] = "bottomlevel",
390     [1] = "simple",
391     [2] = "hbox",
392     [3] = "adjustedhbox",
393     [4] = "vbox",
394     [5] = "align",
395     [6] = "noalign",
396     [8] = "output",
397     [9] = "math",
398     [10] = "disc",
399     [11] = "insert",
400     [12] = "vcenter",

```

```

401     [13] = "mathchoice",
402     [14] = "semisimple",
403     [15] = "mathshift",
404     [16] = "mathleft",
405     ["adjustedhbox"] = 3,
406     ["align"] = 5,
407     ["bottomlevel"] = 0,
408     ["disc"] = 10,
409     ["hbox"] = 2,
410     ["insert"] = 11,
411     ["math"] = 9,
412     ["mathchoice"] = 13,
413     ["mathleft"] = 16,
414     ["mathshift"] = 15,
415     ["noalign"] = 6,
416     ["output"] = 8,
417     ["semisimple"] = 14,
418     ["simple"] = 1,
419     ["vbox"] = 4,
420     ["vcenter"] = 12
421 },
422 ["etex.ifttype"] = {
423     [0] = "none",
424     [1] = "char",
425     [2] = "cat",
426     [3] = "num",
427     [4] = "dim",
428     [5] = "odd",
429     [6] = "vmode",
430     [7] = "hmode",
431     [8] = "mmode",
432     [9] = "inner",
433     [10] = "void",
434     [11] = "hbox",
435     [12] = "vbox",
436     [13] = "x",
437     [14] = "eof",
438     [15] = "true",
439     [16] = "false",
440     [17] = "case",
441     [18] = "defined",
442     [19] = "csname",
443     [20] = "fontchar",
444     ["case"] = 17,
445     ["cat"] = 2,
446     ["char"] = 1,
447     ["csname"] = 19,
448     ["defined"] = 18,
449     ["dim"] = 4,
450     ["eof"] = 14,
451     ["false"] = 16,
452     ["fontchar"] = 20,
453     ["hbox"] = 11,
454     ["hmode"] = 7,
455     ["inner"] = 9,
456     ["mmode"] = 8,
457     ["none"] = 0,
458     ["num"] = 3,
459     ["odd"] = 5,
460     ["true"] = 15,
461     ["vbox"] = 12,
462     ["vmode"] = 6,

```

```

463     ["void"] = 10,
464     ["x"] = 13
465 },
466 ["etex.nodetype"] = {
467     [-1] = "none",
468     [0] = "char",
469     [1] = "hlist",
470     [2] = "vlist",
471     [3] = "rule",
472     [4] = "ins",
473     [5] = "mark",
474     [6] = "adjust",
475     [7] = "ligature",
476     [8] = "disc",
477     [9] = "whatsit",
478     [10] = "math",
479     [11] = "glue",
480     [12] = "kern",
481     [13] = "penalty",
482     [14] = "unset",
483     [15] = "maths",
484     ["adjust"] = 6,
485     ["char"] = 0,
486     ["disc"] = 8,
487     ["glue"] = 11,
488     ["hlist"] = 1,
489     ["ins"] = 4,
490     ["kern"] = 12,
491     ["ligature"] = 7,
492     ["mark"] = 5,
493     ["math"] = 10,
494     ["maths"] = 15,
495     ["none"] = -1,
496     ["penalty"] = 13,
497     ["rule"] = 3,
498     ["unset"] = 14,
499     ["vlist"] = 2,
500     ["whatsit"] = 9
501 },
502 ["etex.interactionmode"] = {
503     [0] = "batch",
504     [1] = "nonstop",
505     [2] = "scroll",
506     [3] = "errorstop",
507     ["batch"] = 0,
508     ["errorstop"] = 3,
509     ["nonstop"] = 1,
510     ["scroll"] = 2
511 },
512 ["luatex.pdfliteral.mode"] = {
513     [0] = "setorigin",
514     [1] = "page",
515     [2] = "direct",
516     ["direct"] = 2,
517     ["page"] = 1,
518     ["setorigin"] = 0
519 }
520 }

521 function get(name, catcodetable)
522     local startpos, endpos, category, entry =
523         string.find(name, "^(%a[%a%d%.]*)%.(?[%a%d]+)$")
524     if not entry then

```

```

525     return
526 end
527 local node = data[category]
528 if not node then
529     return
530 end
531 local num = tonumber(entry)
532 local value
533 if num then
534     value = node[num]
535     if not value then
536         return
537     end
538 else
539     value = node[entry]
540     if not value then
541         return
542     end
543     value = "" .. value
544 end
545 tex.print(catcodetable, value)
546 end
547  $\langle$ /lua $\rangle$ 

```

3 Test

3.1 Catcode checks for loading

```

548  $\langle$ *test1 $\rangle$ 
549 \catcode'\{=1 %
550 \catcode'\}=2 %
551 \catcode'\#=6 %
552 \catcode'\@=11 %
553 \expandafter\ifx\csname count@\endcsname\relax
554   \countdef\count@=255 %
555 \fi
556 \expandafter\ifx\csname @gobble\endcsname\relax
557   \long\def@gobble#1{}%
558 \fi
559 \expandafter\ifx\csname @firstofone\endcsname\relax
560   \long\def@firstofone#1{#1}%
561 \fi
562 \expandafter\ifx\csname loop\endcsname\relax
563   \expandafter@firstofone
564 \else
565   \expandafter@gobble
566 \fi
567 {%
568   \def\loop#1\repeat{%
569     \def\body{#1}%
570     \iterate
571   }%
572   \def\iterate{%
573     \body
574     \let\next\iterate
575   \else
576     \let\next\relax
577   \fi
578   \next
579 }%
580 \let\repeat=\fi
581 }%

```

```

582 \def\RestoreCatcodes{}
583 \count@=0 %
584 \loop
585   \edef\RestoreCatcodes{%
586     \RestoreCatcodes
587     \catcode\the\count@=\the\catcode\count@\relax
588   }%
589 \ifnum\count@<255 %
590   \advance\count@ 1 %
591 \repeat
592
593 \def\RangeCatcodeInvalid#1#2{%
594   \count@=#1\relax
595   \loop
596     \catcode\count@=15 %
597   \ifnum\count@<#2\relax
598     \advance\count@ 1 %
599   \repeat
600 }
601 \expandafter\ifx\csname LoadCommand\endcsname\relax
602 \def\LoadCommand{\input magicnum.sty\relax}%
603 \fi
604 \def\Test{%
605   \RangeCatcodeInvalid{0}{47}%
606   \RangeCatcodeInvalid{58}{64}%
607   \RangeCatcodeInvalid{91}{96}%
608   \RangeCatcodeInvalid{123}{255}%
609   \catcode'\@=12 %
610   \catcode'\=0 %
611   \catcode'\{=1 %
612   \catcode'\}=2 %
613   \catcode'\#=6 %
614   \catcode'\[=12 %
615   \catcode'\]=12 %
616   \catcode'\%=14 %
617   \catcode'\ =10 %
618   \catcode13=5 %
619   \LoadCommand
620   \RestoreCatcodes
621 }
622 \Test
623 \csname @@end\endcsname
624 \end
625 </test1>

```

3.2 Test data

```

626 (*testplain)
627 \input magicnum.sty\relax
628 \def\Test#1#2{%
629   \edef\result{\magicnum{#1}}%
630   \edef\expect{#2}%
631   \edef\expect{\expandafter\stripprefix\meaning\expect}%
632   \ifx\result\expect
633   \else
634     \errmessage{%
635       Failed: [#1] % hash-ok
636       returns [\result] instead of [\expect]%
637     }%
638   \fi
639 }
640 \def\stripprefix#1->{}
641 </testplain>

```

```

642 <*testlatex>
643 \NeedsTeXFormat{LaTeX2e}
644 \documentclass{minimal}
645 \usepackage{magicnum}[2009/04/10]
646 \usepackage{qstest}
647 \IncludeTests{*}
648 \LogTests{log}{*}{*}
649 \newcommand*{\Test}[2]{%
650   \Expect*{\magicnum{#1}}{#2}%
651 }
652 \begin{qstest}{magicnum}{magicnum}
653 </testlatex>

654 <*testdata>
655 \Test{tex.catcode.escape}{0}
656 \Test{tex.catcode.invalid}{15}
657 \Test{tex.catcode.unknown}{}
658 \Test{tex.catcode.0}{escape}
659 \Test{tex.catcode.15}{invalid}
660 \Test{etex.iftypes.true}{15}
661 \Test{etex.iftypes.false}{16}
662 \Test{etex.iftypes.15}{true}
663 \Test{etex.iftypes.16}{false}
664 \Test{etex.nodetype.none}{-1}
665 \Test{etex.nodetype.-1}{none}
666 \Test{luatex.pdfliteral.mode.direct}{2}
667 \Test{luatex.pdfliteral.mode.1}{page}
668 \Test{}{}
669 \Test{unknown}{}
670 \Test{unknown.foo.bar}{}
671 \Test{unknown.foo.4}{}
672 </testdata>

673 <*testplain>
674 \csname @@end\endcsname
675 \end
676 </testplain>
677 <*testlatex>
678 \end{qstest}
679 \csname @@end\endcsname
680 </testlatex>

```

4 Installation

4.1 Download

Package. This package is available on CTAN¹:

[CTAN:macros/latex/contrib/oberdiek/magicnum.dtx](#) The source file.

[CTAN:macros/latex/contrib/oberdiek/magicnum.pdf](#) Documentation.

Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](#)

TDS refers to the standard “A Directory Structure for T_EX Files” ([CTAN:tds/tds.pdf](#)). Directories with `texmf` in their name are usually organized this way.

¹<http://ftp.ctan.org/tex-archive/>

4.2 Bundle installation

Unpacking. Unpack the `oberdiek.tds.zip` in the TDS tree (also known as `texmf` tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation. Check the directory `TDS:scripts/oberdiek/` for scripts that need further installation steps. Package `attachfile2` comes with the Perl script `pdfatfi.pl` that should be installed in such a way that it can be called as `pdfatfi`. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

Unpacking. The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain-`TEX`:

```
tex magicnum.dtx
```

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

<code>magicnum.sty</code>	→ <code>tex/generic/oberdiek/magicnum.sty</code>
<code>magicnum.lua</code>	→ <code>scripts/oberdiek/magicnum.lua</code>
<code>oberdiek.magicnum.lua</code>	→ <code>scripts/oberdiek/oberdiek.magicnum.lua</code>
<code>magicnum.pdf</code>	→ <code>doc/latex/oberdiek/magicnum.pdf</code>
<code>magicnum.txt</code>	→ <code>doc/latex/oberdiek/magicnum.txt</code>
<code>test/magicnum-test1.tex</code>	→ <code>doc/latex/oberdiek/test/magicnum-test1.tex</code>
<code>test/magicnum-test2.tex</code>	→ <code>doc/latex/oberdiek/test/magicnum-test2.tex</code>
<code>test/magicnum-test3.tex</code>	→ <code>doc/latex/oberdiek/test/magicnum-test3.tex</code>
<code>magicnum.dtx</code>	→ <code>source/latex/oberdiek/magicnum.dtx</code>

If you have a `docstrip.cfg` that configures and enables `docstrip`'s TDS installing feature, then some files can already be in the right place, see the documentation of `docstrip`.

4.4 Refresh file name databases

If your `TEX` distribution (te`TEX`, mi`kTEX`, ...) relies on file name databases, you must refresh these. For example, te`TEX` users run `texhash` or `mktextlsr`.

4.5 Some details for the interested

Attached source. The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk magicnum.pdf unpack_files output .
```

Unpacking with L^AT_EX. The `.dtx` chooses its action depending on the format:

plain-`TEX`: Run `docstrip` and extract the files.

L^AT_EX: Generate the documentation.

If you insist on using L^AT_EX for `docstrip` (really, `docstrip` does not need L^AT_EX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{magicnum.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfL^AT_EX:

```
pdflatex magicnum.dtx
makeindex -s gind.ist magicnum.idx
pdflatex magicnum.dtx
makeindex -s gind.ist magicnum.idx
pdflatex magicnum.dtx
```

5 History

[2007/12/12 v1.0]

- First public version.

[2009/04/10 v1.1]

- Adaptation to L^AT_EX 0.40.

6 Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols		76, 77, 78, 82, 84, 549, 550, 551,
\#	551, 613	552, 587, 596, 609, 610, 611,
\%	616	612, 613, 614, 615, 616, 617, 618
\@	552, 609	\CatcodeTableString 147
\@PackageErrorNoLine	101	\count@ 554, 583,
\@ehc	103	587, 589, 590, 594, 596, 597, 598
\@firstofone	560, 563	\countdef 554
\@gobble	557, 565	\csname 10, 18,
\@undefined	52	44, 60, 67, 97, 98, 109, 111, 113,
\[614	115, 122, 124, 126, 133, 242,
\]	610	245, 246, 259, 264, 267, 553,
\{	549, 611	556, 559, 562, 601, 623, 674, 679
\}	550, 612	
\]	615	
		D
		\detokenize 265, 268
		\directlua 139, 141
		\documentclass 644
		A
\advance	590, 598	
\aftergroup	26	
		B
\begin	652	
\body	569, 573	
		C
\catcode	3, 4, 5, 6, 7, 8, 9, 17, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 64, 65, 68, 69, 70, 71, 75,	
		E
\empty	13, 14	
\end	624, 675, 678	
\endcsname	10, 18, 44, 60, 67, 97, 98, 109, 111, 113, 115, 123, 125, 126, 133, 242, 245, 246, 259, 264, 267, 553, 556, 559, 562, 601, 623, 674, 679	
\endinput	26, 152	
\errmessage	634	
\Expect	650	
\expect	630, 631, 632, 636	

I		\newcommand 106, 649	
\ifnum	138, 589, 597	\next	574, 576, 578
\ifx	11, 14, 18, 44, 52, 55, 97, 98, 109, 111, 113, 133, 242, 259, 553, 556, 559, 562, 601, 632	\number	147
L		P	
\immediate	20, 46	\PackageInfo	23
\IncludeTests	647	\ProvidesPackage	15, 61
\input	100, 134, 602, 627	R	
\iterate	570, 572, 574	\RangeCatcodeInvalid	
M			593, 605, 606, 607, 608
\LoadCommand	602, 619	\repeat	568, 580, 591, 599
\LogTests	648	\RequirePackage	136
\loop	568, 584, 595	\RestoreCatcodes	582, 585, 586, 620
\luaescapestring	147	\result	629, 632, 636
\luatexversion	138	S	
N		\space	102
\magicnum 2, 102, 106, 110, 143, 629, 650		\strip@prefix	253, 256, 260
\magicnum@@add	244, 249	\stripprefix	631, 640
\magicnum@add 241, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348		T	
\magicnum@AtEnd	80, 81, 151, 349	\Test	604, 622, 628, 649, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671
\magicnum@directlua	138, 144	\the	68, 69, 70, 71, 82, 587
\meaning	253, 256, 631	\TMP@EnsureCode	79, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95
N		U	
\NeedsTeXFormat	643	\usepackage	645, 646
X		W	
		\write	20, 46
		X	
		\x	10, 11, 14, 19, 23, 25, 45, 50, 60, 66, 74, 120, 129