

# The mdwkey\* package

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## 1 User's guide

This is a key/value-pair parser, rather like the one in David Carlisle's `keyval` package but a little more powerful. There's no problem with having both in the same program.

### 1.1 Terminology

A *key-value pair* is a pair  $\langle key \rangle = \langle value \rangle$ , where the '=' appears at the topmost bracing level. A *tag* is just a single  $\langle key \rangle$ . A *list* is a sequence of key-value pairs and tags separated by commas ',' at the topmost bracing level. A  $\langle key \rangle$  or  $\langle value \rangle$  has a leading and/or trailing space removed, if there are any, and if the whole thing is enclosed in braces, then the braces are removed. Examples:

- `foo = bar` is a key-value pair. The key is 'foo' and the value is 'bar'.
- `{foo = bar}` is a tag. The key is 'foo = bar'.
- `foo = { bar }` is a key-value pair. The key is 'foo' and the value is ' bar ' (with the leading and trailing spaces).
- `foo = { bar }x` is a key-value pair. The key is 'foo' and the value is '{ bar }x'.
- `one,two` is a list of two tags, 'one' and 'two'.

---

\*The mdwkey package is currently at version 1.0, dated 21 August 2003.

- ‘one, {two, three}’ is a list of two tags, ‘one’ and ‘two, three’.

There is no way to get an unmatched brace into a  $\langle key \rangle$  or  $\langle value \rangle$  without stupid catcode tricks.

## 1.2 Using the system

`\mkdef` New key names, and what to do when they’re encountered, is all defined using `\mkdef`. Keys are gathered into *groups*, so that lots of people can use the system without treading on their toes. I recommend that people use  $\langle package-name \rangle : \langle label \rangle$  for their group names.

There’s a lot which can be done using `\mkdef`.

- `\mkdef{\group}{\key}{\stuff}` will perform  $\langle stuff \rangle$  when  $\langle key \rangle$  is given a value: the value is available as #1 in  $\langle stuff \rangle$ .
- `\mkdef{\group}{\key}[\default]{\stuff}` is the same, but additionally if  $\langle key \rangle$  is found as a tag, then treat it as if we found  $\langle key \rangle = \langle default \rangle$  instead.
- `\mkdef{\group}{\key}*\{\stuff\}` will perform  $\langle stuff \rangle$  when  $\langle key \rangle$  is found as a tag.
- `\mkdef*{\group}{\stuff}` will perform  $\langle stuff \rangle$  when an unknown key (one for which there is no specific definition in this group) is given a value: the key is available as #1 and the value as #2 in  $\langle stuff \rangle$ .
- `\mkdef*{\group}[\default]{\stuff}` is the same, but additionally if an unknown key is found as a tag then treat it as if it had been assigned the value  $\langle default \rangle$  instead.
- `\mkdef*{\group}*\{\stuff\}` will perform  $\langle stuff \rangle$  when an unknown key is found as a tag: the key is available as #1 in  $\langle stuff \rangle$ .

`\mkparse` All that remains now is to learn how to use the thing. Once you have a list, you can say `\mkparse{\group}{\list}` to perform all the appropriate actions. (This will mess up `\toks0` and `\next@` and some other standard scratch macros.)

## 2 Implementation

```
1 \package | macro
```

### 2.1 Provide bits of L<sup>A</sup>T<sub>E</sub>X for plain T<sub>E</sub>X

This lot is the infrastructure needed to make the macros work under Plain T<sub>E</sub>X.

```
2 \plain
3 \edef\done{\catcode'\noexpand\@=\the\catcode'\@}
4 \catcode'\@=11
5 \def\@gobble#1{}
6 \def\@firstoftwo#1#2{#1}
7 \def\@firstofthree#1#2#3{#1}
8 \def\@secondoftwo#1#2{#2}
9 \def\@ifnextchar#1#2#3{%
10 \def\next@{%
```

```

11   \ifx\char@#1\expandafter\@firstoftwo%
12   \else\expandafter\@secondoftwo\fi{#2}{#3}%
13   }%
14   \@ifn@i%
15 }
16 \def\@ifn@i{\futurelet\char@\@ifn@ii}
17 \def\@ifn@ii{%
18   \ifx\char@\@sptoken\expandafter\@ifn@i\else%
19   \expandafter\next@fi%
20 }
21 \def\@ifstar#1#2{%
22   \def\next@f%
23     \ifx\char@*\expandafter\@firstofthree%
24     \else\expandafter\@secondoftwo\fi{#1}{#2}%
25   }%
26   \futurelet\char@\next@%
27 }
28 \def\@namedef#1{\expandafter\def\csname#1\endcsname}
29 \def\PackageError#1#2#3{\errhelp{#3}\errmessage{#1 error: #2}\errhelp{}}
30 </plain>

```

## 2.2 Removing spaces

`\withoutspaces` Saying `\withoutspaces{<macro>}{<stuff>}` calls `<macro>`, passing it the argument which is `<stuff>`, shorn of (a) a single leading and/or space token, and (b) a single layer of `{...}` grouping, if present. This improves over `keyval`'s attempt by being a little simpler and only stripping off one layer of braces.

```

31 \def\q@delim{\q@delim}
32 \def\next@#1{%
33   \let\@sptoken=#1
34   \def\withoutspaces##1##2{%
35     \def\next@{##1}\futurelet\char@\wsp@ii##2%
36     \q@delim#1\q@delim\q@delim\relax%
37   }
38   \def\wsp@i{%
39     \ifx\char@\@sptoken\expandafter\wsp@ii%
40     \else\expandafter\wsp@iii\fi%
41   }
42   \def\wsp@ii#1{\wsp@iii}
43   \def\wsp@iii##1#1\q@delim##2\relax{\wsp@iv##1\q@delim\relax}
44   \def\wsp@iv##1\q@delim##2\relax{\next@{##1}}
45 } \next@{ }

```

`\withoutspacesdef` As a trivial but useful application of the above, `\withoutspacesdef{<name>}{<stuff>}` defines `<name>` as a macro containing `<stuff>` with a leading and trailing space deleted and a level of bracing removed.

```

46 \def\withoutspacesdef#1#2{\withspaces\toks@{#2}\edef#1{\the\toks@}}

```

## 2.3 Parsing key/value lists

`\mkparse` The main parser macro. Stash some information away and then start on the main loop.

```

47 \def\mkparse#1#2{%
48   \def\mk@group{#1}%
49   \def\mk@{mk$#1$}%
50   \mk@loop!#2,\q@delim,\relax%
51 }

```

And already the subtlety begins. Note that there's a leading '!' at the front of the token list. This prevents our delimited argument from being entirely brace-enclosed, which in turn stops T<sub>E</sub>X from removing it until we're good and ready.

This doesn't trap empty items – that happens later.

```

52 \def\mk@loop#1,{%
53   \expandafter\def\expandafter\next@\expandafter{\@gobble#1}%
54   \ifx\next@\q@delim\expandafter\mk@x%
55   \else\mk@i#1=\q@delim\expandafter\mk@loop\expandafter!\fi%
56 }
57 \def\mk@x#1\relax{\relax}

```

Now we have to split an entry into a key and a value. If we have  $\langle key \rangle = \langle value \rangle$  then  $\#1 = !\langle key \rangle$  and  $\#2 = \langle value \rangle$ ; if we have only  $\langle key \rangle$ , then  $\#1 = !\langle key \rangle$  as before, and  $\#2$  is empty. The first thing to do is strip the ! and spaces from  $\#1$ . If  $\#2$  is empty then we're done with this stage and can just call `\mk@k` with what we've got; otherwise we swap the trailing = on  $\#2$  for a leading ! and strip that off, and then call `\mk@kv` with the answer.

```

58 \def\mk@i#1=#2\q@delim{%
59   \expandafter\withoutspaces\expandafter%
60   \mk@ii\expandafter{\@gobble#1}{#2}%
61 }
62 \def\mk@ii#1#2{%
63   \ifx\q@delim#2\q@delim\mk@k{#1}%
64   \else\mk@iii{#1}!#2\q@delim\fi%
65 }
66 \def\mk@iii#1#2=\q@delim{%
67   \expandafter\withoutspaces\expandafter%
68   \mk@iv\expandafter{\@gobble#2}{#1}%
69 }
70 \def\mk@iv#1#2{\mk@kv{#2}{#1}}

```

We just have  $\langle key \rangle$ , shorn of spaces and outer braces. If it's empty then the whole entry was empty and we should ignore it. Otherwise, if there's a defined command for handling the token then we use that; if not, then we look for a general unknown-key command. If nothing works, we raise an error.

```

71 \def\mk@k#1{%
72   \ifx\q@delim#1\q@delim\else%
73     \expandafter\let\expandafter\next@\csname\mk@!#1\endcsname%
74     \ifx\next@\relax%
75       \expandafter\let\expandafter\next@\csname\mk@*\!#1\endcsname%
76       \ifx\next@\relax\mk@err{#1}%
77       \else\next@{#1}\fi%
78     \else\next@\fi%

```

```
79 \fi%
80 }
```

We have a *key* and a *value*, both stripped of spaces and braces. If there's a command for this key, then give it the value; otherwise look for a general unknown-key-with-value command. If nothing works, raise an error.

```
81 \def\mk@kv#1#2{%
82 \expandafter\let\expandafter\next@\csname\mk@=#1\endcsname%
83 \ifx\next@\relax%
84 \expandafter\let\expandafter\next@\csname\mk@*=\endcsname%
85 \ifx\next@\relax\mk@err{#1}%
86 \else\next@{#1}{#2}\fi%
87 \else\next@{#2}\fi%
88 }
```

How to raise an error. Not so difficult.

```
89 \def\mk@err#1{%
90 \PackageError{mdwkey}{Key ‘#1’ not found in group ‘\mk@group’}{%
91 I’ve never heard of the key you tried to set. I’m going to ignore it.
92 }
93 }
```

## 2.4 Defining keys

`\mkdefkey` This is all quite dull, really. I tried to merge the two cases, but it failed because I can't pass around macro parameter names through `\@ifnextchar` and their friends. If anyone has any bright ideas, I'd be delighted.

```
94 \def\mkdef{\@ifstar\mkdef@star@\mkdef@}
95 \def\mkdef@#1#2{%
96 \@ifstar%
97 {\mkdef@ii{#1}{#2}}%
98 {\@ifnextchar[%
99 {\mkdef@iii{#1}{#2}}%
100 {\mkdef@i{#1}{#2}}}%
101 }
102 \def\mkdef@i#1#2{\@namedef{mk$#1$=#2}##1}
103 \def\mkdef@ii#1#2{\@namedef{mk$#1$!#2}}
104 \def\mkdef@iii#1#2[#3]{%
105 \toks@{#3}%
106 \expandafter\edef\csname mk$#1$!#2\endcsname%
107 {\expandafter\noexpand\csname mk$#1$=#2\endcsname{\the\toks@}}%
108 \@namedef{mk$#1$=#2}##1%
109 }
110 \def\mkdef@star@#1{%
111 \@ifstar%
112 {\mkdef@star@ii{#1}}%
113 {\@ifnextchar[%
114 {\mkdef@star@iii{#1}}%
115 {\mkdef@star@i{#1}}}%
116 }
117 \def\mkdef@star@i#1{\@namedef{mk$#1$*}##1##2}
118 \def\mkdef@star@ii#1{\@namedef{mk$#1$*!}##1}
119 \def\mkdef@star@iii#1#2[#3]{%
```

```

120 \toks@{#2}%
121 \expandafter\edef\csname mk$#1$*!\endcsname##1%
122   {\expandafter\noexpand\csname mk$#1$*=\endcsname{##1}{\the\toks@}}%
123 \@namedef{mk$#1$*=\}##1##2%
124 }

```

And with that, we're done.

```

125 <+plain>\done
126 </package | macro>

```

Mark Wooding, 21 August 2003

# Appendix

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```

```
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