Graph35*
A LaTeX package to display keys and screen of (some) Casio calculators.

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Abstract

This package provides macros to display keys and menu items of some Casio calculators (including Graph25, Graph35, Graph75 and others…).

Foreword

My dear English readers, I am really sorry… I had my French colleagues in mind when I wrote this package, so, once in a while, the main documentation is written in French. The document you are reading now is only a translation, and I fear that my English translation is worse than what you would have read if I had written it directly in English. Sorry. And good luck reading this…

Contents

*This document corresponds to graph35 0.1.3, dated 2022-11-29. Home page, bug requests, etc. at http://framagit.org/spalax/graph35.

1 Introduction

This document introduces the graph35 package.

1.1 Licence

Further information can be found in the `.dtx` file used to build the `.sty` document and the main (French) documentation, available at http://ctan.org/pkg/graph35.

1.2 Summary

Section 2 covers installation instruction. Macros and package options are introduced in section 3. Some software developped together with this package are described in section 4. Appendixes A to D list available calculators, keys, menu items, and illustrates some options. This document does not include the implementation: it is available in the main (French) documentation.

2 Download and install

2.1 Gnu/Linux Distribution

If applicable, the easiest way to get graph35 working is by installing it by your distribution package. In Debian (and Ubuntu, and surely other distributions that inherit from Debian) it is packaged in `texlive-pictures` since version `2018.20180404-1`. So you can install it by running:

```
sudo apt install texlive-pictures
```

2.2 LaTeX distribution

This package is included both in TeXLive and MiKTeX. It can be installed by their respective package managers.

2.3 Manual install

- Download the archive:

  Stable version http://mirrors.ctan.org/graphics/graph35.zip

  Development version https://framagit.org/spalax/graph35/repository/archive.zip?ref=main

- Uncompress the archive.
- Compile the package : `latex graph35.ins`
- Move the several `.sty` files in a directory that is part of the LaTeX path.

3 Usage

3.1 Supported calculators

Case and keys The macros can display case and keys of the Graph35 calculator only (although it can have another name in another country).

Screen This package implements screen items of models Graph25, Graph35, Graph75, fx-9860Gii, fx-9750Gii, and others.

3.2 Package options

This package has a single `color` option, which is set to `color=real` by default.

This option accepts two values: `real` and `blackandwhite`, defining the default key and case color. See next section for more details.

Moreover, this is not, strictly speaking, a package option, but it is possible, to make compilation faster, to add the following line before loading this package.

```
1 \PassOptionsToPackage{draft}{pixelart0}
```

This line will disable pixelart images (mainly the `\function` macros, see part C.2). Indeed, having a lot of those macros can make compilation very long, and adding this line can make it faster[1].

3.3 Colors

3.3.1 Preset colors

You can chose the case and key colors from preset profiles, or customize them. Those preset profiles are:

real Realistic colors, but can be hard to read when printed in black and white.

[1] For instance, on my computer, adding this line to this files make compiling thirty times faster, from eight minutes to sixteen seconds.

blackandwhite Black and white, hight contrast, that will be easier to read when printed.

3.3.2 Color choice

There are several ways to set colors.

- Package argument `color` defines the default color to use (which can be later overloaded using option `color` of the macros). For instance, to make all drawing black and white, load the package using the following line.

```
\usepackage[color=blackandwhite]{graph35}
```

  By default, realistic color are used (`color=real`).

- Option `color` of macros `\key` and `\calculator` can have an additional value `default`. Using this explicitely uses the default color defined while loading the package.

`\setgraphcolor`

- At last, default color can be redefined at any time using macro `\setgraphcolor{`⟨*color*⟩`}`. For instance, if the package was loaded with option `color=blackandwhite`, use `\setgraphcolor{real}` to use the `real` colors by default.

3.3.3 Custom colors

Arbitrary colors can also be used, by defining the following colors.

`graph35ACON` : Key `ACON`.

`graph35ACONBORDER` : Border of key `ACON`.

`graph35ALPHA` : Key `ALPHA`.

`graph35ALPHABORDER` : Border of key `ALPHA`.

`graph35SHIFT` : Key `SHIFT`.

`graph35SHIFTBORDER` : Border of key `SHIFT`.

`graph35SCREEN` : Screen pixels.

`graph35SCREENBG` : Screen background.

`graph35CASE` : Case.

`graph35CASEBORDER` : Case border.

`graph35EXE` : Key `EXE`.

`graph35EXEBORDER` : Border of key `EXE`.

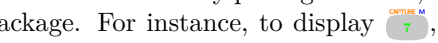
`graph35NUMBER` : Number keys.

`graph35NUMBERBORDER` : Border of number keys.

`graph35KEYTEXT` : Text on keys.

`graph35ALPHATEXT` : Text *alpha* above keys.

`graph35SHIFTTEXT` : Text *shift* above keys.

Those colors are color names as defined by package `xcolor`, and can be defined using macros from this package. For instance, to display  , use the following code:

```
\colorlet{graph35KEYTEXT}{green}
\colorlet{graph35SHIFTTEXT}{orange}
\definecolor{graph35ALPHATEXT}{RGB}{0, 0, 255}
\definecolor{graph35NUMBER}{RGB}{200, 200, 200}
\colorlet{graph35NUMBERBORDER}{graph35NUMBER}

\key[shift, alpha]{7}
```

3.4 Calculators

`\calculator` Right now, only one model is available: GRAPH35+.
Syntax is: `\calculator[`⟨*color, scale*⟩`]{`⟨*model*⟩`}`.

- `{`⟨*model*⟩`}` The list of available models is available in appendix A (page 9).
- `[`⟨*color*⟩`]` Change calculator colors (see previous part 3.3).
- `[`⟨*scale*⟩`]` Change calculator scale. The drawing you get might not be what you expect: see part 3.7 for more information.

For instance, command `\calculator[color=real]{graph35+E}` displays a calculator ten times bigger than the following calculator (scaled down here for readability; a bigger version is displayed in appendix A, page 9).

`\tikzcalculator` One can include a calculator in a Ti*k*Z drawing, using command `\tikzcalculator{`⟨*model*⟩`}`. This command takes a single argument `{`⟨*model*⟩`}`, and displays a calculator around coordinates (0; 0). To draw a calculator elsewhere, or with another scale, use the `scope` environment, as in the following example.

```
\begin{tikzpicture}
  \begin{scope}[shift={(1, 2)}, scale=.5]
    \tikzcalculator{graph35+E}
  \end{scope}
\end{tikzpicture}
```

Anchors are defined for each keys, case borders, and screen, to be used within your Ti*k*Zfigures. See appendix B for more information.

3.5 Keys

`\key` To draw a calculator key, use:

`\key[`⟨*color, prefix, suffix, scale, shift, alpha*⟩`]{`⟨*key*⟩`}`.

For instance, `\key[color=blackandwhite]{DEL}` displays DEL while `\key[shift, alpha]{DEL}` displays INS UNDO DEL.

Arguments are:

- `{`⟨*key*⟩`}` Key name to display (for instance `1` for 1, and `EXE` for EXE). Key name is more or less what is displayed on it. Key names are available as a list in appendix D.1, or as a calculator with captions in figure 6.
- `[`⟨*color, scale*⟩`]` Scale and color of key. Those options have the same syntax and limitations as options of command `calculator` (see section 3.3 for colors, and 3.7 for scale).
- `[`⟨*shift, alpha*⟩`]` Those options enable or disable yellow and red text describing the key meaning when pressed after the SHIFT or ALPHA keys. By default, those texts are hidden (equivalent to `shift=false, alpha=false`) ; to enable the, use `shift=true` and `alpha=true` or `shift` and `alpha`.
- `[`⟨*prefix, suffix*⟩`]` For each key, anchors are defined, allowing references to the key in Ti*k*Z pictures (for instance, they are used to draw figure 6, page 30). By default, anchor names are `key` followed by the key name (for instance `keyDEL` for the `DEL` key). The `prefix` and `suffix` options make the anchor names customizable (as used in the following pictures). With those options, two keys can have different anchors on the same figure, making it possible to use each of those keys. Those options also define anchor names for `SHIFT` et `ALPHA` texts.

Without options : anchors `keyDEL`, `keyDELshift`, `keyDELalpha`.

With options `prefix=foo, suffix=bar` : anchors `fooDELbar`, `fooDELbarshift`, `fooDELbaralpha`.

The anchor names are listed in appendixes B.1 and B.2.

- Peeking at the source code, you may see that more options are used. Those options are not described here because they are not meant to be used by final users, and might change in a later version without notice.

`\tikzkey` As with `\calculator` and `\tikzcalculator`, macro `\tikzkey` does the same as `\key`, excepted that it is meant to be called from within a Ti*k*Z environment. Its syntax is:

`\tikzkey[`⟨*options*⟩`]{`⟨*key*⟩`}{`⟨*coordinates*⟩`}`

Its arguments are

- `[`⟨*options*⟩`]`: same options as macro `\key` ;
- `{`⟨*key*⟩`}`: name of the key ;
- `{`⟨*coordinates*⟩`}`: coordinates the key is drawn around.

3.6 Screen

Three macros can be used to draw parts of the screen: menu items, captions of function keys, battery level.

3.6.1 Menu

`\menu` Macro `\menu{`⟨*icon*⟩`}{`⟨*shortcut*⟩`}` draws an icon from the main menu. For instance, `\menu{RUNMAT}{A}` displays  . Shortcut (the character at the bottom right corner of the item) is independant from the icon, because depending of the calculator model or its version, it can change.

Appendix C.1 is a list of every menu icon and shortcut.

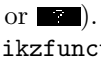
`\tikzmenu` The `\tikzmenu` macro draws a menu item in a Ti*k*Z environment. Its syntax is:

`\tikzmenu[`⟨*options*⟩`]{`⟨*icon*⟩`}{`⟨*shortcut*⟩`}{`⟨*coordinates*⟩`}`

Its arguments are:

- `{`⟨*icon*⟩`}` and `{`⟨*shortcut*⟩`}`: same meaning as the corresponding `\menu` options;
- `{`⟨*coordinates*⟩`}`: coordinates of the top-left corner of the menu item;
- `[`⟨*options*⟩`]`: some options, that are passed as-is to the `\bwpixelart` macro (from the `pixelart0` package). They can be used to change the scale and color of the drawing (for instance `scale=.5, color=red`).

3.6.2 Functions

`\function` The `\function{`⟨*function*⟩`}` macro displays the caption of the keys  to (for instance  or ). Available pixel-arts are listed in appendix C.2.

`\tikzfunction` Macro `\tikzfunction[`⟨*options*⟩`]{`⟨*function*⟩`}{`⟨*coordinates*⟩`}` is the same as `\function`, but from within a Ti*k*Z environment. The `{`⟨*function*⟩`}` argument is the same as for macro `\function`; see macro `\tikzmenu` for the meaning of arguments `[`⟨*options*⟩`]` and `{`⟨*coordinates*⟩`}`.

3.6.3 Battery

`\battery` Macro `\battery{`⟨*state*⟩`}` displays the state of charge of the battery (for instance ). Available pixel-arts (and arguments) are listed in appendix C.3.

`\tikzbattery` Macro `\tikzbattery[`⟨*options*⟩`]{`⟨*state*⟩`}{`⟨*coordinates*⟩`}` is identical to macro `\battery`, but from within a Ti*k*Z environment. Its `{`⟨*state*⟩`}` argument is the same as for `\battery`; see macro `\tikzmenu` for the meaning of arguments `[`⟨*options*⟩`]` and `{`⟨*coordinates*⟩`}`.

3.7 Scaling

Option `scale` used to set size of calculators and keys does not change line width or border radius. The unexpected result is the following drawing of a calculator at a $^1/_{10}$ scale: the case border (green) is too big, and the screen is almost an ellipsis (among other flaws).

.

There are several solutions to fix this, but none of them is perfect, which is why they are not implemented.

- Get used to those flaws. Indeed, for small scale changes, they are barely noticable.
- Embed the drawing in a `\scalebox` or `\resizebox` macro: command `\resizebox{.1}{\calculator{graph35+E}}` gives the following drawing.

- Use option `transform canvas` from the `pgf` package (for instance: `\begin{tikzpicture}[scale=`. Line width and border radius will be correctly scaled, but the bounding box will not be changed, neither will be the coordinates (thus anchors will be useless).

At last, when including drawings in a `tikzpicture` environment using the `scale` option, do not forget to add option `tranrsform shape`, so that bounding box is also changed.

4 Binaries

A few Python3 software are maintained together with this LaTeX package. They are not distributed with it, so they have to be downloaded directly from the code repository. They are specialized enough to share this package repository, but if you were to use them for something else, good for you!

Most of those handle `.pxl` files. This is a custom file format, coding a pixel-art picture as lines of `0`s and `1`s. Each menu, battery, function icon is stored as one of those files, and converted to LaTeX code before being included in this package.

`catpxl` Display a `.pxl` file to the terminal.

`completefunctionchars` Each function icon has its readable characters associated to it (it is used in appendix C.2). This software look for function icons without such characters, and asks user for them.

`erate.keys` and `generate.pixelart` Generate the LaTeX files generating the pixel-art and keys, from the source files in this repository.

`screenshot2pixelart` Parse a calculator screenshot to find new function and menu icons.

Figure 1: Calculator `graph35+E`.

A Calculators

Here is the list of available calculators, together with their keyword (used as argument for macros `\calculator` and `\tikzcalculator`).

- `graph35+E`: figure 1.

B Anchors

Anchors of keys, shift and alpha texts, screen, etc.

B.1 Anchors of keys

Each key defines the anchors shown in figure 2.

B.2 Anchors of key `REPLAY`

The `REPLAY` key defines some additionnal anchors, for each of its arrows. They are illustrated in figure 3.

B.3 Screen anchors

Anchors of the screen are illustrated in figure 4.

B.4 Case anchors

Anchors of the case are illustrated in figure 5.

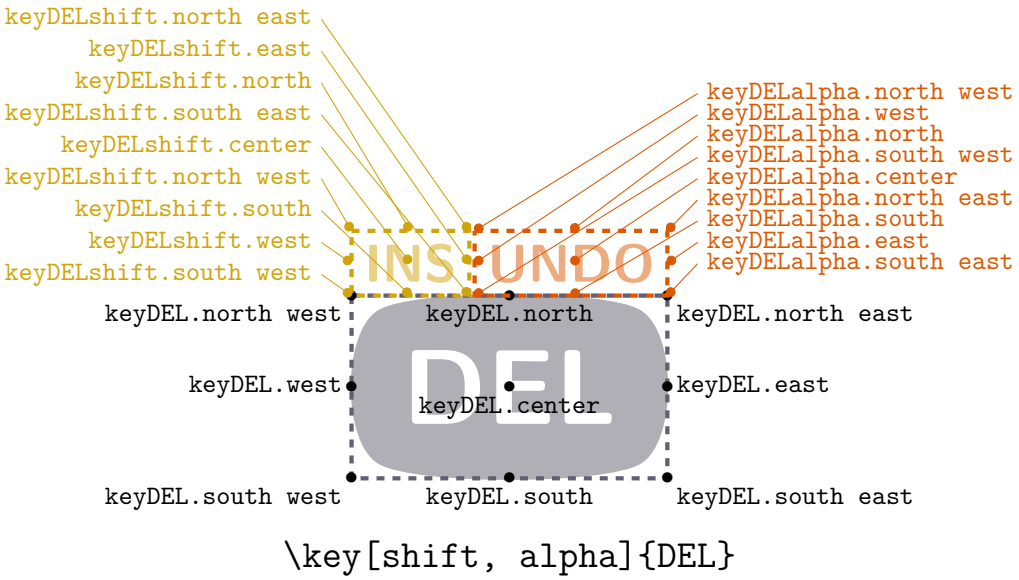


Figure 2: Key anchors

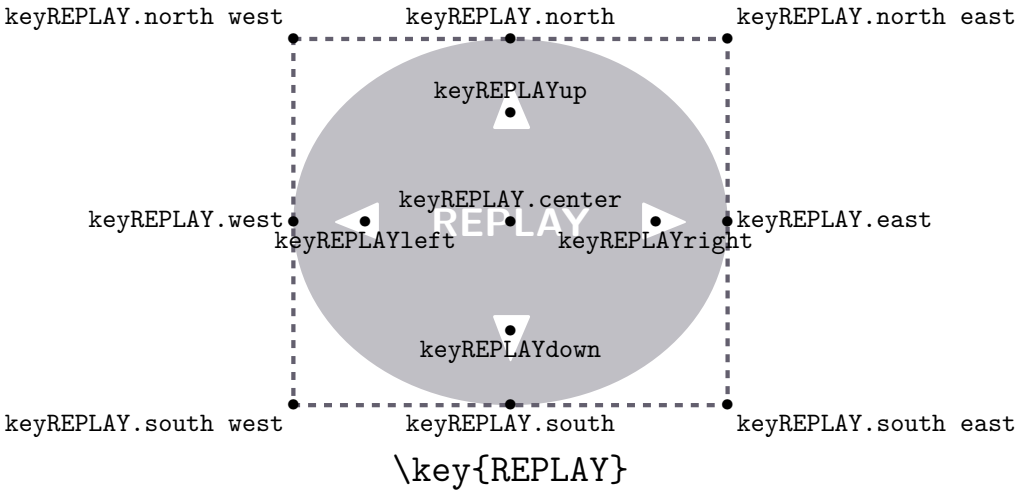


Figure 3: `REPLAY` key anchors

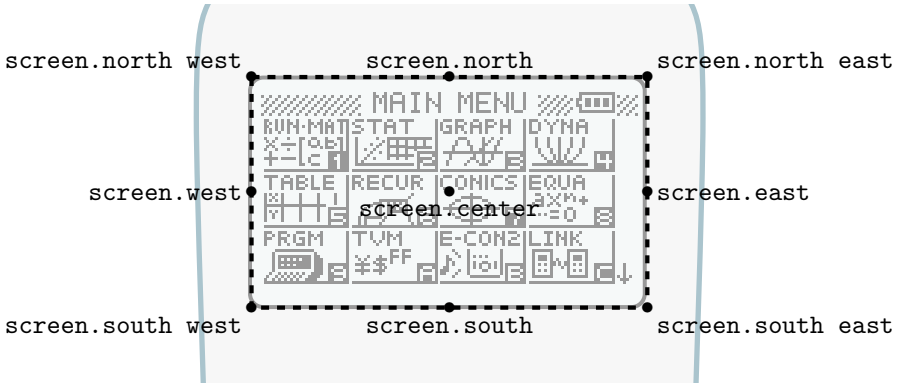


Figure 4: Screen anchors

C Pixel art

C.1 Menu

Two special icons and shortcuts are available: `black`, which produces a black pixel-art; and `blank`, which produces nothing.

C.1.1 Icons

- \menu{black}{black}
- \menu{blank}{black}
- \menu{CONICS}{black}
- \menu{DYNA}{black}
- \menu{eACT}{black}
- \menu{ECON2}{black}
- \menu{eCON3}{black}
- \menu{EQUA}{black}
- \menu{GEOM}{black}
- \menu{GRAPH}{black}
- \menu{LINK}{black}
- \menu{MEMORY}{black}
- \menu{PRGM}{black}
- \menu{RECUR}{black}
- \menu{RUN}{black}
- \menu{RUNMAT}{black}
- \menu{SSHT}{black}
- \menu{STAT}{black}
- \menu{SYSTEM}{black}
- \menu{TABLE}{black}
- \menu{TVM}{black}

C.1.2 Shortcuts

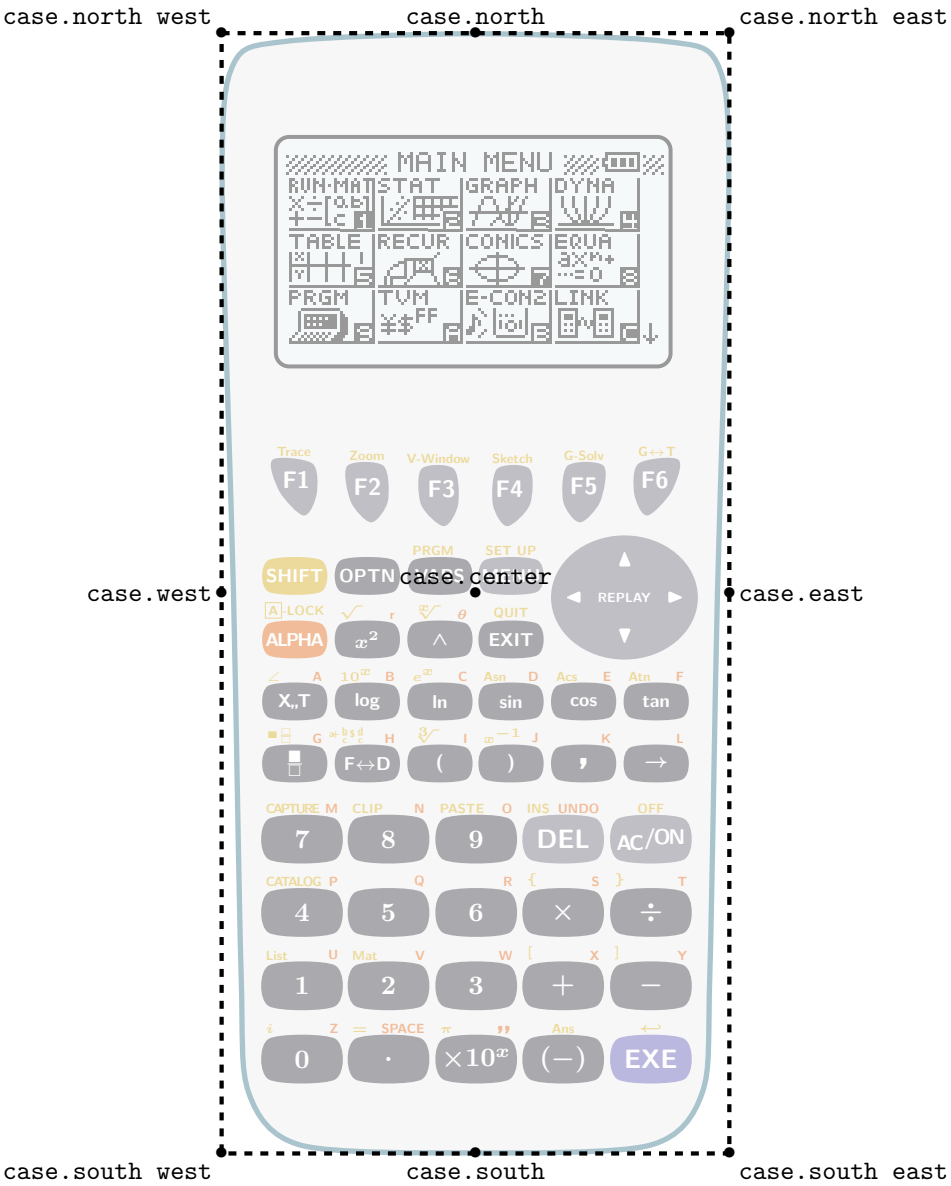


Figure 5: Case anchors

-  \menu{black}{1}
-  \menu{black}{2}
-  \menu{black}{3}
-  \menu{black}{4}
-  \menu{black}{5}
-  \menu{black}{6}
-  \menu{black}{7}
-  \menu{black}{8}
-  \menu{black}{9}
-  \menu{black}{A}
-  \menu{black}{B}
-  \menu{black}{black}
-  \menu{black}{blank}
-  \menu{black}{C}
-  \menu{black}{D}
-  \menu{black}{E}
-  \menu{black}{F}
-  \menu{black}{G}
-  \menu{black}{H}

C.2 Functions

Available pixel arts are sorted according to the visible characters (latin letters and figures). To find the keyword corresponding to the picture you want, look at its visible characters, and find your picture in the corresponding part of this index.

For example, no character is visible on  or (indeed, letters of are greek letters, not latin ones); on , letters `acn` are visible; on  , only the letter `r` is visible; and so on.

Empty

 battery

blank

 colon-b

 contrast-b

 degree-b

 Delta-b

 different

 different-b

 dms

 dms-b

 dollar-b

 doublequote-b

 doublerightarrow-b

 equal-b

 geq-b

 GREEK

 greek

 gt

 gt-b

 key

 leq-b

 lt

 lt-b

 micro-b

 next

 nextb

 output-b

 percent-b

 period-b

 question-b

 quote-b

 rightarrow

 Sigma-b

 square-b

 style1

 style2

 style3

 style4

 style5

 style6

 style7

 tilde-b

1

 1

10

10

100

100

1p

1P

1s

1S

1var

1VAR

1VAR-b

2

2

2-b

200

200

21

2x1

22

2x2

2p

2P

2s

2S

2var

2VAR

2VAR-b

2way

2WAY

3

3-b

31

3x1

33

3x3

38k

to38k

3pin

3PIN

4

4-b

5

5-b

6

6-b

60

60

7400

7400

9850

9850

9860

9860

a

a-b

a0

a0

a0-b

a1

a1

a1-b

a2

a2-b

aa

Aa

ab

ab

Sab

abc

ABC

abdf

ABdf-b

abi

tcomplexalgebraic-b

abs

Abs-b

abt

ABT

abx

aplusbx

aplusbx-b

atimesbx

atimesbx-b

ac

ac

Sac

acn

Sacn-b

add

ADD


ADD-b

adf


Adf-b

adv


ADV-b

aebx


aebx


aebx-b

all

ALL


ALL-b

alway


Alway

amt


AMT-b

an

an


an-b

San


San-b

an1

an1


an1-b


an1-b2


San1-b

an2

an2


an2-b


San2-b

ancn


ancn-b

and

And-b

angl

ANGL-b

anov


ANOV

anpl

anPl-b

anst


anSt-b

apl

SaPl-b

app

APP-b

apr

APR-b


tAPR

area

AREA-b

arg


Arg-b

as

AandS-b

asgn


ASGN

aug


Aug-b

auto

AUTO

Auto


Auto-2

Auto-b

axb


axplusb

axplusb-b

b

b-b

b0

b0-b

b1

b1-b

b2

b2-b

bal

BAL

BAL-b

bar

Bar-b

base

BASE

bc

bc

Sbc

bcd

Bcd

bdf

Bdf-b

bin


BIN-b


Bin-b

binm


BINM-b

bkup


BKVP-b

bn


bn-b


Sbn-b

bn1


bn1-b


Sbn1-b

bn2


bn2-b


Sbn2-b

bnst


bnSt-b

bond


BOND-b

bot


BOTbottom


BOTright

box


BOX


Box-b

bpd


Bpd

brk


Brk-b

brkn


Brkn-b

btm


BTM

c


c-b

c0


C0-b

c1


C1-b

c2


C2-b

cabl


CABL-b

calb


CALB-b

calc


CALC


CALC-b

calib


CALIB

capa


CAPA-b

capt


capt


CAPT-b

cash


CASH-b

casio


CASIO-b

ccd


Ccd

cel

CEL-b

cell

CELL

ch1

CH1

char


CHAR-b

chg


Chg-b

chi


CHI


CHI-b

Chi-b

chng

CHNG

close

Close-b

clr


CLR


CLR-b

cls


cls


Cls-b

cma

CMA-b

cmp


Cmp-b

cmpd

 CMPD-b

cmpr

 CMPR-b

cn

 cn-b

 Scn-b

cn1

 cn1-b

 Scn1-b

cn2

 cn2-b

 Scn2-b

cnst

 CnSt-b

cnt

 cnt

cnvt

 CNVT-b

col

 COL

 COL-b

com

 COM-b

conj

 Conj-b

conv

 CONV-b

copy

 COPY

 COPY-b

cosh

 cosh-b

cosh1

 cosh1-b

cost

 COST

 COST-b

 Cost-b

cpd

 Cpd

cplx

 CPLX-b

crcl

 Crcl

 Crcl-b

crnt

 CRNT-b

cstm

 CSTM-b

ctgy

 CTGY-b

ctl

 CTL-b

cuml

 Cuml-b

cut

 CUT

cy

 CY-b

d

 d-b

d2dt2

 d2dt2

d2dx2

 d2dx2-b

data

 DATA-b

 Data-b

 percentDATA-b

days

 DAYS-b

db

 DB

ddt

 ddt

ddx

 ddx-b

defg

 DefG-b

del

 DEL

 DEL-b

dela

 DELA-b

dell

 DELL-b

depr

DEPR DEPR-b

det

Det Det-b

df

df df-b

diff

diff diff

dim

DIM DIM-b

Dim Dim-b

disp

DISP DISP-b

dist

DIST DIST-b

dld

dlminusD dlminusD

dlplusD dlplusD

dms

tDMS tDMS-b

do

Do Do-b

dot

dot dot-b

draw

DRAW DRAW

DRAW DRAW-b

drwc

DrwC DrwC-b

drwf

DrwF DrwF-b

drwn

DrwN DrwN-b

drwt

Drwt Drwt-b

dsz

Dsz Dsz-b

dx

Idx Idx

Idx Idx-b

dyna

DYNA DYNA-b

Dyna Dyna-b

e

e e-b

E Exa-b

edf

Edf Edf-b

edit

EDIT EDIT

EDIT EDIT-b

eff

EFF EFF-b

tEFF tEFF

else

Else Else-b

end

End End-b

eng

ENG ENGshiftleft

ENG ENGshiftright

engy

ENGY ENGY-b

entr

ENTR ENTR-b

equa

EQUA EQUA-b

es

EtS EtS-b

esym

ESYM ESYM-b

exam

EXAM EXAM-b

exe

EXE EXE

exit

EXIT EXIT

EXIT EXIT-b

exp

Exp Exp

EXP EXP-b

Exp Exp-b

Exp Exp-b2

extd

Extd Extd

f

F F

F F-b

F F-b2

f femto-b

fa


Fa-b

fab


Fab-b

fact


FACT-b


Fact-b

fast


Fast

fb


Fb-b

fcd


Fcd

file


FILE-b

fill


FILL-b


Fill-b

fline


FLine


FLine-b

fmax


FMax-b

fmin


FMin-b

for


For-b

forc


FORC-b

form


FORM


FORM-b

fp


FP


FP-b

fpd


Fpd

frac


Frac-b

ftbl


FTbl-b

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FULL

furie

Furie

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FV


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Gcd

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GPH2

GPH2-b

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GPH3

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GRAB

grph

GRPH

GRPH-b

Grph-b

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Ipercent

Ipercent-b

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Iden-b

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IEnd-b

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INPT-b

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INT-b

Int-b

Intdiv-b

SINT

SINT-b

intg

INTG

Intg-b

intr

INTR-b

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Inv

Inv-b

invb

InvB

invc

InvC

invf

InvF

invg

InvG

invh

InvH

invn

InvN

invp

InvP

invt

Invt

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IRR

IRR-b

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ISCT

isz

Isz-b

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Join-b

jump

JUMP-b

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LANG-b

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Lbl Lbl-b

lcm

LCM LCM-b

lcte

Lcte Lcte-b

left

Left Left-b

len

Len Len-b

leng

LENG LENG-b

Leng Leng-b

lgst

Lgst Lgst

Lgst Lgst-b

line

Line Line

LINE LINE-b

Line Line-b

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List List

LIST LIST-b

List List-b

tLST tLIST-b

lm

LtoM LtoM-b

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LMEM LMEM-b

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Log Log-b

logab

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LOGIC LOGIC-b

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LpW LpW-b

lwr

Lwr Lwr-b

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M Mega-b

m milli-b

main

MAIN MAIN-b

man

Man Man

mark

MARK MARK-b

mass

MASS MASS-b

mat

MAT MAT-b

Mat Mat-b

tMAT tMAT-b

math

MATH MATH

Math Math

MATH MATH-b

max

MAX MAX

Max Max-b

max max-b

maxx

maxX maxX-b

maxy

maxY maxY-b

mean

Mean Mean-b

med

Med Med

Med Med-b

mem

Mem Mem

MEM MEM-b

memo

MEMO MEMO

menu

MENU MENU-b

Menu Menu-b

mid

Mid Mid-b

min

MIN MIN

Min Min-b

min min-b

minx

minX minX-b

miny

minY minY-b

mkf

MKF MKF-b

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MLTI MLTI

mn

mxn mxn-b

mod

MOD MOD-b

Mod Mod-b

mode

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MODE MODExp-b

move

MOVE MOVE

mrg

MRG MRG

Mrg Mrg-b

ms

MandS MandS-b

msa

MSa MSa-b

msab

MSab MSab-b

msb

Msb Msb-b

mse

Mse Mse-b

mv

MV MV

n

n n

n n-b

nano nano-b

n1

n1 n1-b

n2

n2 n2-b

name

NAME NAME-b

nan

Nan Nan-b

ncd

Ncd Ncd

ncr

nCr nCr-b

ndis

NDis NDis-b

new

NEW NEW-b

next

Next Next-b

nfv

NFV NFV

NFV NFV-b

no

NO NO

none

None None

None None-b

norm

Norm Norm

NORM NORM-b

Norm Norm-b

not

Not Not-b

npd

Npd Npd

npp

NPP NPP-b

npr

nPr nPr-b

npv

NPV NPV

NPV NPV-b

num

NUM NUM-b

off

Off Off

Off Off-b

on

On On

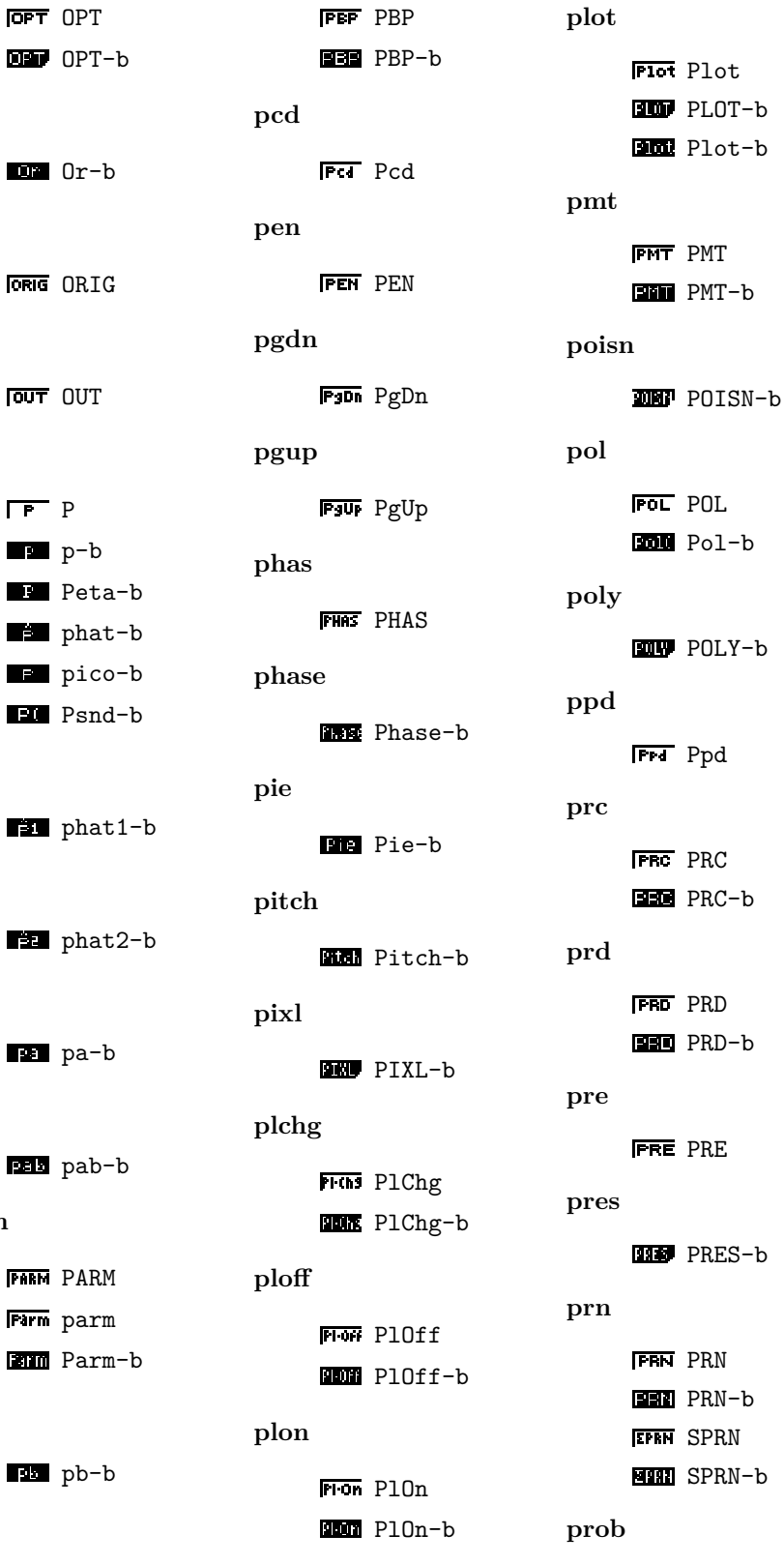
On On-b

open

OPEN OPEN-b

Open Open-b

opt


OPT OPT
OPT OPT-b
or
Or Or-b
orig
ORIG ORIG
out
OUT OUT
p
P P
p p-b
Peta-b
phat-b
pico-b
Psnd-b
p1
phat1-b
p2
phat2-b
pa
pa pa-b
pab
pab pab-b
parm
PARM PARM
Parm parm
Parm Parm-b
pb
pb pb-b
pbp
PBP PBP
PBP PBP-b
pcd
Pcd Pcd
pen
PEN PEN
pgdn
PgDn PgDn
pgup
PgUp PgUp
phas
PHAS PHAS
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Phase Phase-b
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Pie Pie-b
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Pitch Pitch-b
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PIXL PIXL-b
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PlChg PlChg
PlChg PlChg-b
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PlOff PlOff-b
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PlOn PlOn
PlOn PlOn-b
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Plot Plot-b
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PMT PMT
PMT PMT-b
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POISN POISN-b
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POL POL
Pol Pol-b
poly
POLY POLY-b
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Ppd Ppd
prc
PRC PRC
PRC PRC-b
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PRD PRD
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PRE PRE
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PRN PRN
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q3

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 Rsnd-b

 tcomplexpolar-b

r2

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r38k

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ran

 Ran-b

rand

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rang

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rcl

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rdel

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rec

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recr

 RECR-b

rect

 RECT

recv

 RECV

 Recv

 Recv-b

ref

 Ref-b

reg

 REG

 REG-b

rel

 REL-b

ren

 REN-b

rep

 Rep-b

rept

 REPT

reslt

 RESLT-b

 Reslt-b

right

 Right-b

rmdr

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rnd

 RND

 Rnd-b

rndfi

 RndFi-b

rnf

RNF RNF-b

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rot

Rot Rot-b

row

ROW ROW
ROW ROW-b

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Rref Rref-b

rset

RSET RSET-b

rt

R-T RT
R-TH RTtheta-b

rtbl

RTbl RTbl-b

rtrn

Rtrn Rtrn-b

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RUN RUN

rw

Rw+ Rwplus

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R-Y RY-b

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scat

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SDev SDev-b

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se se-b

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SELS SELS-b

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shift

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SIML SIML-b

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SL SL

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smpl

SMPL SMPL-b

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 Solve

solvn

 SolvN-b

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sqr

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 Src-b

srta

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 STAT-b

 Stat-b

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 STO-b

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 Stop-b

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 STRP-b

strt

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stup

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styl

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 Sum-b

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sx2

 sx2-b

sy

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t

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 TABL

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Test-b

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tlow

tLow-b

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TOPleft

TOPtop

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tpd

tran

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TRAN-b

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Vert

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vrnr

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vwin

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wake

WAKE-b

web

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wend

WEnd-b

whle

Whle-b

wiz

WIZ-b

x

factorialx-b

sigmax-b

 Sx-b

 txequal

 txgeq

 txgt

 txleq

 txlt

 x

 X-b

 x-b

 X-b2

 X-b3

 xbar-b

 xequal

 xequal-b

 xgeq-b

 xgt-b

 xhat-b

 xleq-b

 xlt-b

x1

 x1-b

 xbar1-b

x1inv

 x1Inv-b

x2

 Sx2-b

 X2

 x2

 x2-b

 xbar2-b

 xpower2-b

x2inv

 x2Inv-b

x3

 X3

 x3

 x3-b

 xpower3-b

x4

 X4

 x4

 xpower4-b

xcal

 XCAL

xfct

 Xfct-b

xinv

 xInv-b

xor

 Xor-b

xrw

 XRw

 XRwplus

xt

 Xt-b

xy

 Sxy-b

 xy-b

y

 sigmay-b

 Sy-b

 tYequal

 tYgeq

 tYgt

 tYleq

 tYlt

 Y

 Y-b

 Y-b2

 ybar-b

 Yequal

 Yequal-b

 Ygeq-b

 Ygt-b

 yhat-b

 Yleq-b

 Ylt-b

y1

 y1-b

y2

 Sy2-b

 y2-b

y3

 y3-b

ycal

 YCAL

yes

 YES

yfct

 Yfct-b

yicpt

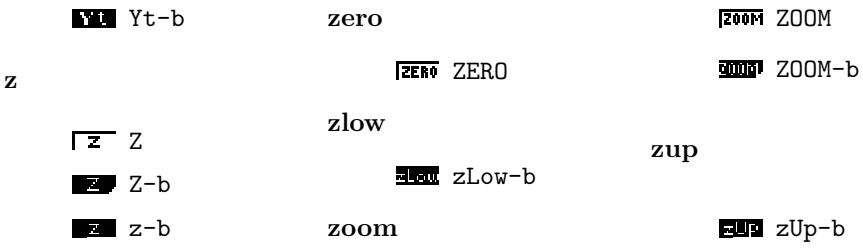
 YICPT

yld

 YLD

 YLD-b

yt



C.3 Battery

List of status of battery charge.

- \battery{empty}
- \battery{low}
- \battery{high}
- \battery{medium}

D Keys

D.1 List of keys

Sorting order is arbitrary. To find them on a calculator, see figure 6.

- \key{ACON}
- \key{DEL}
- \key{ALPHA}
- \key{EXE}
- \key{F5}
- \key{F4}
- \key{F1}
- \key{F6}
- \key{F3}
- \key{F2}
- \key{MENU}
- \key{EXIT}
- \key{FD}
- \key{OPTN}
- \key{VARS}
- \key{XthetaT}
- \key{closeparen}
- \key{comma}
- \key{cos}
- \key{fraction}
- \key{ln}
- \key{log}
- \key{openparen}
- \key{power}
- \key{rightarrow}
- \key{sin}
- \key{square}
- \key{tan}
- \key{1}
- \key{10}
- \key{2}
- \key{3}
- \key{4}
- \key{5}
- \key{6}
- \key{7}
- \key{8}
- \key{9}
- \key{divide}
- \key{dot}
- \key{minus}
- \key{opposite}
- \key{plus}
- \key{times}
- \key{zero}
- \key{REPLAY}
- \key{SHIFT}

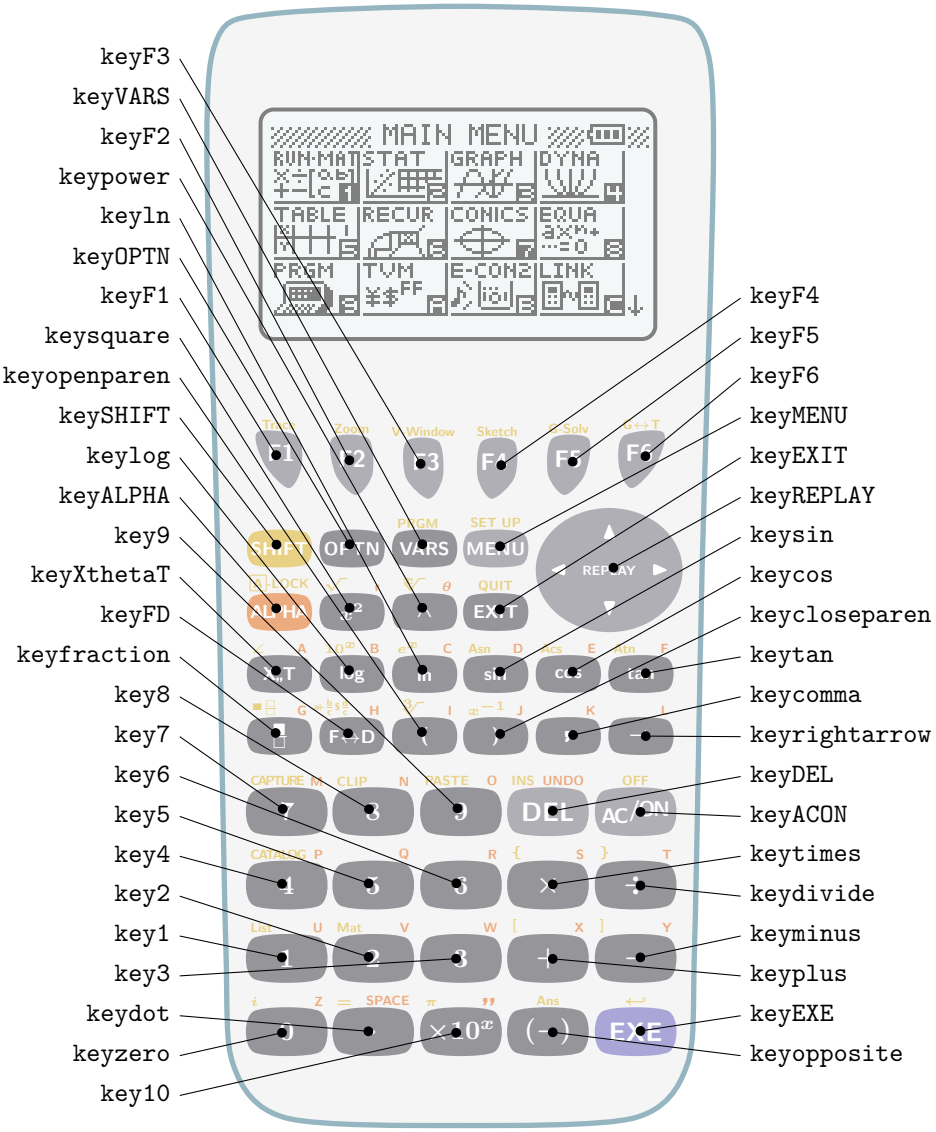


Figure 6: Keywords of keys

List of Figures