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` 0.1.1, dated 2018-04-18. 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=master`

- 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.

```
\PassOptionsToPackage{draft}{pixelart}
```

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.

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.

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

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 10).
- `[`⟨*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 10).

`\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 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 32). 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 `pixelart` 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).

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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=.1`
  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.

`enerate.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.

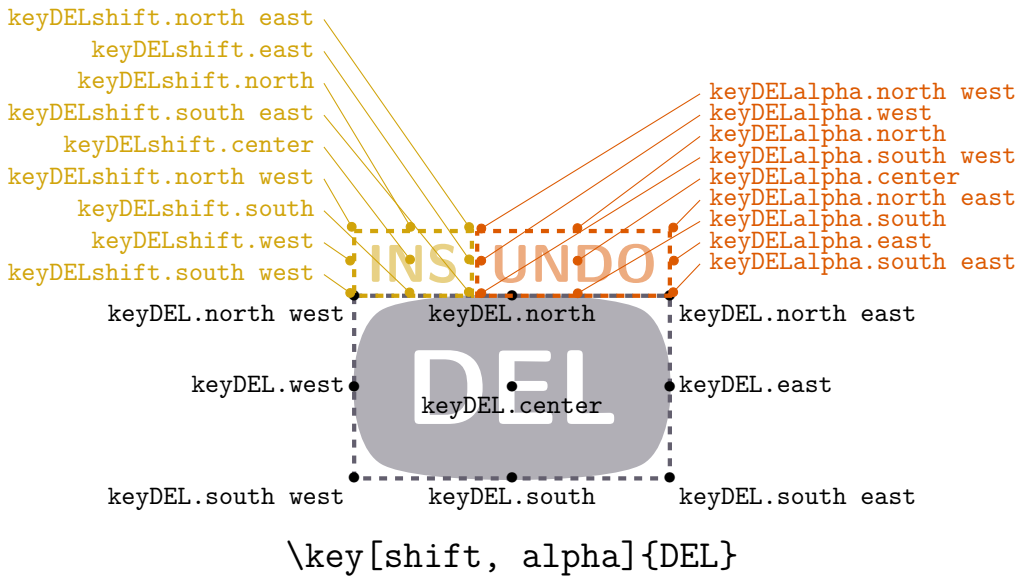


Figure 2: Key anchors

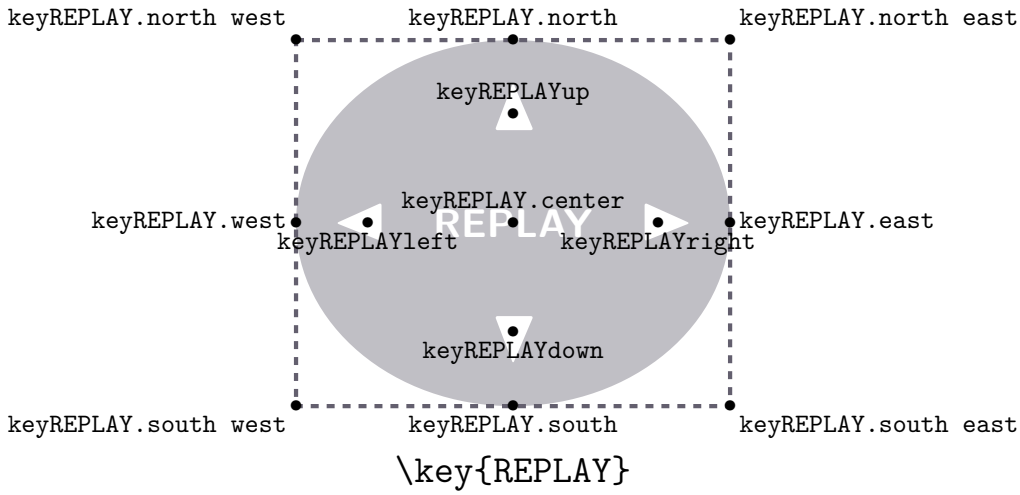


Figure 3: `REPLAY` key anchors

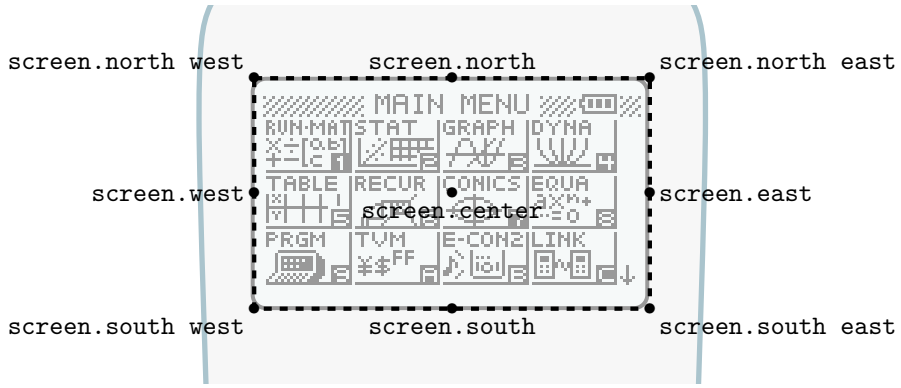


Figure 4: Screen anchors

B.4 Case anchors

Anchors of the case are illustrated in figure 5.

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}

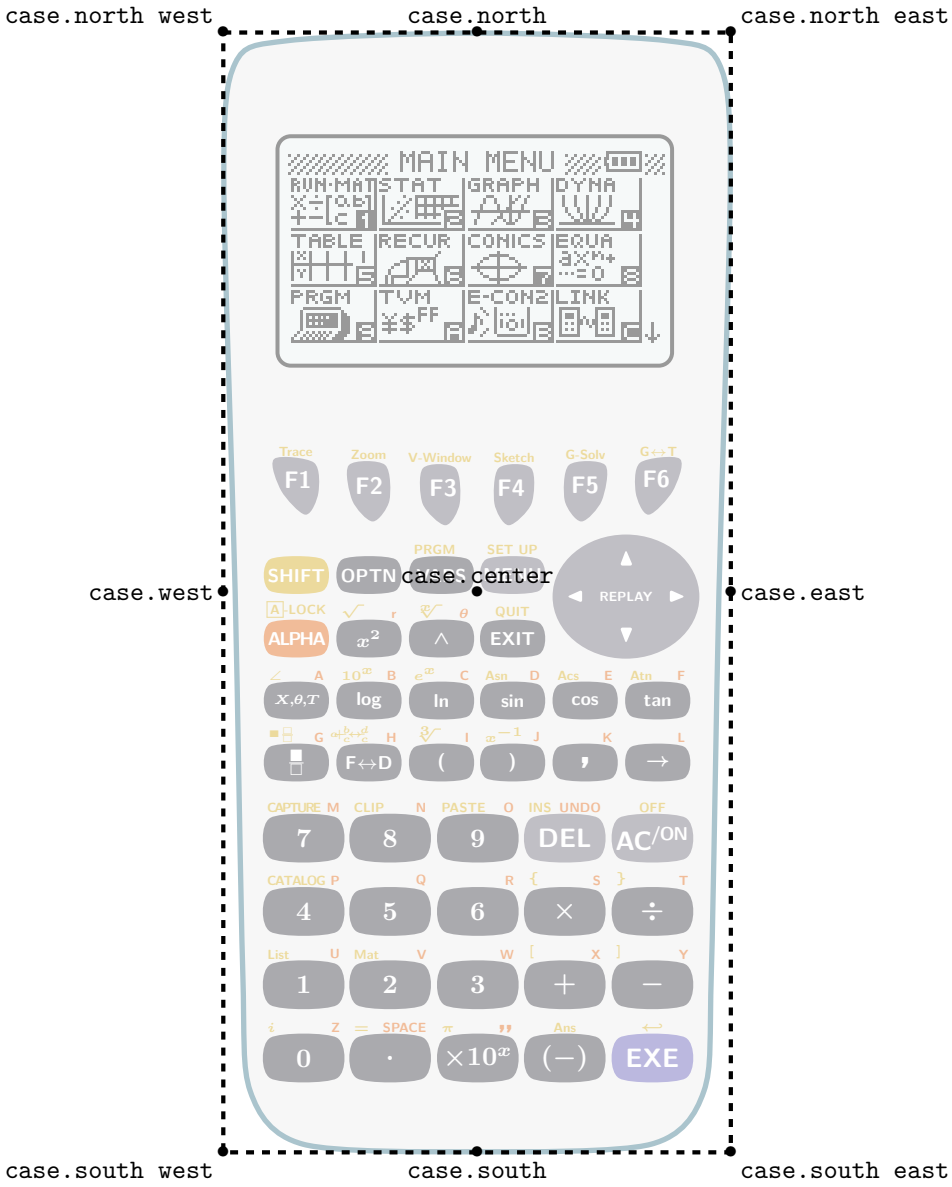


Figure 5: Case anchors

-  \menu{SYSTEM}{black}
-  \menu{TABLE}{black}
-  \menu{TVM}{black}

C.1.2 Shortcuts

-  \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

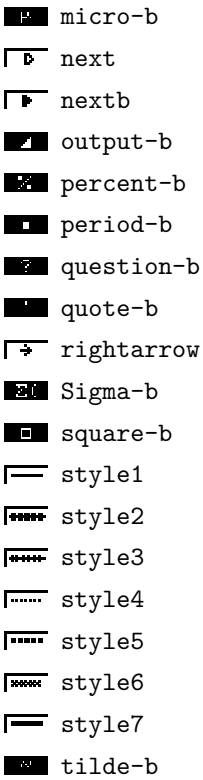
 gt-b

 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 CAPA-b

capt

Capt capt

CAPT CAPT-b

cash

CASH CASH-b

casio

CASIO CASIO-b

ccd

Ccd Ccd

cel

CEL CEL-b

cell

CELL CELL

ch1

CH1 CH1

char

CHAR CHAR-b

chg

Chg Chg-b

chi

CHI CHI

CHI CHI-b

Chi Chi-b

chng

CHNG CHNG

close

Close Close-b

clr

CLR CLR

CLR CLR-b

cls

Cls cls

Cls Cls-b

cma

CMA CMA-b

cmp

Cmp Cmp-b

cmpd

CMPD CMPD-b

cmpr

CMPR CMPR-b

cn

Cn cn-b

SCn Scn-b

cn1

Cn1 cn1-b

SCn1 Scn1-b

cn2

Cn2 cn2-b

SCn2 Scn2-b

cnst

CnSt CnSt-b

cnt

Cnt cnt

cnvt

CNVT CNVT-b

col

COL COL

COL COL-b

com

COM COM-b

conj

Conj Conj-b

conv

CONV CONV-b

copy

COPY COPY

COPY COPY-b

cosh

Cosh cosh-b

cosh1

COSH cosh1-b

cost

COST COST

COST COST-b

Cost Cost-b

cpd

Cpd Cpd

cplx

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-b

det

 Det-b

df

 df-b

diff

 diff

dim

 DIM-b

 Dim-b

disp

 DISP-b

dist

 DIST-b

dld

 dlminusD

 dlplusD

dms

 tDMS-b

do

 Do-b

dot

 dot-b

draw

 DRAW

 DRAW-b

drwc

 DrwC-b

drwf

 DrwF-b

drwn

 DrwN-b

drwt

 Drwt-b

dsz

 Dsz-b

dx

 Idx

 Idx-b

dyna

 DYNA-b

 Dyna-b

e

 e-b

 Exa-b

edf

 Edf-b

edit

 EDIT

 EDIT-b

eff

 EFF-b

 tEFF

else

 Else-b

end

 End-b

eng

 ENGshiftleft

 ENGshiftright

engy

 ENGY-b

entr

 ENTR-b

equa

 EQUA-b

es

 EtS-b

esym

 ESYM-b

exam

 EXAM-b

exe

 EXE

exit

 EXIT

 EXIT-b

exp

 Exp

 EXP-b

 Exp-b

 Exp-b2

extd

 Extd

f

 F

 F-b

 F-b2

 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

FORM FORM-b

fp

FP FP

FP FP-b

fpd

Fpd Fpd

frac

Frac Frac-b

ftbl

FTbl FTbl-b

full

FULL FULL

furie

Furie Furie

fv

FV FV

FV FV-b

g

g g-b

G Giga-b

gcd

Gcd Gcd

GCD GCD-b

gcon

G-CON GCON

Gcon Gcon-b

gdx

GIdx GIdx-b

geo

GEO GEO-b

gmem

GMEM GMEM-b

go

GO GO

gof

GOF GOF

goto

Goto Goto-b

gpd

Gpd Gpd

gph1

GPH1 GPH1

GPH1 GPH1-b

gph2

GPH2 GPH2

GPH2 GPH2-b

gph3

GPH3 GPH3

GPH3 GPH3-b

gplt

G-PLT GPLT

GPlt GPlt-b

grab

GRAB GRAB

grph

GRPH GRPH

GRPH GRPH-b

Grph Grph-b

gslv

GSLV GSLV-b

gtky

Gtky Gtky-b

hcd

Hcd Hcd

help

HELP HELP-b

hgeo

HGEO HGEO-b

hist

Hist Hist-b

hpd

Hpd Hpd

hyp

HYP HYP-b

hztl

Hztl Hztl

Hztl Hztl-b

i

i i-b

I% Ipercent

I% Ipercent-b

iden

line

- Line
- LINE-b
- Line-b

list

- List
- LIST-b
- List-b
- tLIST-b

lm

- LtoM-b

lmem

- LMEM-b

load

- LOAD-b

log

- Log
- Log-b

logab

- logab-b

logic

- LOGIC-b

lpw

- LpW-b

lwr

- Lwr-b

m

- Mega-b
- milli-b

main

- MAIN-b

man

- Man

mark

- MARK-b

mass

- MASS-b

mat

- MAT-b
- Mat-b
- tMAT-b

math

- MATH
- Math
- MATH-b

max

- MAX
- Max-b
- max-b

maxx

- maxX-b

maxy

- maxY-b

mean

- Mean-b

med

- Med
- Med-b

mem

- Mem
- MEM-b

memo

- MEMO

menu

- MENU-b
- Menu-b

mid

- Mid-b

min

- MIN
- Min-b
- min-b

minx

- minX-b

miny

- minY-b

mkf

- MKF-b

ml

- MtoL-b

mlti

- MLTI

mn

- mxn-b

mod

 MOD-b

 Mod-b

mode

 MODE-b

 MODExp-b

move

 MOVE

mrg

 MRG

 Mrg-b

ms

 MandS-b

msa

 MSa-b

msab

 MSab-b

msb

 Msb-b

mse

 Mse-b

mv

 MV

n

 n

 n-b

 nano-b

n1

 n1-b

n2

 n2-b

name

 NAME-b

nan

 Nan-b

ncd

 Ncd

ncr

 nCr-b

ndis

 NDis-b

new

 NEW-b

next

 Next-b

nfv

 NFV

 NFV-b

no

 NO

none

 None

 None-b

norm

 Norm

 NORM-b

 Norm-b

not

 Not-b

npd

 Npd

npp

 NPP-b

npr

 nPr-b

npv

 NPV

 NPV-b

num

 NUM-b

off

 Off

 Off-b

on

 On

 On-b

open

 OPEN-b

 Open-b

opt

 OPT

 OPT-b

or

 Or-b

orig

 ORIG

out

 OUT

p

 P

 p-b

 Peta-b

 phat-b

 pico-b

 Psnd-b

p1

 phat1-b

p2

 phat2-b

pa

 pa-b

pab

 pab-b

parm

 PARM

 parm

 Parm-b

pb

 pb-b

pbp

 PBP

 PBP-b

pcd

 Pcd

pen

 PEN

pgdn

 PgDn

pgup

 PgUp

phas

 PHAS

phase

 Phase-b

pie

 Pie-b

pitch

 Pitch-b

pixl

 PIXL-b

plchg

 PlChg

 PlChg-b

ploff

 PlOff

 PlOff-b

plon

 PlOn

 PlOn-b

plot

 Plot

 PLOT-b

 Plot-b

pmt

 PMT

 PMT-b

poisn

 POISN-b

pol

 POL

 Pol-b

poly

 POLY-b

ppd

 Ppd

prc

 PRC

 PRC-b

prd

 PRD

 PRD-b

pre

 PRE

pres

 PRES-b

prn

 PRN

 PRN-b

 SPRN

 SPRN-b

prob

 PROB-b

prod

 Prod-b

prog

 PROG-b

 Prog-b

proj

 Proj

ptch

 Ptch-b

pts

 PTS-b

pv

 PV

 PV-b

pwr

 Pwr

 PWR-b

 Pwr-b

py

 PY-b

q

 Qsnd-b

q1

 Q1-b

q3

 Q3-b

r

 r-b

 r-b2

 r-b3

 requal

 requal-b

 Rsnd-b

 tcomplexpolar-b

r2

 r2-b

r38k

 R38k-b

ran

 Ran-b

rand

 RAND-b

rang

 RANG-b

rcl

 RCL

 RCL-b

 Rcl-b

rdel

 RDEL

rec

 Rec-b

recal

 RECAL

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


Simp-b2

sin


Sin


Sin-b

sinh


sinh-b

sinh1


sinh1-b

size


SIZE-b

sktch

SKTCH-b

sl

SL

smem

SMEM-b

smpl

SMPL-b

snd

Snd

solv

SOLV


SOLV-b

solve

Solve

solvn

SolvN-b

sonic

sonic

sp

sp-b

sqr


SQR

src

SRC

SRC-b

Src-b

srta


SRTA

SrtA-b

srtd

SRTD


SrtD-b

ssa


SSa-b

ssab


SSab-b

ssb

SSb-b

sse

SSe-b

stat

STAT-b

Stat-b

std

STD

step

Step-b

stick

STICK-b

sto

STO-b

Sto-b

stop

STOP

Stop-b

str


STR

STR-b

Str-b

strp

STRP-b

strt

STRT

Strt-b

stup


STUP-b

styl


STYL-b

sum

Sum-b

svas

SVAS-b

swap

SWAP

sx

sx-b

sx1

sx1-b

sx2

sx2-b

sy

sy-b

sybl

SYBL

SYBL-b

syd

SYD

t

T

t-b

t-b2

Tera-b

tsnd-b

Ttheta-b

tabl

TABL

TABL-b

Tabl-b

tang

Tang

Tang-b

tanh

tanh-b

tanh1

tanh1-b

tcd

tcd

test

TEST-b

Test-b

text

TEXT

Text

Text-b

then

Then-b

time

TIME-b

tlow

tLow-b

tmpr

TMPR-b

to

To-b

tool

TOOL-b

top

TOP

TOPleft

TOPtop

tpd

tpd

tran

TRAN

TRAN-b

trig

TRIG

trn

Trn-b

tup

tUp-b

tvm

TVM-b

type

TYPE-b

unit

UNIT-b

upr

Upr-b

usb

USB

var

var

VAR-b

Var Var-b

vct

VCT VCT-b

velo

VELO VELO-b

ver

VER VER-b

vert

Vert Vert

Vert Vert-b

vlum

VLUM VLUM-b

vnlk

VNLK VNLK-b

vrnr

VRNR VRNR-b

vwin

VWIN VWIN-b

VWin VWin-b

wake

WAKE WAKE-b

web

WEB WEB

Web Web-b

wend

WEnd WEnd-b

whle

Whle Whle-b

wiz

WIZ WIZ-b

x

x! factorialx-b

sigmax-b

Sx Sx-b

txequal

txgeq

txgt

txleq

txlt

x x

X X-b

x x-b

X X-b2

X X-b3

xbar-b

xequal

xequal-b

xgeq-b

xgt-b

xhat-b

xleq-b

xlt-b

x1

x1 x1-b

xbar1-b

x1inv

x1Inv x1Inv-b

x2

Sx2 Sx2-b

X^2 X2

x^2 x2

x2 x2-b

xbar2 xbar2-b

x^2 xpower2-b

x2inv

x2Inv x2Inv-b

x3

X^3 X3

x^3 x3

x3 x3-b

x^3 xpower3-b

x4

X^4 X4

x^4 x4

x^4 xpower4-b

xcal

XCAL XCAL

xfct

Xfct Xfct-b

xinv

xInv xInv-b

xor

Xor Xor-b

xrw

XRw XRw

XRw+ XRwplus

xt

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

Yt-b

z

Z

Z-b

z-b

zero

ZERO

zlow

zLow-b

zoom

ZOOM

ZOOM-b

zup

zUp-b

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.

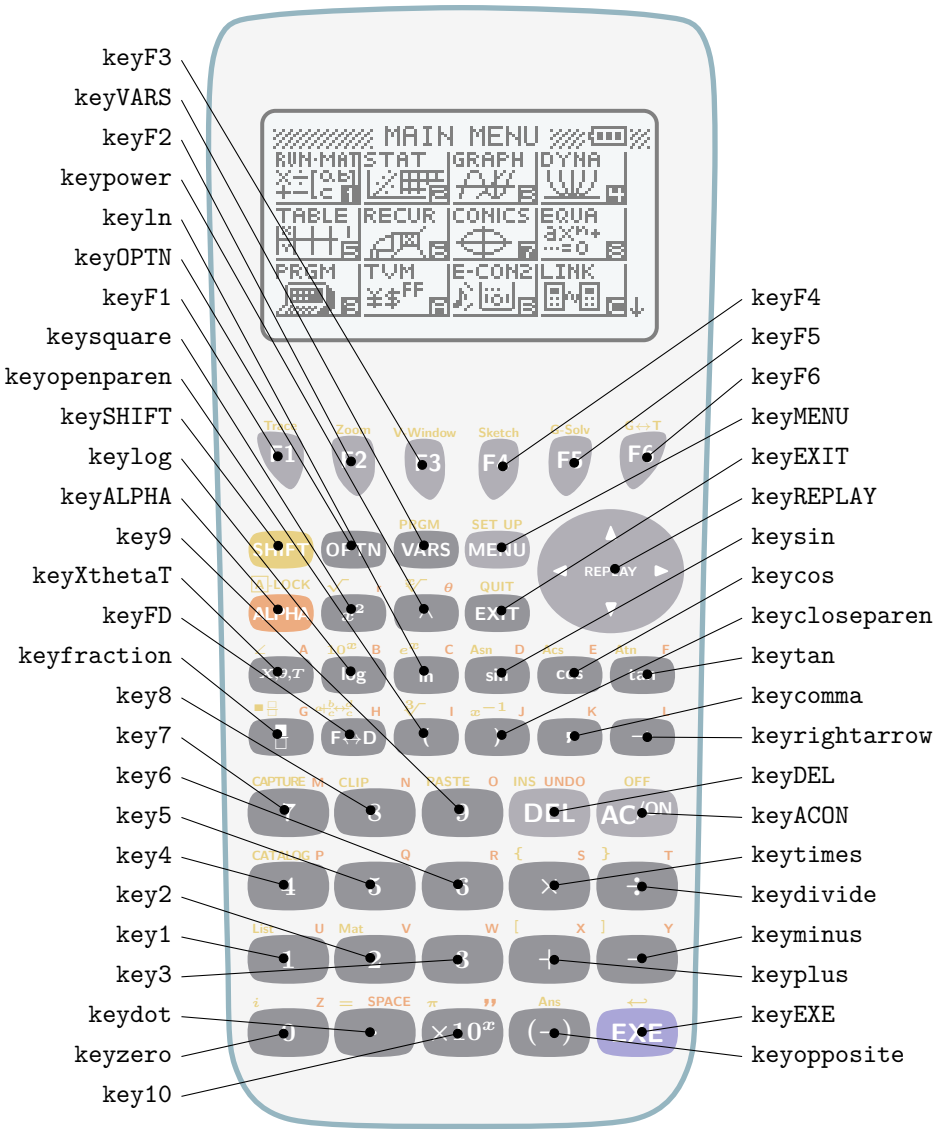


Figure 6: Keywords of keys

-  \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}

List of Figures