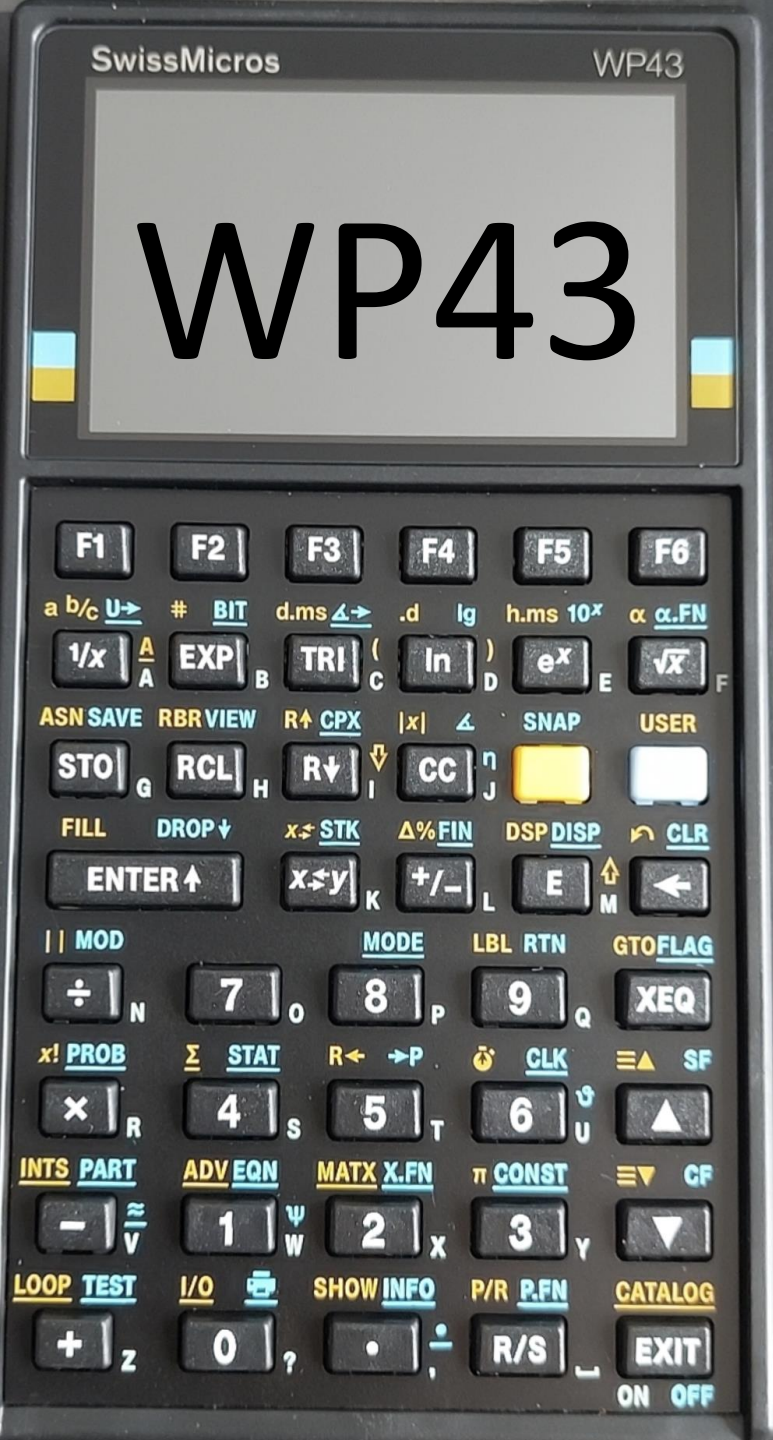




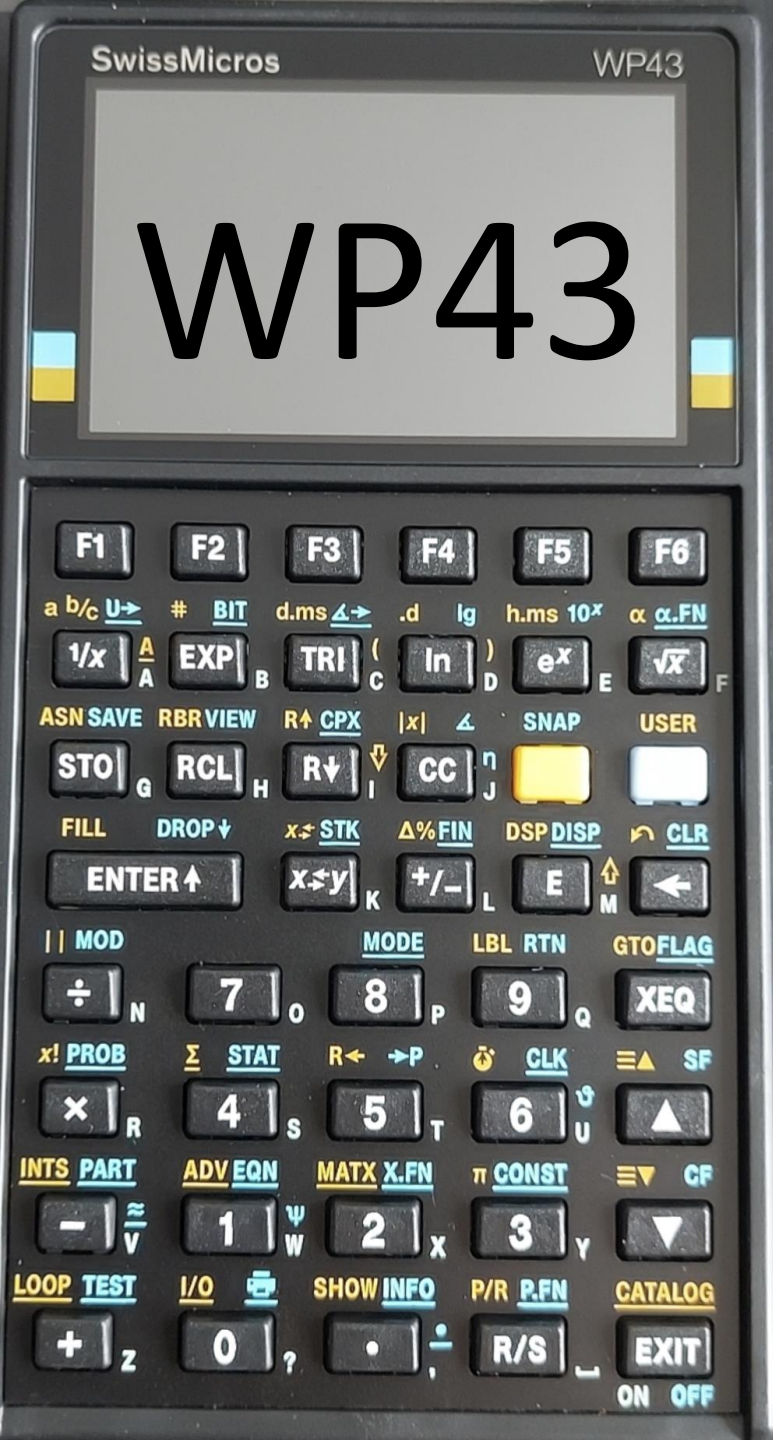
Jaco Mostert
classic43.com

forum.swissmicros.com



WP43 GPL code,
types,
accuracy





Why C43 ?

Why do we need a different layout?

A few drivers ...



SwissMicros

WP43

WP43

BIGGEST DRIVERS

OPERATORS LEFT / RIGHT

Direct Trig
Direct Math

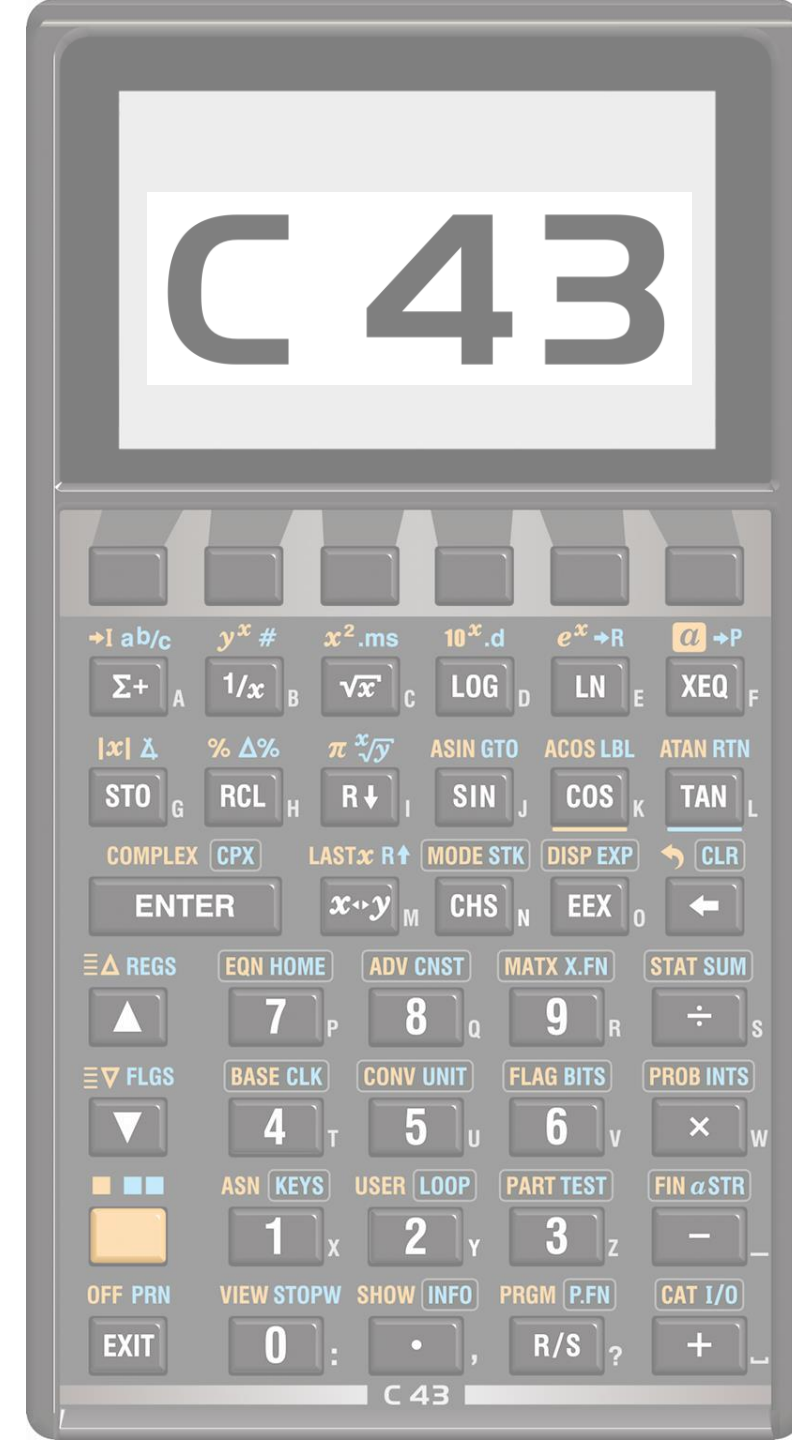
43

DM42

BIGGEST DRIVERS

OPERATORS LEFT / RIGHT

AVAILABILITY DM42



HP42S



BIGGEST DRIVERS

OPERATORS LEFT / RIGHT

AVAILABILITY DM42

HP42S LEGACY

C 43



HP42S



A detailed photograph of an HP42S scientific calculator. The calculator is dark blue with a light blue LCD screen at the top. The screen displays 'x: 1 10' and a row of function labels: 'DEG', 'RND', 'FNRD', 'RECT', and 'POLAR'. Below the screen is a grid of buttons. The top row includes buttons for Σ^- , y^x , x^2 , 10^x , e^x , and GTO. The second row has Σ^+ , $1/x$, $\sqrt{x}$, LOG, LN, and XEQ. The third row features COMPLEX, %, π , ASIN, ACOS, and ATAN. The fourth row contains STO, RCL, $R\downarrow$, SIN, COS, and TAN. The fifth row has an ALPHA key, LAST α , MODES, DISP, and CLEAR. The sixth row includes ENTER, $x \geq y$, $+/-$, E, and a left arrow. The seventh row has EST, SOLVER, $\int f(x)$, MATRIX, and STAT. The eighth row contains SST, BASE, CONVERT, FLAGS, and PROB. The ninth row has an orange OFF key, ASSIGN, CUSTOM, PGM.FCN, and PRINT. The tenth row includes EXIT, TOP.FCN, SHOW, PRGM, and CATALOG. The bottom row features a yellow ON key, 0, a decimal point, R/S, and a plus sign. The calculator is shown from a slightly angled perspective, highlighting its physical design and button layout.

**White & Gold labels:
66 (C43) / 74 (HP42S)
= 89% match 1:1**

HP42S LEGACY

HP42S

Display: $x: 1 \ 10$

Mode indicators: 0.00 , 0.00 , 0.00 , 0.00 , 0.00 , 0.00

Keypad functions:

- Σ^- (highlighted in red)
- Σ^+
- y^x
- x^2
- 10^x
- e^x
- GTO
- Σ^+
- $1/x$
- $\sqrt{x}$
- LOG
- LN
- XEQ
- COMPLEX
- %
- π
- ASIN
- ACOS
- ATAN
- STO
- RCL
- $R\downarrow$
- SIN
- COS
- TAN
- ALPHA
- LAST x
- MODES
- DISP
- CLEAR
- ENTER
- $x \geq y$
- $+/-$
- E
- $\leftarrow$
- EST
- SOLVER
- $\int f(x)$
- MATRIX
- STAT
- $\uparrow$
- 7
- 8
- 9
- $\div$
- SST
- BASE
- CONVERT
- FLAGS
- PROB
- $\downarrow$
- 4
- 5
- 6
- $\times$
- ASSIGN
- CUSTOM (highlighted in red)
- PGM.FCN
- PRINT
- 1
- 2
- 3
- $-$
- TOP.FCN (highlighted in red)
- 0
- SHOW
- PRGM
- CATALOG
- EXIT
- ON
- $\cdot$
- R/S
- $+$

BIGGEST DRIVERS

White & Gold labels:
66 (C43) / 74 (HP42S)
= 89% match 1:1
with 37 blue labels,
71 / 74 = 96% match

HP42S
LEGACY

BIGGEST DRIVERS

White & Gold labels:
66 (C43) / 74 (HP42S)
= 89% match 1:1
with 37 blue labels,
71 / 74 = 96% match

**HP42S
LEGACY**

BIGGEST DRIVERS

White & Gold labels:
66 (C43) / 74 (HP42S)
= 89% match 1:1
with 37 blue labels,
71 / 74 = 96% match

**HP42S
LEGACY**



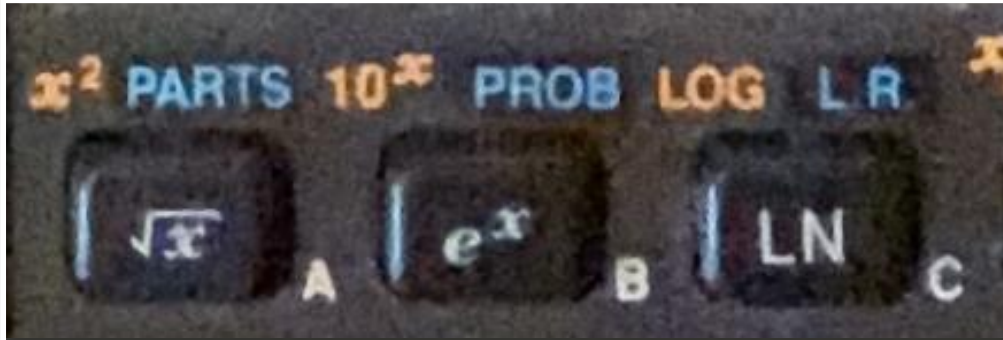
FONT and LABEL design

C 43

C 43



C43 Label and Font Design



HP32SII

HP42S



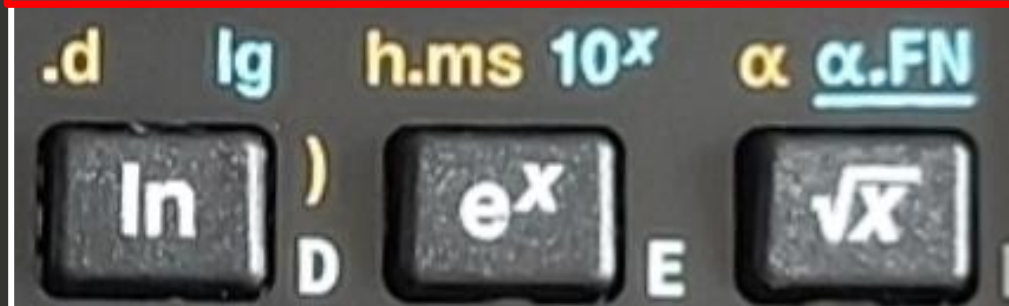
HP35S

C 43



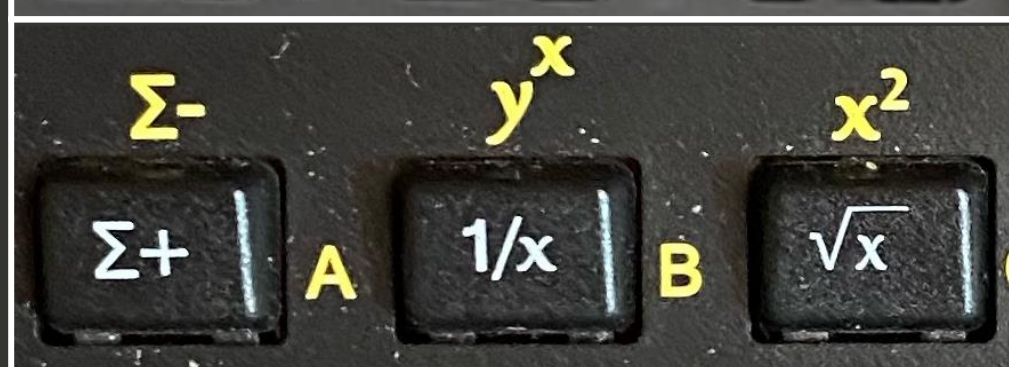
HP15C

WP43



HP48SX

DM42



C43 Label and Font Design

HP42S

C 43



LABEL
INFLUENCE
FONT

HP15C



LABEL TEMPLATES

Target is metal plate



Alt B

DRG $\rightarrow$ I $\frac{a}{b/c}$

Alt A

USER $\rightarrow$ I $\frac{a}{b/c}$ y^x # x^2

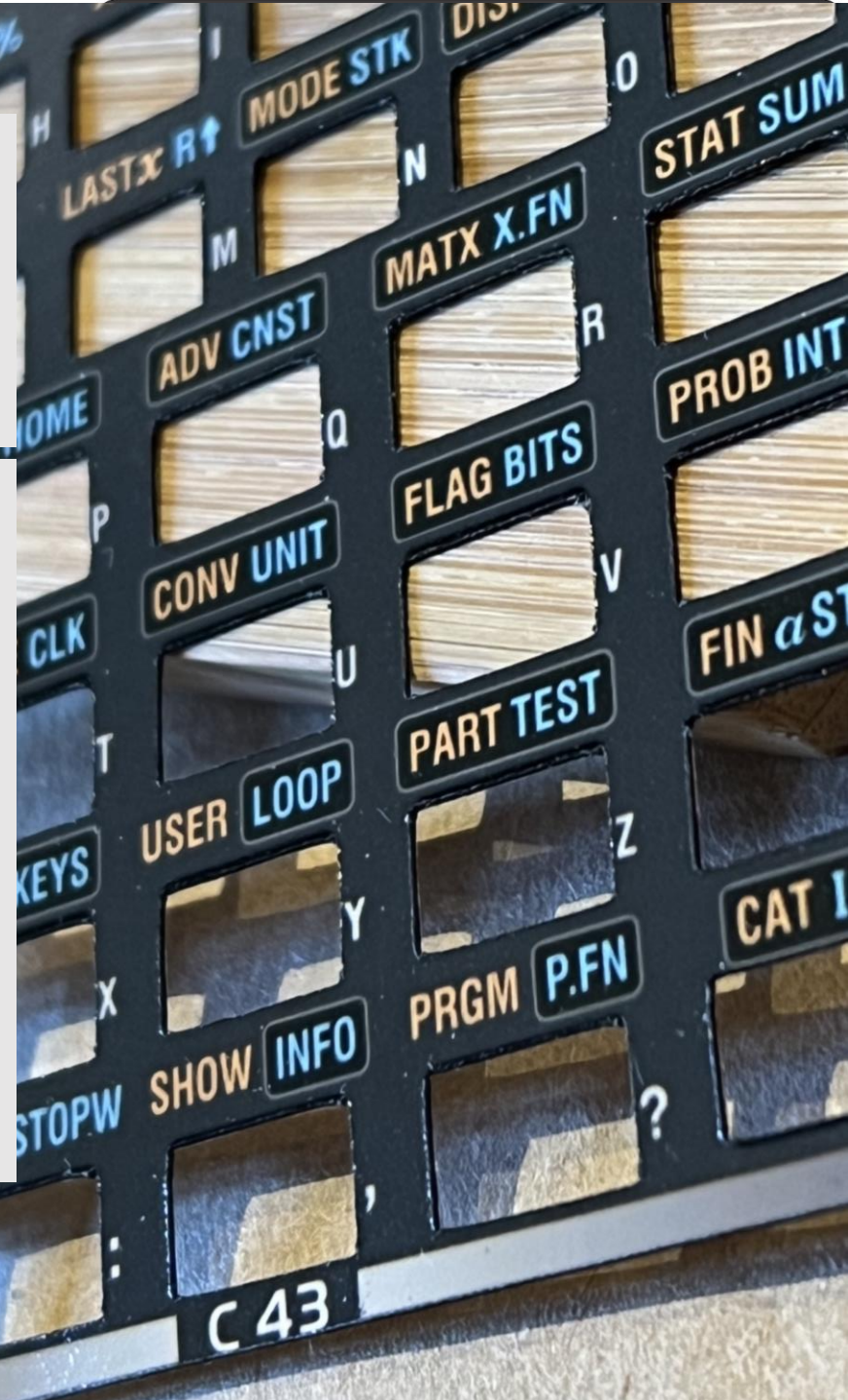
C43

$\rightarrow$ I $\frac{a}{b/c}$ y^x # x^2 .ms 10^x .d e^x

LABEL TEMPLATES

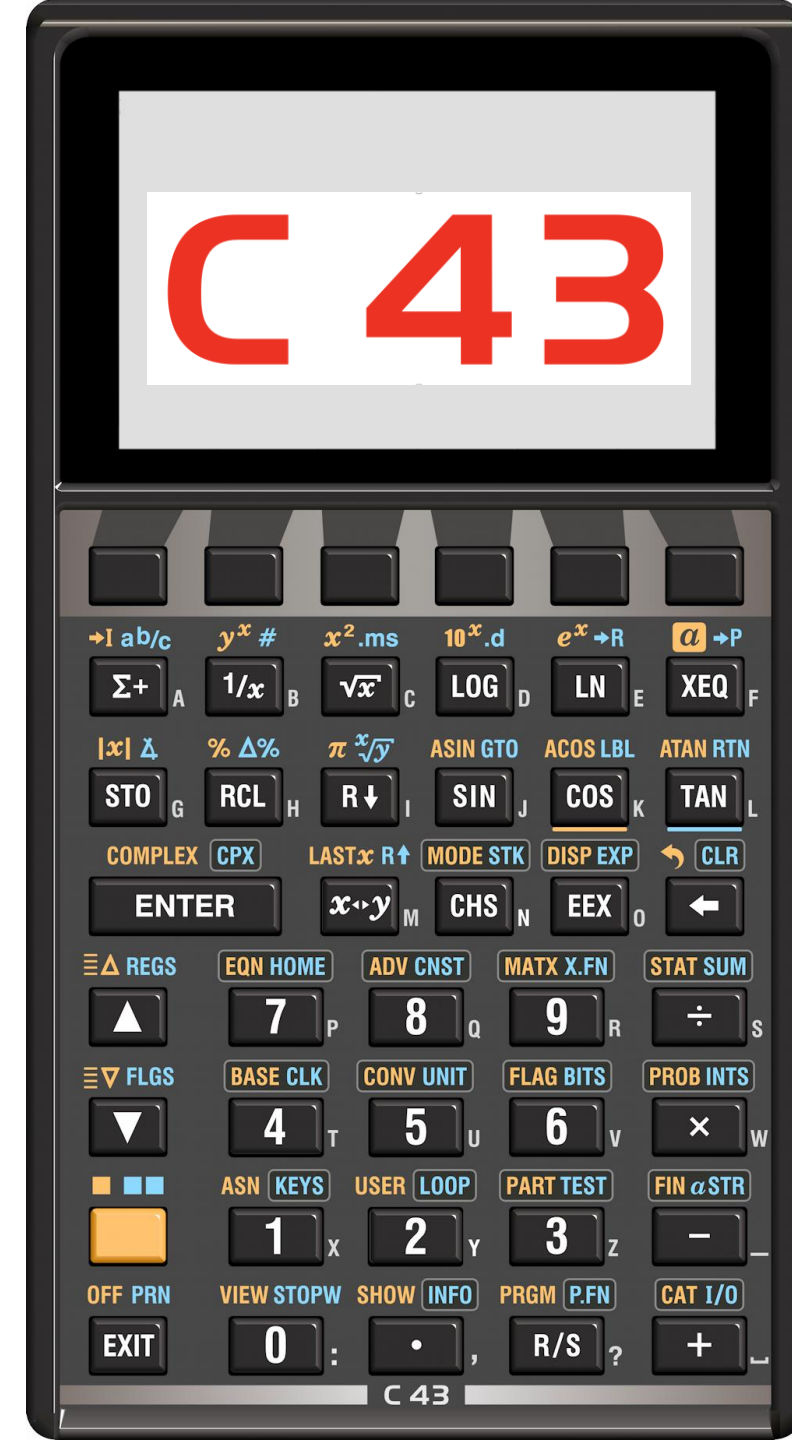
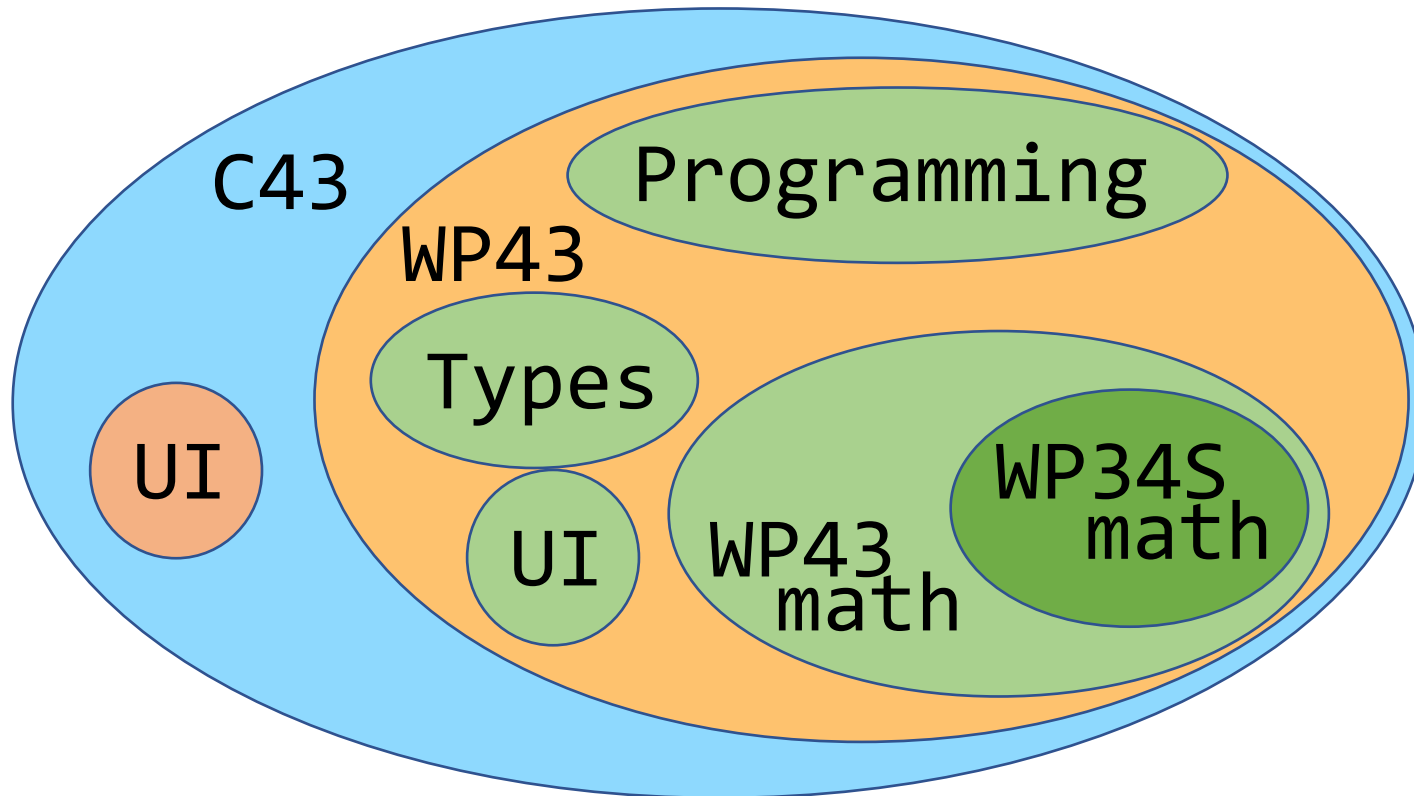
Target is metal plate

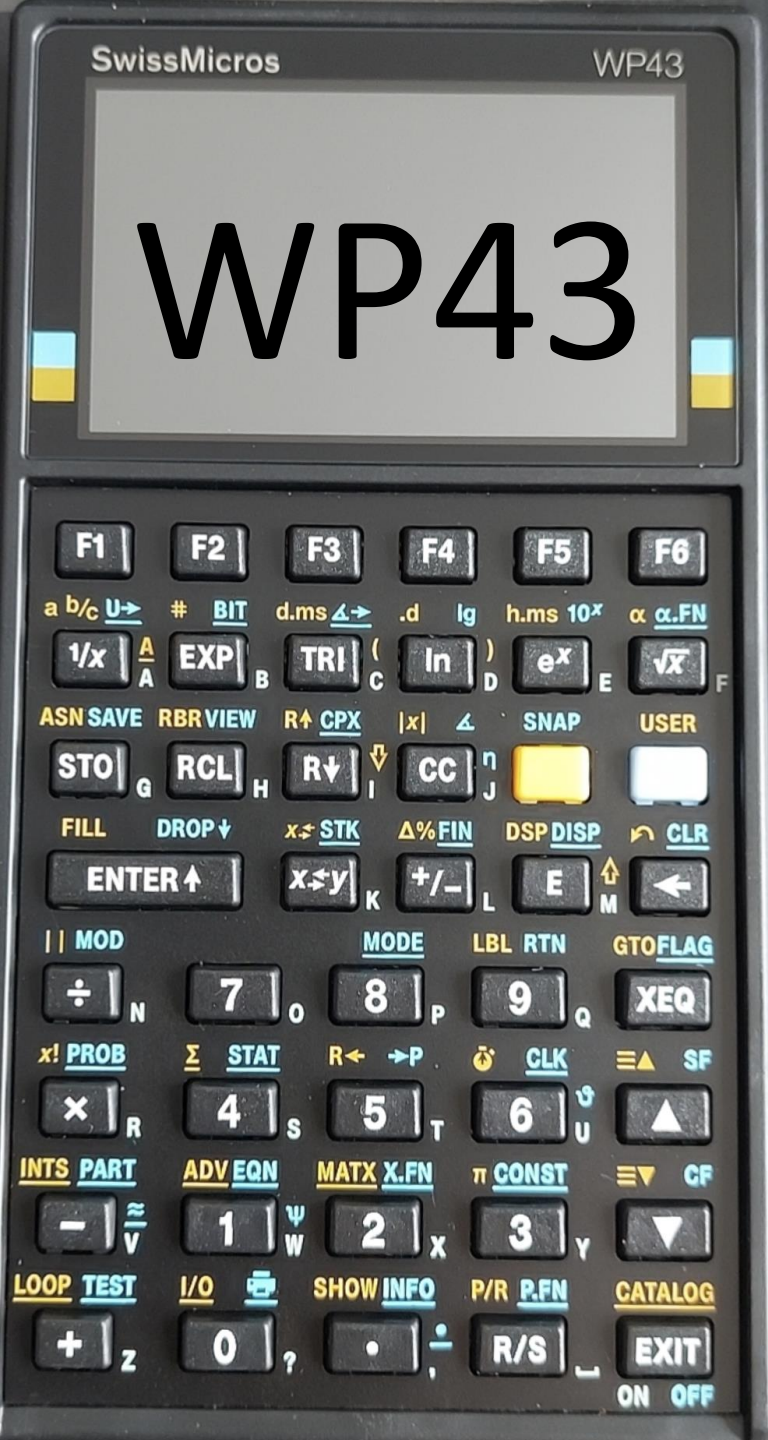
Samples on actual
calculators are
temporary paper
templates



C43 remains a special WP43

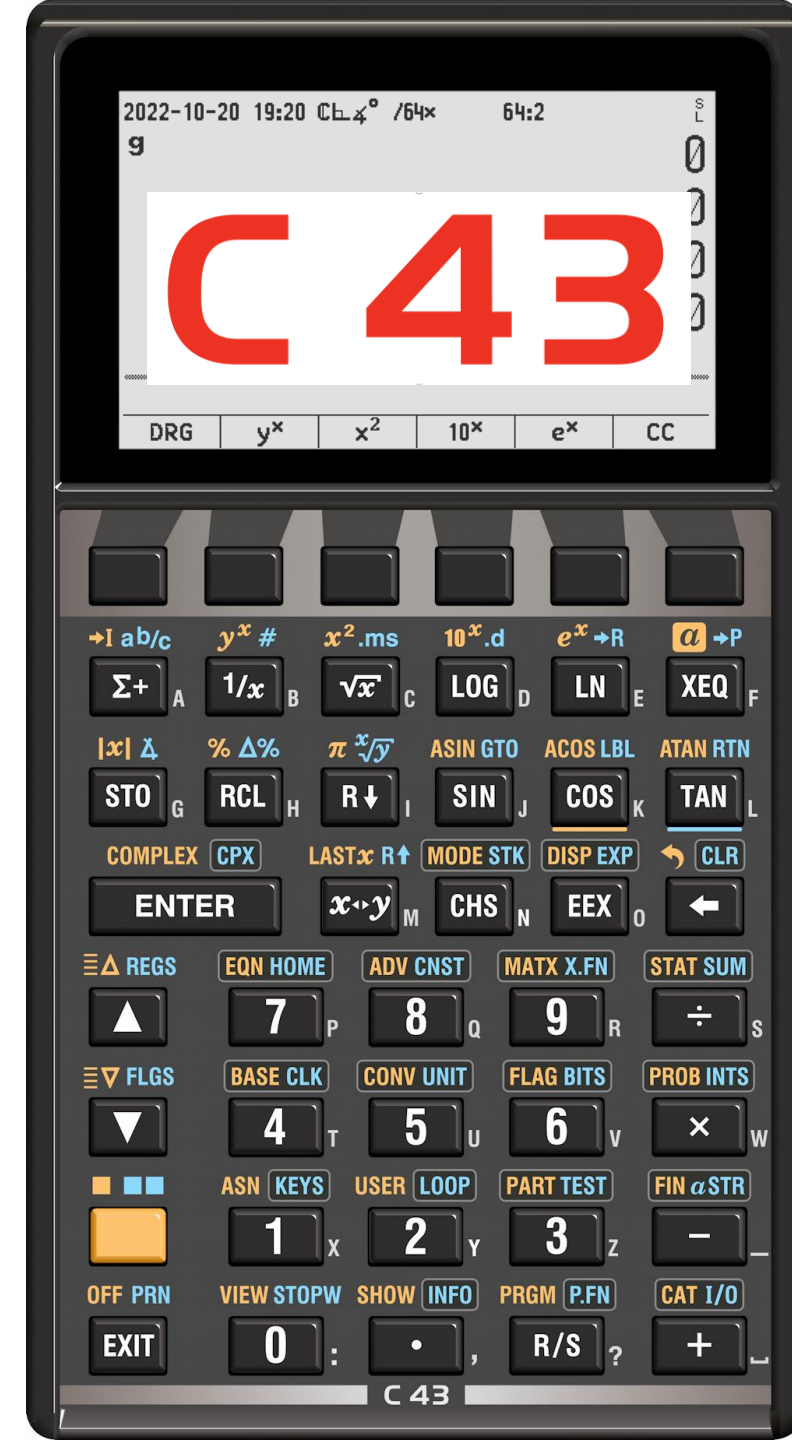
100% dependent on WP43 Math & Stats
WP43 programming & WP43 code base
- Aiming for 99% program compatibility

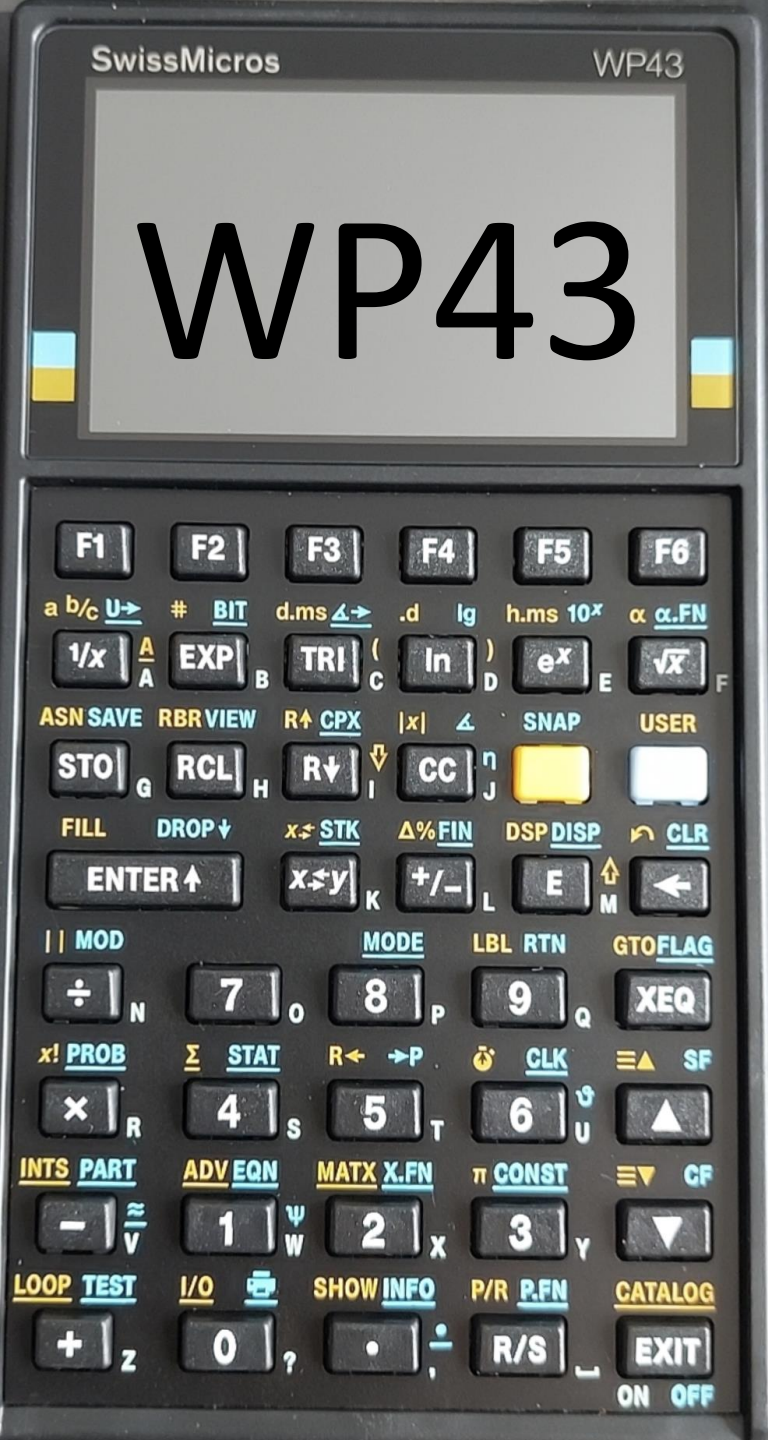




BIGGEST ENABLERS

How
a single shift key
DM42 operates the
WP43 system

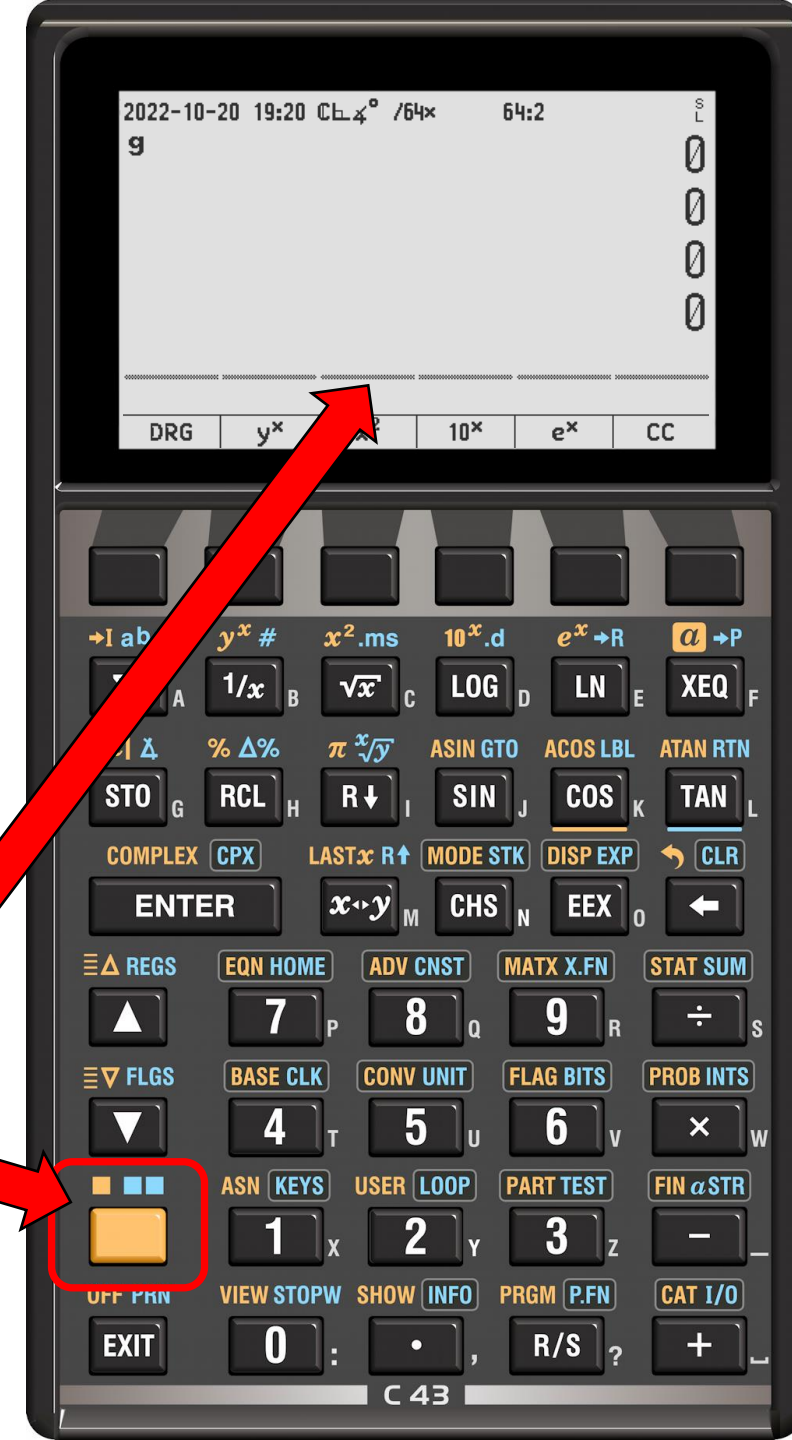


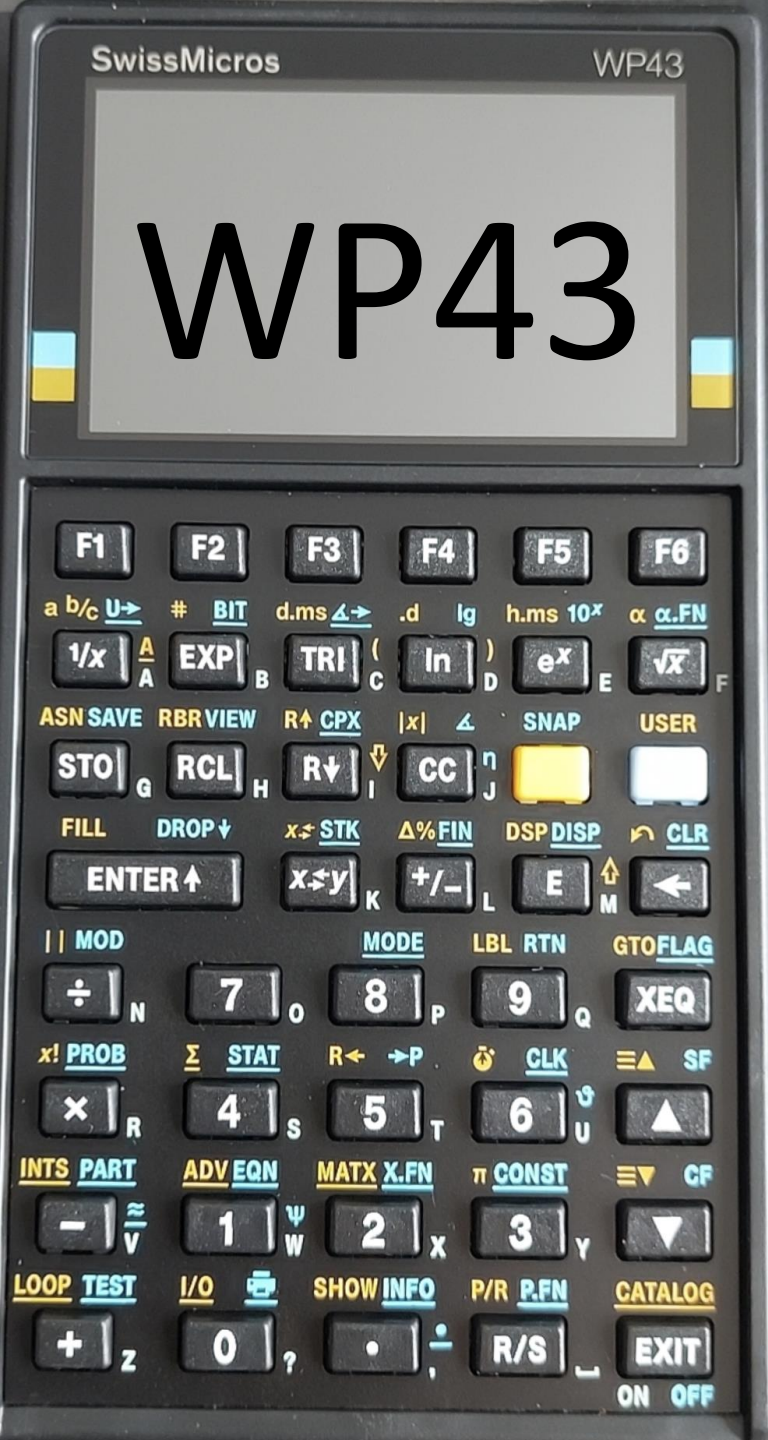


BIGGEST ENABLERS

How could a single
shift key DM42
operate the WP43
system?

Visual feedback
Double shift f / g

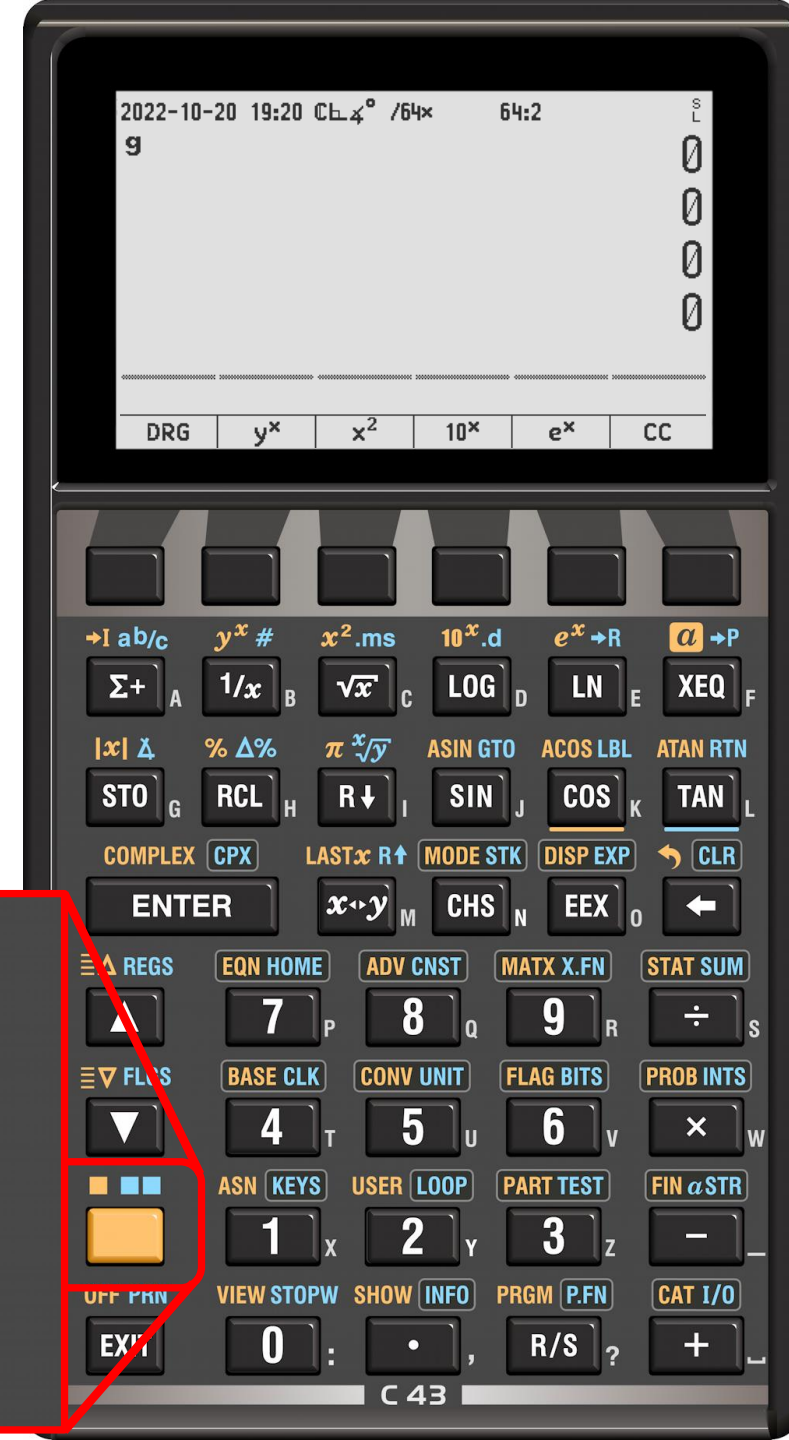
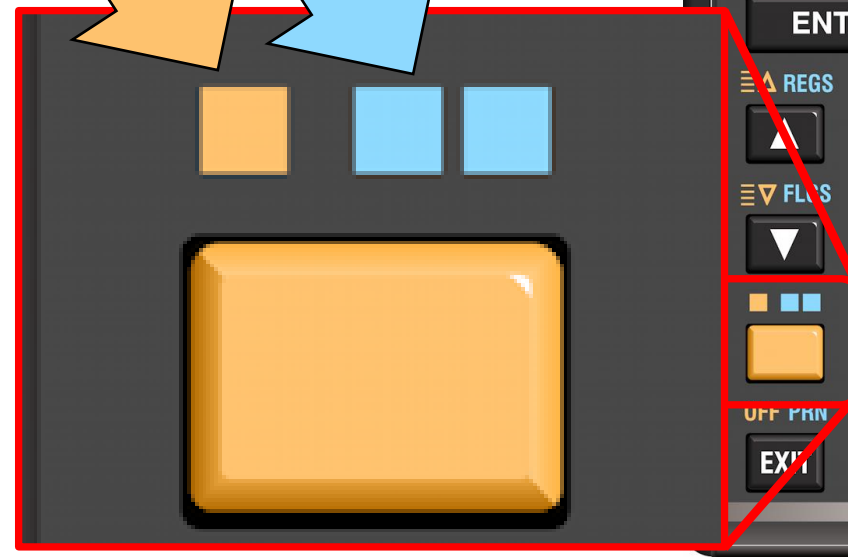


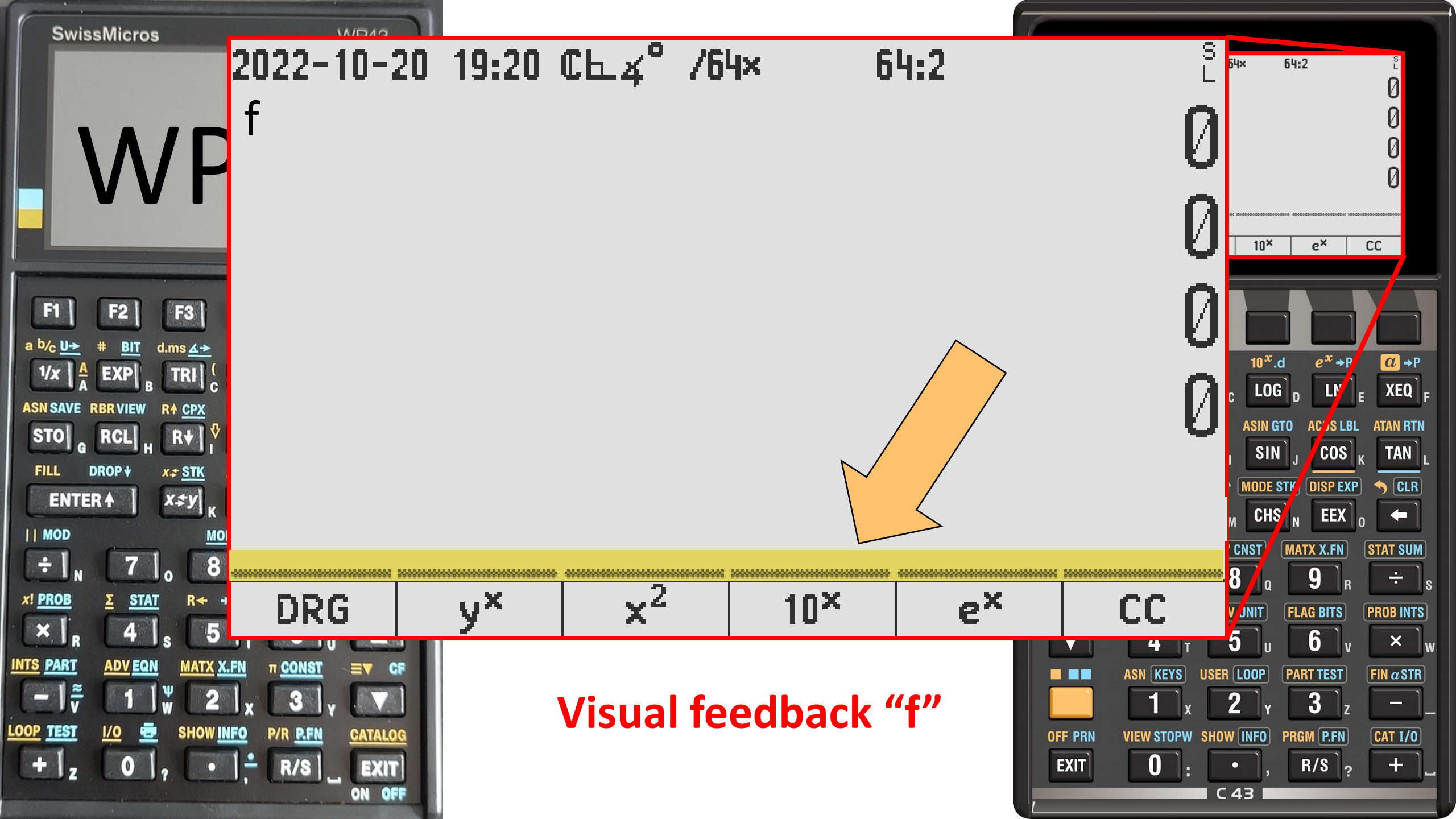


BIGGEST ENABLERS

How could a single
shift key DM42
operate the WP43

Double
Shift
f / g



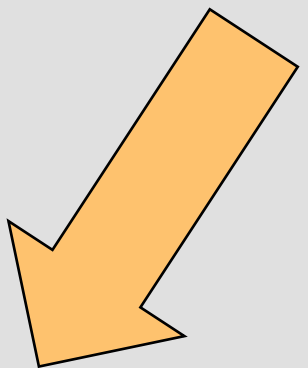


2022-10-20 19:20 CL 4° /64x 64:2

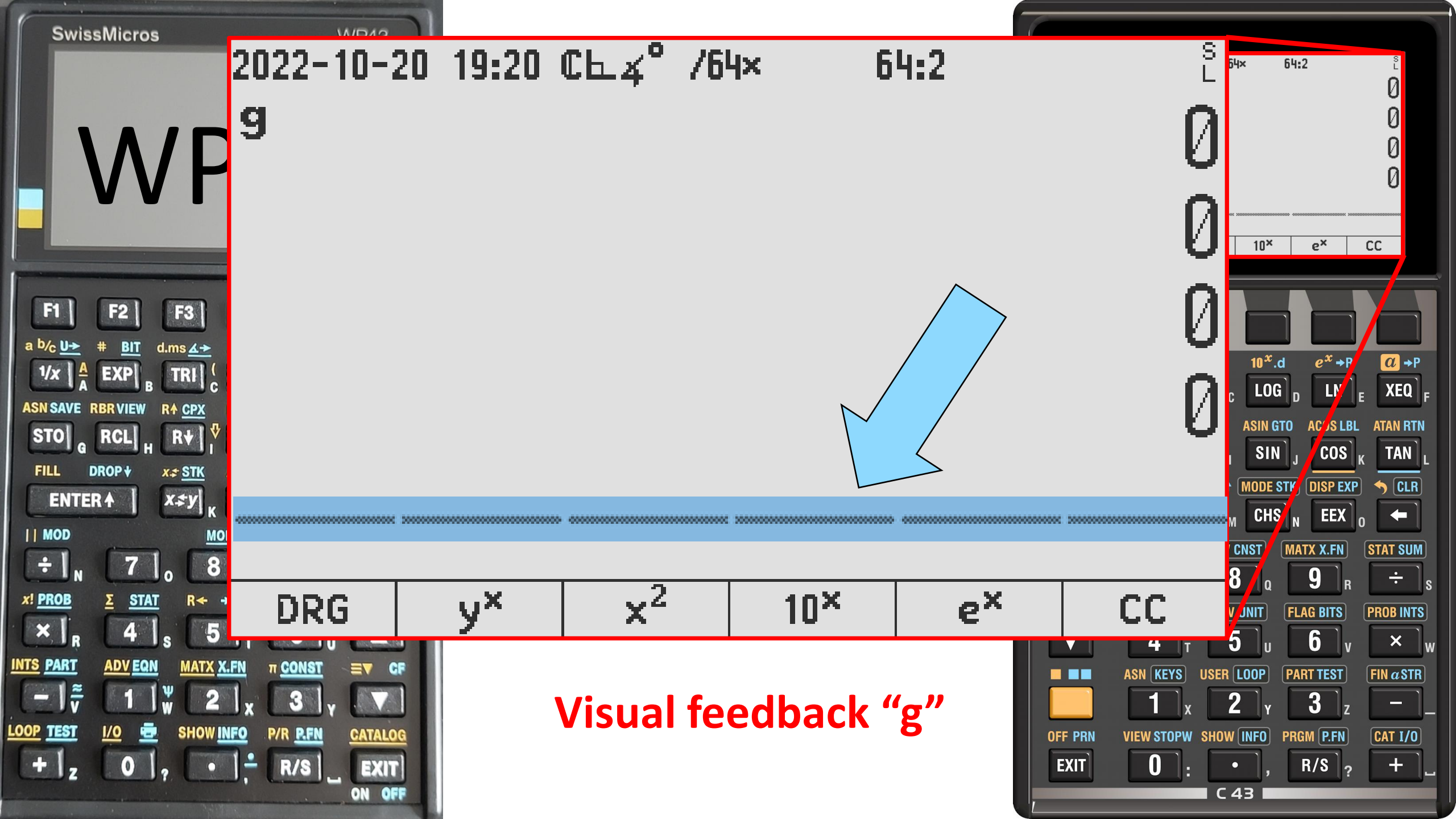
f

0
0
0
0
0

DRG y^x x^2 10^x e^x CC



Visual feedback "f"



2022-10-20 19:20 CL 4° /64x 64:2

g

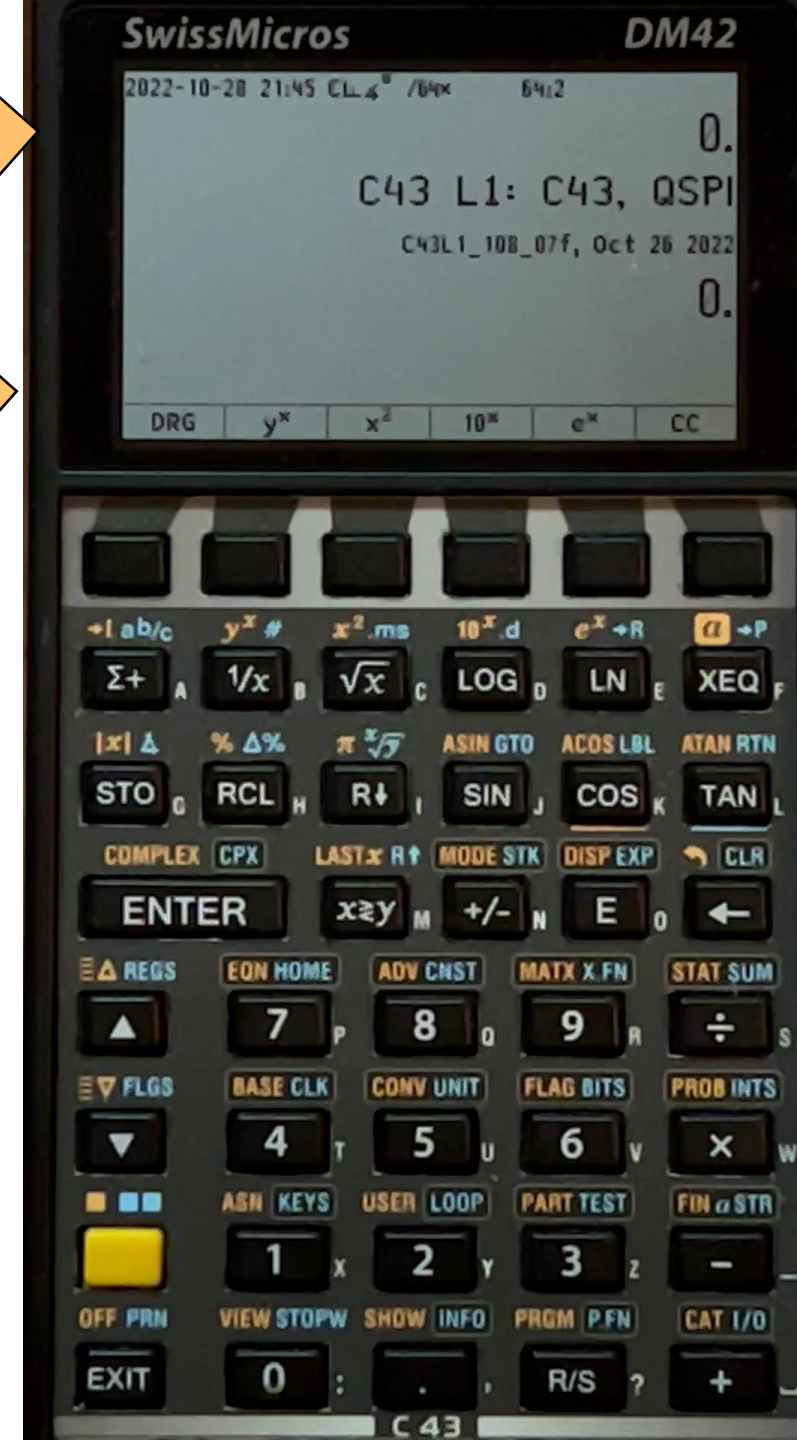
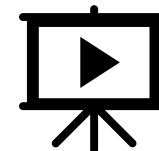
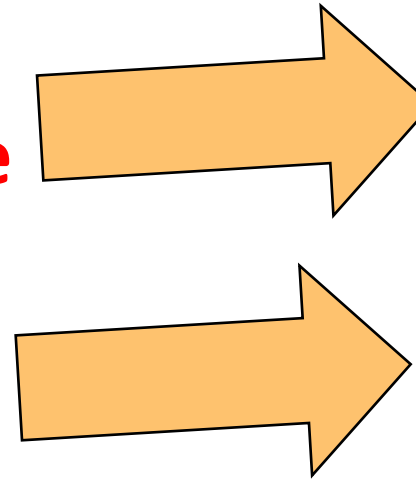
DRG y^x x^2 10^x e^x CC

Visual feedback “g”

BIGGEST ENABLERS

How could a single
shift key DM42
operate the WP43
system?

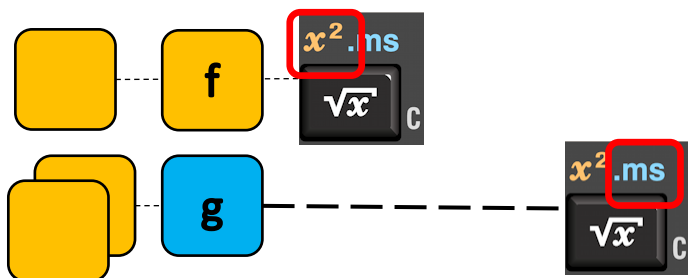
Double
Shift
f / g
And
HOME



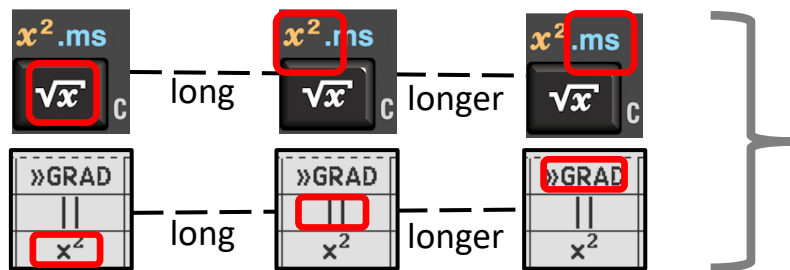
C43

SINGLE / DOUBLE / LONG SUMMARY

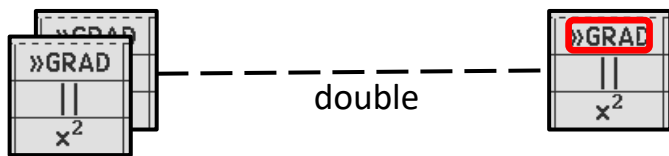
Mandatory shift, then key press:



Optional shortcut, to NOT press shift:



Optional shortcut, to NOT do longer press



Normal shift & press

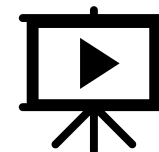
Double shift & press

Single long press

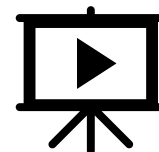
Double press



F[FN key] long press
Primary FN key



Reach g[F4]
Double press f, then F4
Long press F4
Double press F4



UI ADDITIONS

- DIRECT ACCESS & CYCLIC
- INTUITIVE EXTENTIONS
 -  DROP & CLSTK
 -  HOME MENU
 -  BASE MENU
- LARGE SCREEN
- EXPERIMENTAL UI



INTERACTIVE DIRECT MATH ACCESS C 43

NON-MENU
KEYS/LABELS



INTERACTIVE DIRECT MATH ACCESS C 43

NEW CYCLIC KEYS
C43 x 5

NON-MENU
KEYS



Default MyMenu

ORIGINAL CYCLIC
KEYS WP43 x 2

GOLD MATH KEYS:
to MyMenu x 4

REGS

FLGS

OFF PRN

VIEW STOPW SHOW

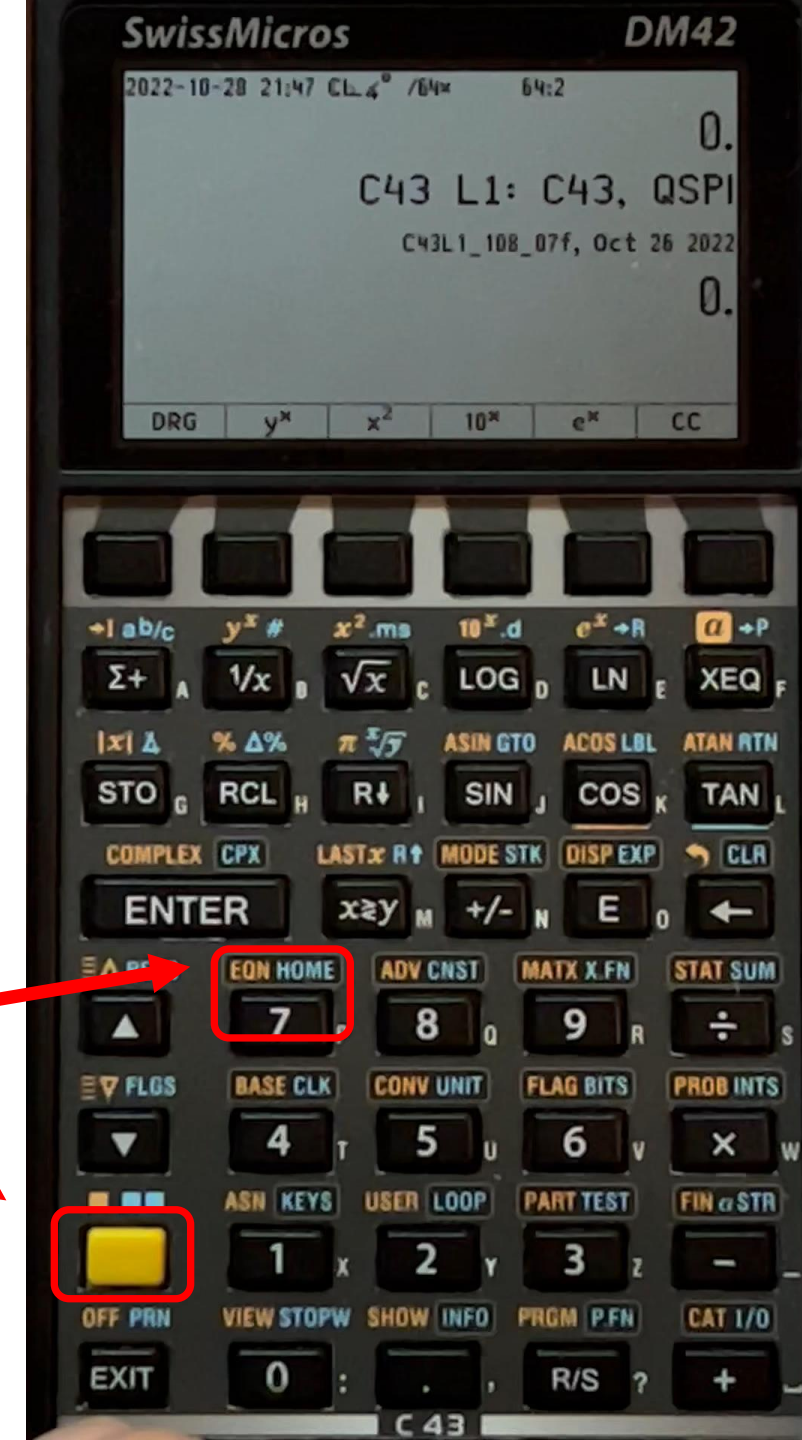
C 43

C43

UI Additions : **HOME**

»DEG	»RAD	»GRAD	i	RECT $\odot$	POLAR $\odot$
x	$\sqrt{x}$		x!	$\rightarrow R$	$\rightarrow P$
DRG	y^x	x^2	10^x	e^x	CC

HOME MENU



C43

UI Additions : HOME

»DEG	»RAD	»GRAD	i	RECT	POLAR
------	------	-------	---	------	-------

x	$\sqrt[n]{x}$	x^2	$x!$	$\rightarrow R$	$\rightarrow P$
---	---------------	-------	------	-----------------	-----------------

DRG	y^x	x^2	10^x	e^x	CC
-----	-------	-------	--------	-------	----

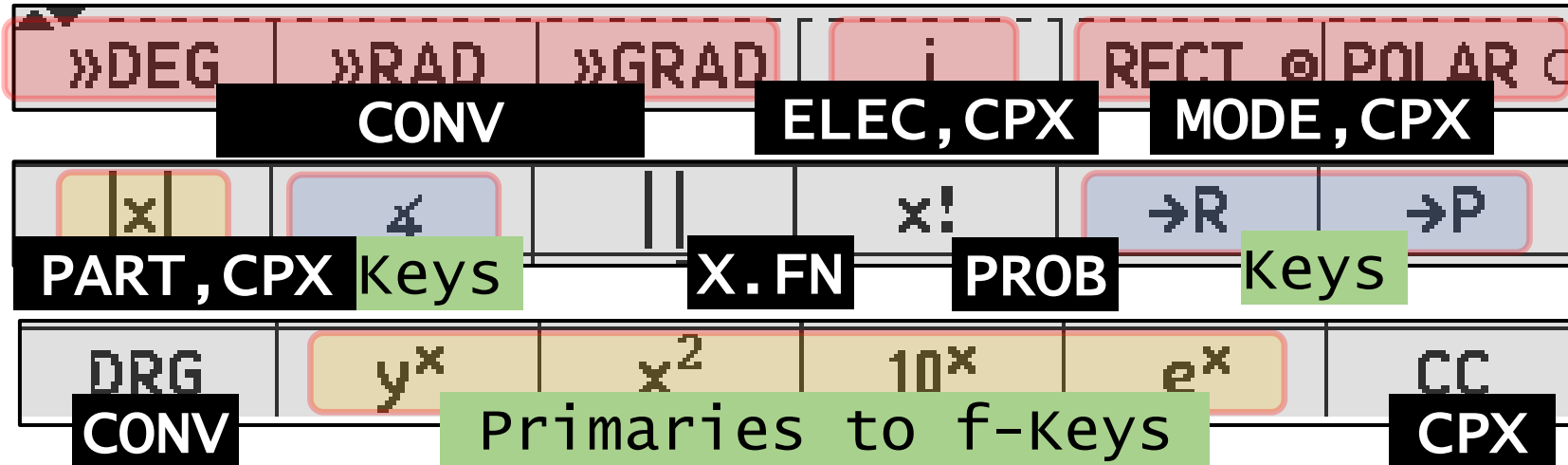
»DEG	»RAD	»GRAD	i	RECT	POLAR
x	$\sqrt[n]{x}$	x^2	$x!$	$\rightarrow R$	$\rightarrow P$
DRG	y^x	x^2	10^x	e^x	CC

HOME MENU



C43

UI Additions : HOME



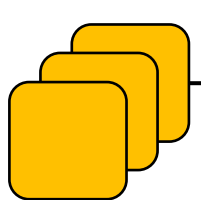
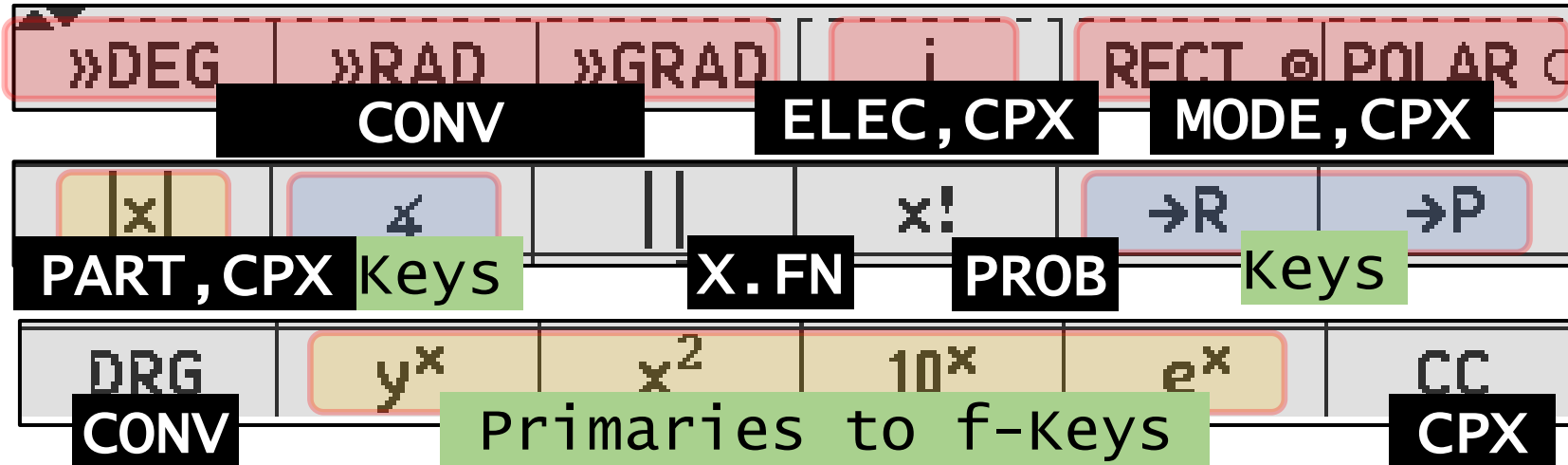
»DEG	»RAD	»GRAD	i	RECT	POLAR
x	4		x!	→R	→P
DRG	y ^x	x ²	10 ^x	e ^x	CC

HOME MENU



C43

UI Additions : HOME & MyMENU



MyMENU

$\gg$ DEG	$\gg$ RAD	$\gg$ GRAD	i	RECT $\odot$ POLAR $\circ$
$ x $	$\sqrt[n]{x}$	$ $	$x!$	$\rightarrow R$ $\rightarrow P$
DRG	y^x	x^2	10^x	e^x CC

HOME MENU

Identical unshifted line: continuity

DRG	y^x	x^2	10^x	e^x	CC
-----	-------	-------	--------	-------	----

DEFAULT MyMENU



C43

UI Additions : HOME Up & Dn

»DEG	»RAD	»GRAD	i	RECT	POLAR
CNST	CPX	EXP	XEQM	MyM	ELEC
DRG	y^x	x^2	10^x	e^x	CC

CONVENIENCE MENU

SF	CF	RL	RR	RMD	IDIV
FP	IP		$x!$	BASE	INTS
DRG	y^x	x^2	10^x	e^x	CC

CONVENIENCE MENU

»DEG	»RAD	»GRAD	i	RECT	POLAR
x	$\frac{1}{x}$		$x!$	$\rightarrow R$	$\rightarrow P$
DRG	y^x	x^2	10^x	e^x	CC

HOME MENU

»DEG	»RAD	»GRAD		RECT	POLAR
·f	DMC _{ALL}	DSP ₃	$x!$	·G	·T
·p	·n	·μ	·m	·k	·M

SI PREFIX MENU

To KEY replica



C43

UI Additions : HOME – Key Replica



:

:



b/c	MODE	ms	d	R	P
y ^x	x ²	10 ^x	e ^x	α	
USER	1/x	√x	LOG	LN	XEQ

Δ%	π	SNAP		
STD	RCL	TRIG	f	g

CPX	R↓	STK	EXP	CLR
COMPL	LASTx	MODE	DISP	↔
ENTER	x↔y	CHS	EEX	←

REGS	HOME	CNST	X.FN	SUM
EQN	ADV	MATX	STAT	
1	2	3	4	5

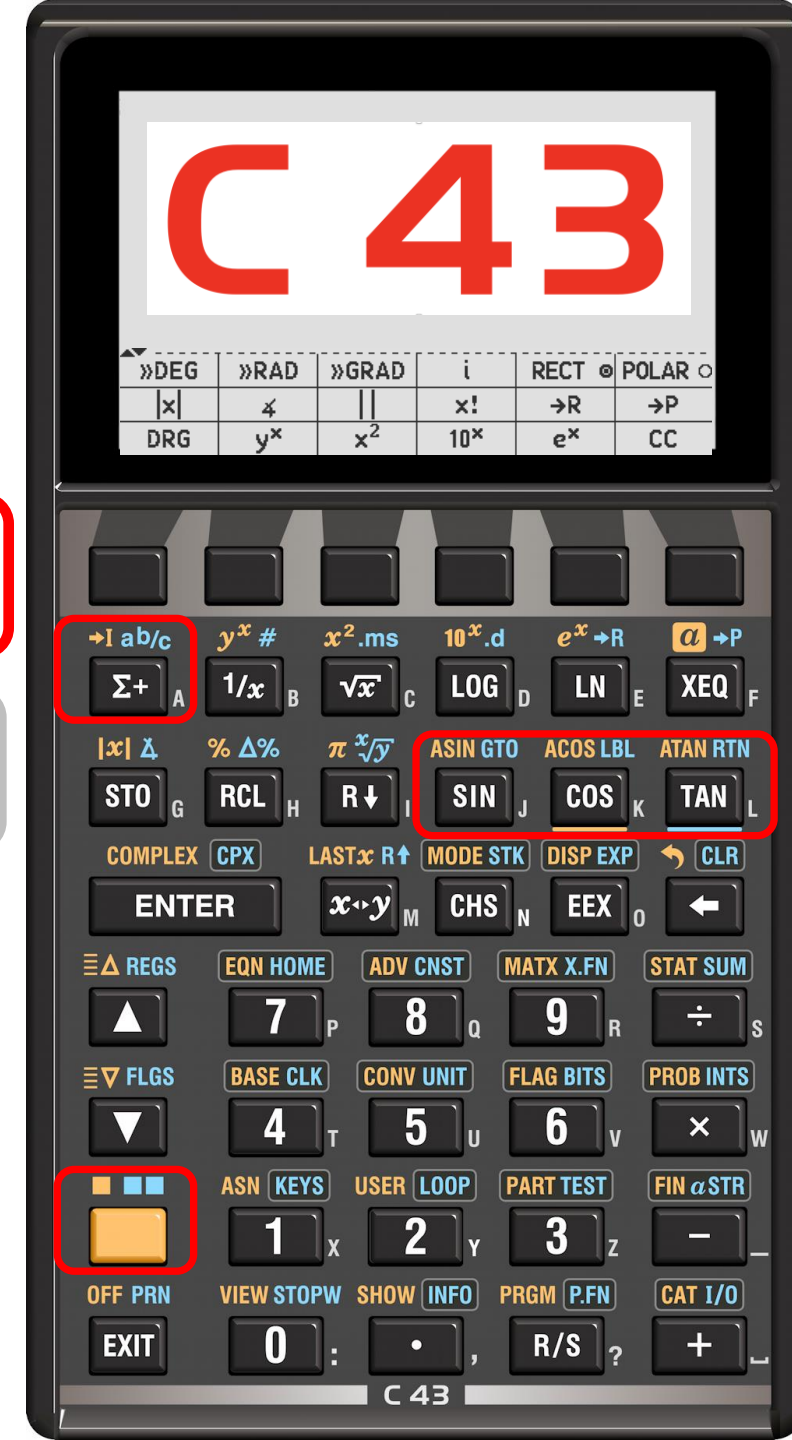
FLGS	CLR	UNIT	BITS	INTS
BASE	CONV	FLAG	PROB	
1	4	5	6	x

RTN	KEYS	LOOP	TEST	αSTR
LBL	ASN	USER	PART	FIN
GTO	1	2	3	-

PRN	STOPW	INFO	P.FN	I/O
OFF	VIEW	SHOW	PRGM	CAT
EXIT	0	.	R/S	+

Solid colour =
Changed USER keys

Greyed out =
default keys



C43

UI Additions : **BASE**

2022-10-29 11:15 CL₄[°] #KEYA-F 64:2

X:	1B ₁₆
X:	1 1011 ₂
	0.000
	1B ₁₆

LEAD.0	WSIZE ₆₄	64-BIT	32-BIT	16-BIT	8-BIT
BITS	INTS	AND	OR	XOR	NOT
IP	MODE# ₁₆	HEX	DEC	OCT	BIN



U06	U08	U16	U32	U64	SWAP.B
S06	S08	S16	S32	S64	SWAP.W
SL1	SR1	RL1	RR1	RL	RR

BASE MENU



C43 UI Large Display

```
2022-10-25 00:19 CL 4° #KEYA-F 64:2 UL  
X: 3 E816  
X: 11 1110 10002  
X: 1 7508  
X: 1 00010
```

SHOW

Short integer

X in HEX, displayed in
#2, #8, #10, #16

```
2022-10-27 11:01 CL 4° /max 64:2 SL  
X: 185131426470358721  
030003064550489120286  
063150089838997749248  
000
```

SHOW

Long integers

Large/small font

C 43

- Large Screen
 - **SHOW**
 - BASE
 - ALPHA 3-1n
 - CB/RB/state

C43 UI Large Display

2022-10-27 11:13 $\angle$ /max 64:2 $\angle$
X: 0.7071067811865475244
00844362104849
+i×0.7071067811865475244
00844362104849

SHOW
Complex

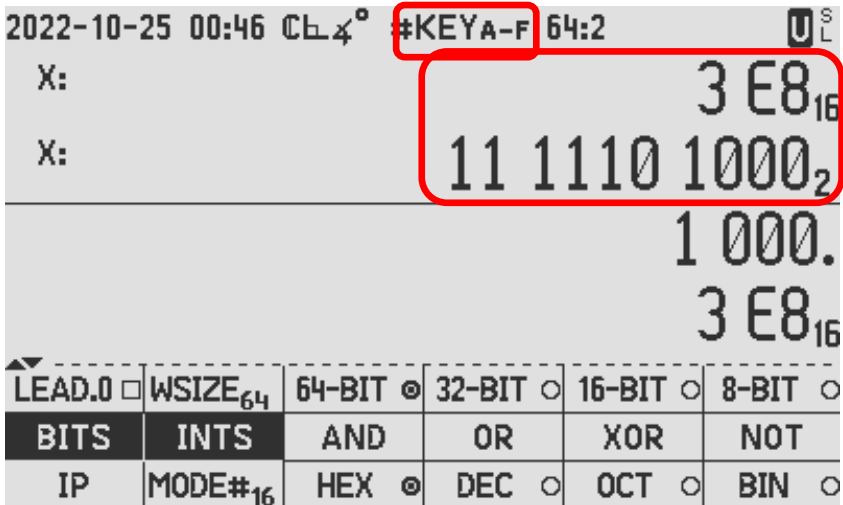
2022-10-25 00:38 $\angle$ /64x 64:2 $\angle$
X: 1°13'48.00"
X: 1.23°
X: 0.021467549799530254^r
X: 0.006833333333333333 π
X: 1.366666666666666667^g

SHOW
Angle measures

C 43

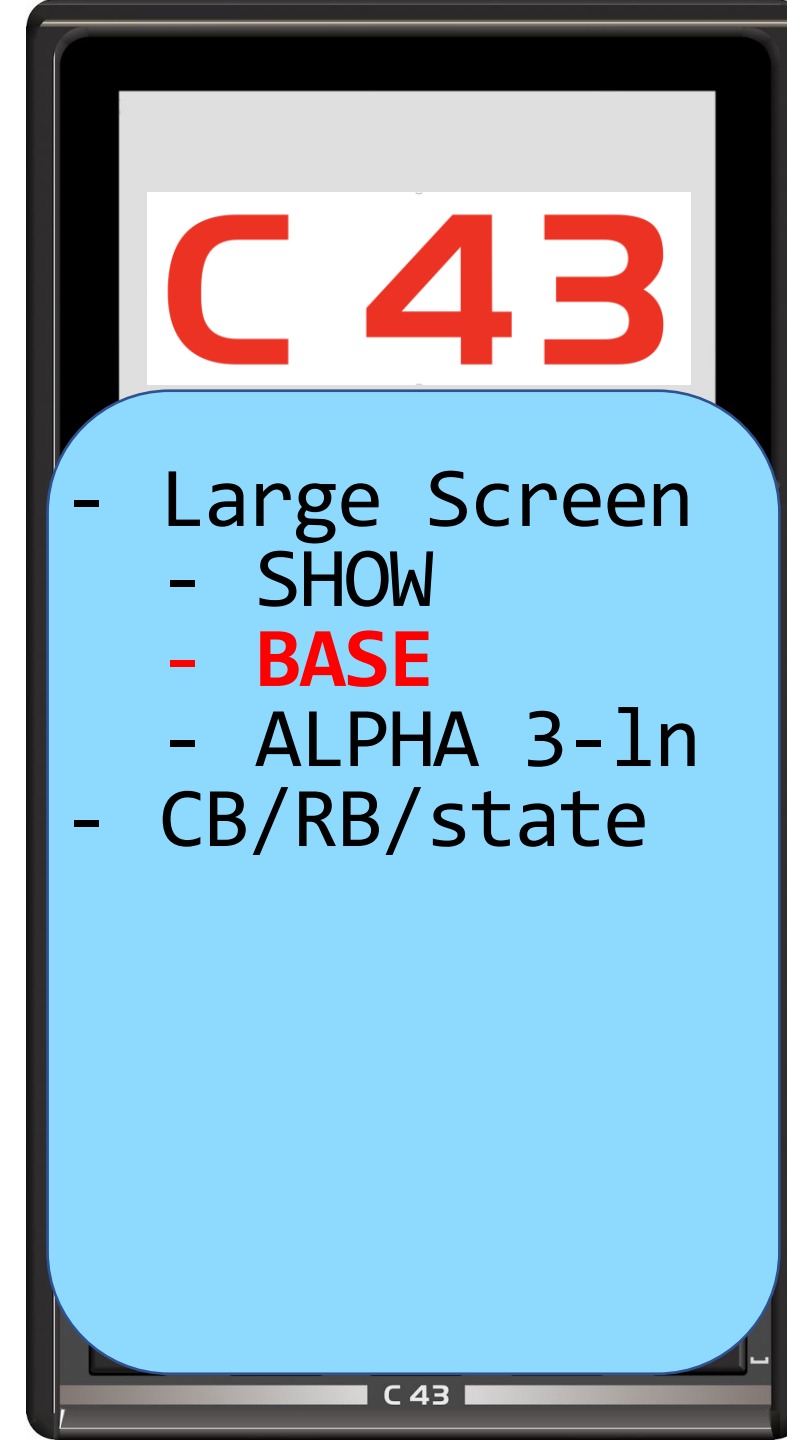
- Large Screen
- **SHOW**
- BASE
- ALPHA 3-1n
- CB/RB/state

C43 UI Large Display

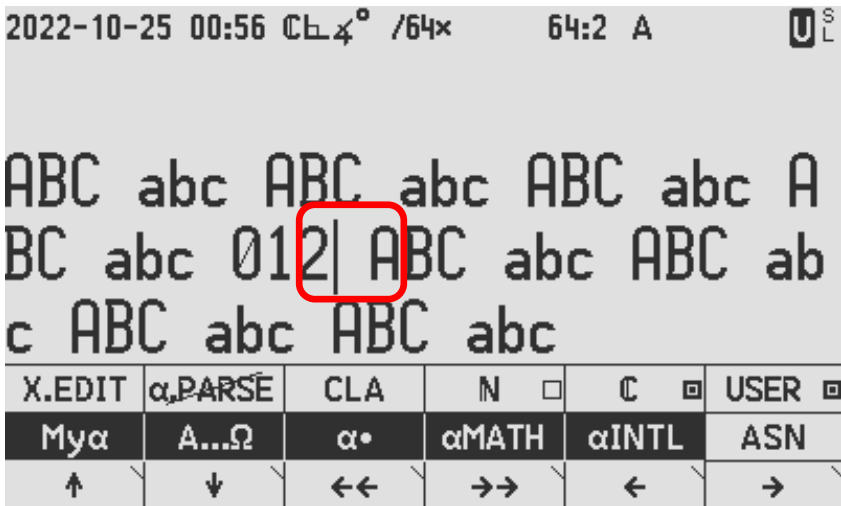


BASE mode: entry

- displays X in HEX & binary
- Activates keys A-F

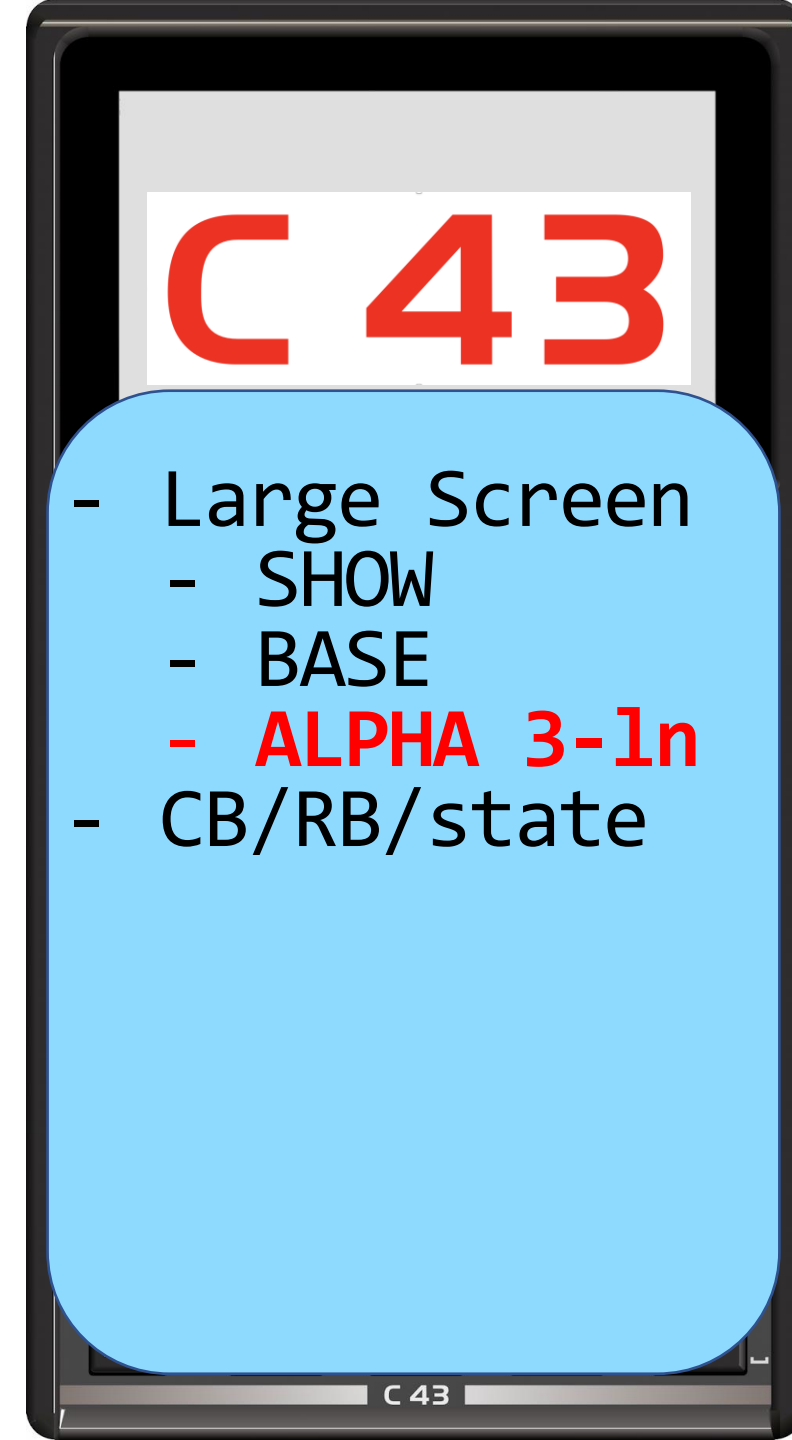


C43 UI Large Display



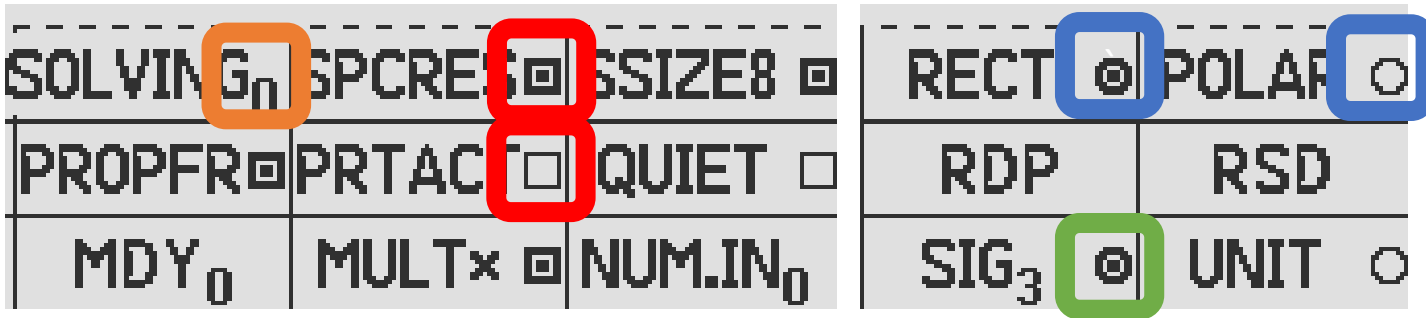
ALPHA entry:

- 3-line editor
- Alpha menu
- Large Text

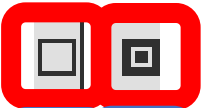


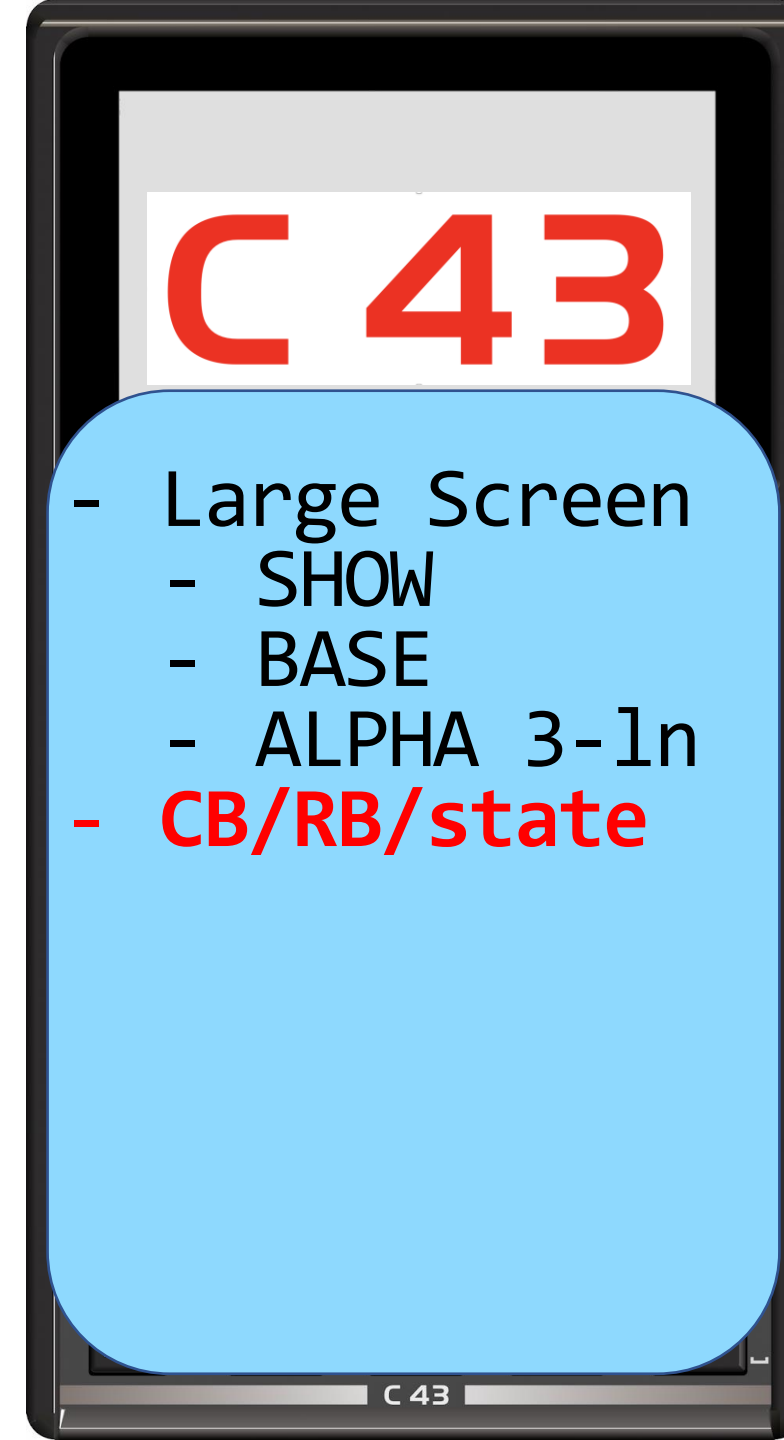
C43 UI Menu Changes

Radio buttons & check boxes



CFG: SYS.FLG Editor

- Status only 
- Status & CheckBox 
- Radio Button Selection 
- Radio button status 



C43 UI functionality changes

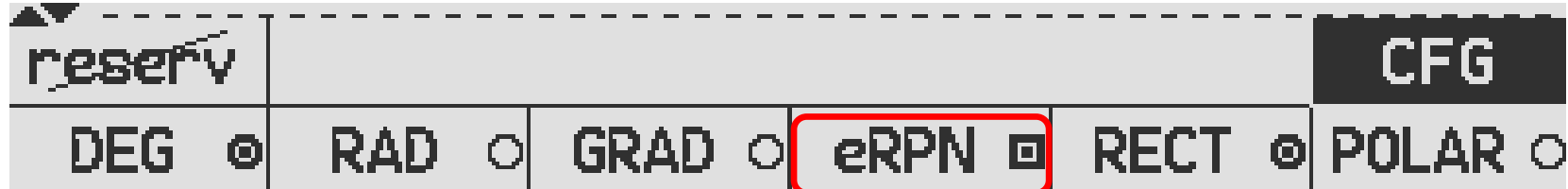
eRPN (default option)

“There are two basic versions of RPN.
One is the classical RPN and **the other**
is what I will call Entry RPN.

The difference between the two “RPN”
versions is making the extra copy when
the ENTER key is pressed.”

HP RPN Evolves
Richard J.
Nelson

MODE



C 43

- eRPN / RPN
- SIG
- UNIT
- Cycling
 - >I
 - .ms
 - DRG
 - DMC
 - ASS.ALL

C43 UI functionality changes

SIG

“The WP 34S and 31S have for a long time had a compile time option to add the rarely seen 'significant figures' display mode, implemented by Nigel(UK) [in WP34S/C/31S].

Very few calculators offer this feature, one example is the Commodore S61 from 1976.”

Bit,
hpmuseum, 2015

DISP

RNG ₆₁₄₅	HIDE ₀			RECT ⊗	POLAR ○
SDL	SDR	ROUND	ROUNDI	RDP	RSD
FIX ○	SCI ○	ENG ○	ALL ○	SIG ₃ ⊗	UNIT ○

C 43

- eRPN / RPN
- **SIG**
- UNIT
- Cycling
 - >I
 - .ms
 - DRG
 - DMC
 - ASS.ALL

C43 UI functionality changes

SIG

2022-10-25 01:48 CL₄[°] /64x 64:2 U^S_L

π / 1000

π

$\pi \times 1000$

$\pi \times 1000\ 000$

0.003 142
3.142
3 142.
3 142 000.

DISP

C 43

- eRPN / RPN
- SIG
- UNIT
- Cycling
 - >I
 - .ms
 - DRG
 - DMC
 - ASS.ALL

C43 UI functionality changes

SI UNIT PREFIX

2022-10-25 01:51 $\angle 4^\circ$ /64x 64:2 U^{S}

π / 1000	3.142 m
π	3.142
π x 1000	3.142 k
π x 1000 000	3.142 M

HOME Dn

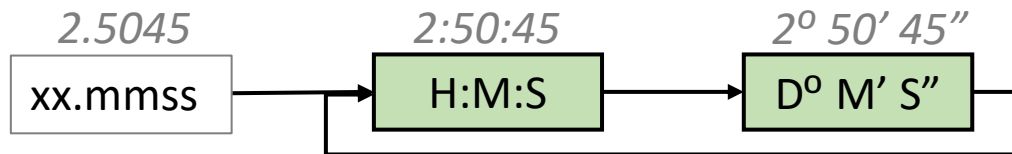
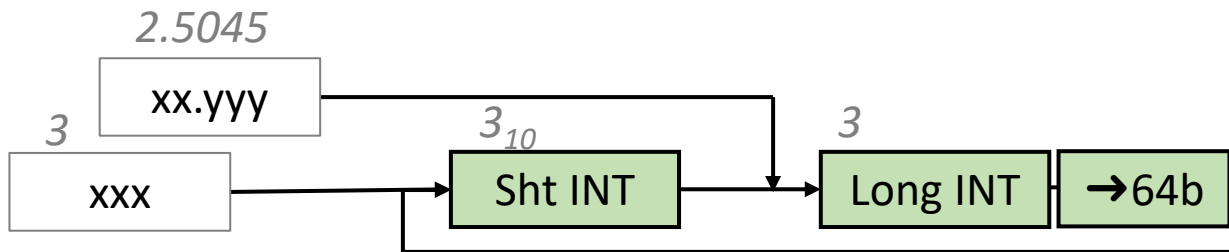
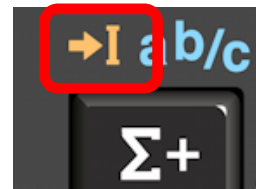
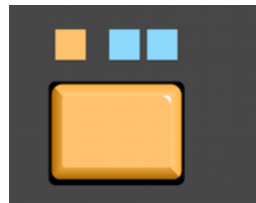
»DEG	»RAD	»GRAD		RECT $\odot$	POLAR $\circ$
·f	DMC UNIT	DSP ₃	x!	·G	·T
·p	·n	·μ	·m	·k	·M

C 43

- eRPN / RPN
- SIG
- **UNIT**
- Cycling
 - >I
 - .ms
 - DRG
 - DMC
 - ASS.ALL

C43 UI functionality changes

CYCLING KEYS

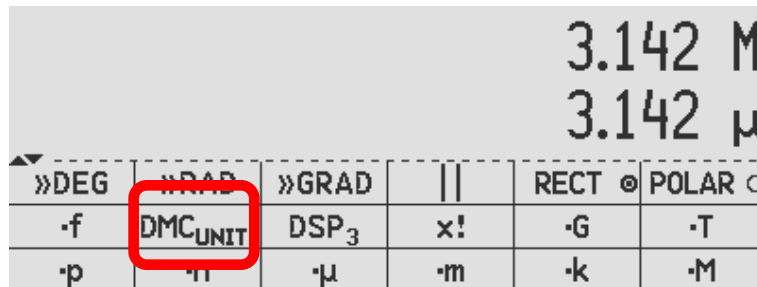
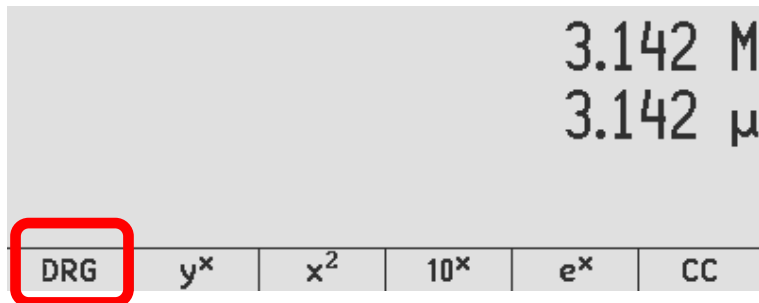
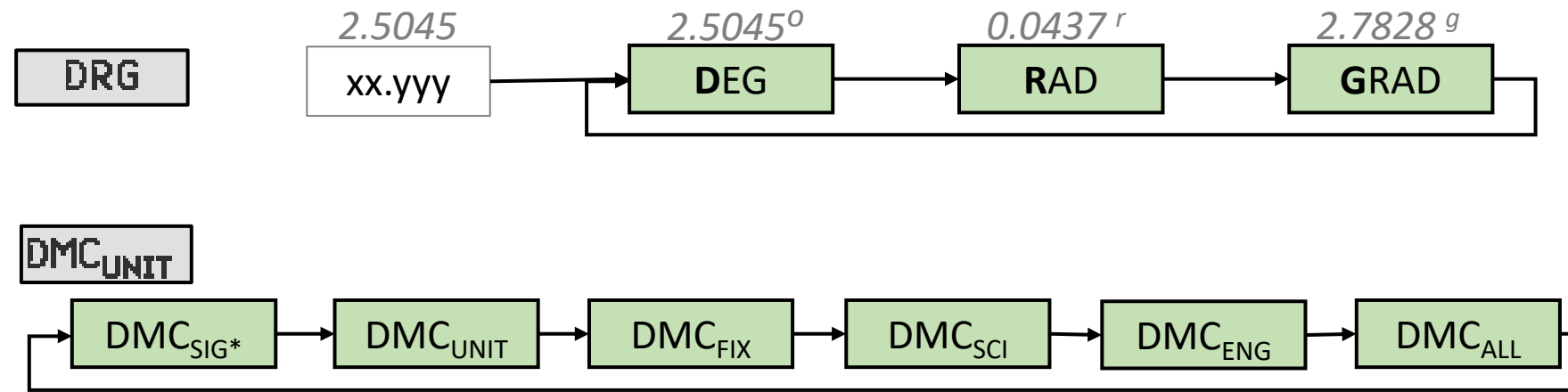


C 43

- eRPN / RPN
- SIG
- UNIT
- **Cycling**
 - f/g
 - >I
 - .ms
 - DRG
 - DMC

C43 UI functionality changes

CYCLING KEYS (Cont.)

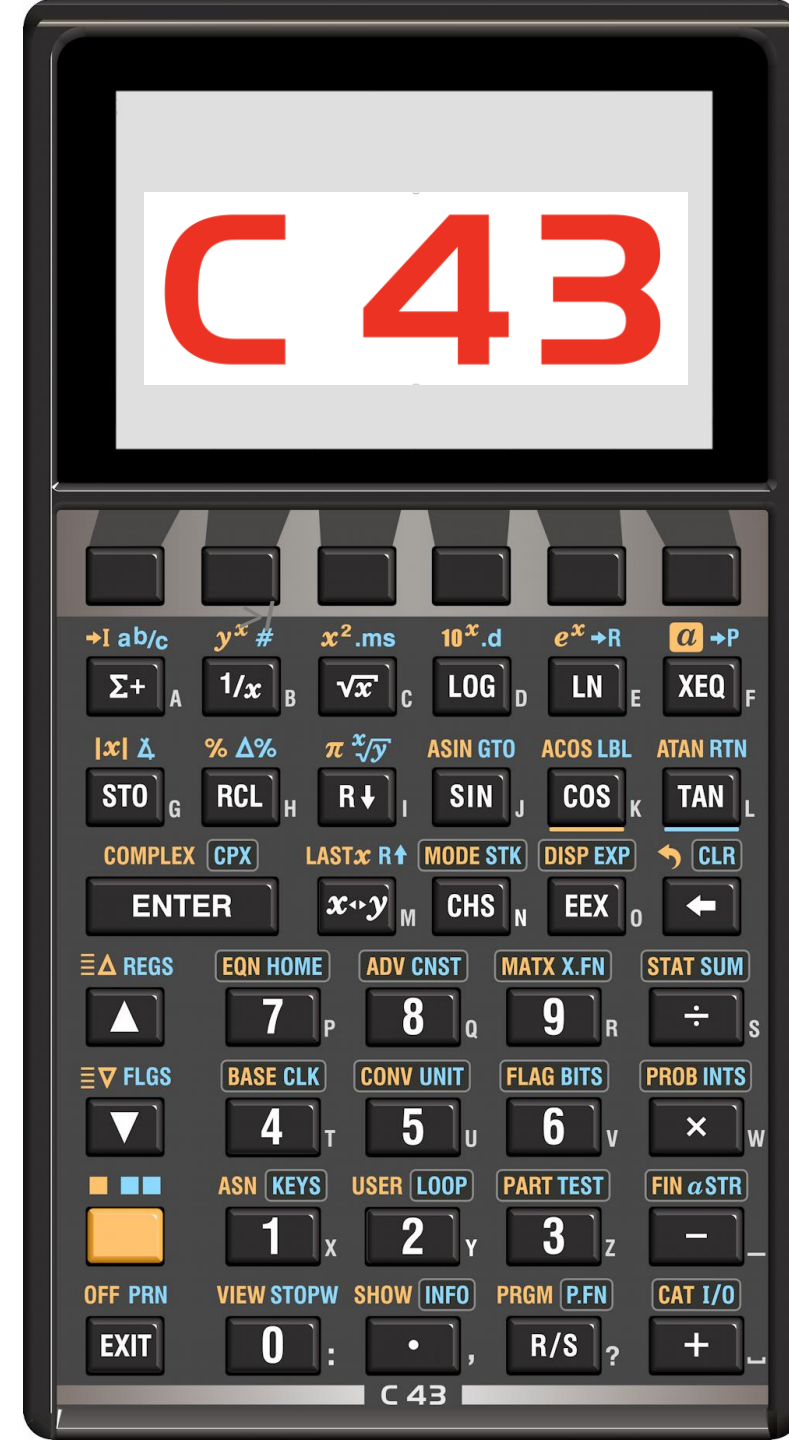


C 43

- eRPN / RPN
- SIG
- UNIT
- **Cycling**
 - f/g
 - >I
 - .ms
 - **DRG**
 - **DMC**

C43 UI experimental

- Test Bed for key layouts:
 - V43LT, V43RT, AltA, AltB, even WP43
- CYCLING keys evolved:
 - f/g, >I, .ms, DRG, DMC in C43
- Triple press for HOME: maybe options
- Double press for DROP: works well
- Long press for CLRSTK: works well
- Long press for EXITCLR: ok, still WIP
- SHOW for stack: may interfere with P/R
- EXFRAC: WIP: maybe outside fractions



- END
- EXTRA SLIDES

2022-10-29 00:20 C_L 4° /64× 64:2 0_L
NOP 0.
C43 L1: C43 template SIM
C43L1_108_07f, Oct 26 2022 0.
Σ+NRM RESET USER
C43 V43 LT V43 RT WP43
UΣ CC U↑ CC C43AltA C43AltB DM42 ASN



2022-10-29 00:23 C_L 4° /64× 64:2 0_L
C43 L1: C43 template SIM
C43L1_108_07f, Oct 26 2022 0.
»DEG »RAD »GRAD i RECT POLAR
|x| 4 % Δ% π √y ASIN GTO ACOS LBL ATAN RTN
STO G RCL H R↓ I SIN J COS K TAN L
COMPLEX CPX LASTxR↑ MODE STK DISP EXP CLR
ENTER↑ xzy K CHS L EEX M ←
REGS EQN HOME ADV CNST MATX X.FN STAT SUM
↑ 7 N 8 O 9 P ÷ Q
FLGS BASE CLK CONV UNIT FLAG BITS PROB INTS
↓ 4 R 5 S 6 T × U
BLRTN ASN KEYS USER LOOP PART TEST FIN αSTR
1 W 2 X 3 Y - Z
OFF PRN VIEW STOPW SHOW INFO PRGM P.FN CAT I/O
EXIT 0 : . R/S ? +



2022-10-29 00:22 C_L 4° /64× 64:2 0_L
f C43 L1: C43 template SIM
C43L1_108_07f, Oct 26 2022 0.
Σ+NRM RESET USER
C43 V43 LT V43 RT WP43
UΣ CC U↑ CC C43AltA C43AltB DM42 ASN

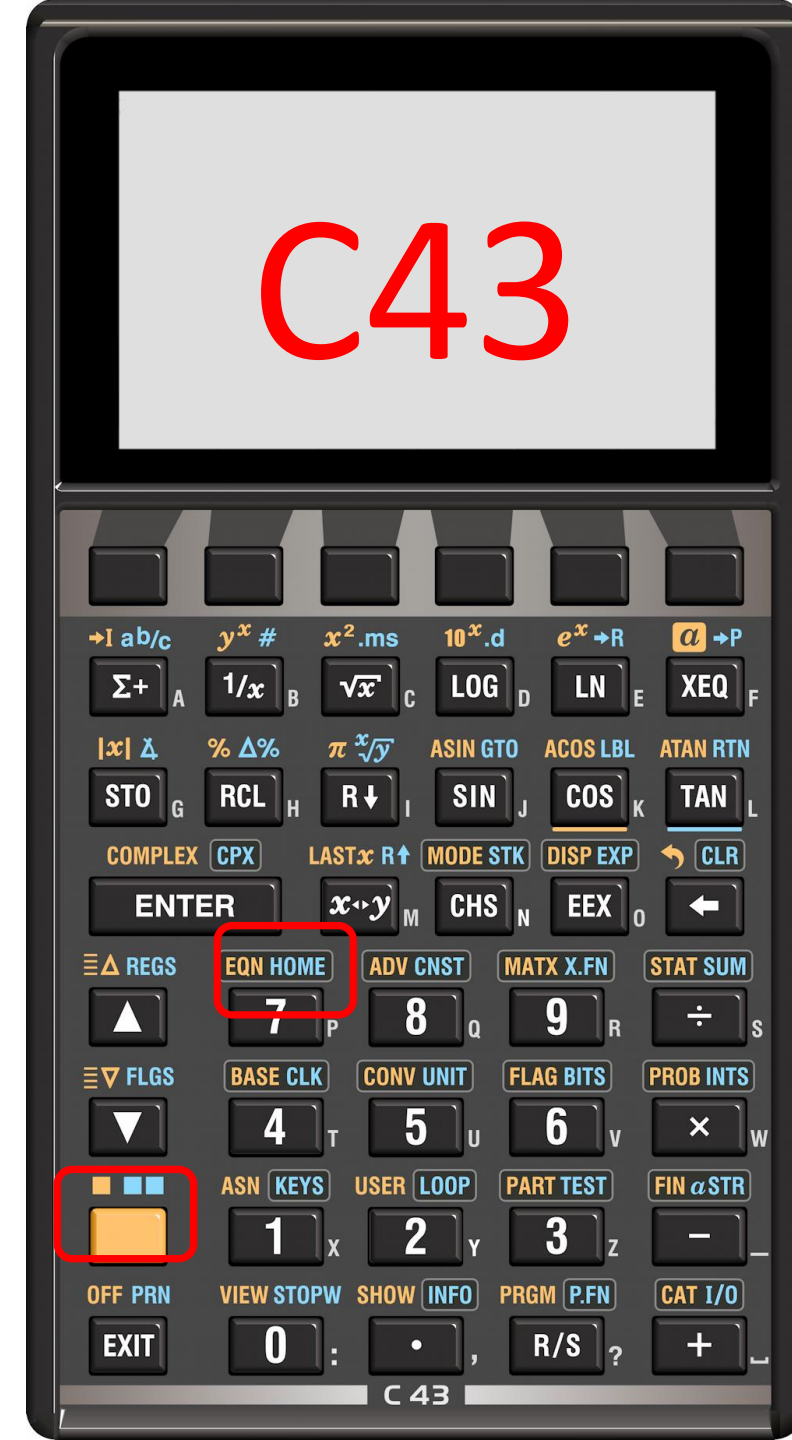




C43

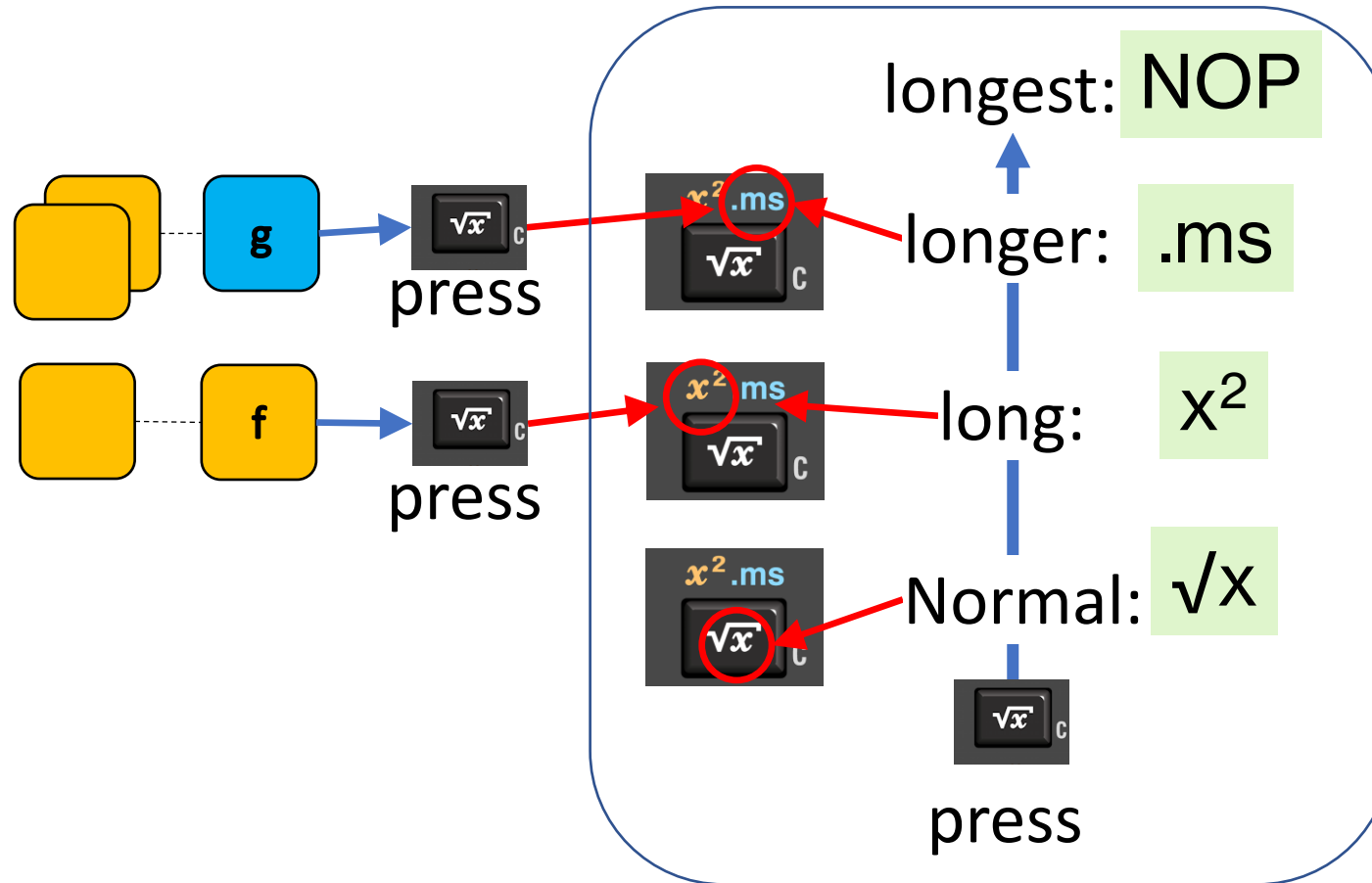
UI Additions : UI EXTRAS

- **ELEC**
 - More topical menus ?
- **EXFRAC**
 - Displays multiples $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$, θ , π ...
- **RECT/POLAR**
 - >R & >P has hybrid old/new
 - X = Complex or X,Y = Real/Int

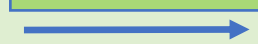


C43

UI Additions : KEY LONGPRESS

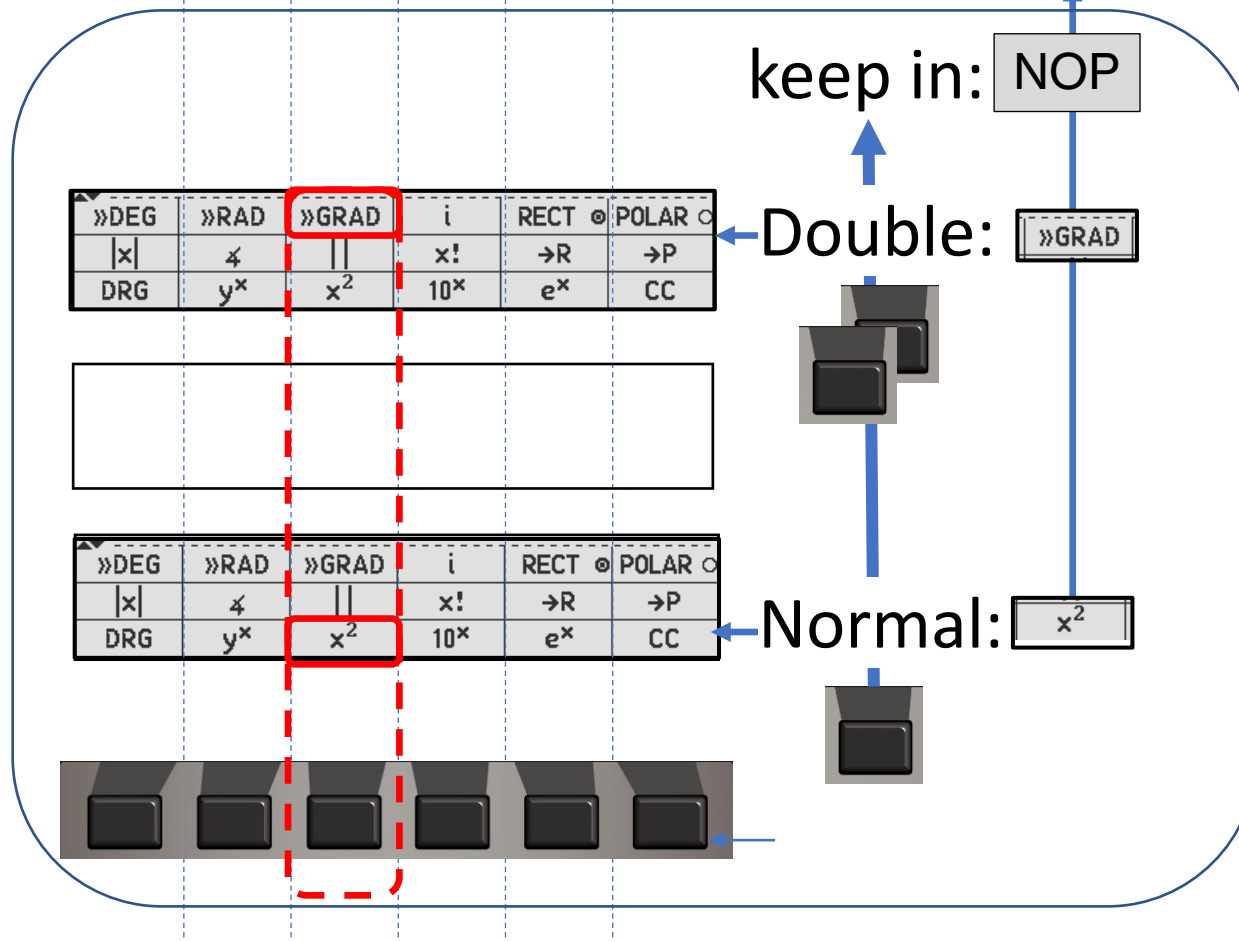


UI Additions : FN LONGPRESS



C43

UI Additions : FN DOUBLE CLICK



C43

UI Additions : HOME

