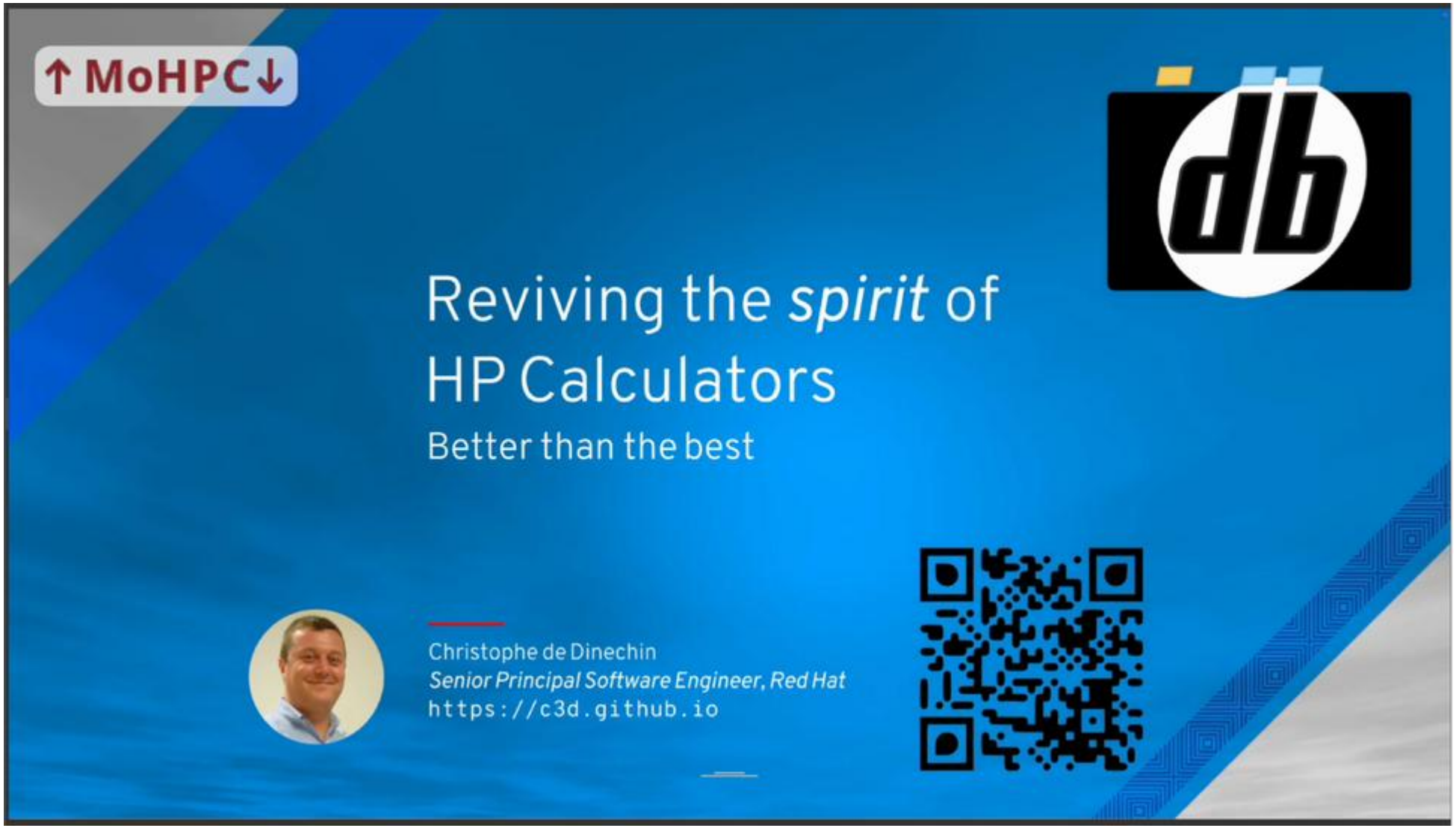
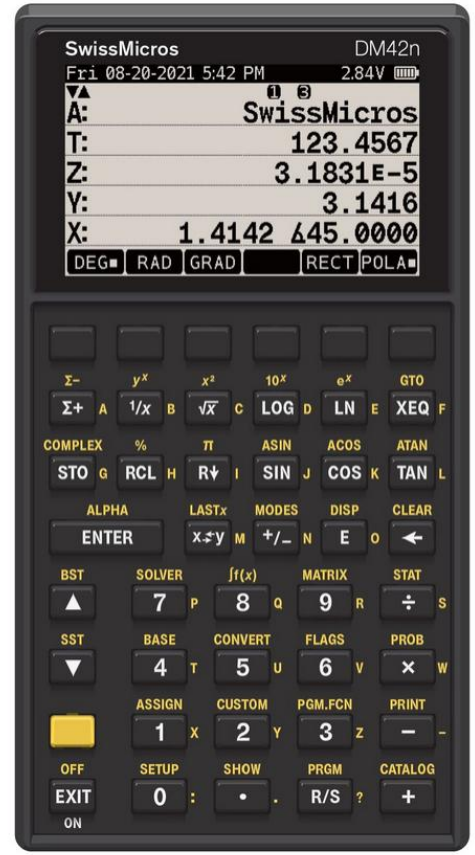
The db48X / db50X – An Introduction

Created by Christophe de Dinechin
Presented at the Stuttgart 2024 Conference



DM32, DM42, DM42n as starting points



→db48X

→ db50X

Why prefer the db48x/50x over the hp 50g?

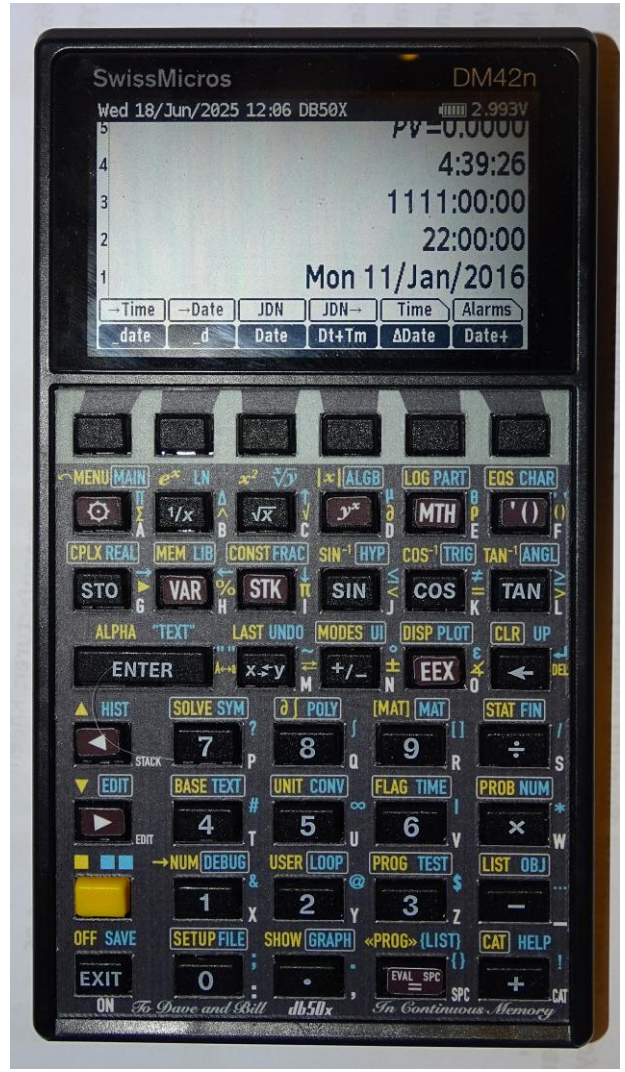
db48x/50x	attribute	hp50g
5.3" x 2.8" x 0.5"	dimensions	7.2" x 3.4" x 0.9"
180g / 6.3 oz	weight	9.6 oz
400 x 240	display resolution	131 X 80
2017 - present	Intro/discontinuation dates	2006 to 2015
24MHz(battery) / 80MHz (USB)	Processor Speed	75MHz (ARM9)
43	no. of keys	51

Evolution: WP34S, WP43S, C47, db50X

RPN

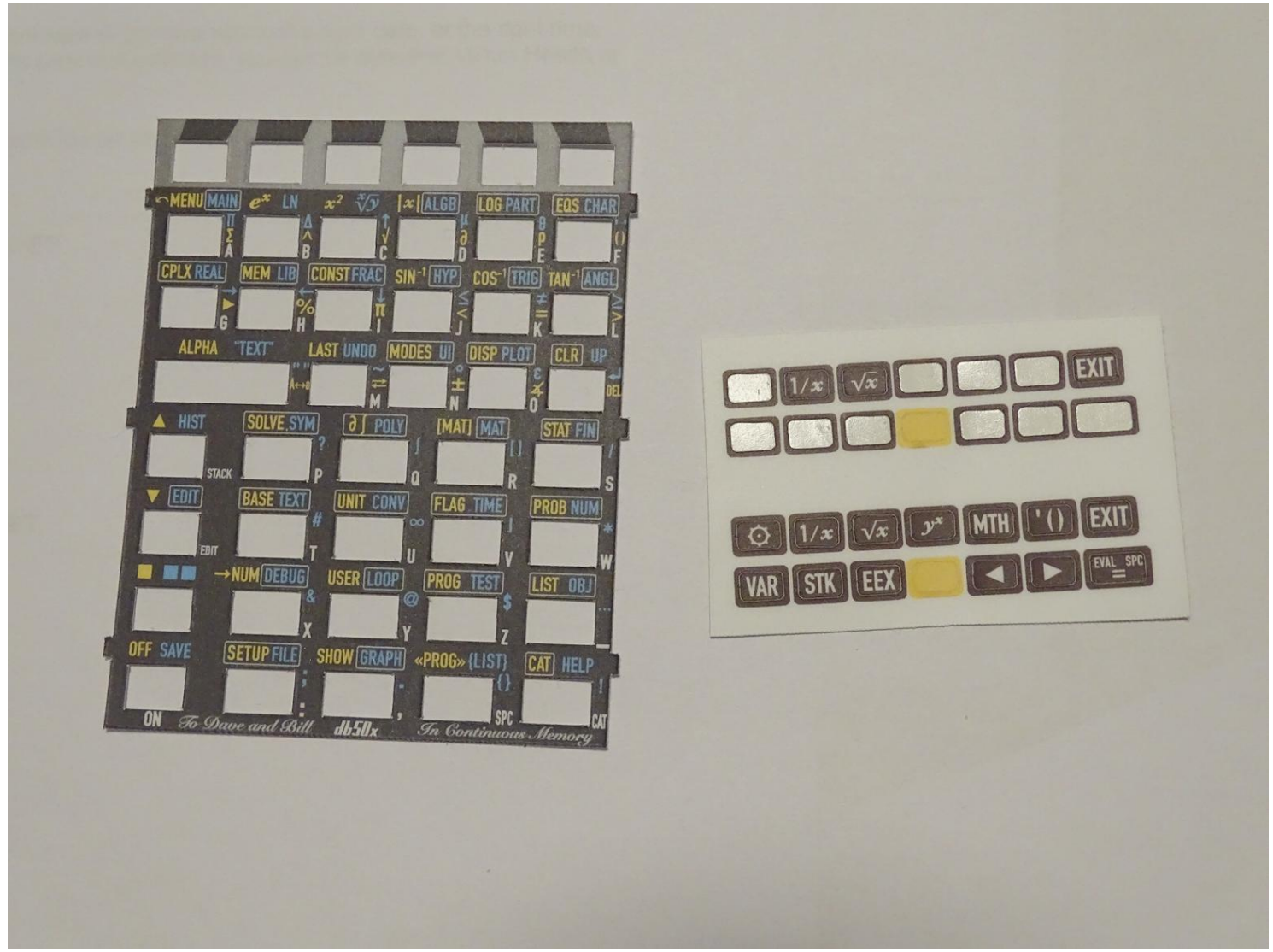
RPN

RPN



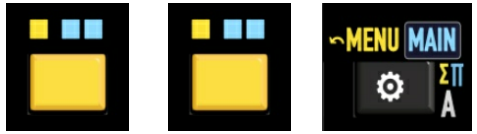
RPL

Overlays (tabbed or adhesive) and Key Labels

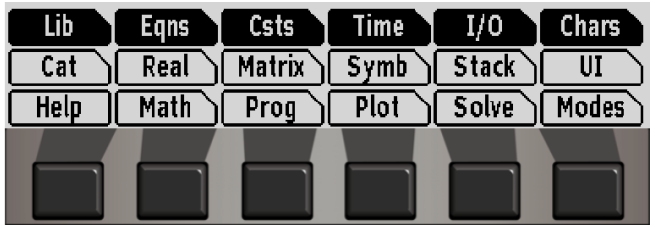


Main Menu, left-shifted, right-shifted:

Main Menu

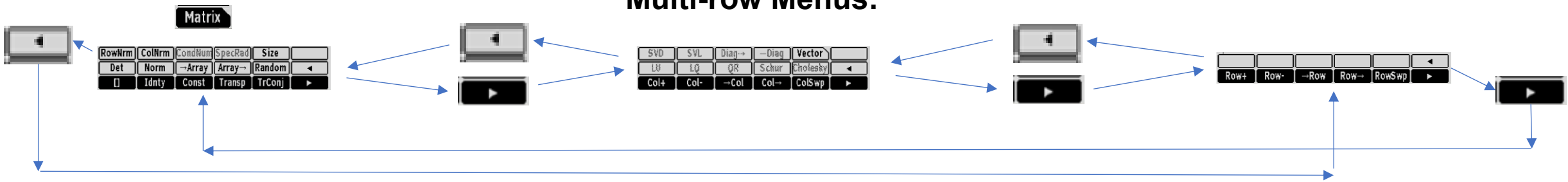


Left-shift

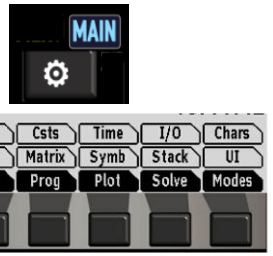


Right-shift

Multi-row Menus:

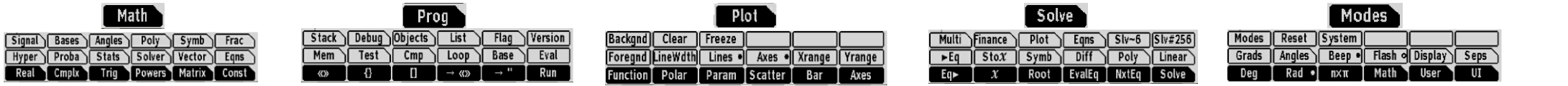


Menus, menus, menus…
Many redundancies:

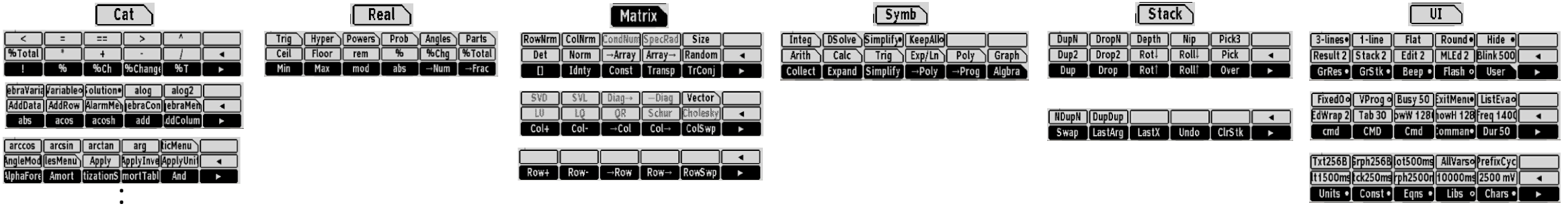


(Based on v0.9.7)

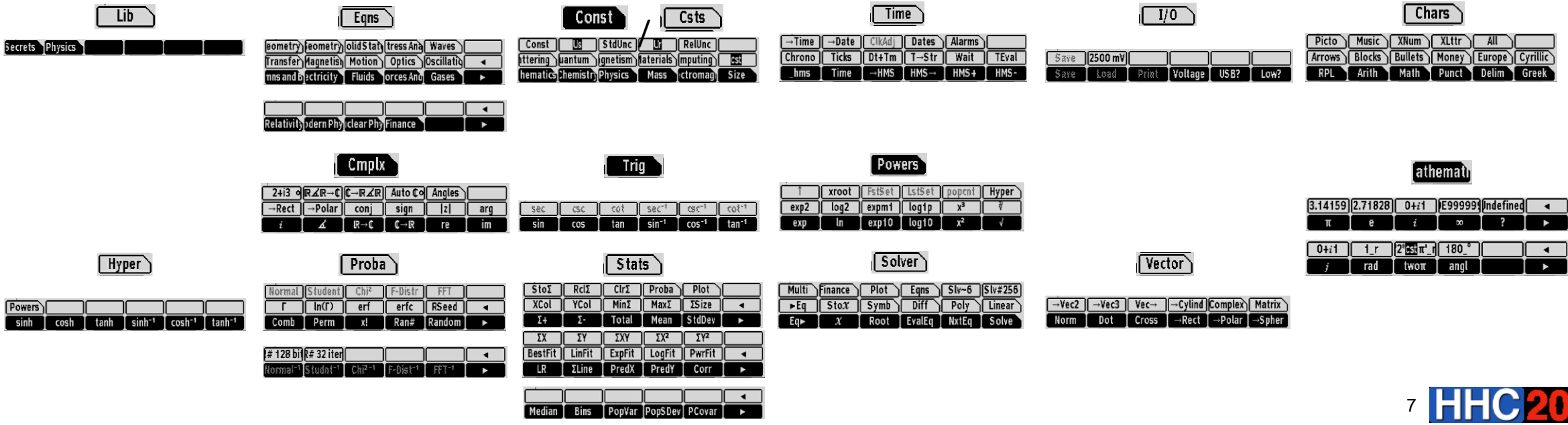
1



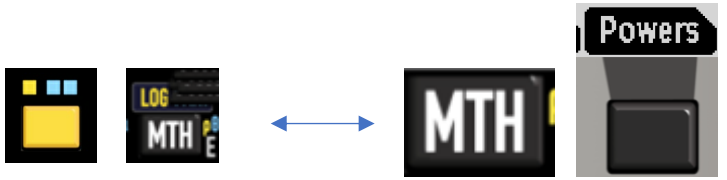
2

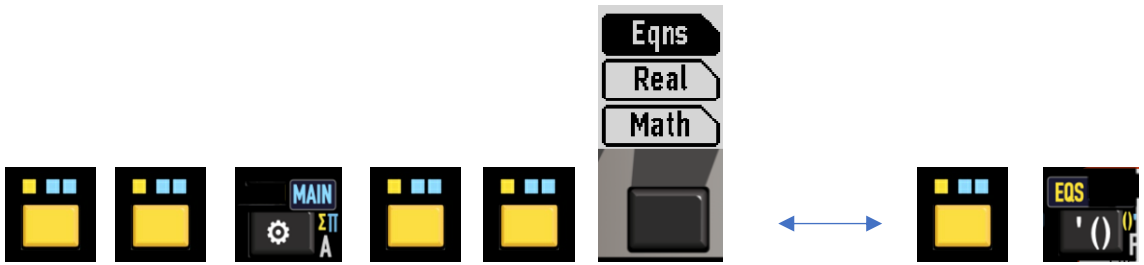


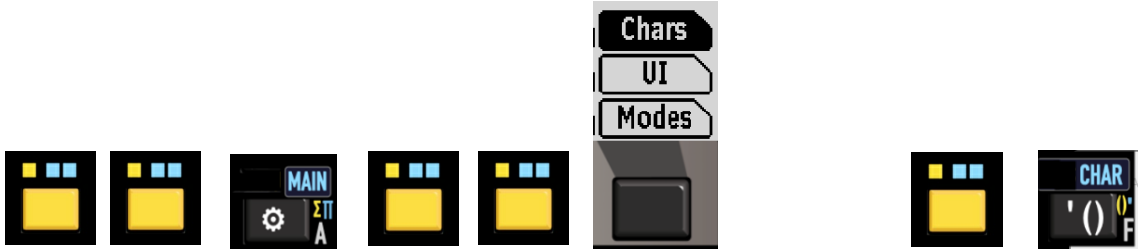
3

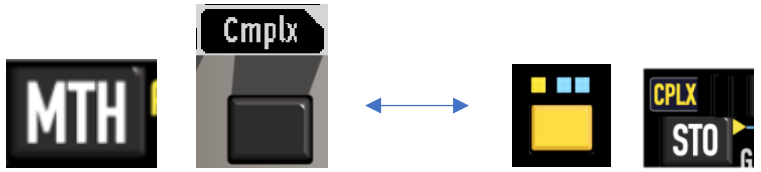


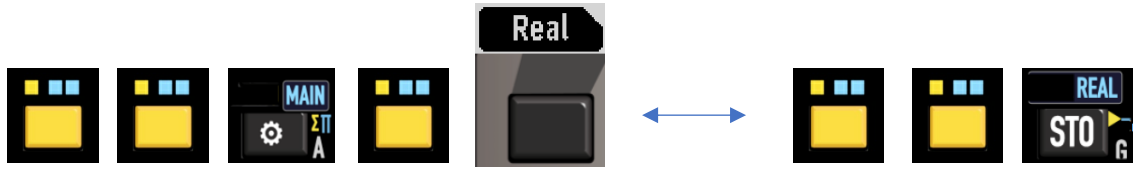
Some Keyboard Redundancy Examples:



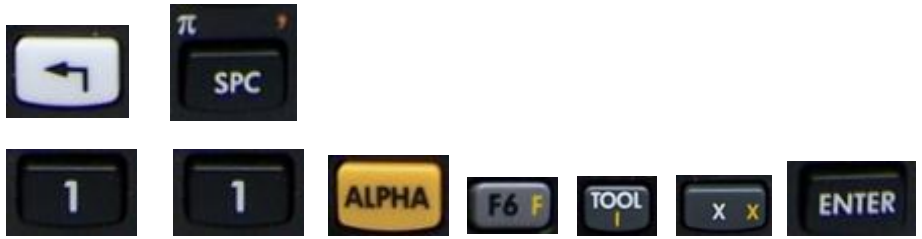


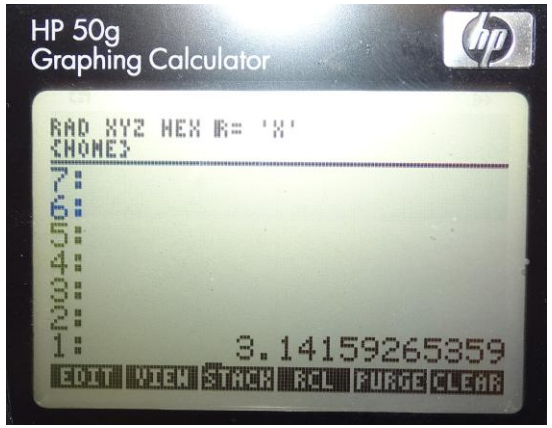


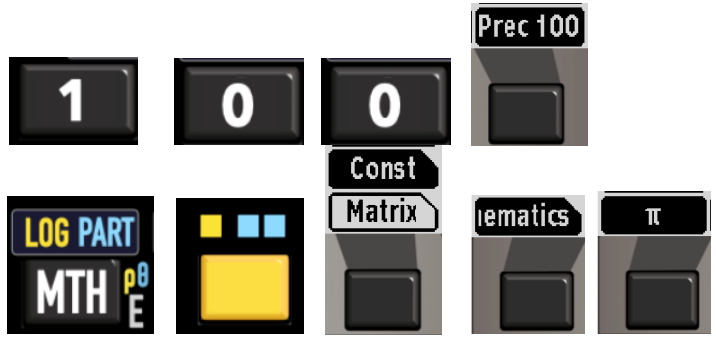


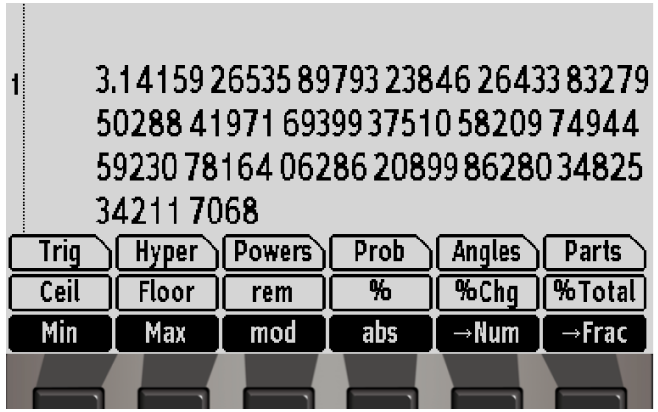


Beyond the Limits, part 1: pi

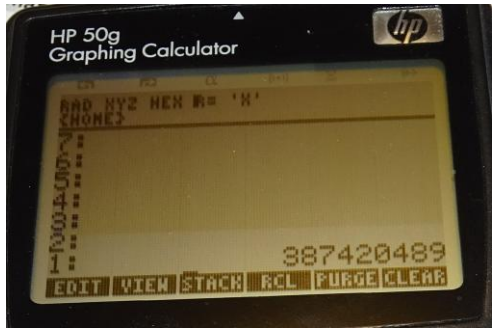


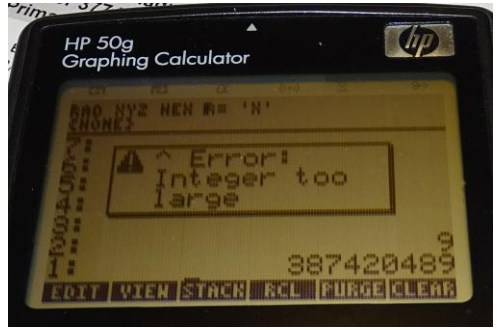


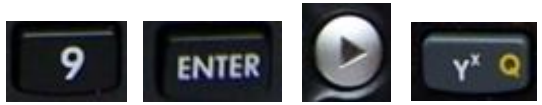


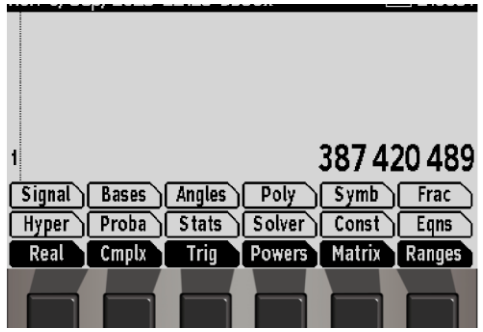


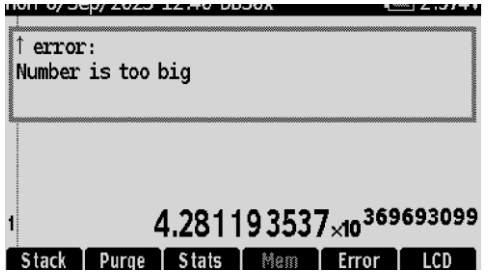
Beyond the Limits, part 2: 9^{9^9}











WolframAlpha

9^9^9

NATURAL LANGUAGE | MATH INPUT | EXTENDED KEYBOARD | EXAMPLES | UPLOAD | RANDOM

Input

9^{9^9}

Power of 10 representation

$10^{10^{8.567841344487361}}$

Number length

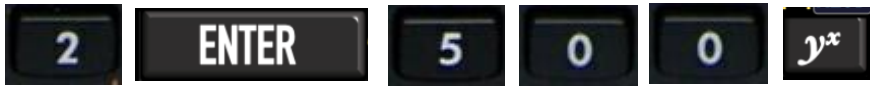
369 693 100 decimal digits

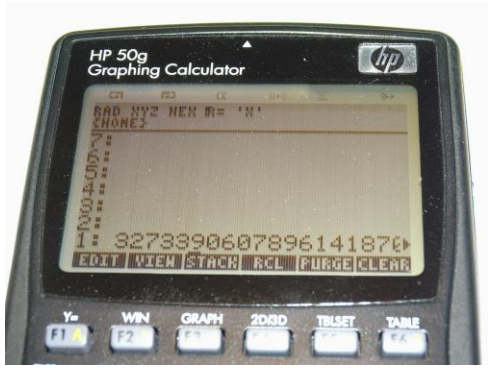
$\approx 3.69693 \times 10^8$ decimal digits

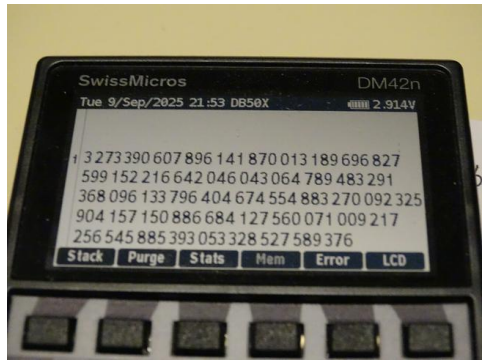
Last few decimal digits

…2627177289

Beyond the Limits, part 3: 2^{500}







FROM THE MAKERS OF **WOLFRAM LANGUAGE** AND **MATHEMATICA**

WolframAlpha

2^500

NATURAL LANGUAGE | MATH INPUT | EXTENDED KEYBOARD | EXAMPLES | UPLOAD | RANDOM

Input

2^{500}

Result — Step-by-step solution

3 273 390 607 896 141 870 013 189 696 827 599 152 216 642 046 043 064 789 483 ...
291 368 096 133 796 404 674 554 883 270 092 325 904 157 150 886 684 127 560 ...
071 009 217 256 545 885 393 053 328 527 589 376

Decimal form — More digits

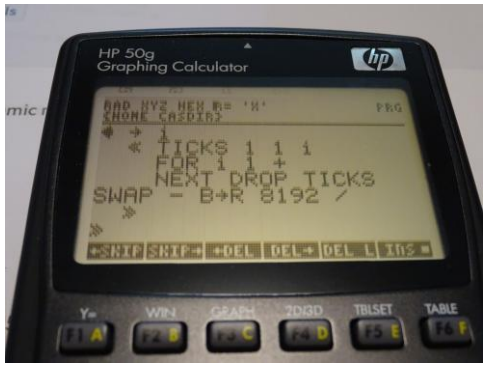
$3.27339060789614187001318969682759915221664204604306478948329136...$
$80961... \times 10^{150}$

Number length

151 decimal digits

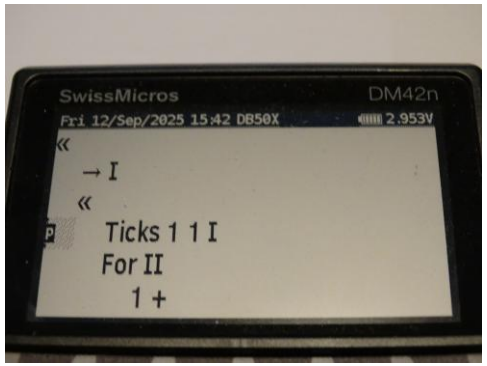
Comparative timing

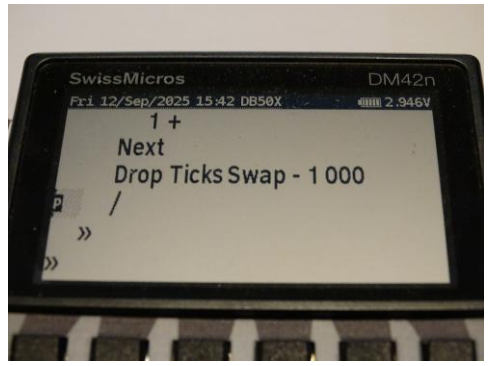
HP50g:



Counter		Elapsed Time
5		0.0299
25		0.1193
500		2.2427
1000		4.4780

db48/50X:





Counter		Elapsed Time
5		0.0100
25		0.0100
500		0.1200
1000		0.2200
10000		2.1800
20000		4.3600
100000		28.9700

(roughly 20X speed improvement)

Pros and Cons

Pros:

1. db48/50X significantly smaller physical size
2. Much faster
3. Dynamic Range wider
4. SwissMicros LCD higher resolution

Cons:

1. Fewer keys / increased keystrokes for some operations
2. Documentation still “evolving”
3. Only one shift key despite two shifted-key planes

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Not remotely HP Calculators This is the place for generally off-topic stuff that might interest HP calculator users anyway.	2,143	19,136
Test forum For trying forum features.	172	750
Forum Issues and Administration Discussions about forum problems, features, suggestions etc.	300	2,160

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Plus42 Fedora Linux grbrum, 08-26-2025, 12:17 AM	7	212	08-27-2025, 09:26 PM Last Post: grbrum	
DB48X: HP48-like RPL implementation for DM42 (Pages: 1 2 3 4 ... 41) c3d, 07-08-2023, 07:00 PM	816	280,490	08-26-2025, 07:30 AM Last Post: raprism	
Envy mode on: Look what I have just got!			08-24-2025, 10:09 PM	

c3d
Senior Member

Posts: 433
Threads: 10
Joined: Sep 2022

Release v0.9.11 is now available for testing.

This release implements arithmetic and basic functions on uncertain numbers.
This propagates uncertainty using quadradic superposition, in a way similar to OpenRPNCalc, with a generalization for correlated variables.

New features

- Arithmetic and basic functions on uncertain numbers
- Add support for complex-valued unit objects, e.g. **5+3*i*Ω**
- Add support for range-valued unit objects, e.g. **1…3Ω**
- Support arithmetic operation on infinities, e.g. **∞ 42 +**
- Add commands to generate mathematical constants (π, e, ∞ and −∞)
- Parsing and editing of ranges containing infinities
- Accept infinities in **→Range** and variants
- Comparison of infinite values and finite values
- Add union and intersection commands for ranges
- Add operations to build ranges and uncertain numbers from components
- Add derivative for **erf** and **erfc**

Bug fixes

- Do not leave bad expressions behind after errors on ranges
- Obey the **InfinityError** flag when detecting divide-by-zero in ranges
- Avoid crash pushing null pointer after unit evaluation error
- Avoid spurious inconsistent units error due to date computations
- Null-protection in variadic list construction to fix a null-deref crash

Improvements

- Accelerate error exit from arithmetic operations
- Render uncertain numbers as **110±σ15** instead of **110±15σ**
- Accept **–** as valid input in constants (for **–∞**)
- Record performance data for iPhone 16
- Change spelling to **→σRange** in **RangeMenu**
- Use **ASSERT** for divide by zero inner checks (remove dead code)

DB48X,HP,me

Links

https://48calc.org/db48x/index.html

https://sites.google.com/view/hp-plus-calculator-comparison/home/rpn-rpl-graphing-calculator-photo-gallery#h.iasykspy4p3m

https://github.com/c3d/db48x/blob/stable/help/db50x.md#keyboard-interaction

https://github.com/c3d/db48x/releases

Overlays: https://www.hpmuseum.org/forum/thread-20113.html ("Spiff72")

Overviews: https://github.com/c3d/db48x/blob/stable/help/db50x.md#keyboard-interaction