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ROHDE&SCHWARZ

Sponsor Presentation from Mike Faith

DIY Macropad Workshop

Led by Ethan Tabler and Will McGloughlin
PSU IEEE 2021

Sponsor presentation from Rohde and Schwarz

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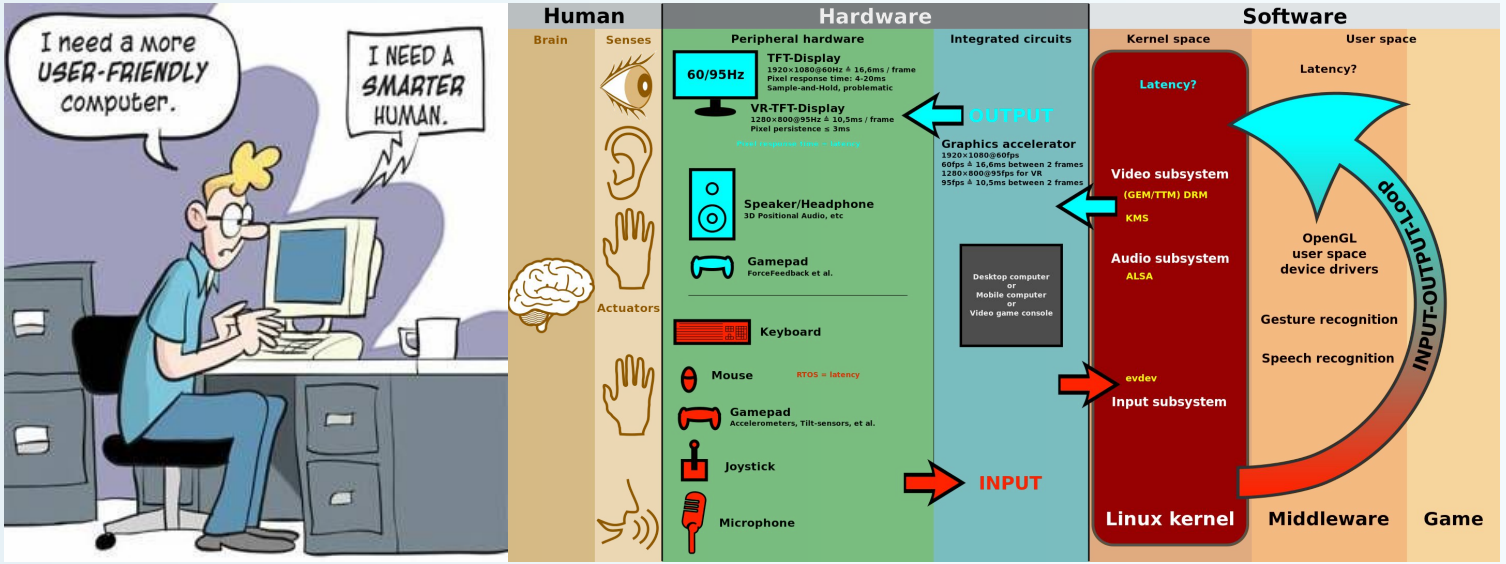
Intro to Macropads

- What is a macropad
- Potential uses
- What do other macropads look like

Interfacing with PCs

- Pro Micro
  - Made by SparkFun
  - Most widely available board in the Arduino ecosystem with **HID** support
    - Can send mouse and keystrokes



Original Prototype

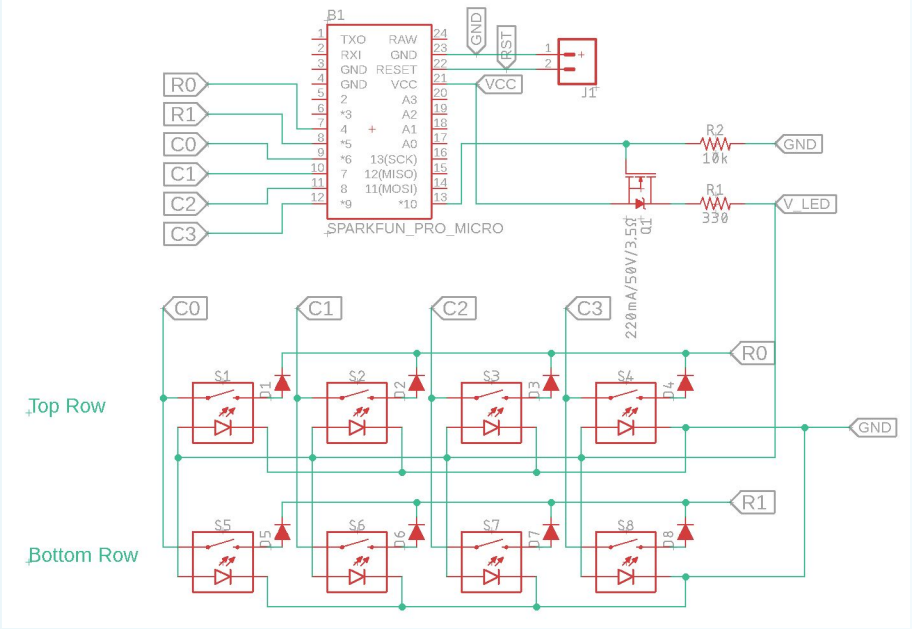
- 4 buttons hooked up to an Arduino Pro Micro
- Macros were programmed into the board using the Arduino IDE
- Issues
  - Harder to program macros
  - Somewhat limited in scope of macros
- QMK was a much better solution

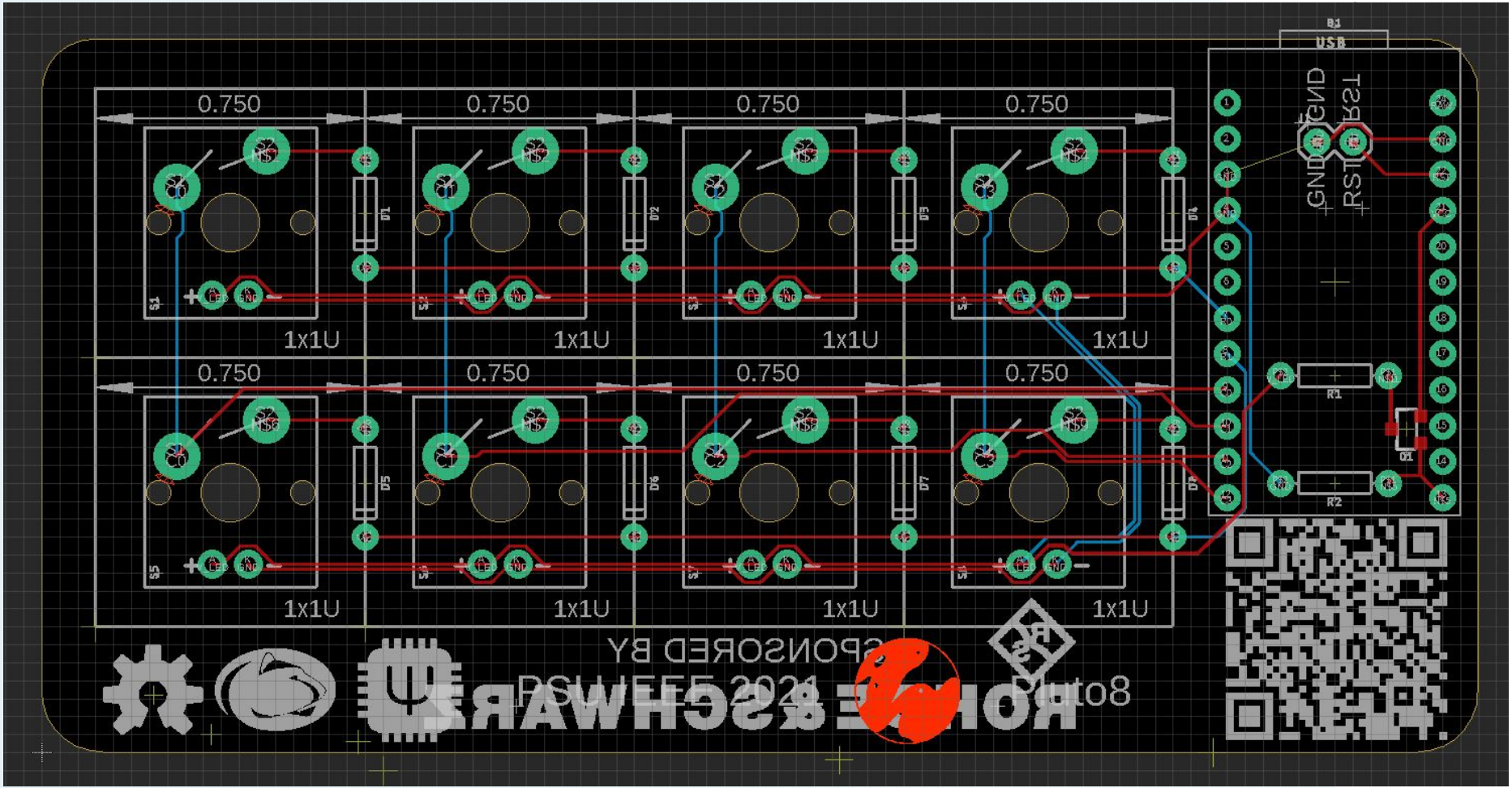
QMK

- What is QMK?
- What can you do with it?
- How do commercial boards use QMK?

QMK circuit design

- What does the circuit need in order to be QMK compatible
  - Matrix of keyswitches and diodes
  - Need to tell QMK which pins on pro micro correspond to each row and column of the matrix
    - In our setup, we do this with the online firmware builder
  - Lights(Optional)
    - Numlock
    - Backlight
    - Underglow
    - etc.




0.750
0.750
0.750
0.750
1x1U
1x1U
1x1U
1x1U
0.750
0.750
0.750
0.750
1x1U
1x1U
1x1U
1x1U
USB
GND
RST
R1
R2
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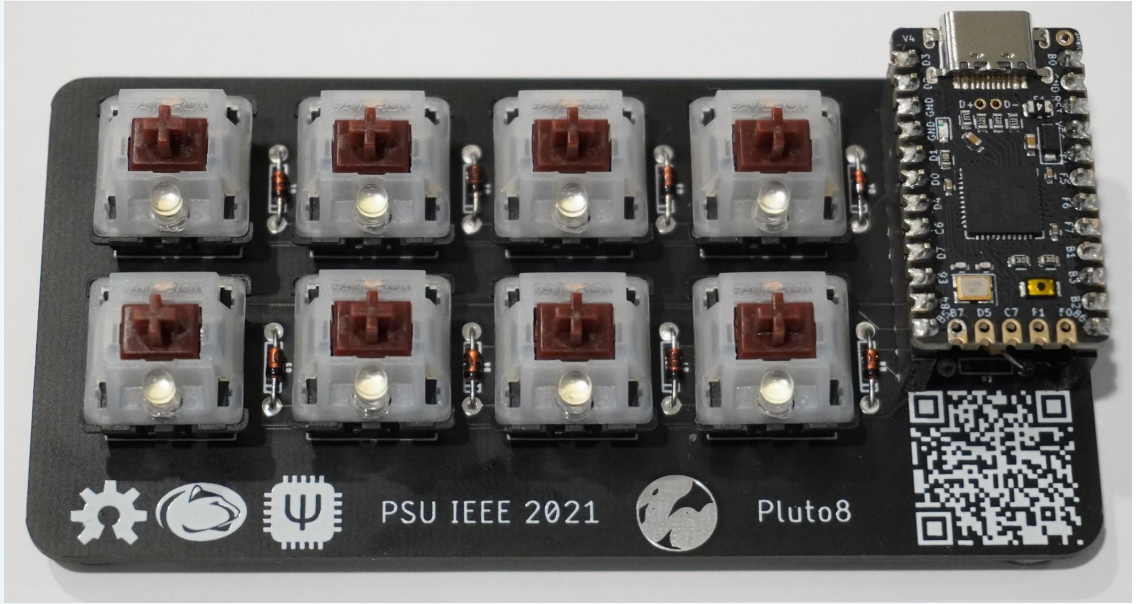
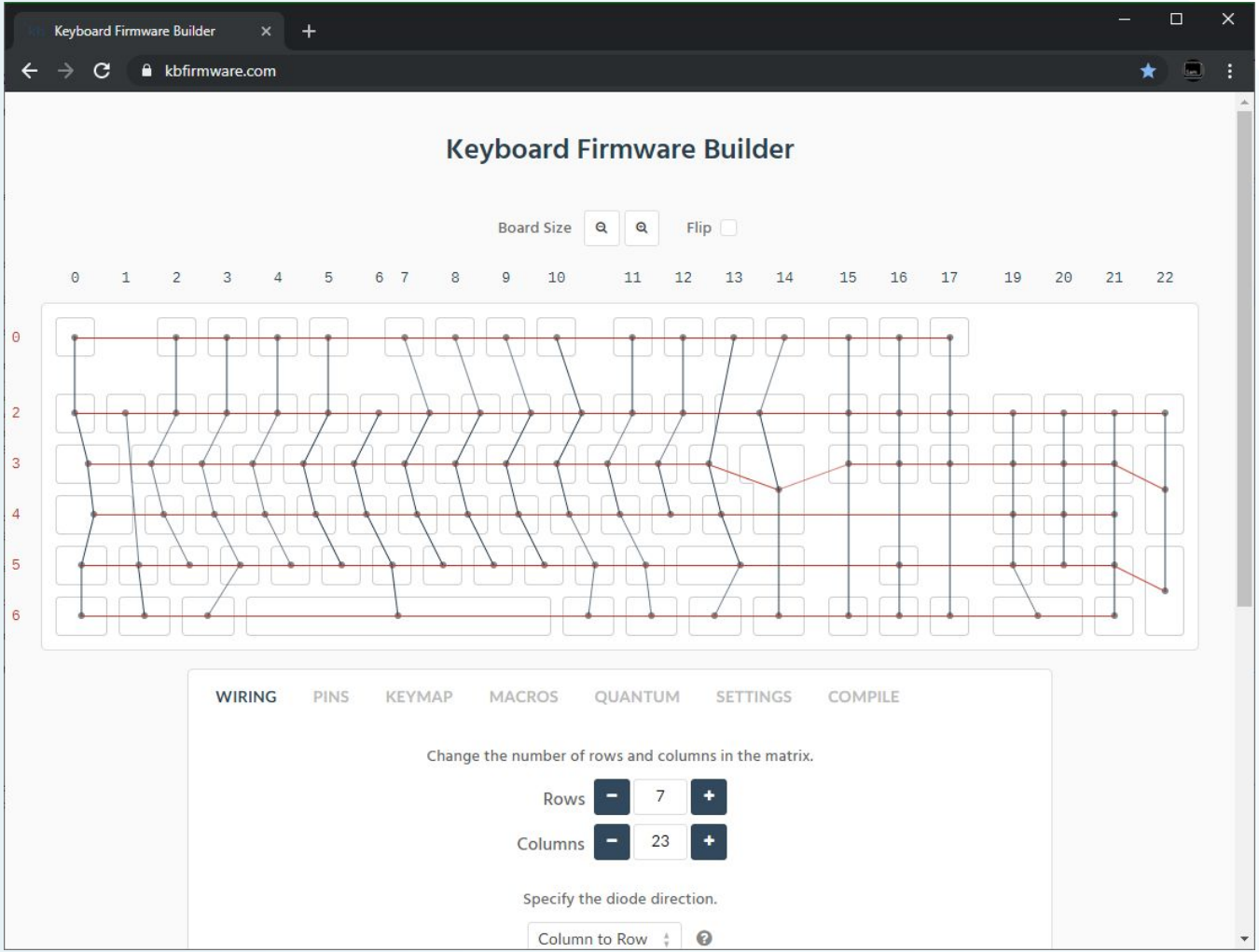
Pluto8

Our design

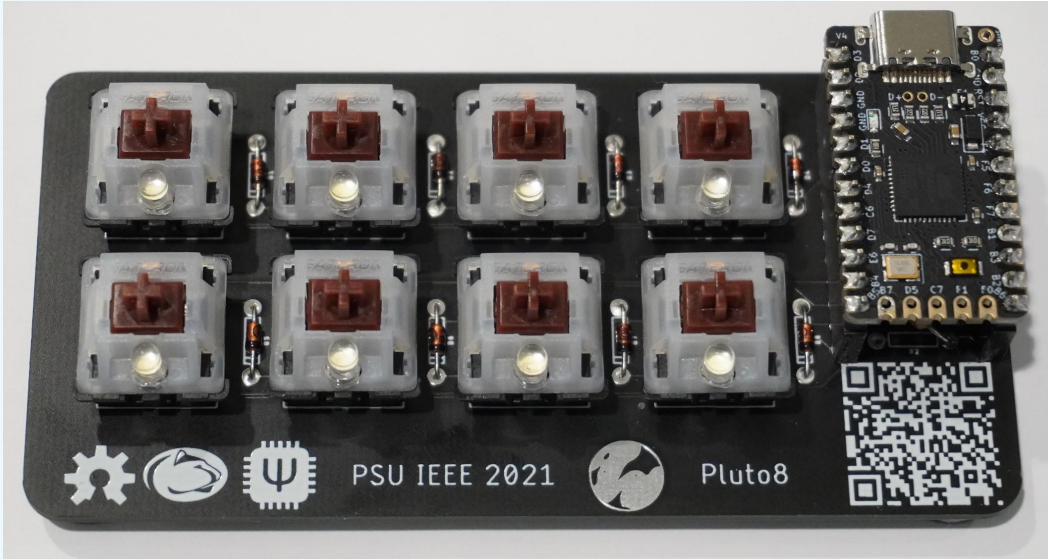
- 2x4 switch matrix
- Custom key mapping and pin setup (see gist)
- Firmware made with online tools
  - Layout for QMK
  - Make firmware from that layout
- Program pro micro like normal
  - See also: Elite-C
- Different keyswitches
  - Brown vs Yellow




Keyboard Firmware Builder
kbfirmware.com
Keyboard Firmware Builder
Board Size
Flip
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 19 20 21 22
0
2
3
4
5
6
WIRING
PINS
KEYMAP
MACROS
QUANTUM
SETTINGS
COMPILE
Change the number of rows and columns in the matrix.
Rows
7
Columns
23
Specify the diode direction.
Column to Row

Our design

- 2x4 switch matrix
- Custom key mapping and pin setup (see gist)
- Firmware made with online tools
  - Layout for QMK
  - Make firmware from that layout
- Program pro micro with QMK Toolkit
  - See also: Elite-C
- Different keyswitches
  - Brown vs Yellow



Assembly

Flashing

OBRIGADO
gracias
どうも
ARIGATO
hvala
DANK U
takk
謝謝
MERSI
merci
obrigado
danke schön
köszi
PALDIES
muchas gracias
ありがとう
TEŞEKKÜR EDERIM
MOLTE GRAZIE
GO RAIBH MAITH AGAT
danke
grazas
GRAZZI
THANKS
THANK YOU
благодаря
TAK
どうも
qujan
TAK
asante
muchas gracias
vielen dank
PALDIES
OBRIGADO
DANK U
mesi
grazie
DZIEKI
MULTUMESC
TACK
Gràcies
多謝
감사합니다
köszi
TEŞEKKÜR EDERIM
muchas gracias
obrigado
спасибо
NA GODE
благодаря
danke