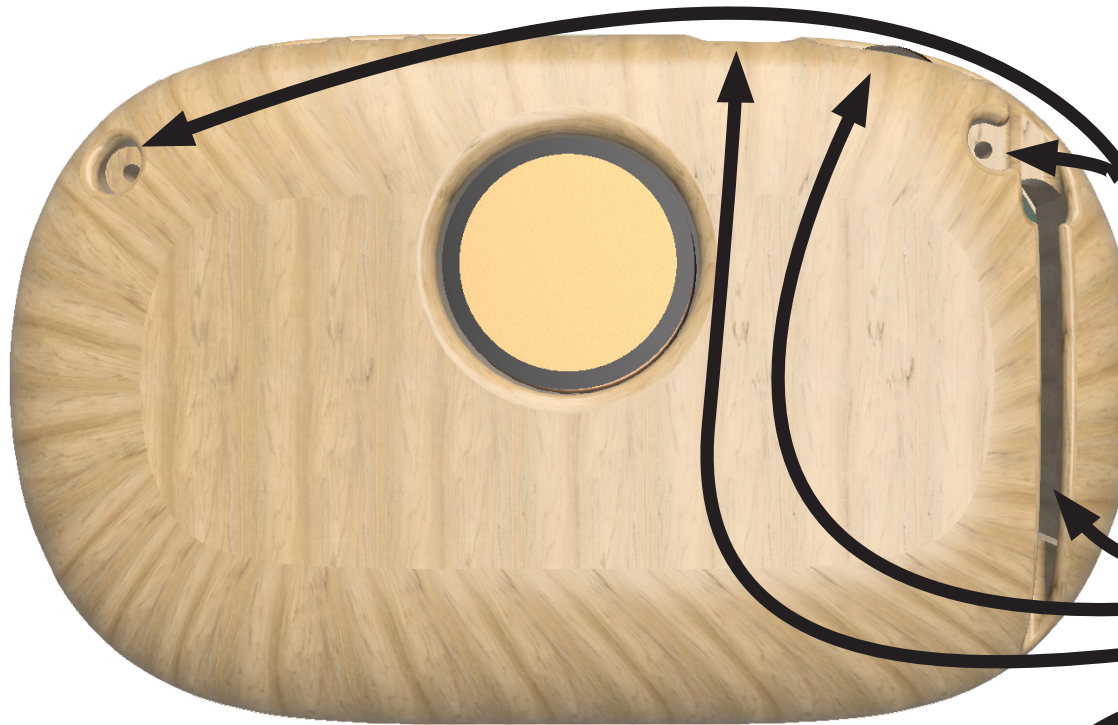CARE AND FEEDING OF YOUR

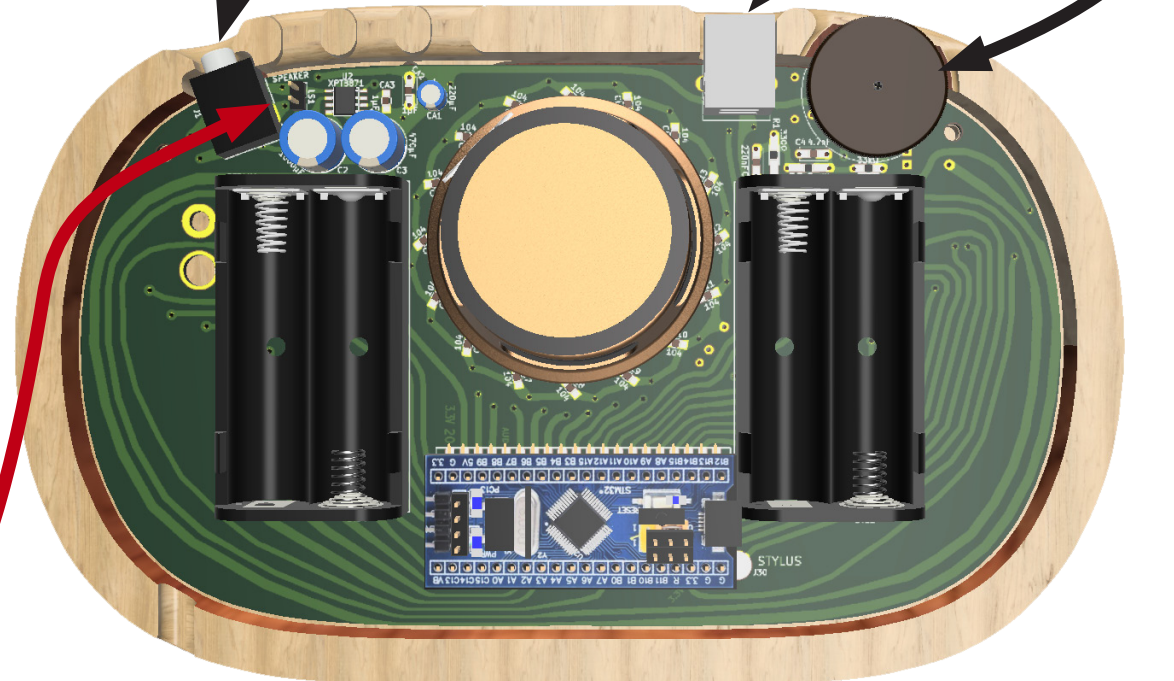# Stylish!

TRUCKER BELT-BUCKLE SYNTHESIZER

REMOVE TWO SCREWS ON THE BACK
TURN OVER
REMOVE FRONT
LIFT PCB CAREFULLY
CHANGE BATTERIES ON BOTTOM OF PCB
REPLACE PCB
REPLACE TOP
REPLACE SCREWS

STYLUS HOLDER
VOLUME / POWER
USB
HEADPHONE JACK

MAY EMIT HIGH PITCHED SOUNDS IF USB POWER USED WITHOUT BATTERIES, SO ALWAYS HAVE BATTERIES INSTALLED.

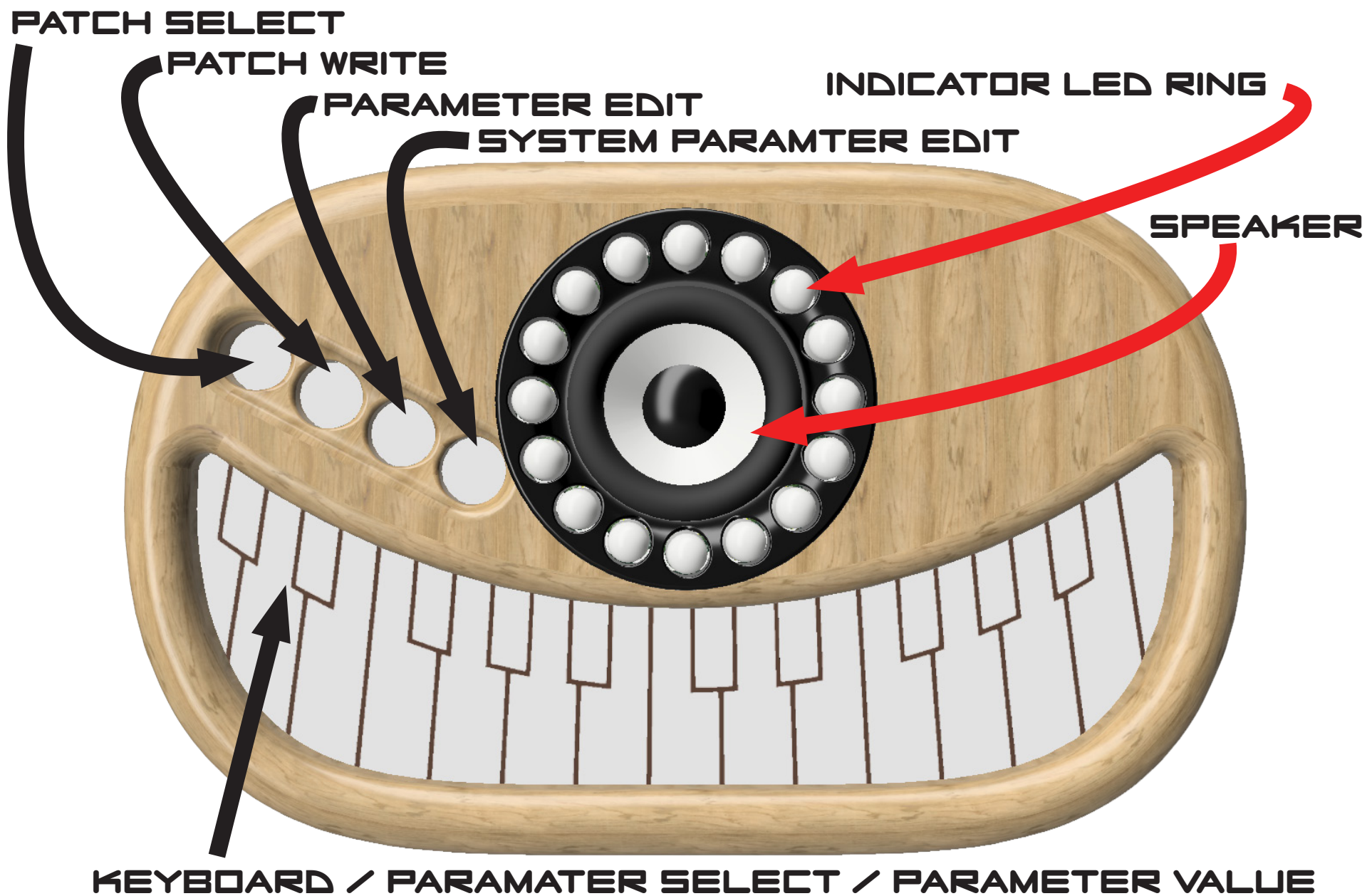AMPLIFIER MAY OVERHEAT WITH PROLONGED USE. LET IT REST SOMETIMES.

SPEAKER WIRE HERE

CONTROLS

PATCH SELECT

PATCH WRITE

PARAMETER EDIT

SYSTEM PARAMTER EDIT

INDICATOR LED RING

SPEAKER

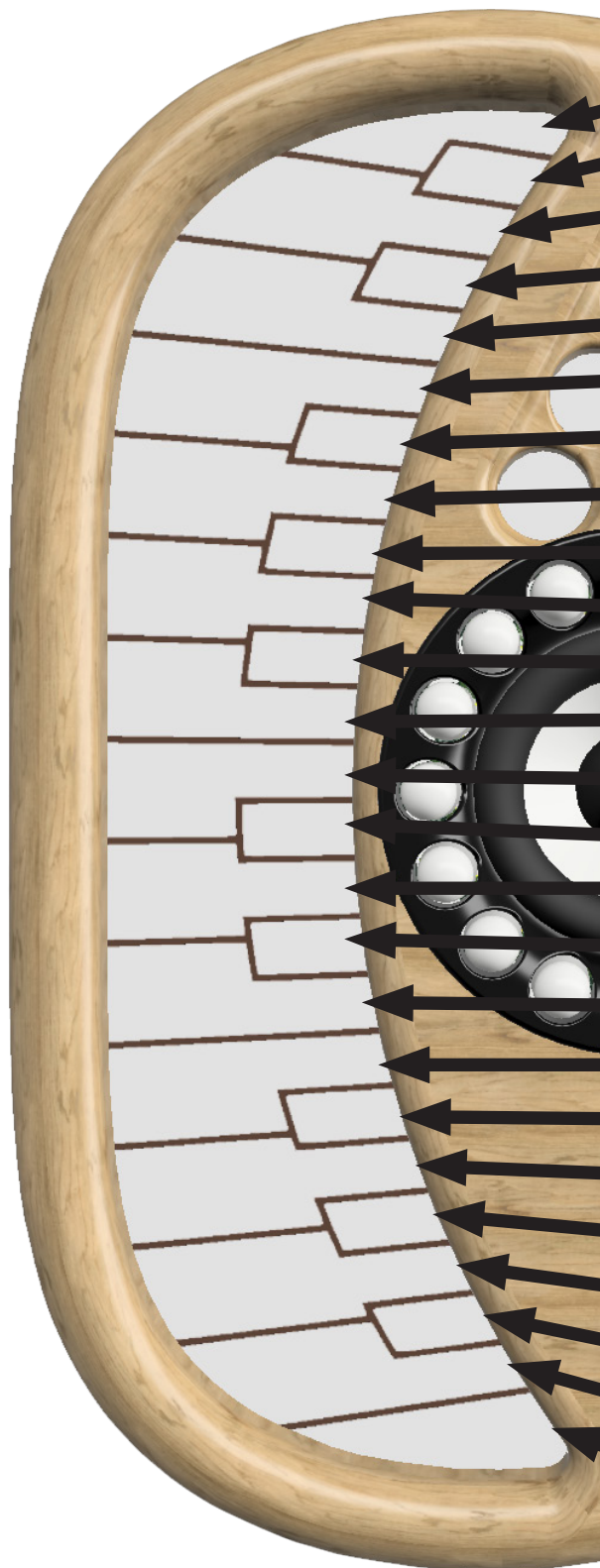KEYBOARD / PARAMATER SELECT / PARAMETER VALUE

CONTROLS

PATCH SELECT - LOAD A SOUND TO PLAY ON THE KEYBOARD
TAP ONCE AND LED RING FLASHES BLUE
TAP ON KEYBOARD TO SELECT A SOUND
    TO LOAD.
NEW SOUND WILL PLAY
TAP TIL YOU FIND THE SOUND YOU WANT
    TO LOAD.
TAP "PATCH SELECT" AGAIN TO KEEP SOUND
    YOU CAN PLAY IT ON THE KEYBOARD NOW
TAP ANY OTHER BUTTON TO ABORT
    (WILL RETURN TO ORIGINAL SOUND)

PATCH WRITE - WRITE THE SOUND TO A DIFFERENT SLOT
TAP ONCE AND LED RING FLASHES RED
TAP ON KEYBOARD TO SELECT A SOUND
    TO OVERWRITE
SOUND IN SELECTED SLOT WILL PLAY
TAP TIL YOU FIND THE SOUND YOU WANT
    TO OVERWRITE
TAP "PATCH WRITE" AGAIN TO OVERWRITE SOUND
    YOU CAN PLAY IT ON THE KEYBOARD NOW
TAP ANY OTHER BUTTON TO ABORT
    (WILL RETURN TO ORIGINAL SOUND)

CONTROLS

PARAMETER   - CHANGE SYNTHESIZER PARAMETER
EDIT   TAP ONCE AND LED RING FLASHES GREEN
                     ON THE LEFT SIDE ONLY
             TAP ON KEYBOARD TO SELECT A PARAMETER
                     TO EDIT
             LED RING WILL ALTERNATE BETWEEN
                     RIGHT HALF GREEN
                     PARAMETER NUMBER BARGRAPH
                     AND PARAMETER VALUE BARGRAPH
             TAP ON KEYBOARD TO SELECT A NEW VALUE
                     PARAMETER VALUE WILL UPDATE
                     (BARGRAPH WILL REFLECT THIS)
                     SOUND WILL PLAY
        TAP "PARAMETER EDIT" AGAIN TO KEEP CHANGE
                     YOU CAN PLAY ON THE KEYBOARD NOW
          TAP ANY OTHER BUTTON TO ABORT
                     (WILL RETURN TO ORIGINAL SOUND)

PARAMETER EDIT

OSCILLATOR 1 WAVEFORM
OSCILLATOR 1 NOTE OFFSET
OSCILLATOR 2 WAVEFORM
OSCILLATOR 2 NOTE OFFSET
NOISE LEVEL
OSCILLATOR DETUNE
ENVELOPE ATTACK
ENVELOPE DECAY
ENVELOPE SUSTAIN
ENVELOPE RELEASE
FILTER RESONANCE
FILTER FREQUENCY
LFO WAVEFORM
LFO FREQUENCY
FUTURE
FUTURE
ENVELOPE TO FILTER
ENVELOPE TO PITCH
FUTURE
FUTURE
LFO TO FILTER
LFO TO PITCH
LFO TO VOLUME
FUTURE
LFO TO NOISE

OSCILLATOR 1,2
WAVEFORM
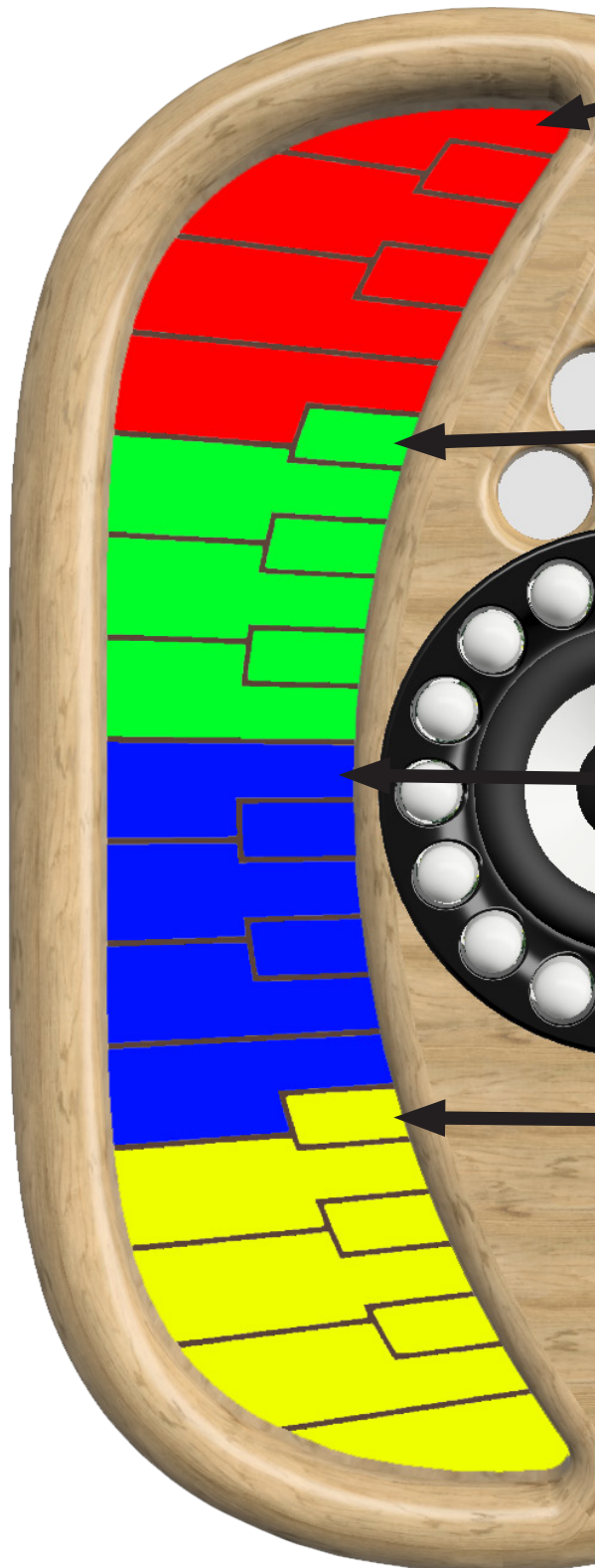
SAWTOOTH WAVE :   OCTAVE 1
OCTAVE 2
OCTAVE 3
OCTAVE 4
OCTAVE 5
OCTAVE 6

SQUARE WAVE :   OCTAVE 1
OCTAVE 2
OCTAVE 3
OCTAVE 4
OCTAVE 5
OCTAVE 6

TRIANGLE WAVE :   OCTAVE 1
OCTAVE 2
OCTAVE 3
OCTAVE 4
OCTAVE 5
OCTAVE 6

SINE WAVE :   OCTAVE 1
OCTAVE 2
OCTAVE 3
OCTAVE 4
OCTAVE 5
OCTAVE 6

LFO WAVEFORM IS THE SAME BUT NO OCTAVE

CONTROLS

SYSTEM   -   CHANGE GLOBAL PARAMETER
PARAMETER   TAP ONCE AND LED RING FLASHES YELLOW
EDIT   ON THE LEFT SIDE ONLY
                     TAP ON KEYBOARD TO SELECT A PARAMETER
                             TO EDIT
                     LED RING WILL ALTERNATE BETWEEN
                             RIGHT HALF YELLOW
                             SYSTEM PARAMETER NUMBER BARGRAPH
                             AND PARAMETER VALUE BARGRAPH
                     TAP ON KEYBOARD TO SELECT A NEW VALUE
                             SYSTEM PARAMETER VALUE WILL UPDATE
                             (BARGRAPH WILL REFLECT THIS)
                             SOUND WILL PLAY
                     TAP "SYSTEM PARAMETER EDIT" AGAIN TO KEEP
                             YOU CAN PLAY ON THE KEYBOARD NOW
                     TAP ANY OTHER BUTTON TO ABORT
   (WILL RETURN TO ORIGINAL VALUE)

PARAMETER LIST ON NEXT PAGE.

SYSTEM PARAMETERS
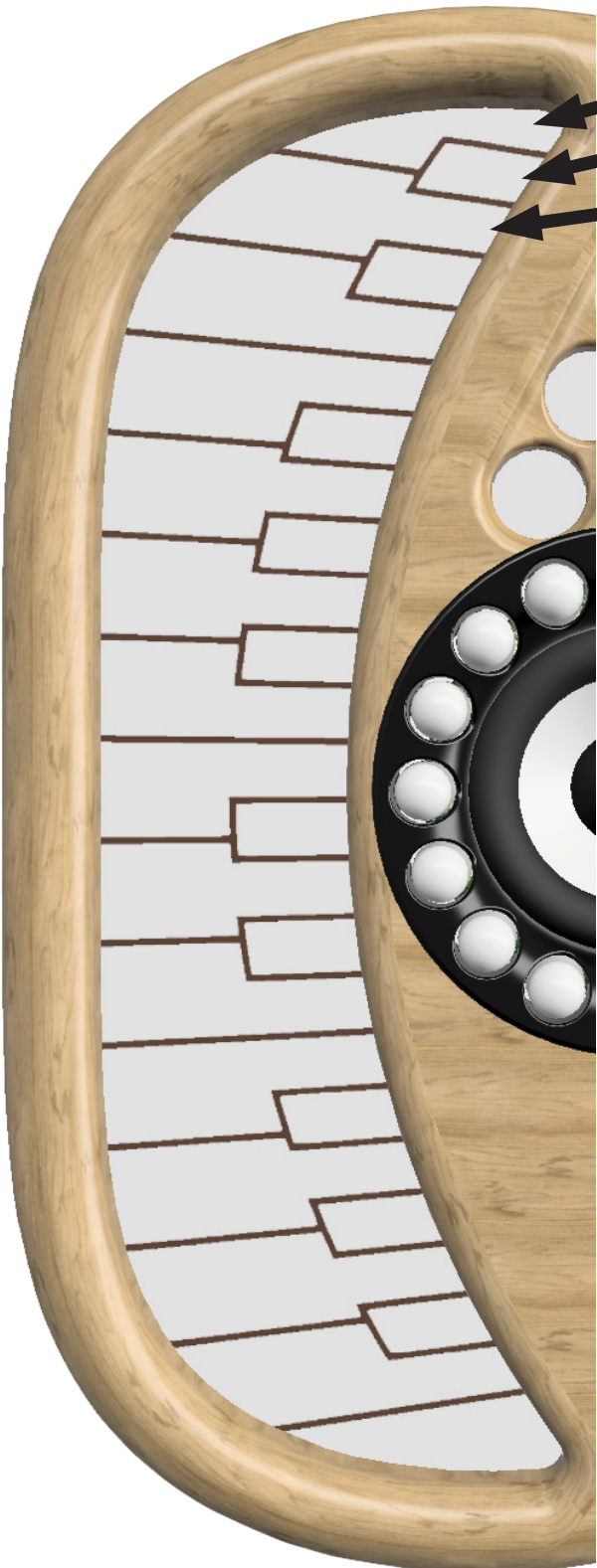
LED BRIGHTNESS
COARSE TUNING (NOTE)
FINE TUNING (2 CENTS)
FUTURE

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CARE INSTRUCTIONS

EACH WOOD STYLISH! UNIT IS A HAND-ASSEMBLED DIY CREATION! EACH UNIT IS UNIQUE AND WILL HAVE CHARACTER AND ECCENTRICITIES DUE TO THE NATURE OF THE WOOD, AND THE TRIALS OF CONSTRUCTION.
PLEASE APPRECIATE THESE AS BEAUTY MARKS!

THE 3D PRINTED PARTS WILL MELT IF EXPOSED TO HEAT! DO NOT LEAVE STYLISH! IN YOUR HOT CAR, IN THE DIRECT SUN, OR IN OTHER HOT PLACES!

STYLISH! IS MADE OF WOOD!
* ALTHOUGH IT IS COVERED IN A POLYURETHANE VARNISH, IT IS PROBABLY NOT GOOD TO EXPOSE IT TO MOISTURE!
* SCREWS CAN BE STRIPPED OUT IF YOU ARE NOT CAREFUL! PLEASE TAKE CARE NOT TO OVER-TIGHTEN SCREWS!
* WOOD IS SOFT AND CAN DENT AND SCRATCH EASILY! TAKE CARE NOT TO LET STYLISH GET SCRATCHED OR DENTED!

THE STYLUS WIRE IS SOMEWHAT DELICATE! PLEASE TAKE CARE NOT TO RIP THE WIRE OUT!

TAKE CARE WHEN CHANGING BATTERIES TO ALIGN SCREWS WITH THE HOLES IN THE PCB WHEN PUTTING IT BACK TOGETHER SO AS NOT TO SCRATCH THE PCB.

SCHEMATIC DIAGRAM

KB1
StylusKeyboardA

C0	0	C0
C#0	1	C#0
D0	2	D0
D#0	3	D#0
E0	4	E0
F0	5	F0
F#0	6	F#0
G0	7	G0
G#0	8	G#0
A0	9	A0
A#0	10	A#0
B0	11	B0
C1	12	C1
C#1	13	C#1
D1	14	D1
D#1	15	D#1
E1	16	E1
F1	17	F1
F#1	18	F#1
G1	19	G1
G#1	20	G#1
A1	21	A1
A#1	22	A#1
B1	23	B1
C2	24	C2
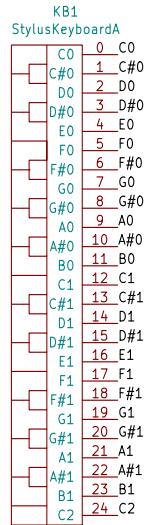
Keyboard is pattern on front of PCB.

STM32F103C8T6 "Blue Pill" board

U1 — stm32f103c8t6-module-china

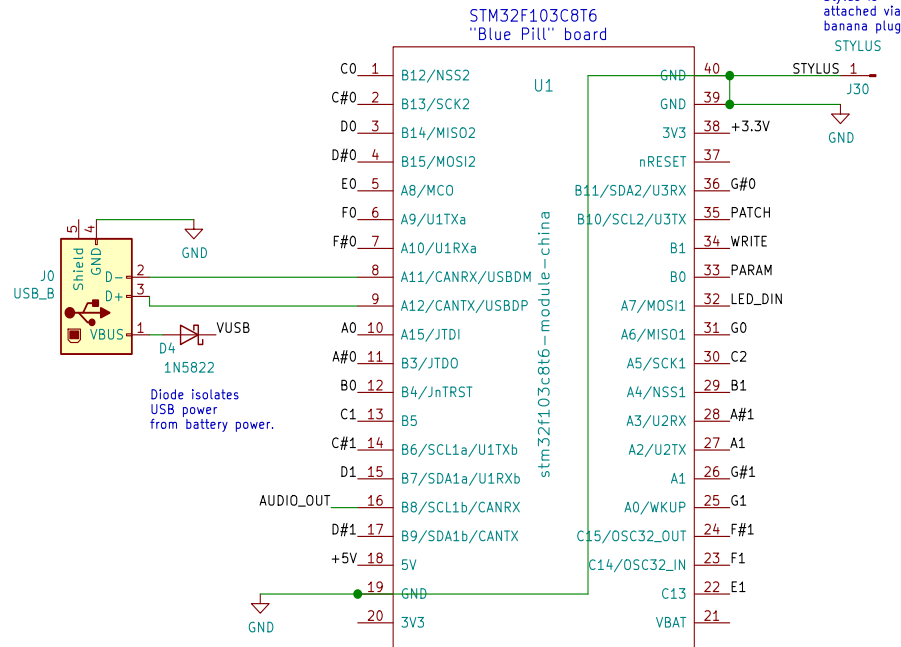| Pin				Pin
C0	1	B12/NSS2	GND	40
C#0	2	B13/SCK2	GND	39
D0	3	B14/MISO2	3V3	38
D#0	4	B15/MOSI2	nRESET	37
E0	5	A8/MCO	B11/SDA2/U3RX	36
F0	6	A9/U1TXa	B10/SCL2/U3TX	35
F#0	7	A10/U1RXa	B1	34
	8	A11/CANRX/USBDM	B0	33
	9	A12/CANTX/USBDP	A7/MOSI1	32
A0	10	A15/JTDI	A6/MISO1	31
A#0	11	B3/JTDO	A5/SCK1	30
B0	12	B4/JnTRST	A4/NSS1	29
C1	13	B5	A3/U2RX	28
C#1	14	B6/SCL1a/U1TXb	A2/U2TX	27
D1	15	B7/SDA1a/U1RXb	A1	26
AUDIO_OUT	16	B8/SCL1b/CANRX	A0/WKUP	25
D#1	17	B9/SDA1b/CANTX	C15/OSC32_OUT	24
+5V	18	5V	C14/OSC32_IN	23
	19	GND	C13	22
	20	3V3	VBAT	21

Right-side net labels: +3.3V, G#0, PATCH, WRITE, PARAM, LED_DIN, G0, C0, B1, A#1, A1, G#1, G1, F#1, F1, E1

J0 USB_B — Shield, GND, D-, D+, VBUS

GND
VUSB
D4 1N5822

Diode isolates USB power from battery power.

STYLUS 1 — STYLUS
J30
GND

Stylus is attached via banana plug.

PCB UI Pads for Stylus

PATCH	1	J28 PATCH SELECT
WRITE	1	J26 WRITE PATCH
PARAM	1	J27 PARAM SELECT
	1	J29 MODE

D1 1N4148   D2 1N4148

Diodes create 4th button input as 2nd and 3rd button simultaneous press.

Power Input

VUSB
BT12H1 Battery   BT34H1 Battery   D3 1N5822
GND
BT12 — BTN1, BTP2, BTN3, BTP4 — BT34

Switch is ganged with wheel potentiometer.

GND
470µF C3   1000µF C2
+5V

Power filtering capacitors might be optional.

PWM Output Filter

AUDIO_OUT
R2 47kΩ
R1 8Ω
C1 1µF
GND
SW1
OVERDRIVE
Volume RV1
GND
PWM_OUT

R/C Circuit to convert PWM pulses to waveform

Amplifier Stage

PWM_OUT
CA4 0.39µF   RA1 100Ω   4 IN
U2 XPT8871
3 MODE   VOP 8
2 BYP   VON 5
1µF CA3
1 SD   VDD   GND
CA1 470µF
CA2 1µF
GND   +5V

Speaker
J1
LS1

Headphone jack detaches speaker. Jumper 1,2,5,4 if no headphone jack.

WS2812B-16-LED-RING

+3.3V   R3 44Ω   LED_DIN
CL16 22µF
DIN
VIN
GND
DOUT
GND
WS2812B-16-LED-RING.sch

This capacitor eliminates LED ring noise!

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SoftEgg®

STYLISH! The Trucker Belt Synthesizer was created by Timon at SoftEgg®.
http://www.softegg.com

More project details on Hackaday.io!
https://hackaday.io/project/160859-stylish

All hardware and software files are available on GitHub here:
https://github.com/softegg/Stylish-Trucker-Belt-Synthesizer
CC BY-NC-SA License
NON-COMMERCIAL USE ONLY!

Made with STM32Duino under LGPLv2.1 License
STMicroelectronics libraries under BSD3-Clause,
and Mozzi under CC BY-NC-SA license.

Only hardware is sold for below cost, software is provided for free.
I lost a lot of money on this. Watch for a Kickstarter soon!