

synthCube

stroh modular
ultraflop sequencer

module documents v1.0
05/19/2017

V1.0 includes original documentation from stroh modular and supplemental build notes and pictures from mike cameron
thank you dustin and mike!

Errata:

copyright 2017 synthcube.com

Page 1

Circuit Description

Designed by Dustin Stroh

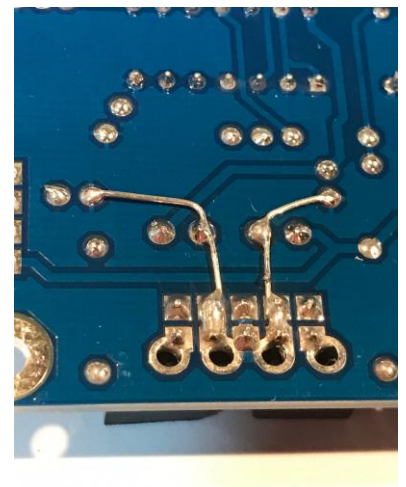
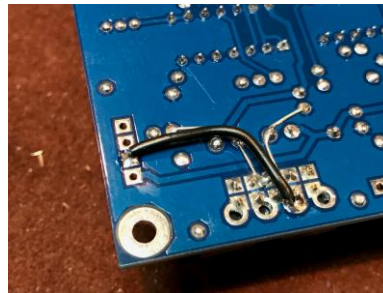
A discussion thread is here:

<https://www.muffwiggler.com/forum/viewtopic.php?t=99252&postdays=0&postorder=asc&start=100>

- Populate PCB with standard parts.
- Perform Ground Fix
- Wire OR combiner in MOD Sections
- Populate panel
- Pre-wire panel
- Wire panel to PCB - this is not easy to keep organized... prepare yourself!
- Install Stage LEDs

Ground Fix

- Ground plane connections missing on caps in power section.
- Wire ground connections from power header to electrolytic caps and then to ceramics
- Also wire ground to aux power section

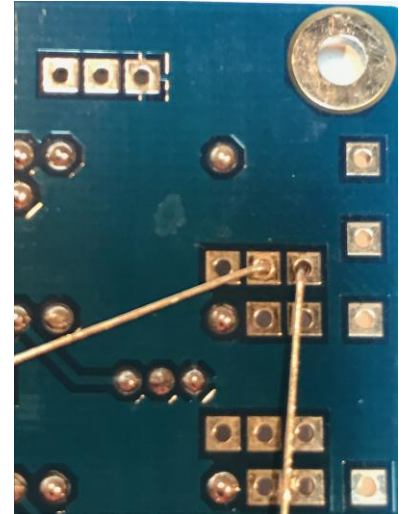


OR Combiner (board MOD section)

- This wiring will allow the panel switches to turn steps (including their individual jacks) on or off. The output of the combined gates will appear on the Clock Out in place of the standard internal clock output utilizing the pads marked MOD1 - MOD8
- beginning with channel 1, insert 1N4148 diode standing up in leftmost 2 pads with stripe pointed toward center pad.



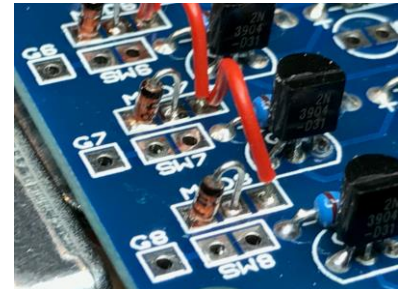
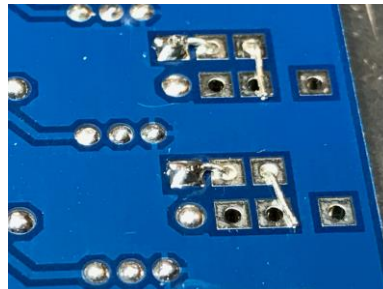
- bend the leads so that the outermost lead can be bent down to contact the SW1 pad, and that the center lead bends inward to the center of the board, crossing the rightmost pad of the mod section



- solder the diode in place and trim the leads to remove excess-- only solder the 2 pads where the leads come through the panel.
- Do the same for the remaining 7 channels



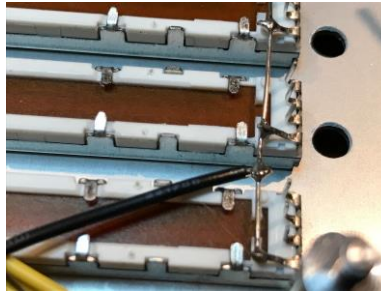
- using small bits of wire, connect the rightmost pad of the mod sections together, beginning at channel 1.
- On Channel 8, this will connect to CLK OUT



PANEL PREP

- install all jacks switches, pots & sliders according to diagram
- install standoffs
- clip off jack switch terminal and buss jack grounds together - including the switch on the ext clock input

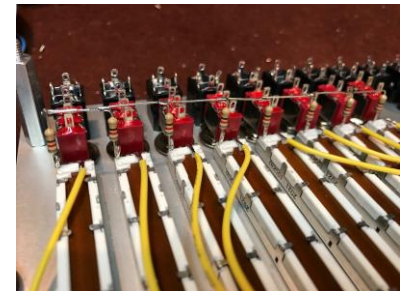
- On the top end of the sliders, bend the E terminal down toward the slider body. These are the (-) terminals of the slider LEDs. Bus them together with some wire, connect a piece of wire to this array long enough to connect to the ground in the aux power connection.



- Bend slider terminal (3) down to slider body, attach 6-8" of wire. !! from the back of the panel, ch1 is on the right, but on the left of the pcb so you'll need enough wire to reach. Repeat for other channels.



- Install LED resistors by clipping one end short (to about 1/4") and soldering to the B terminals of the slider. Bend the remaining lead 90 degrees to touch its neighbor, trim and solder to buss all them together.



- carefully bend them down toward the panel (the wires installed in previous step will keep them from making contact with anything).



- Connect a wire to this bussed resistor array for connecting to the positive terminal of the aux power connections.
- Connect wires to terminals 1 + 2 of the slider, leaving extra length.
- connect lead wires to each stage's jacks and switches (lower 2 terminals) leaving spare length.
- On the clock out Jack, wire a resistor from the tip of the jack to the ground wire (for the OR combiner). Also connect a length of wire for connecting to the PCB (in the final steps).



WIRING

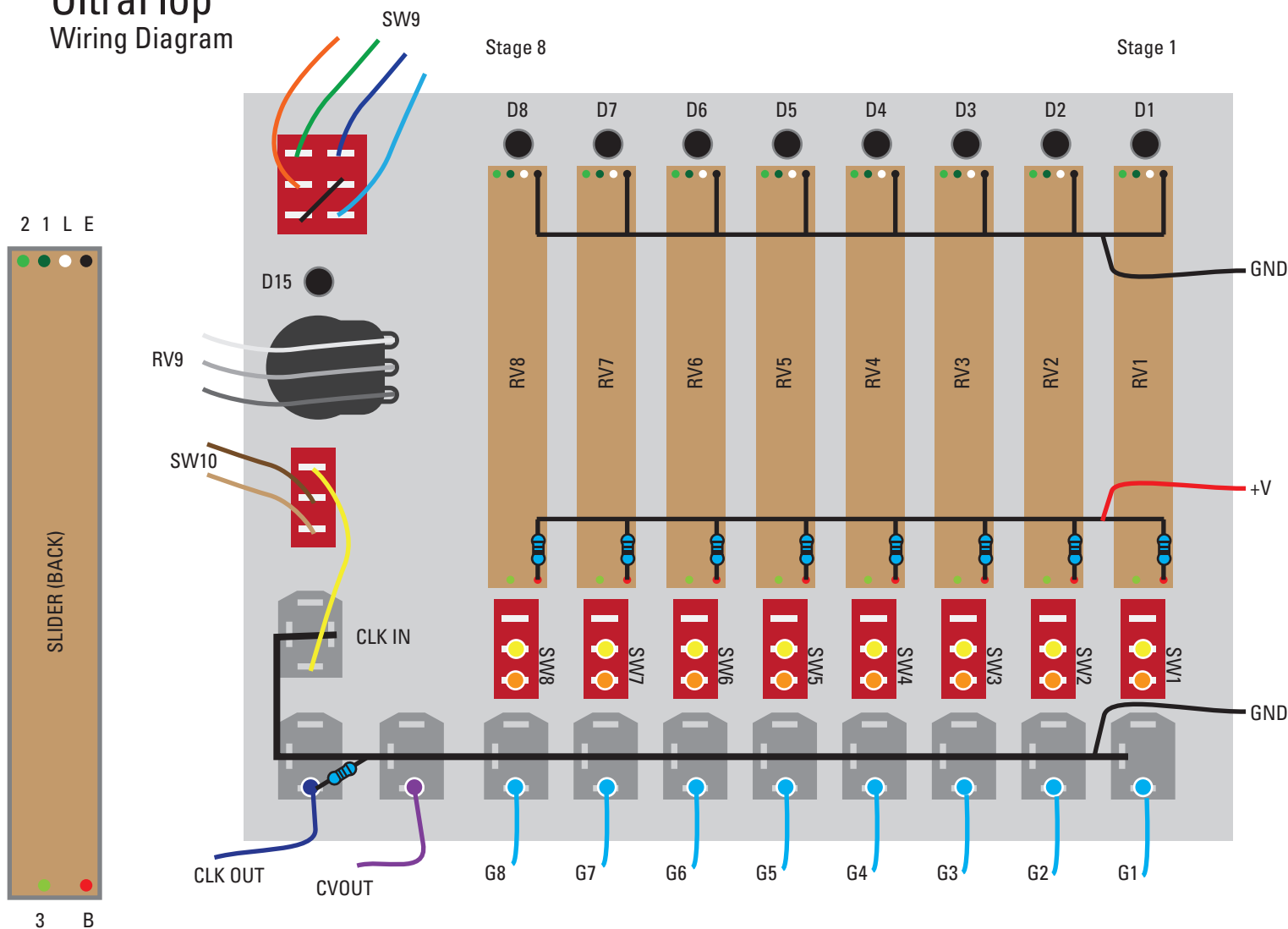
- Using the wiring diagram, begin connecting the stage sliders, switches and jacks to the PCB. it is best to pick one type of connection and complete it for all 8 stages, i.e. switches, then jacks, then sliders. be mindful of how much wire length you're leaving, it can become a tangled mess with all those wires crisscrossing the board. Make all these connections on the underside of the PCB.
- Once all the stages are wired, connect the rate pot, direction and clock source switches according to the wiring diagram.
- mount the pcb to the standoffs
- connect the clock out jack to the OR combiner on the pcb at MOD8
- install stage and clock LEDs, wiring them to their respective locations on the top side of the PCB.

isn't this fun?

J3rk

UltraFlop

Wiring Diagram

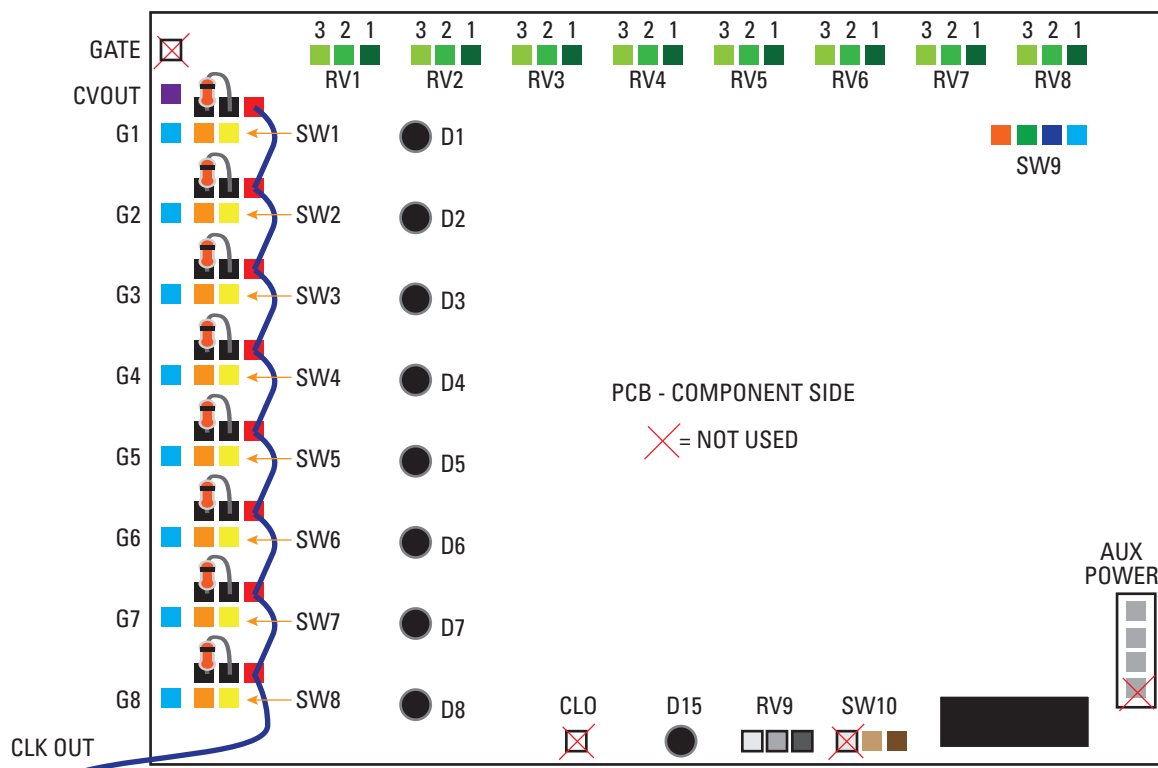
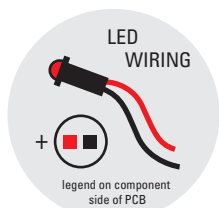
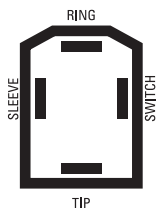


1,2,3 - potentiometer

L - unconnected

E - LED Anode (-)

B - LED Cathode (+)



Module : Ultraflop			Total Parts : 246							
BOM Line	Type	Mfg Part Number	Manufacturer	Short Description		Value	Unit	Qty	Part Notes	Reference Designator
Line 1	CAP	K104K15X7RF5TL2	Vishay	MLCC - Leaded 0.1uF 50volts 10% X7R 2.5mm LS		0.1	uF	15	INC +1 FOR CLOCK BP FIX	BP, C2
Line 2	CAP	FK14X5R1E475K	Kemet	Multilayer Ceramic Capacitors MLCC - Leaded 4.7uF 25volts X5R +/-10% 2.5MM LS		4.7	uF	1		C4
Line 3	CAP	EEA-GA1A101B	Panasonic	Electrolytic Cap 100uF		100	uF	2		POWER
Line 4	CAP	K101J15C0GF5TL2	Vishay	Multilayer Ceramic Cap 100pF		100	pF	1		C1
Line 5	CAP	FK18C0G2E221J	TDK	Multilayer Ceramic Cap 220pF 2.5mm LS		220	pF	1	MOD PER DS	C3
Line 6	HDR	3-640440-2	TE Connectivity	0.1 Header Socket 2P Red		2	pin	8		
Line 7	HDR	640456-2	TE Connectivity	0.1 Header 2P Friction Lock		2	pin	8		SW1 TO SW8
Line 8	HDR	640456-3	TE Connectivity	0.1 Header 3P Friction Lock		3	pin	10		RV1 TO RV9, SW10
Line 9	HDR	3-640440-3	TE Connectivity	0.1 Header Socket 3P Red		3	pin	10		
Line 10	HDR	640456-4	TE Connectivity	0.1 Header 4P Friction Lock		4	pin	1		SW9
Line 11	HDR	3-640440-4	TE Connectivity	0.1 Header Socket 4P Red		4	pin	1		
Line 12	HDR	30310-6002	3M	10-pin Shrouded Keyed Power Header		10	pin	1		
Line 13	HDW	MMSPHPZ3006-515	Fastener Express	M3X.5X6mm Pan Zinc Panel Screws		1	each	2		
Line 14	HDW	SSB0403-10A2	Fastener Express	4-40 x 1/4 Socket Hd Cap Screw Stainless Black Oxide		1	each	3		
Line 15	HDW	FE-1HEXSO	Fastener Express	4-40 X 1" Hex Male/Female Standoff Aluminum		1	inch	3		
Line 16	HDW	FE-M3-.5-6PAN-BLK	Fastener Express	M3X.5X6mm Pan Black Oxide Panel Screws		1	each	2		
Line 17	HDW	MSCS2005BLK-8P1	Fastener Express	M2 x .4 x 5mm Socket Head Cap Screws A2 Stainless Black Oxide		1	each	16	SLIDERS	
Line 18	HDW	FE-4-40NUT	Fastener Express	4-40 Nuts- standoffs		1	each	3		
Line 19	HDW	#4 Nylon Washer	Fastener Express	#4 Flat Washer Nylon		4	each	4		
Line 20	IC	595-CD4013BE	Texas Instruments	CD4013BE Flip Flops Dual CMOS		1	each	2		4013
Line 21	IC	CD4046BEE4	Texas Instruments	CD4046 Phase Locked Loops - PLL Micropower PLL		1	Each	1		U13

BOM Line	Type	Mfg Part Number	Manufacturer	Short Description	Value	Unit	Qty	Part Notes	Reference Designator
Line 22	IC	TL074CN	Texas Instruments	TL074 Quad OpAmp	1	each	3		U6, U9, U7
Line 23	IC	CD4028BE	Texas Instruments	CD4028BE Encoders Decoders Multiplexers Demultiplexers BCD-to-Decimal	1	Each	1		U2
Line 24	IC	CD4029BE	Texas Instruments	CD4029BE Counter lcs Preset UpDn Binary	1	each	1		U1
Line 25	IC	CD4081BE	Texas Instruments	CD4081BE Logic Gates Quad 2-Input	1	Each	2		U10, U11
Line 26	IC	CD4093BE	Texas Instruments	CD4093 Quad Schmitt Nand Gate	1	each	1		U8
Line 27	IC	TL072-CN	Texas Instruments	TL072 OpAmp	1	each	1		U12
Line 28	IC	CD4051BE	Texas Instruments	CD4051BE 8 Ch Mux	1	each	1		U3
Line 29	IC	A-857	GTK	8 PIN MACHINE TOOLED IC SOCKET	8	each	1		
Line 30	IC	A-1317	GTK	14 PIN MACHINE TOOLED IC SOCKET	14	pin	8		
Line 31	IC	A-1319	GTK	16 PIN MACHINE TOOLED IC SOCKET	16	each	4		
Line 32	JCK	LJE0352-4R	Lih Sheng	3.5mm jack stereo	3.5	mm	11		
Line 33	LED	696-LXH312ID-150	Lumex	LED Panel Mount Indicators 3mm Red 6" Leads	3	mm	9	CHECK PANEL FIT	
Line 34	POT	RV16AF-10-15R-B1M	Alpha	1M OHM LINEAR TAPER POTENTIOMETER ROUND SHAFT SOLDER LUGS	1	mOhm	1		RV9
Line 35	POT	PTL60-10R0-104B2	Bourns	Slide Potentiometers 100Kohms Travel=60mm	100	Kohm	8		
Line 36	PWR	10-16EUROCABLE	Erthenvar	EURO 10-16 PIN POWER CABLE	10	each	1		
Line 37	RES	271-1K-RC	Xicon	Metal Film Resistor 1Kohm 1%	1	kOhm	1		R20
Line 38	RES	271-2.2K-RC	Xicon	Metal Film Resistor 2.2Kohm 1%	2.2	kOhm	1		R43
Line 39	RES	271-4.7M-RC	Xicon	Metal Film Resistor 4.7Mohm 1%	4.7	mOhm	1		R42
Line 40	RES	271-10K-RC	Xicon	Metal Film Resistor 10Kohm 1%	10	kOhm	5	+1 FOR DIODE 'OR' MOD	R12, R39, R41, R48
Line 41	RES	271-49.9K/AP-RC	Xicon	1/4w metal film resistor 49K9	49.9	kOhm	1		R40
Line 42	RES	271-82K-RC	Xicon	Metal Film Resistor 82Kohm 1%	82	kOhm	1		R23

BOM Line		Type	Mfg Part Number	Manufacturer	Short Description	Value	Unit	Qty	Part Notes	Reference Designator
Line	43	RES	271-100-RC	Xicon	Metal Film Resistor 100ohm 1%	100	Ohm	2		R9, R19
Line	44	RES	271-100K-RC	Xicon	Metal Film Resistor 100Kohm 1%	100	kOhm	19		R10, R11, R13 TO R19, R21, R22, R24 TO R29, R38, R45, R47
Line	45	RES	271-220K-RC	Xicon	Metal Film Resistor 220Kohm 1%	220	kOhm	1		R44
Line	46	RES	271-330-RC	Xicon	Metal Film Resistor 330ohm 1%	330	Ohm	9		R1 TO R8, R46
Line	47	RES	271-680-RC	Xicon	Metal Film Resistor 680ohm 1%	680	Ohm	8		R30 TO R37
Line	48	RES	271-680K-RC	Xicon	Metal Film Resistor 680Kohm 1%	680	kOhm	1		
Line	49	RES	271-820-RC	Xicon	Metal Film Resistor 820ohm 1%	820	Ohm	8		SLIDER LED INLINE W/POWER
Line	50	SEMI	BL01RN1A1F1J	Murata	Ferrite Beads	1	each	2		
Line	51	SEMI	1N4148	Fairchild Semiconductor	1N4148 Signal Diode	2	each	12	+8 FOR DIODE 'OR' MOD	D11 TO D14
Line	52	SW	TE-MTS2033	Tayda	MINI TOGGLE SWITCH DPDT ON-ON-ON	1	each	1		SW9
Line	53	SW	A-4567	Mountain Switch	MINI TOGGLE SWITCH SPDT ON-ON	1	each	9		SW1 TO SW 8, SW10
Line	54	TRN	2N3904TF	Central Semiconductor	2N3904 NPN Transistor	3	each	11		Q1 TO Q11
Line	55	WIR	22AWG Stranded	Empire Wire	22AWG Stranded Hookup Wire	1	foot	5		

