

Quantix-8

Construction manual v 1.1b

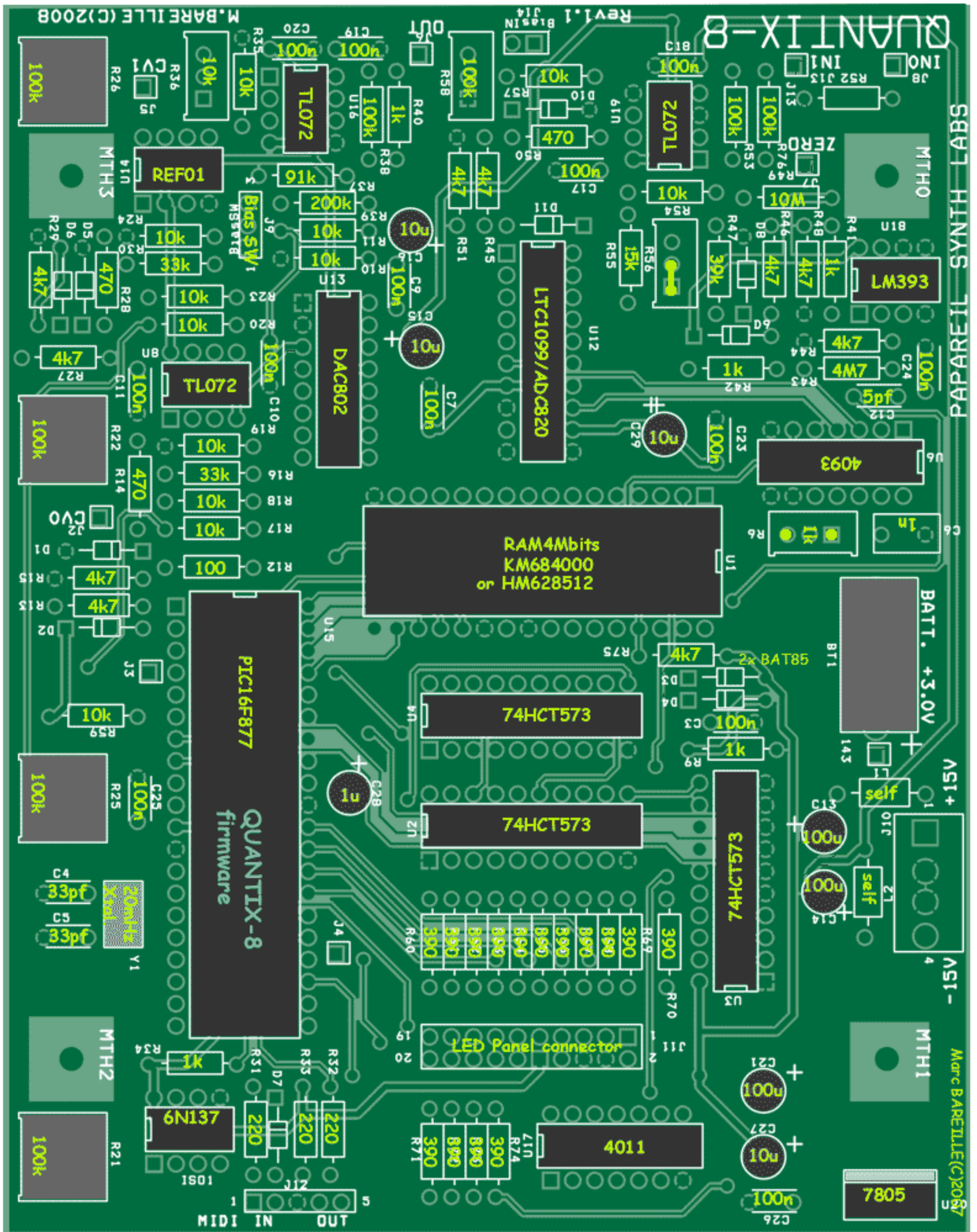
Contain

- schematic
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- pcb v1.1 bug fix - very important ...

Contact m.bareille@free.fr

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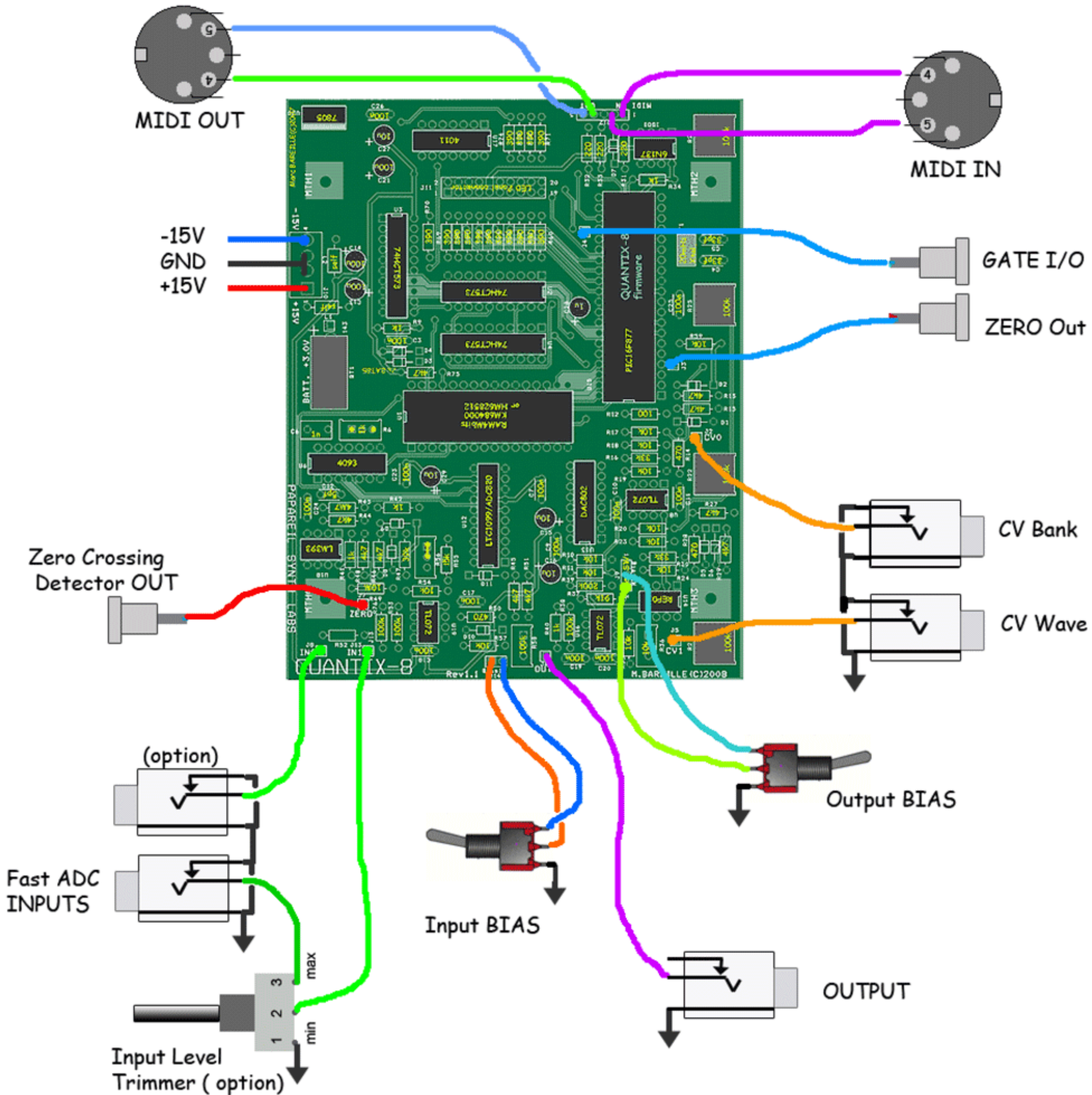
QUANTIX-8 rev 1.1 Implantation schematic



All diodes are 1N4148 excepted D3,D4 = BAT85 !

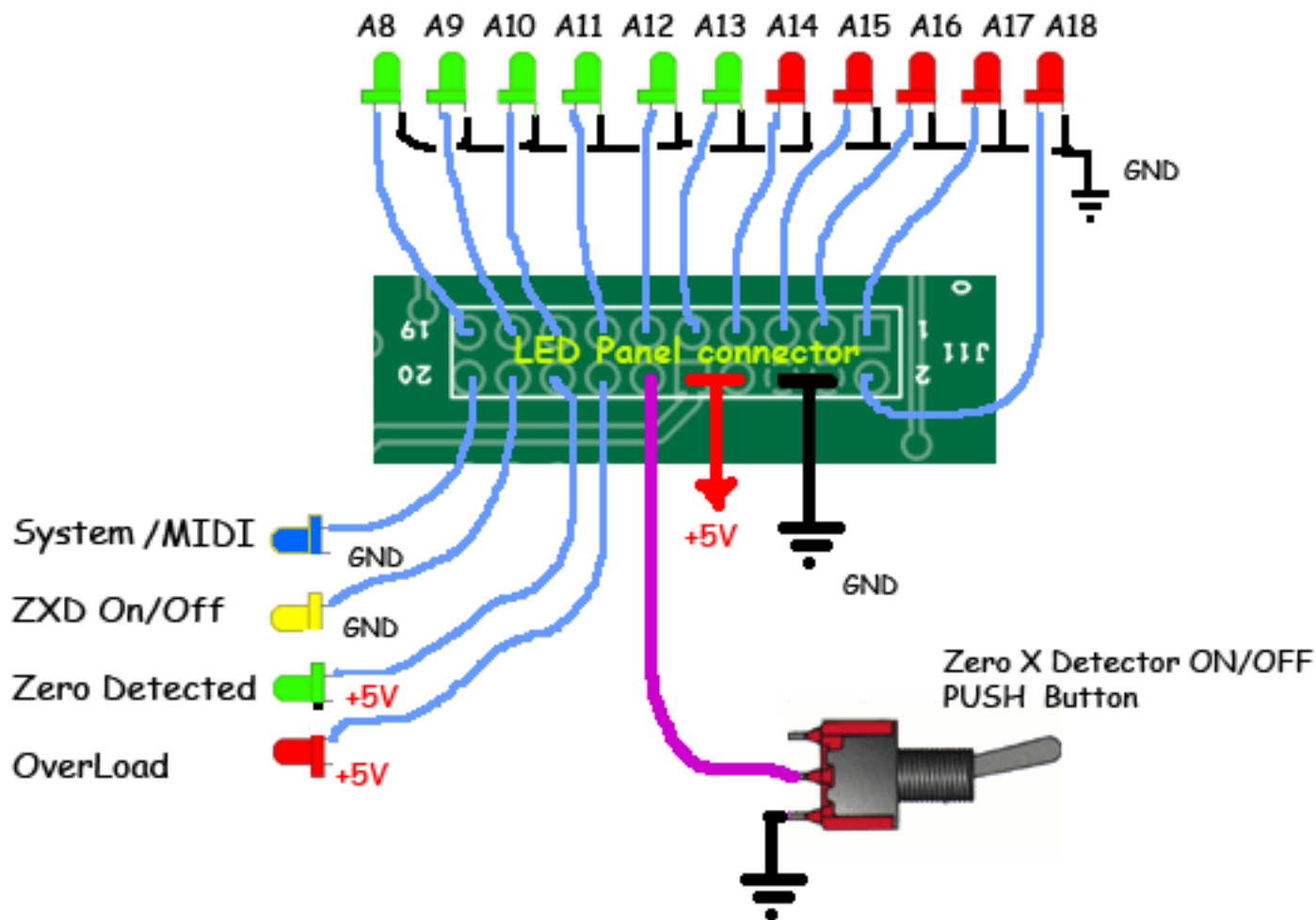
Bill Of Materials

Item	Quantity	Reference	Part
1	1	BT1	Batt Lithium 3V
2	14	C3,C7,C9,C10,C11,C17,C18, C19,C20,C22,C23,C24,C25, C26	100n ceramic npo,cog
3	2	C4,C5	33p ceramic
4	1	C6	1n polyester/polypro
5	1	C12	5p ceramic
6	3	C13,C14,C21	100u/25V chemical radial
7	4	C15,C16,C27,C28	10u/25V chemical radial
8	1	C29	10µ to 47u/25V chemical radial
9	9	D1,D2,D5,D6,D7,D8,D9,D10, D11	1N4148 Diodes
10	2	D3,D4	BAT85 Low drop diodes
11	1	ISO1	6N137 or equiv
22	2	L1,L2	Inductors (option)
23	6	R6,R9,R34,R40,R41,R42	1k
24	13	R10,R11,R17,R18,R19,R20, R23,R24,R35,R54,R57,R58, R59	10k
25	1	R12	100
27	10	R13,R15,R27,R29,R44,R45, R46,R48,R51,R75	4k7
27	3	R14,R28,R50	470
28	2	R16,R30 33k	
29	7	R21,R22,R25,R26,R38,R52, R53	100k
30	3	R31,R32,R33	220
31	1	R36	5k
32	1	R37	91k
33	1	R39	200k
34	1	R43	4M7
35	1	R47	39k
36	1	R49	10M
37	1	R55	15k
38	1	R56	0
39	15	R60,R61,R62,R63,R64,R65, R66,R67,R68,R69,R70,R71, R72,R73,R74	390
40	1	U1	KM684000 or HM628512
41	3	U2,U3,U4	74HC573 (or HCT)
42	1	U6	4093
43	3	U8,U16,U19	TL072 (or better FET opamps...)
44	1	U12	LTC1099 or ADC820
45	1	U13	DAC0800 or DAC0801, DAC0802
46	1	U14	REF01 or REF192 or DIY around a TL431...
47	1	U15	PIC16F877A + firmware v1.4x (or >)
48	1	U17	4011
49	1	U18	LM393
50	1	U20	LM7805C with asmall heatsink - TO220
51	1	Y1	20MHz crystal H49...



QUANTIX-8 Wiring Schematic

Designed by Marc BAREILLE (c)2008
revised 2011



QUANTIX-8

LED Panel Connector

Wiring Schematic

QUANTIX-8 rev 1.1 Construction Manual

Before to start construction, please take time to read all this document...

Construction:

- 1) Solder all resistors.
- 2) Solder all IC Sockets (at least for the RAM and PIC)
- 3) Solder capacitors. **Do the C18 pcb correcti on using one of the 2 method, see page 10/11**
- 4) Solder L1,L2 inductors if you use them, else replacethem by two resistor legs
- 5) Solder all diodes . Take care with their orientation
- 6) Solder all IC whitout sockets, and the 7805 regulator
- 7) solder Connectors (PSU , HE10 for leds), battery socket
- 8) Wash/deflux the pcb
- 9) Solder trimmers and pots
- 10) Fill all remaining via holes with solder
- 11) Wire the pcb to the front panel connectors/leds/switches-Use the Wiring Schematic.
- 12) plug all IC on their respective sockets...Do no install the Lithium battery now

First try:

- 1) check one last time that all parts are correctly soldered , no remaining short cut or unwanted solder joins...
- 2) Plug the +/-15V PSU and set power on : The System/MIDI led should blink 3 times or a bit more if the Flash memory is not yet initialised - "MB Magic Boot" TM feature...
- 3) Measure voltage at each ICs pin according to the schematic. Check for the +5V on digital chips, +/-15V for analog Ics, and Vref= +10V at the REF01 output. Turn pots Banks /Wave , the selected waveform number is displayed by the leds (A8..A18). Inject a CV/lfo into the Bank/Wave CV and test if it work ...
- 4) Plug the Quantix8 MIDI IN and OUT to the PC OUT and IN (or to your dispatch) and run the Quantix-8 Editor software. Use the 'Midi scan' button to detect automaticaly your module on any channel. When the Quantix 8 module is recognised , it appear in a 'slot' on the Control Module box with all parameters set. Download a bank, read it back, check for no errors ...Do this cycle again with a full wavetable now, it is slightly longer (approx 5/6 min to RX/TX 2048 waveforms).
- 5) When done power off the Quantix-8 and install the Lithium battery. Power on again, load a wavetable into the RAM. Power Off , wait, power on and download all the wavetable from the Quantix-8 to the PC. You should get back in the PC the same wavetable with no error . Any error here mean there is a problem of data retention : check your battery voltage (it should be >2.8V).

Calibration:

- Output : to adjust the output the simplest way it is to set the Quantix-8 in MCV mode and adjust the output range to get a 1V/oct range as clean as possible with the R36 trimmer. Use a 10 oct chromatic scale ramp to do this.

-Fast ADC Clock : check with a frequency meter or a scope on pin for the presence of a 500/600KHz clock on U12-pin6. Adjust with trimmer R6 if needed . You can also use a 1K fixed resistor instead of R6 if you prefer...

-Input : Set the Quantix-8 in 'Quantiser/Wavetable osc' mode with the PC software (disable MCV mode and Gate IN). Be sure you have loaded the RAM with some clean and easy to recognise waveforms (sin, tri et ...) If you have an oscilloscope, plug it at the Quantix-8 output. to monitor the selected waveform . The goal it is to obtain on the scope screen , exactly the same waveform draw you get on the PC editor screen. When the Quantix-8 input is correctly tuned you can see each waveform 'dots' on the scope. Inject a CLEAN 1Kz UPSAW signal into the (Fast ADC) INPUT. Adjust the gain with R56 (if used -optional) , the level if you use an input attenuator and the offset with R58 ... Use Zero Crossing and Overflow leds to adjust the input range too. When done , your Quantix-8 is ready to work :)

Quantix-8 Construction notes :

- D3,D4 are low voltage drop diode ...

_ U17 MUST be a 4011 and U5 MUST be a 4093 .. Both ics are pin to pin compatible but if you mismatch it wont work!

-R6 trimmer (1k) is fully optional . It allow to set the Fast ADC clock. You can replace it by a 1k 1%metal fim resistor. The freq of the Fast dac should be at least 500kHz , but you can, set it to go faster or slower by adjusting R6

-IS01 is a 6N137 (r34=1kmin) , many other compatible exist.
Adapt R34 to the opto you are using (3K3 for 6n136 or 6n135)

Fast ADC input stage:

Like assembled ones into my modular: not prooven to be the best ;)

R56 is not mounted. Pin2/3 are shunted by a resistor wire . R55 is 14k7 (say 15k) ... I have added an AC switch and an attenuator trimmer like described bellow ...You are not obliged to do the same... Feel free to adapt this stage to your modules levels (VCO/LFO etc ..)

1)U19A is a unity gain inverter ... as most VCOs on the market provide down saw waveform instead of upsaw , you may want to bypass U19A (= bad idea) or to add a switch to choose direct or inverted input...

2)Same idea for the 'AC' switch (= bias /offset). Solder only the R57 pin on the op amp side. Wire the other leg to the middle point of a switch (inersor3 points). Wire ones side of the switch to R58 middle pin (where R57 was previously connected). The other side of the switch go to ground. When the switch is set to ground there is no offset applied so the input work with 0..+5V range , with R58 correctly set and switched to 'AC' position, the input voltage range is 5Vpp. This allow to use the full adress range for the current waveform in RAM, instead of 1/2 with positive CVs only...

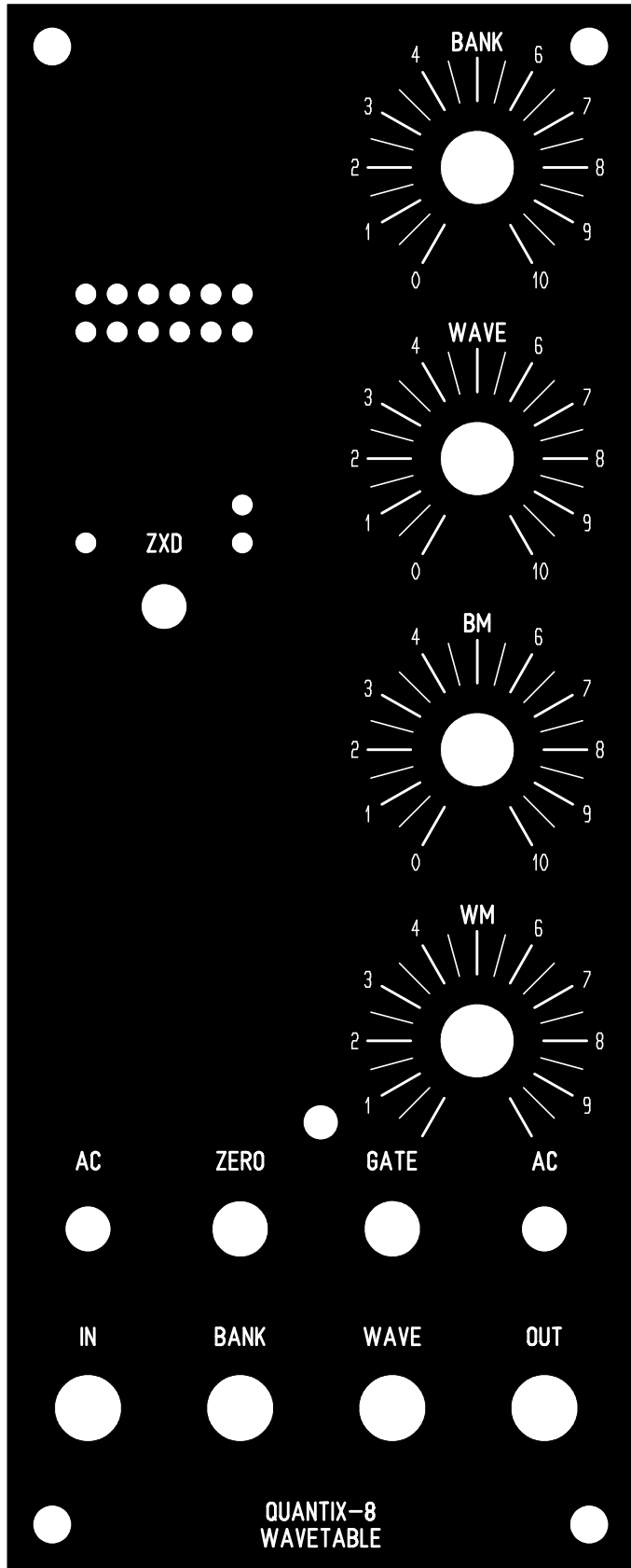
3) If you need to deal with higher input voltages simply add an input attenuator (like multiturn for panels. The advised value is 20k to 100K) or a simple voltage divider with two resistors if you prefear fixed things..

4) Another possible adaptation of the input stage is to make it fully parametric with input level attenuator and bias pots on the panel . The big advandtage is to be able to 'calibrate' the Quantix to any kind of incoming signals... The drawback is that you will need to do that quite often ... This is why it is preferable to work with relatively calibrated inputs with the Quantix ...

If you have doubts about the values you should use,just start with the advised ones and connect a 100K level attenuator pot beetwen the input jack and the Quantix8 input ...

OUTPUT STAGE

- TAKE CARE !!! ----> J9 Bias switch pins 2 and 3 are inversed on the PCB
- The REF01 can be replaced by any 10V equivalent voltage ref chip (REF102 ...) or by an adapted voltage divider...
- Use a socked for ic 16 ... It allow to find a better thing than, a TL072 (15mV offset ...) . A LM358 deal with 1mW offset , better for CV Quantize/ mcv but sound thinner ...



Quantix-8 pcb rev1.1

C18 Bug correction

Method #1

U19

Cut here

re connect

like this with a resistor
leg or a little wire

-15V

Mount C18 as indicated on the otherside

Quantix-8 pcb rev1.1

C18 Bug correction

Method #2

Mount C18 as indicated

C18 pin is connected to GND on top layer only

Scratch the varnish locally with a sharp blade to make the solder

Cut the 4 little traces from pad to GND layer

