SDR – Part 6

Photos, Tables and Schematics

I published a construction article in the June 2022 publication of Practical Wireless Magazine.

Electronic viewing of the magazine, as part of a subscription, is here: https://pocketmags.com/eu/practical-wireless-magazine

As necessitated by space constraints the photos, tables and schematics in the article might be a little small to be of any use for some readers.

So here are each of the photographs, tables and schematics in high resolution.

Samuel

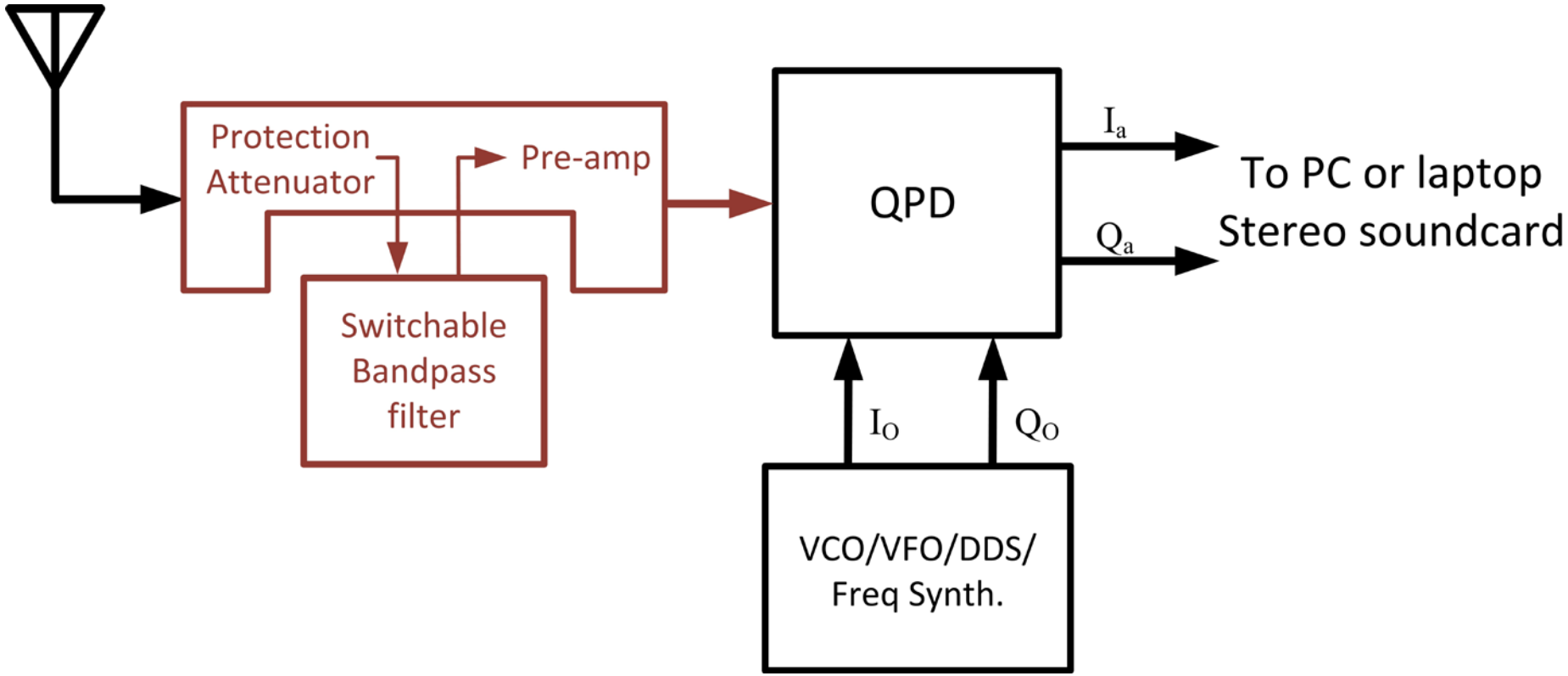

Figure 1. Basic block diagram

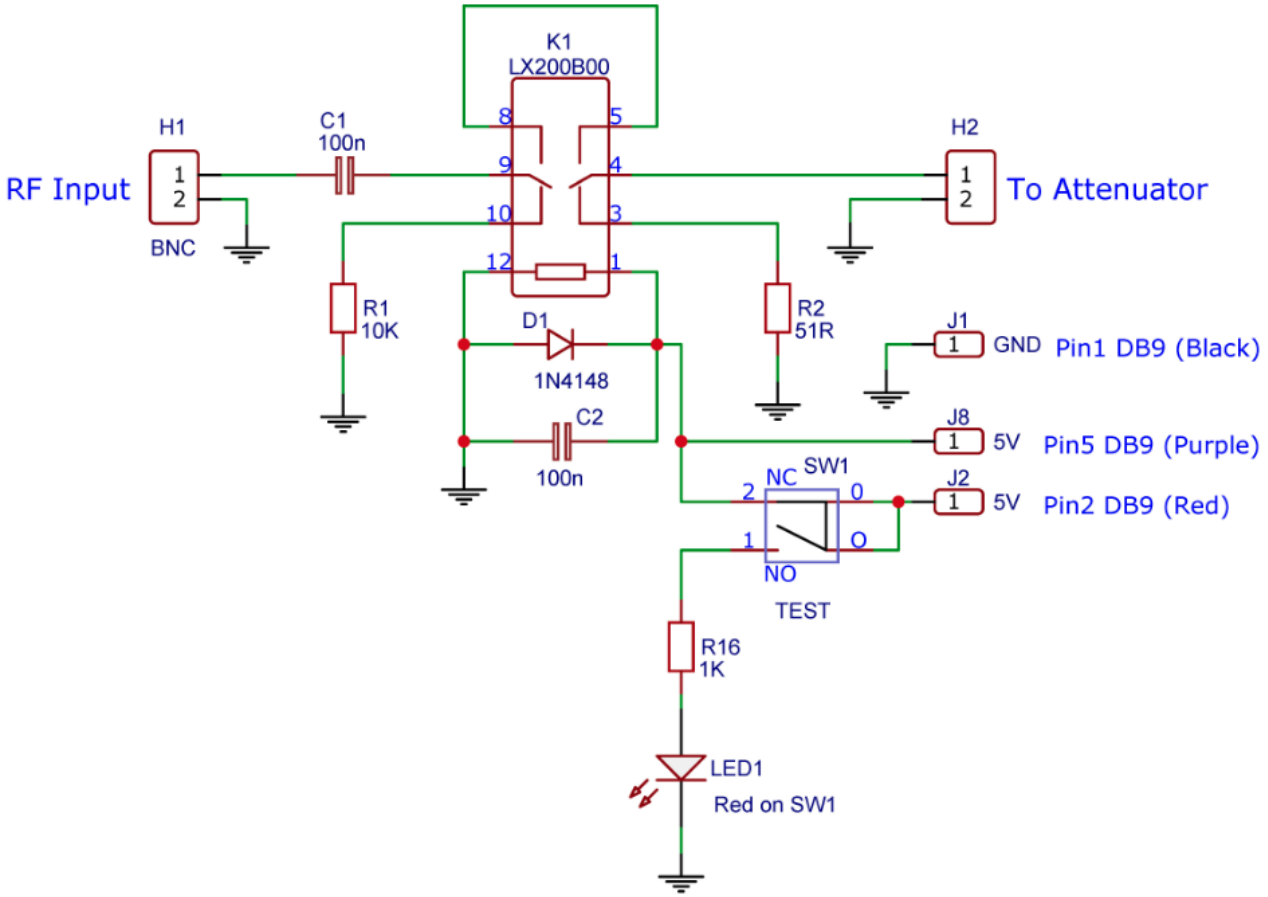

Figure 2. Schematic diagram of the simple protection circuitry.

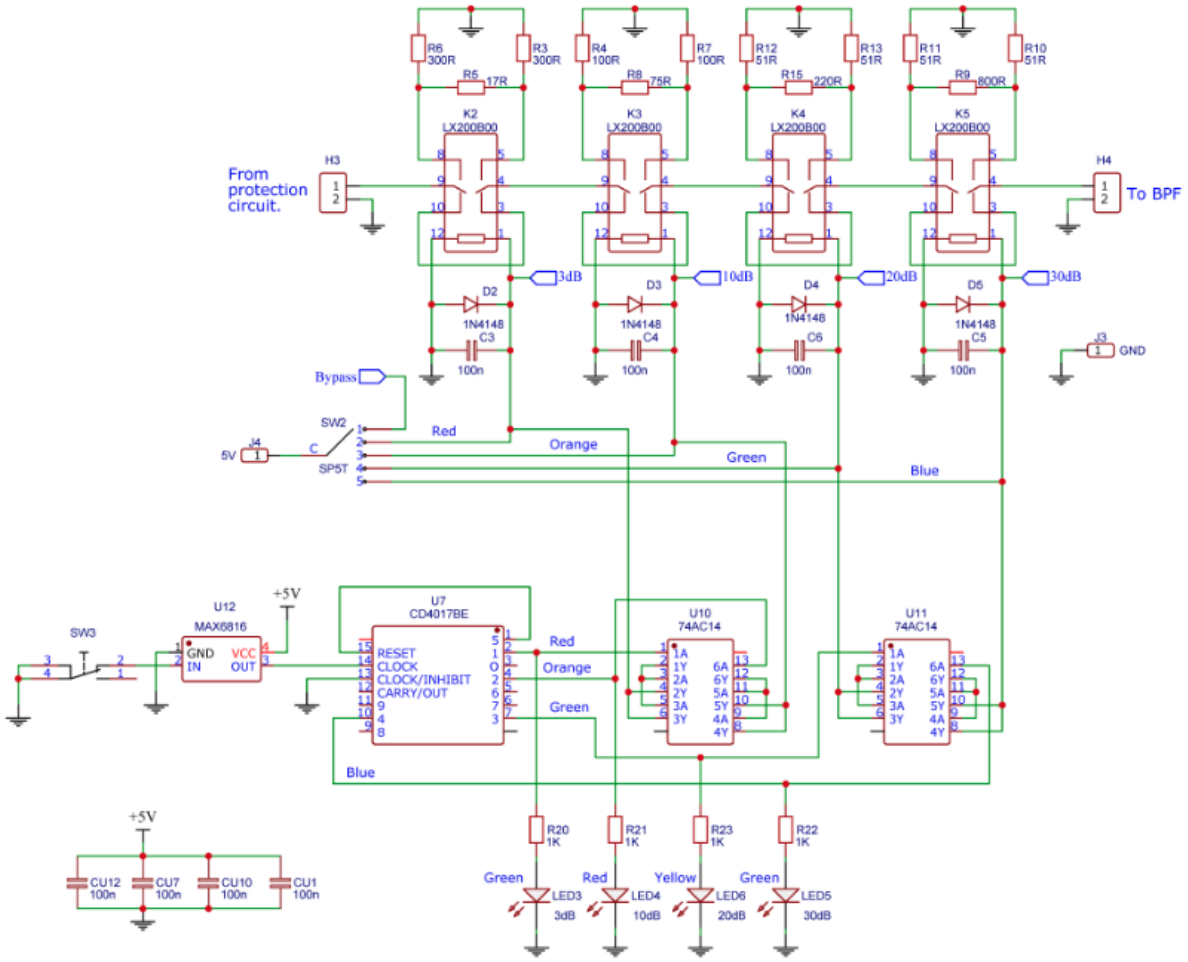

Figure 3. Schematic diagram of the attenuator circuitry.

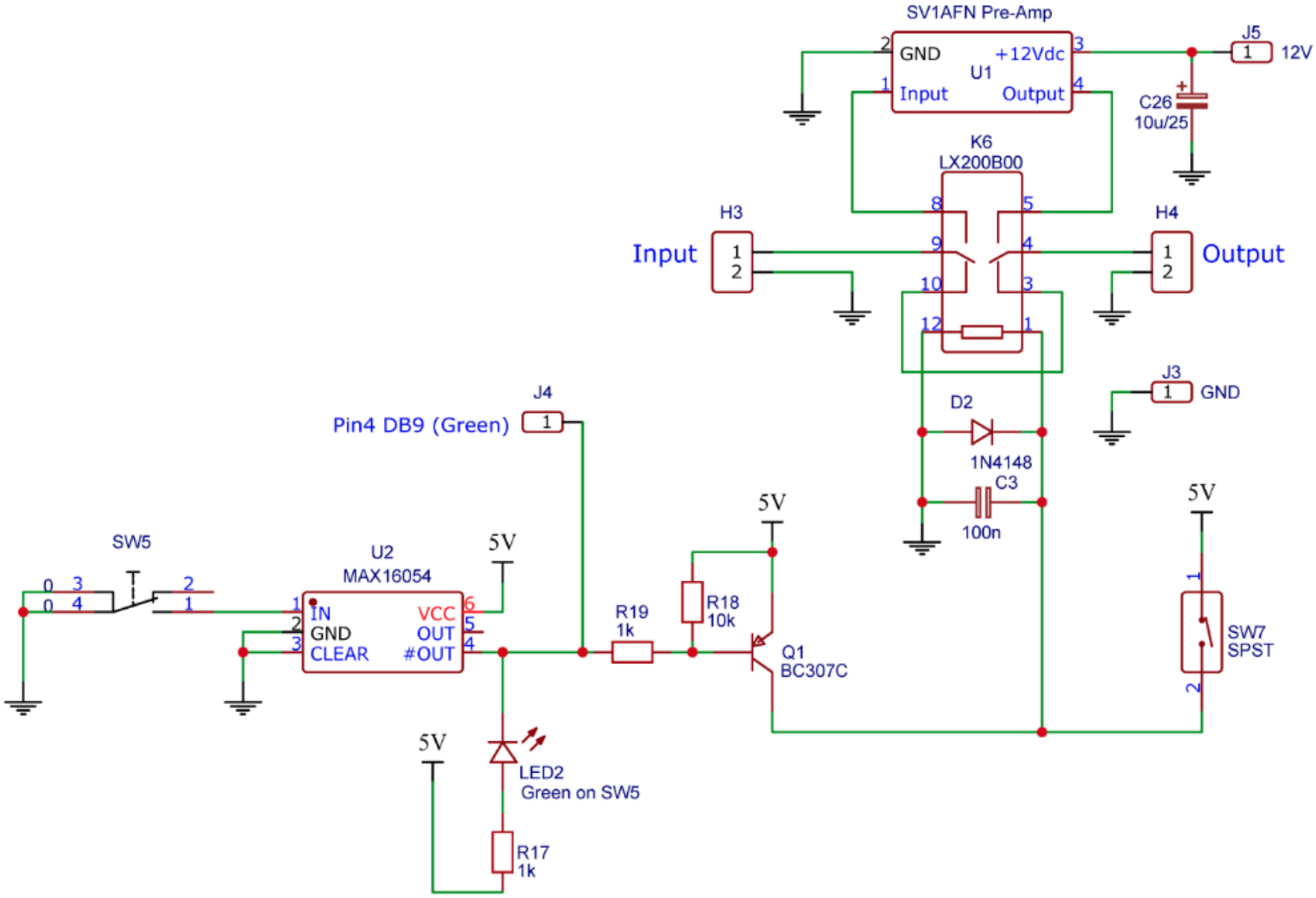

Figure 4. Schematic Diagram of the Pre-amplifier circuit

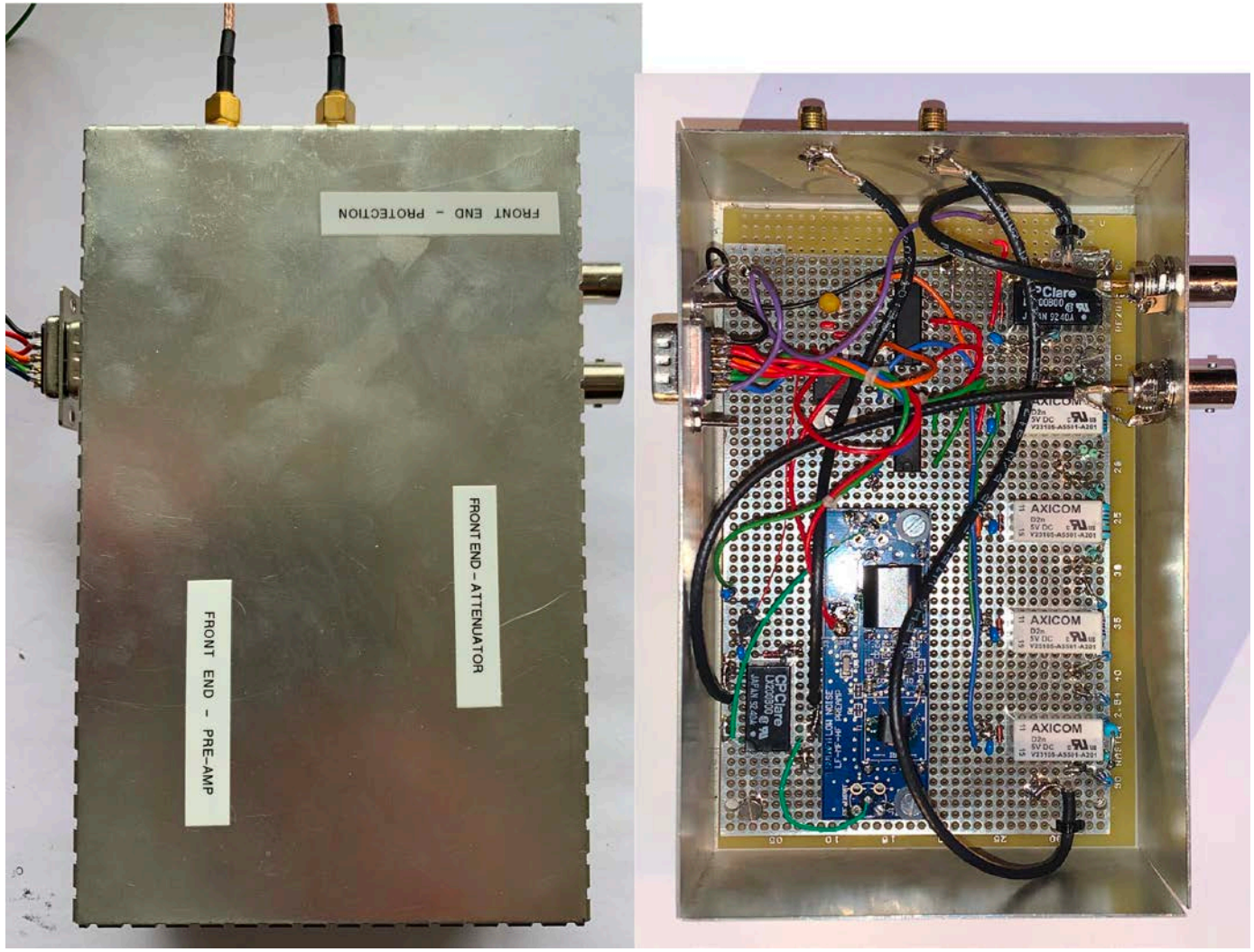

Figure 5. Schematic Diagram of the Pre-amplifier circuit

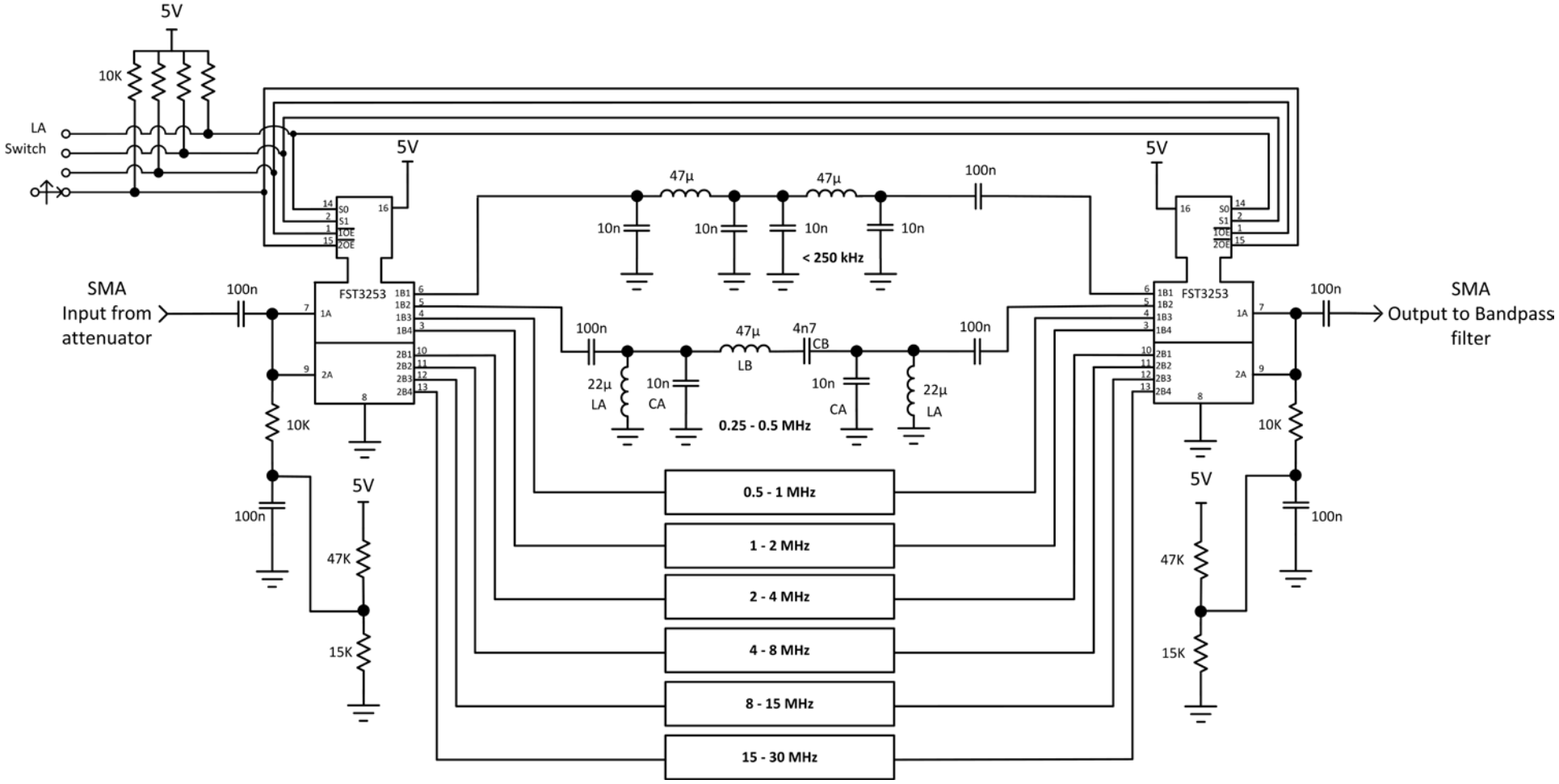

Figure 6. Schematic Diagram of the switchable bandpass filter

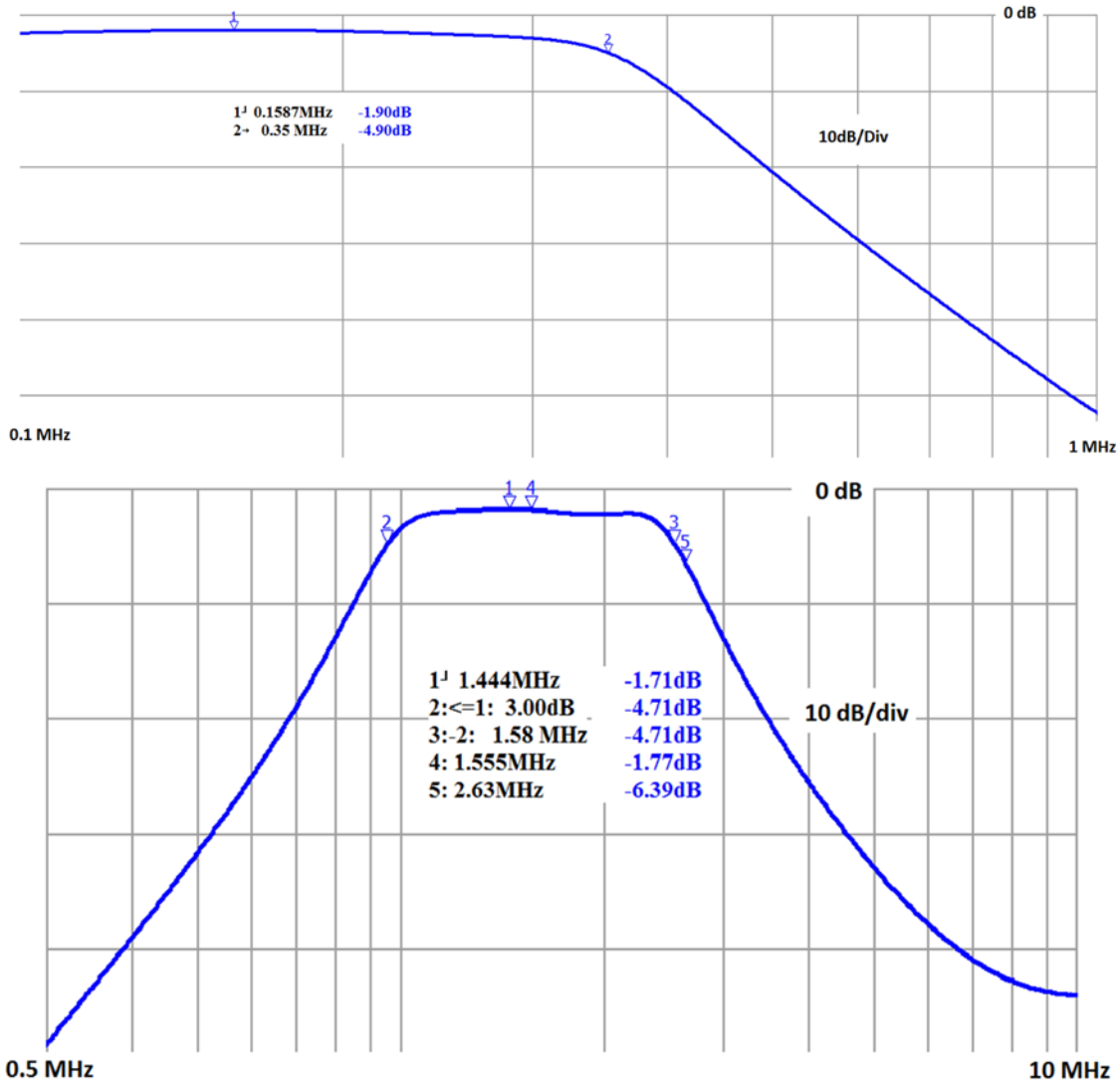

Figure 7. Response of the LPF (top) and 1 - 2 MHz BPF (bottom)

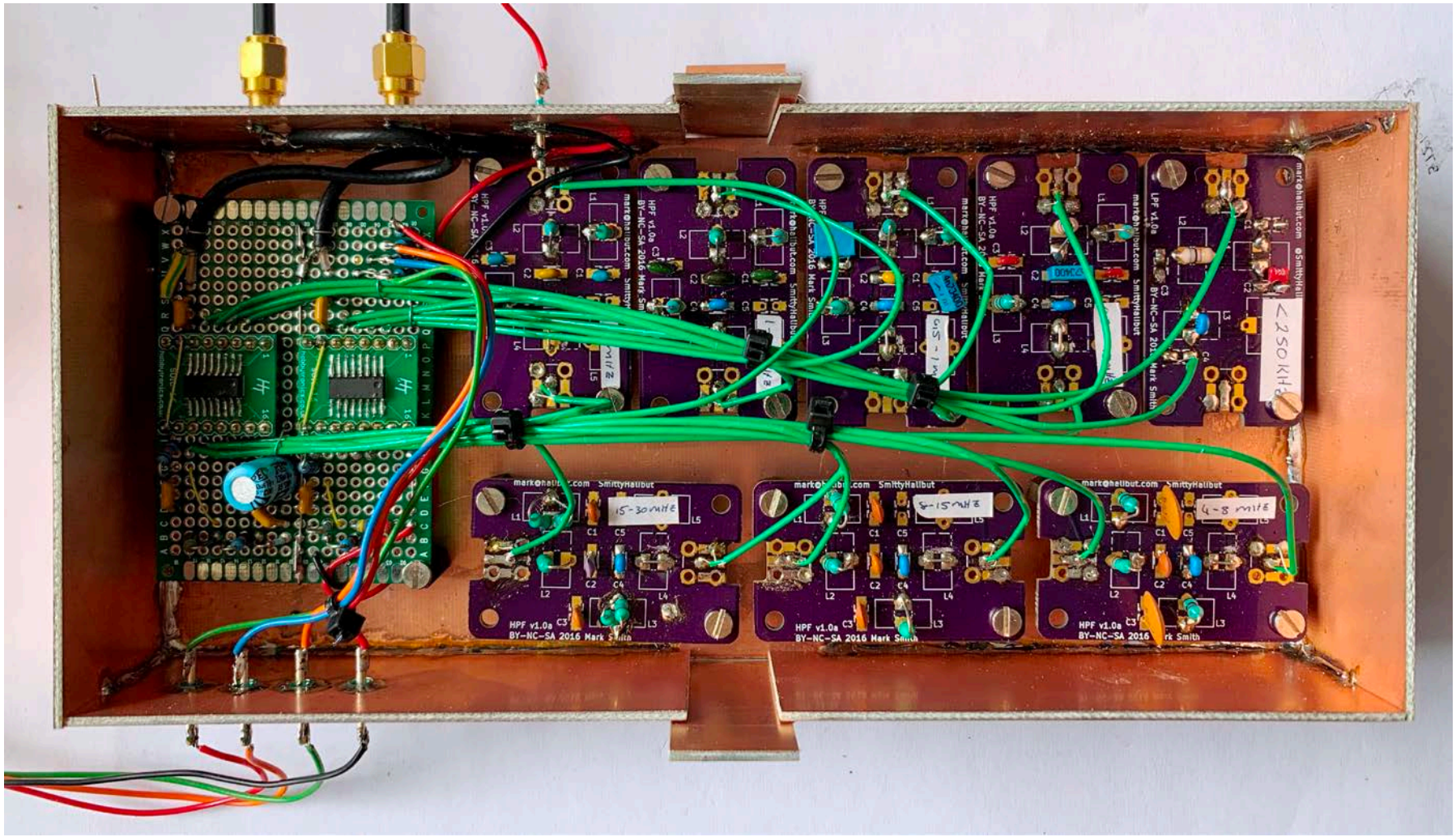

Figure 8. The built BPF circuitry

Event	U7						Relay selected	LED Lit
	Pin 3 Q0	Pin 2 Q1	Pin 4 Q2	Pin 7 Q3	Pin 10 Q4	Pin 1 Q5		
Start-up	1	0	0	0	0	0	None	-
Push SW3	0	1	0	0	0	0	K2	LED 3
Push SW3	0	0	1	0	0	0	K3	LED 4
Push SW3	0	0	0	1	0	0	K4	LED 5
Push SW3	0	0	0	0	1	0	K5	LED 6
Push SW3	0	0	0	0	0	1	Immediate reset of U7. Pin 1 Q5 going high triggers a reset on U7 pin 15.	
Back to start up	1	0	0	0	0	0	None	-

Table 1. The sequence of events for SW3

Band	LA	CA	LB	CB
0.25 – 0.5 MHz	22 µH	10nf	47 µH	4.7nf
0.5 – 1 MHz	10 µH	4.7 nf	22 µH	2.2 nf
1 – 2 MHz	4.7 µH	2.7 nf	10 µH	1.2 nf
2 – 4 MHz	2.2 µH	1.5 nf	4.7 µH	680 pf
4 – 8 MHz	1 µH	820 pf	2.2 µH	390 pf
8 – 15 MHz	470 nH	390 pf	1 µH	180 pf
15 – 30 MHz	330 nH	180 pf	680 nH	82 pf

Table 2. Bandpass filter component values

Band	S0	S1	/1OE	/2OE
< 250 kHz	0	0	0	1
0.25 – 0.5 MHz	1	0	0	1
0.5 – 1 MHz	0	1	0	1
1 – 2 MHz	1	1	0	1
2 – 4 MHz	0	0	1	0
4 – 8 MHz	1	0	1	0
8 – 15 MHz	0	1	1	0
15 – 30 MHz	1	1	1	0

Table 3. BPF control lines truth table