



# DT-AFRZ AUDIO FREEZER MODULE USER MANUAL

Document revision-0 (05-05-2024): Initial Release

## I. Description

DT-AFRZ is a processing module for audio sample freezer (infinite sustainer) designed for guitar effect pedal application. It has selectable momentary and latch operation, automatic transient avoidance, adjustable trigger delay, and continuous fade-out speed control features.

In momentary mode, pressing and holding down the foot switch will trigger the sampling and freezing of the incoming sound, and releasing the switch will fade out the the frozen sound. In the latch mode, a brief press or a tap will sample and freeze the incoming sound, and a long press (held pressed more than 0.5 seconds) will fade out the previously frozen sound.

When the capture operation gesture is detected on the foot-switch, the actual sampling

process is delayed by an adjustable amount of delay period. After this period elapses, the sampling process will be executed immediately if the auto-transient avoidance is off. In other case, when the auto-transient avoidance is on, the sampling process will still be delayed until there's no detected transient or until 250 ms period has elapsed, whichever comes first.

## II. Features

- Continuous fade-out speed control
- Smooth transition between capture
- Adjustable trigger delay
- Automatic transient avoidance
- Select-able momentary/latch operation
- Zero latency analog dry-trough

## III. Block Diagram

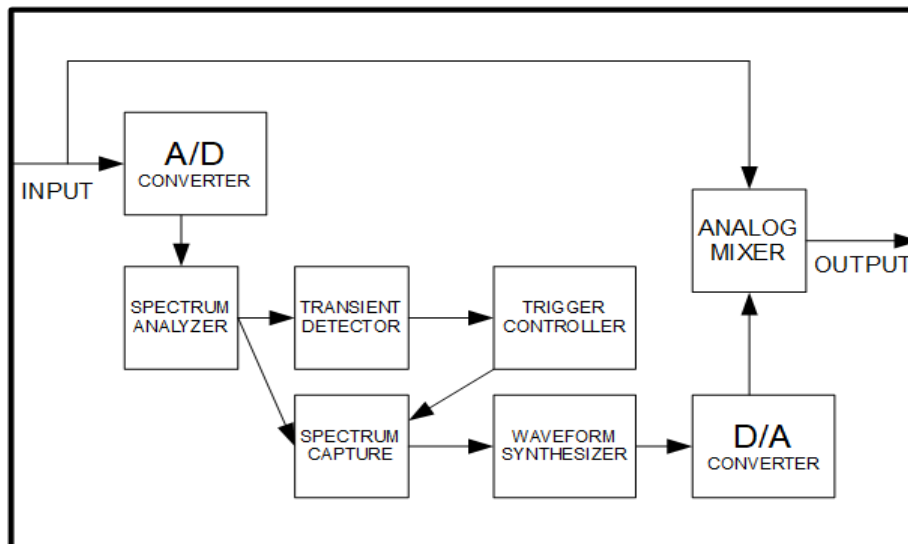
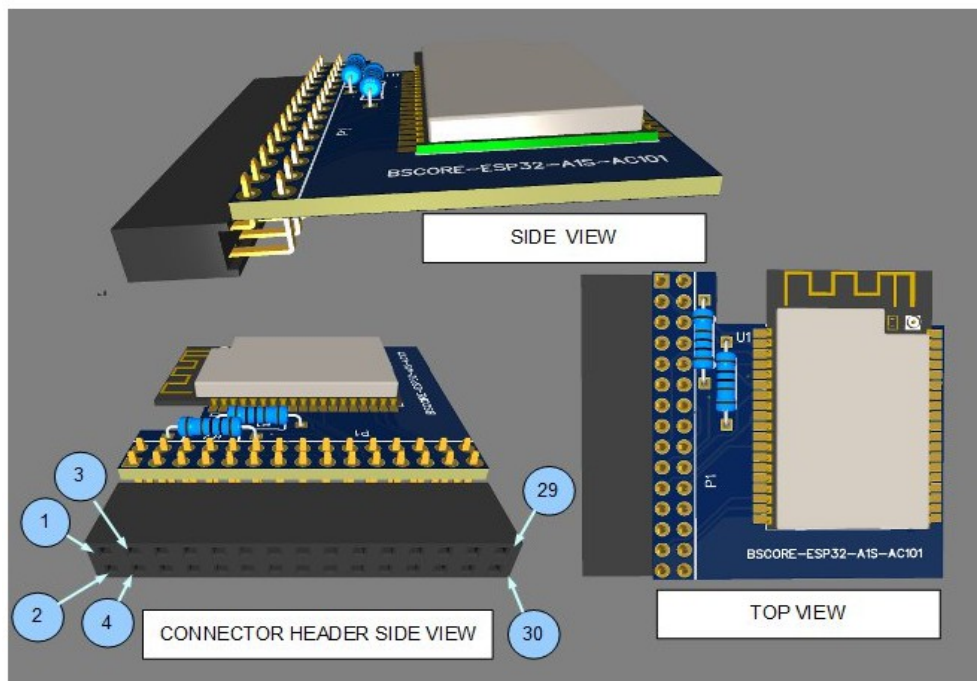


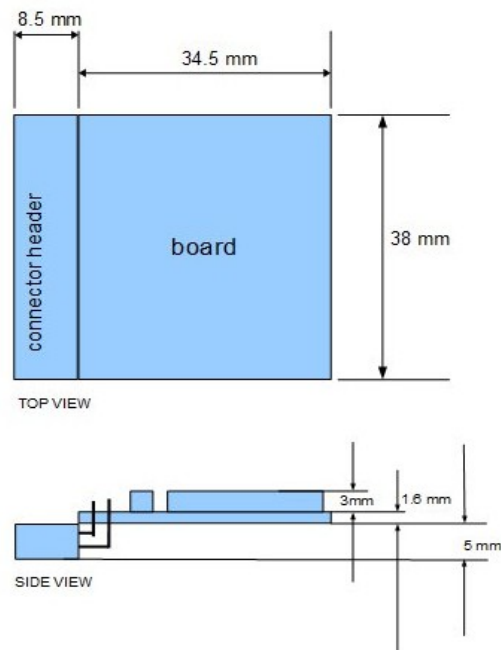
Figure 1. DT-AFRZ M Block Diagram



#### IV. Pinout Diagram and Pin Description



DGND	2	1	DC3V3
RXD	4	3	TXD
PROG-2	6	5	PROG-1
PROG-4	8	7	PROG-3
I2C-SDA	10	9	I2C-SCK
LED-2	12	11	LED-1
D2	14	13	D1
D4	16	15	D3
A2	18	17	A1
A4	20	19	A3
A6	22	21	A5
OUT-R	24	23	OUT-L
IN-R	26	25	IN-L
MIC-N	28	27	MIC-P
AGND	30	29	AGND



**Figure 2. DT-FOG Module Pinout Diagram**



NUMBER	NAME	DESCRIPTION
1	DC3V3	Power supply input +3.3V
2	DGND	Digital ground
3		(UNUSED)
4		(UNUSED)
5		(UNUSED)
6		(UNUSED)
7		(UNUSED)
8		(UNUSED)
9		(UNUSED)
10		(UNUSED)
11	LED-1	Indicator LED
12		(UNUSED)
13	D1	Digital input for the main foot switch
14		(UNUSED)
15		(UNUSED)
16		(UNUSED)
17	A1	FX LEVEL CONTROL
18	A2	FADE OUT SPEED CONTROL
19	A3	TRIGGER DELAY
20	A4	CONTROL MODE (LATCH/MOMENTARY)
21		(UNUSED)
22	A6	AUTO TRANSIENT AVOIDANCE CONTROL (ON/OFF)
23		(UNUSED)
24	OUT	Audio output
25		(UNUSED)
26	IN	Audio input
27		(UNUSED)
28		(UNUSED)
29	AGND	Analog ground
30	AGND	Analog ground

**Table 1. DT-AFRZ Module Pin Description**

#### **V. Electrical Specification**

- **Power supply voltage: DC 3.3V**
- **Current consumption: 100 mA (max)**
- **Audio input voltage range: 1 Vrms (2.8 Vpeak-to-peak)**
- **Input impedance: 20 kOhm**
- **Output impedance: 1 kOhm**

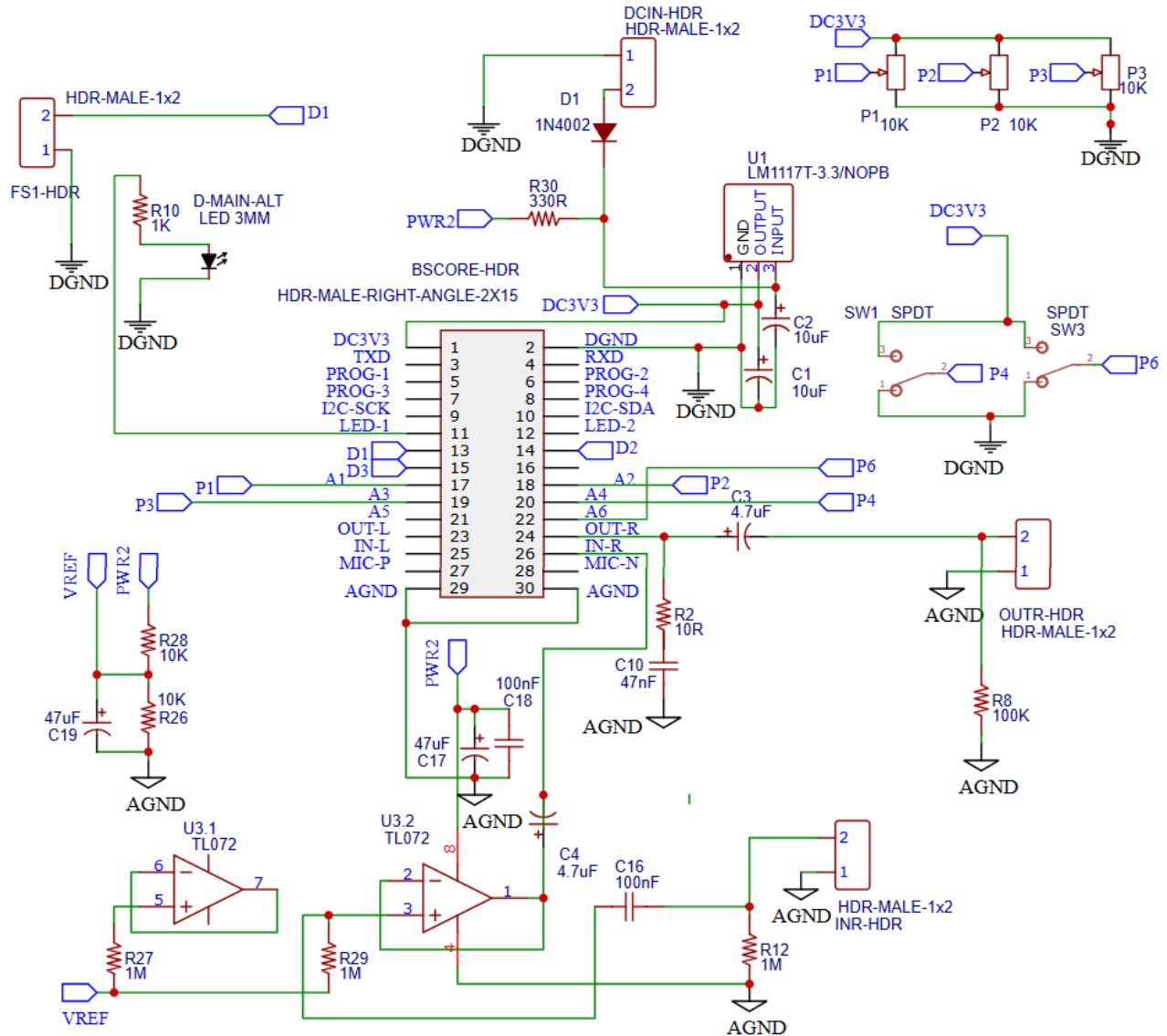


## **VI. Controls**

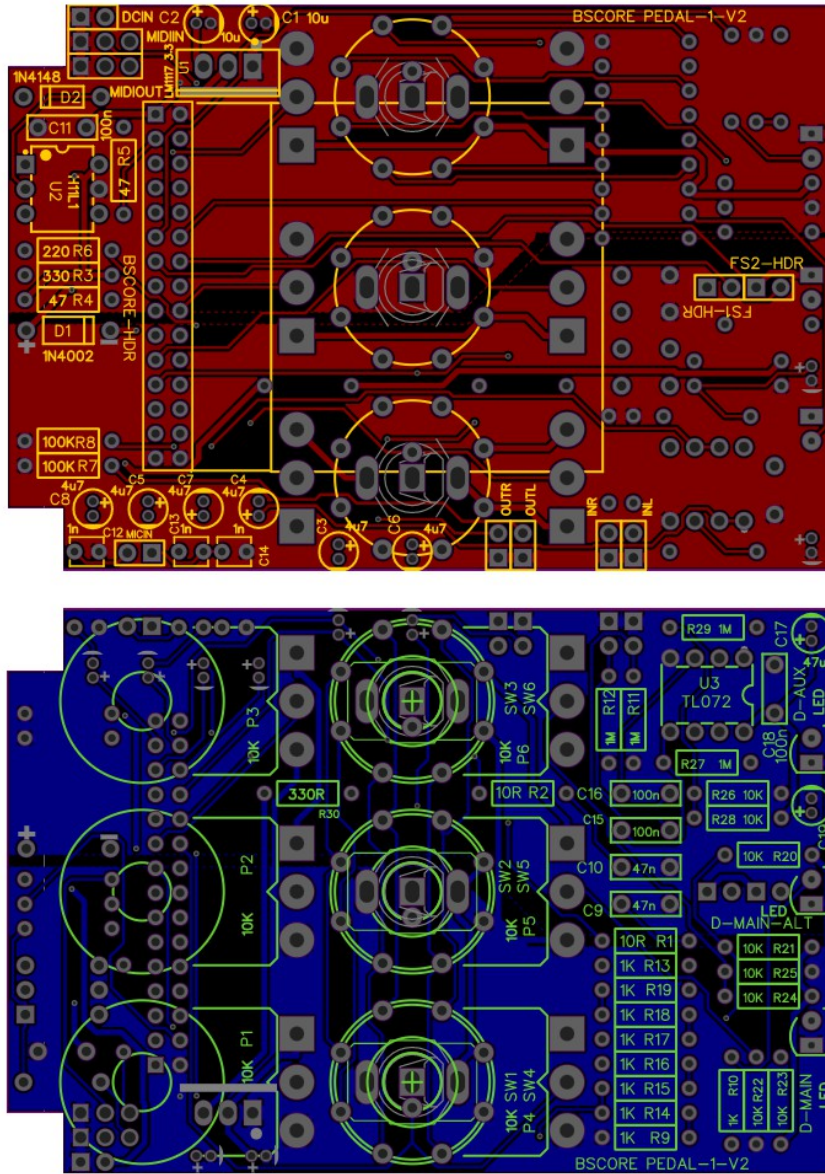
- **FX LEVEL KNOB** is used to adjust the volume of the sustained sound
- **FADE OUT KNOB** controls the speed of the sustained sound fade out when the hold function is released
- **TRIGGER DELAY KNOB** controls the delay time between the foot-switch pressing and the audio sample capture triggering
- **CONTROL MODE SWITCH** is used to select the foot switch's operation mode (latching/momentary)
- **AUTO TRANSIENT AVOIDANCE SWITCH** is used to enable or disable the automatic transient avoidance function.
- **SAMPLE/HOLD FOOT-SWITCH** is used to control the sample, hold (freeze), and fade operation. In the latch mode: tap the switch to sample or resample and freeze, press+hold(more than 500 ms)+release to fade. In the momentary mode: press+hold to sample and freeze, release to fade.

## **VII. Building AFRZ Pedal Using Blackstomp's Generic Production Model-1 (BGPM-1) PCB**

- A) Application circuit is shown in Figure 3
- B) BGPM-1 PCB is shown in th Figure 4
- C) Bill of materials (BOM) is shown in the Table-2
- D) Off-board wiring layout is shown in the Figure 5
- E) Drill template for 125B enclosure is shown in Figure 6



**Figure 3. DT-AFRZ Pedal Application Circuit (Input Impedance = 0.5 MOhm)**



**Figure 4. BGPM-1 PCB (Upper: TOP SIDE, Lower: BOTTOM SIDE)**

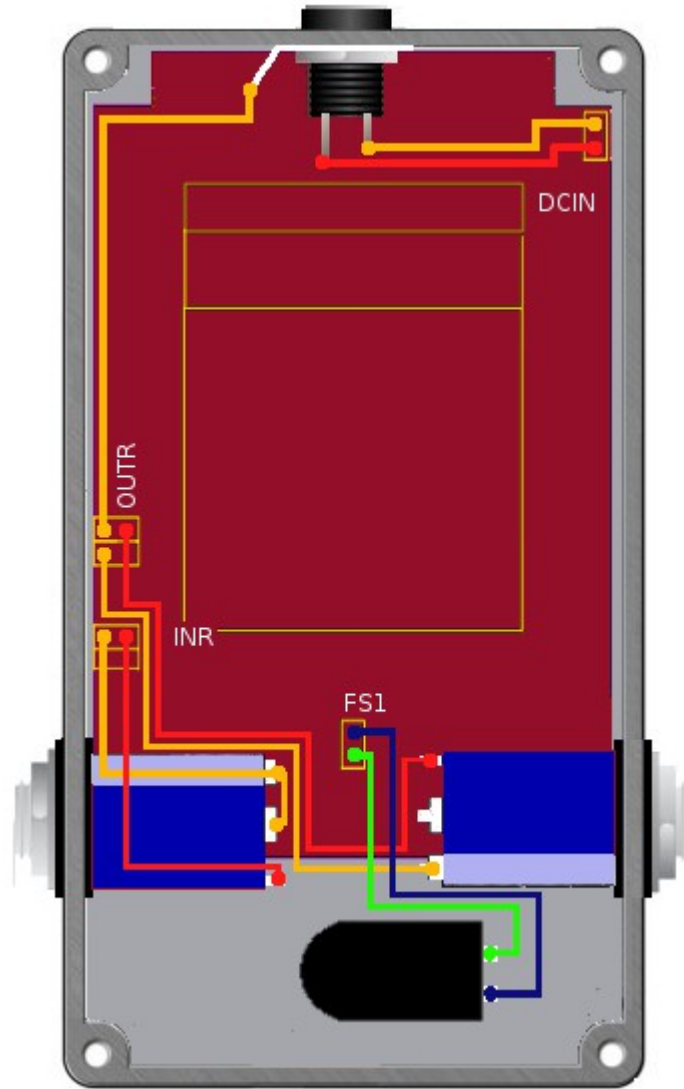


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<b>ID</b>	<b>NAME</b>	<b>DESIGNATOR</b>	<b>QTY</b>	<b>ASSEMBLY SIDE</b>
<b>ON-BOARD PARTS</b>				
1	HDR-MALE-RIGHT-ANGLE-2X15	BSCORE-HDR	1	TOP
2	10uF	C1,C2	2	TOP
3	4.7uF	C3,C4	2	TOP
4	47nF	C10	1	BOTTOM
5	100nF	C16,C18	2	BOTTOM
6	47uF	C17,C19	2	BOTTOM
7	1N4002	D1	1	TOP
8	LED 3MM	D-MAIN-ALT	1	BOTTOM
9	HDR-MALE-1x2	DCIN-HDR,FS1-HDR,INR-HDR,OUTR-HDR	4	TOP
10	10K	P1,P2,P3	3	BOTTOM
11	10R	R2	1	BOTTOM
12	100K	R8	1	TOP
13	1K	R10	1	BOTTOM
14	1M	R12,R27,R29	3	BOTTOM
15	10K	R26,R28	2	BOTTOM
16	330R	R30	1	BOTTOM
17	SPDT	SW1,SW3	2	BOTTOM
18	LM1117T-3.3/NOPB	U1	1	TOP
19	TL072	U3	1	BOTTOM
<b>OFF-BOARD PARTS</b>				
20	DT-AFRZ MODULE	PLUGGED TO BSCORE-HDR	1	
21	SPST FOOT-SWITCH	WIRED TO FS1-HDR	1	
22	ISOLATED DC SOCKET	WIRED TO DCIN-HDR	1	
23	ISOLATE 6.35MM TS SOCKET	WIRED TO INR-HDR, OUTR-HDR	2	

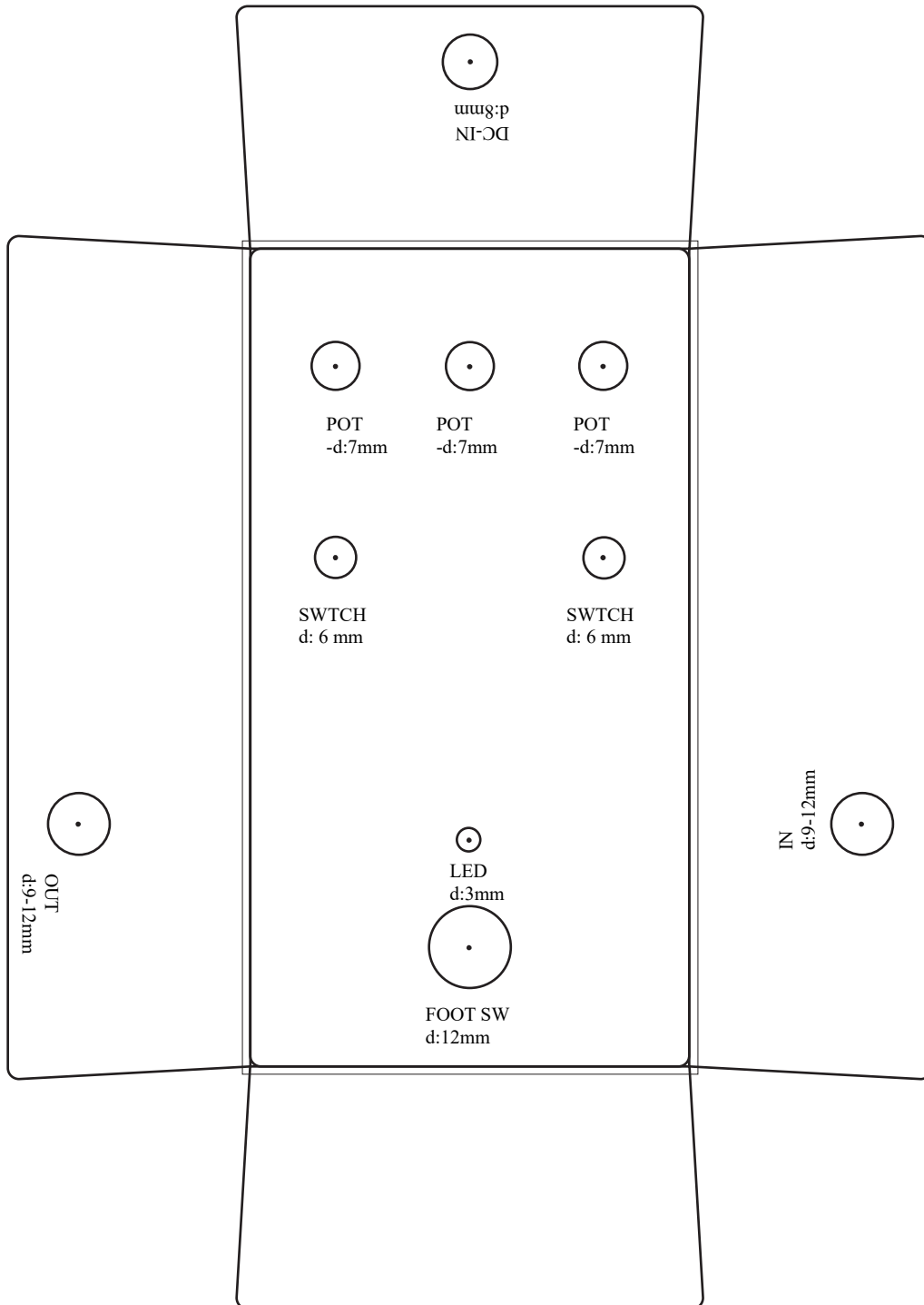
**Table 2. DT-AFRZ Pedal Circuit Bill of Materials (BOM)**





**Figure 5. DT-AFRZ Pedal Off-Board Wiring Layout**





**Figure 6. DT-AFRZ Pedal Drill Template for 125B Enclosure**

END OF USER MANUAL, Revision-0