Open Speech Platform Hardware Documentation 03/23/18

Jellybean (JB)

CS44 Cable

Breakout Board (BOB)

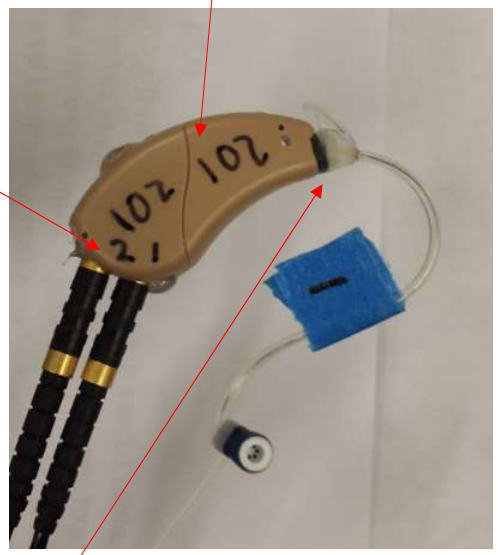
Zoomtac 8 (ZT8)

For use with BoB v6 and JBv6 only. This document does not cover prior systems.

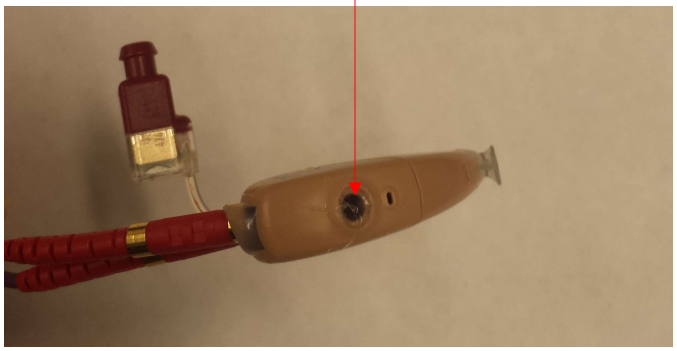
Jellybean

2x CS44 cable to the BOB.
The cables are labelled 1 and 2, and should be Connected to ports 1 and 2 labelled on the JB shell.
Cable 1 is always closer to the receiver.

The jellybean shell has been sealed with hot glue. Do not attempted to open it.
102 is the serial number of this JB.



Correctly connecting the cables and applying power will result in a green light visible in this port.

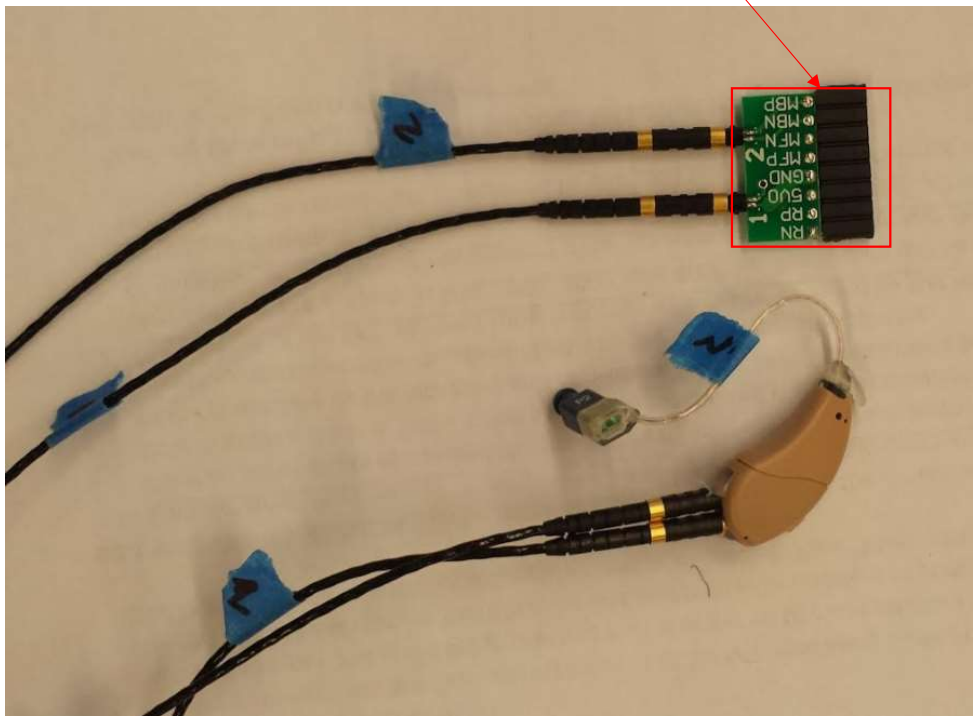


Standard CS44 connector.
Feel free to use different receivers.
All jellybeans work with left and right receivers.

CS44 cable

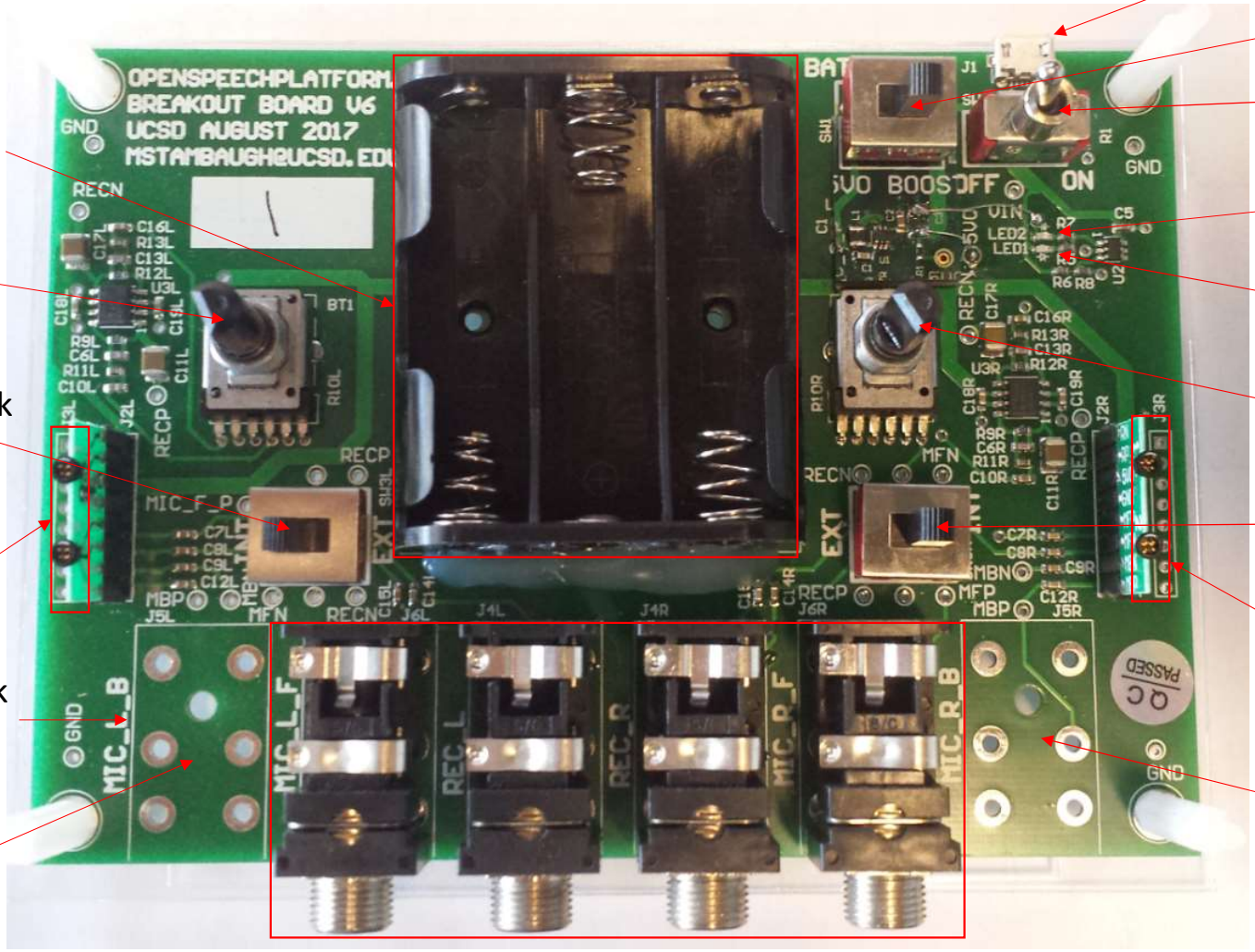
The red dot on the cable should line up with the white stripe on the connector.

This CS44 adapter is necessary to connect to the BoB. The pin labels on the adapter should match the pin labels on the BoB.



It is recommended that the BoB-end of cables be left secured and attached to the box via tape or other means for strain relief. The cables are 1 meter long.

Breakout Board



1) USB B-Micro

2) Power source selector

3) Power switch

4) Power on LED (green)

5) Low Battery LED (red)

6) Right volume adjust

7) Right Loopback selector

8) CS44 adapter to Right JB

Jack not installed (no Back microphone in JBv6)

13) Battery pack

12) Left volume adjust

11) Left Loopback selector

10) Left JB CS44 adapter

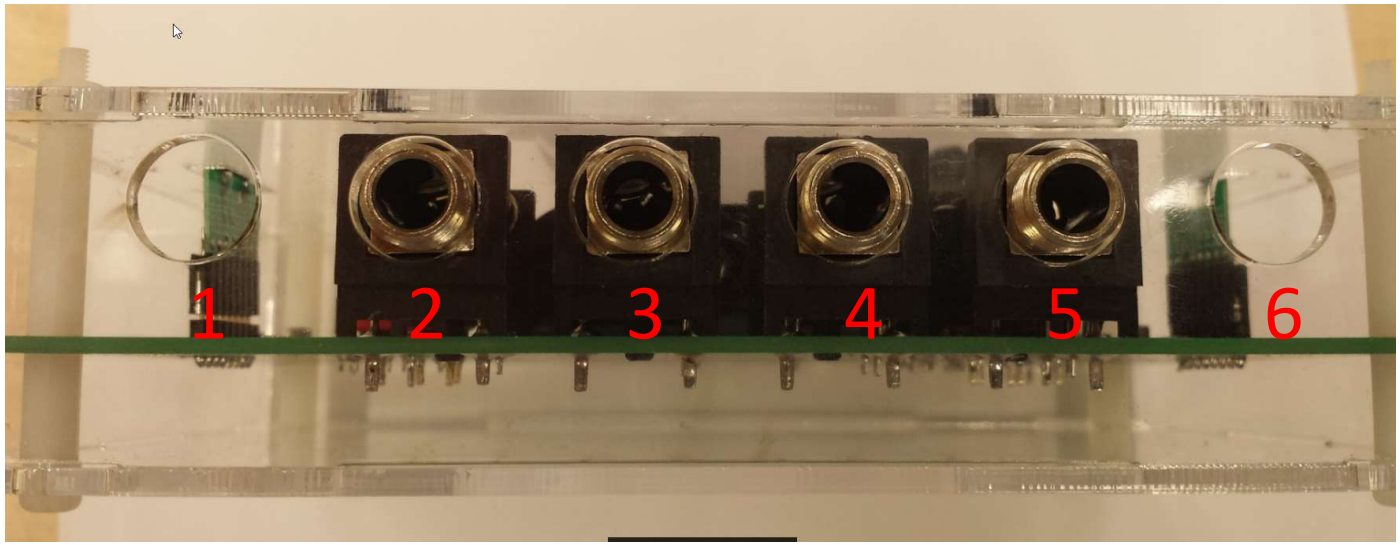
9) 4x TRS ¼” jack to ZT8

Jack not installed (no Back microphone in JBv6)

Breakout Board, continued

1) USB B-Micro : Takes a standard USB supply of 5V as an alternative to battery power. No data is carried over the USB cable. If using battery power, DISCONNECT THE USB CABLE.
2) Power source selector : Switch to the left for battery power, to the right for USB power. Use a USB source from the Verifit or a computer, NOT from a 2-prong wall-outlet-adapter. Acoustic noise from a floating-ground USB source can be substantial (45dB+).
3) Power switch : Left for OFF, right for ON.
4) Power on LED : This LED will turn on (GREEN) if power is supplied to the board. If using battery power, the LED will turn OFF in the case of low battery, and the RED led will turn on.
5) Low Battery LED: This LED will turn on (RED) if the battery voltage drops below 3V.
6) Right volume adjust : Logarithmic potentiometer, clockwise to increase volume. This knob does NOT affect the gain of the microphone signal coming from the JB.
7) Right loopback selector : Right for INTERNAL loopback (fully analog, front mic only). Left for EXTERNAL loopback (via ZT8 + DSP software).
8) CS44 adapter to Right JB : Match with marks on the adapter PCB. #2 towards the ¼" connectors (front), #1 towards the USB connector (back). Match with signal names on the adapter PCB.
9) 4x TRS ¼" jack to ZT8 : See next page.
10) CS44 adapter to Left JB : Match with marks on the adapter PCB. #2 towards the ¼" connectors (front), #1 towards the USB connector (back). Match with signal names on the adapter PCB.
11) Left loopback selector : Left for INTERNAL loopback (fully analog, front mic only). Right for EXTERNAL loopback (via ZT8 + DSP software).
12) Left volume adjust : Logarithmic potentiometer, clockwise to increase volume. This knob does NOT affect the gain of the microphone signal coming from the JB.
13) Battery pack : Takes 3 standard AA alkaline cells.

Breakout Board to Zoomtac 8 Connection



1) Left Back Mic output
2) Left Front Mic output
3) Left Receiver input
4) Right Receiver input
5) Right Front Mic output
6) Right Back Mic output

All inputs and outputs are differential.
Outputs are biased at 0V DC.

Back Microphones and associated jacks are not installed in the current versions of JB and BoB.

Startup Procedure

See page 4 for locations of switches and knobs mentioned on this page. Switches 2, 7, and 11 will require a pen or other aid to switch with the box assembled. This is by design to prevent accidental switching of operating modes during experiments.

For each ear:

1. Connect Jellybean to BoB with the CS44 cables and connectors 10 (left) or 8 (right) on the BoB.
2. Use Switch 11 (left) or 7 (right) on the BoB to enable Internal loopback mode.
3. Use Switch 2 to select the power source for the BoB.
4. Turn on the power to the BoB (switch 3). A green light should be visible in the Jellybean.
5. Turn knobs 12 (left) or 6 (right) on the BoB clockwise to increase the system gain. With a receiver in place and maximum system gain the Jellybean should feedback audibly when a hand is cupped over the receiver. The absence of audible feedback suggests an error in system assembly.
6. Place Jellybean and receiver in Verifit or other calibration device.
7. Using a pink noise or ANSI 3.22 as a guide, adjust the output volume with knobs 12 or 6 on the BoB until the desired gain is achieved. 40-42dB gain is typical before acoustic feedback occurs.
8. Use Switch 11 or 7 to engage External mode. Connect the BoB to ZoomTac or other audio interface using ¼” TRS cables (See page 6 for connector functions).
9. Adjust input gain on ZoomTac (or equivalent) to maximize dynamic input range to the ADC.
10. Run the OSP software and attenuate as desired within the program.

Troubleshooting

If no sound is coming out of the receiver, check the following:

1) Is the BoB's "Power on" (green) LED on? If not, check switches 3 (power) and 2 (source select).
2) Is the JB's "Power on" (green) LED on? If not, check the CS44 cable connections. Verify that cables 1 and 2 are in the correct sockets on both JB and BoB. Verify that the adapter board is not in backwards.
3) Check switch 7 or 11. Is the BoB in the correct mode for this test (Internal or External)? If External mode is desired, verify the proper cable connection to ZT8 (or equivalent).
4) Check knobs 6 or 12. In the fully-counterclockwise position they will cut off output completely.
5) Is the receiver properly seated in the Jellybean?

Single Ear Signal Path (BoB v6.x)