

ARB-3D Kit Instructions

Version 1.1.0

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1 Getting started

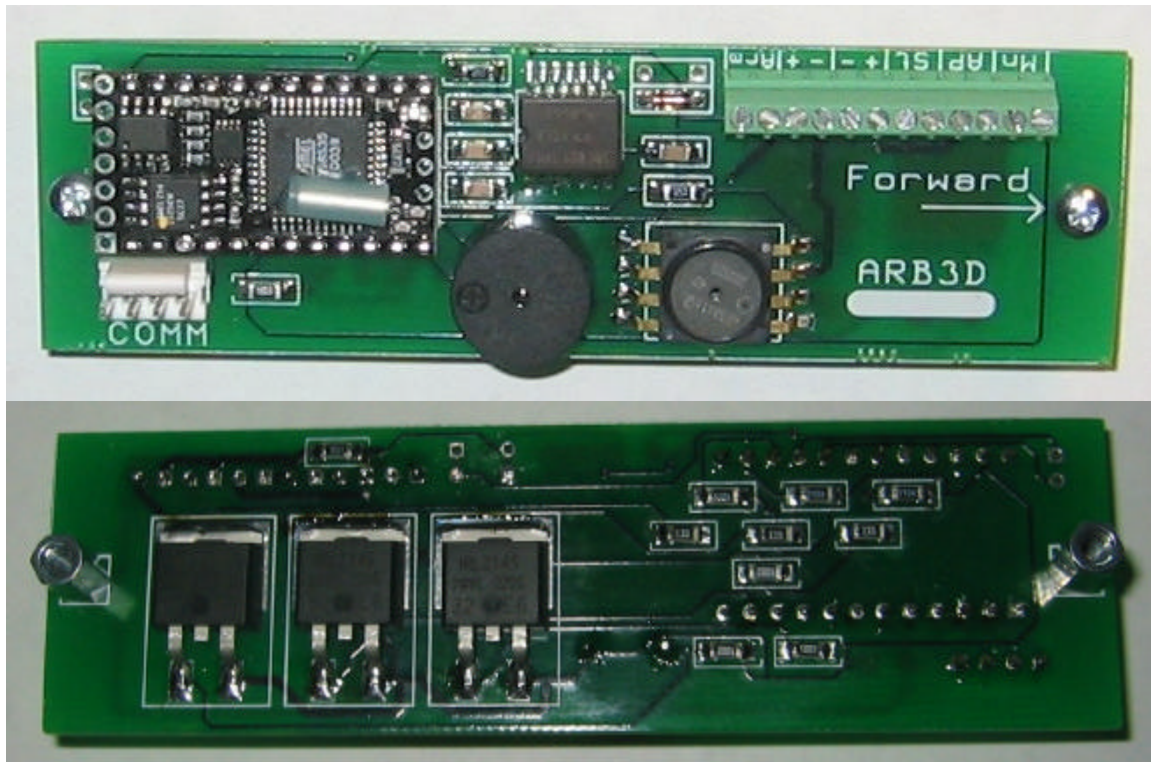
Tools needed: Soldering iron, solder, tweezers, wire cutters and needle nose pliers. Open the package and identify all of the parts to be sure everything is enclosed. Below you will see a list of all of the parts and board locations.

Parts List:

Quantity	Description	Part ID	PCB Label
1	ARB3D PCB	ARB3D	-
1	BasicX-24	BX-24	J7
1	50g Accelerometer	ADXL150	J5
1	Barometer	MPXA4115A	JP1
1	12 Pin Terminal Block	-	MnApSt+---+Arm
1	4 Pin Male Header	-	COMM
1	4 Pin Female Header	-	-
1	4-Conductor Cable	-	-
1	RJ11-to-DB9 Connector		
1	Buzzer element	CEP-2242	-
3	HexFET 60v 10A	IRLZ14S	-
4	#4-40 Screws	-	-
2	#4-40 Standoffs		
1	Diode	1N41	D1
13	Resistors	3x150, 1x1003, 3x1002, 3x335, 3x1104	-
4	0.1 uF Cap		-

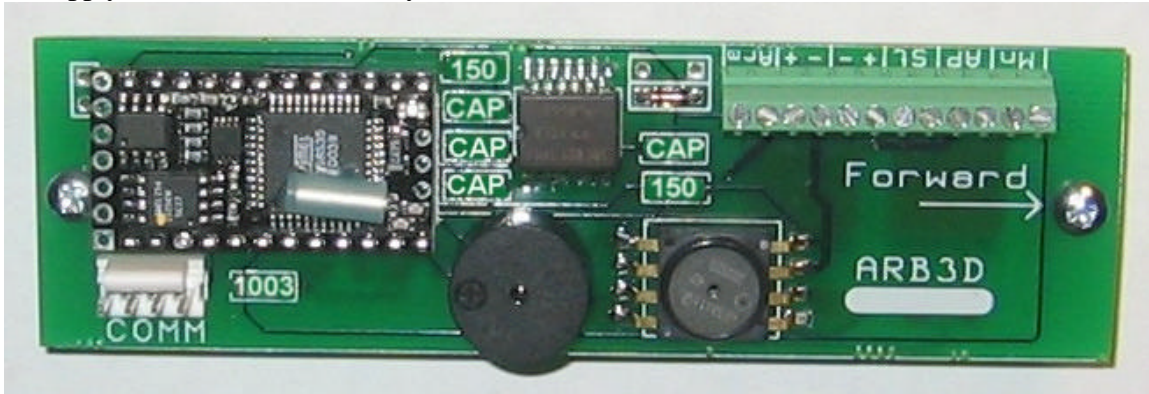


2 ARB3D Assembly Instructions

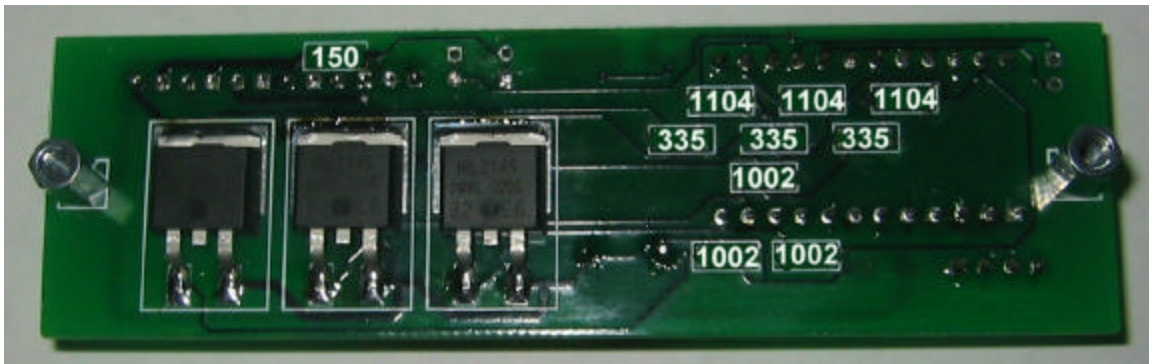


Step 1: Identify the diode and locate the black stripe on one end. This is to match the white line drawn across the D1 label. Insert the diode in that position and solder in place. The J5 connection above the D1 connection is to bypass the diode for low power consumption, but careful not to reverse the polarity for the input power, it will destroy the board.

Steps 2&3: Helpful if you dab a very small amount of solder on each pad. Using tweezers, solder one side of the surface mount resistor/capacitor at a time. Then go back and apply more solder if necessary.



Step 2: Solder in all 4 capacitors (0.1uF) as seen in the picture labeled CAP. Polarity (positive and negative leads) doesn't matter in these capacitors.

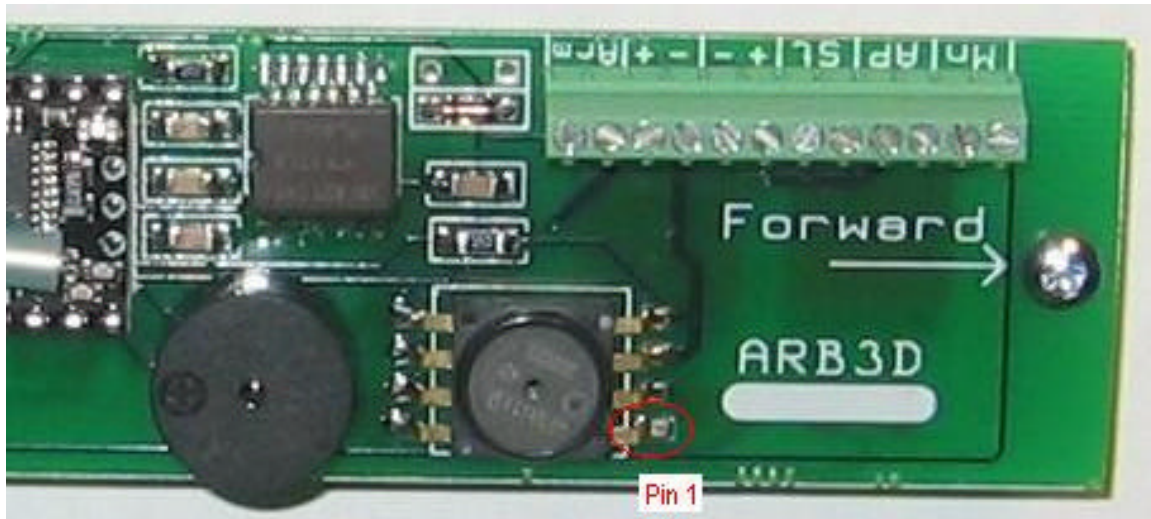
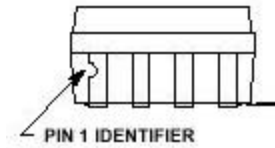


Step 3: Locate 13 resistors and solder them to the corresponding numbers in the picture to the numbers that are on the part.

Step 4: Flip board over and solder the 3 HexFETs labeled 'IRLZ14S' onto the board shown below. It often takes a lot of solder and a longer time to heat the area for a good solder bond. BE SURE THE SOLDER MAKES A GOOD BOND!

Step 5: Locate the ADXL150 accelerometer part and the J10 label on the board. **Note:** Be careful when handling the accelerometer, the pins are easily bent. Orient the accelerometer so that the notch on the chip aligns with the notch drawn on the board. Position the accelerometer pins to line up with the corresponding pads on the board. Take a soldering iron tip and hold it to any one of the last pins on one side. Then repeat on the other side, but in the opposite corners. This is to tack in the chip on the board. Carefully heat each pin with the iron and touch the pin with a very small amount of solder (enough just to melt the tip of the solder). Repeat with every pin. **Note:** Orientation is very important in this step, take your time!

Step 6: Locate the barometer labeled 'MPXA4115A' and the very tiny notch in one of the pins. The pin with the notch should be soldered to the lower right hand pad (board oriented so the 'ARB3D' is facing you).



Step 7: Locate the BasicX-24 stamp. Orientation is very critical in this step. You should notice there are 7 open holes on one side and 3 open holes on the other side. The side with the 7 open holes should face outside and the 3 open holes face inside. See the picture for clarity.

Step 8: Solder the buzzer with the positive lead to the square pad and the other lead to the round pad. See picture for clarity.

Step 9: Locate the 4-pin male header and solder it in the row of 4 holes above 'COMM' label. **It is important that the orientation is correct!** The locking tab should be closer to the 24-pin socket.

Step 10: Locate the 12-pin terminal block and solder it on the board labeled 'MnApSt+--+Arm'. Be sure the terminal openings are facing outward.

3 Communication Cable Assembly Instructions

Step 1: Using wire strippers at the 10-Gauge setting, strip about 5/8"-3/4" on both ends of the 4-conductor cable supplied. Strip off about 1/8" on each individual wire.

Step 2: Heat the end of a wire and put a 'coat' of solder to the exposed copper. At one end, place each wire into the crimp contact. Now with the soldering iron, push the tip onto each end of the wire so the solder melts. Now the wire should be bonded to the crimp contact. Next crimp down the tabs of the crimp contact using needle nose pliers. Make sure that the tabs will not be obstructing when it comes time to insert them into the connector.



Step 3: You will see numbers stamped on the 4-pin female connector. Push each crimped contact in according to the matching color and number:

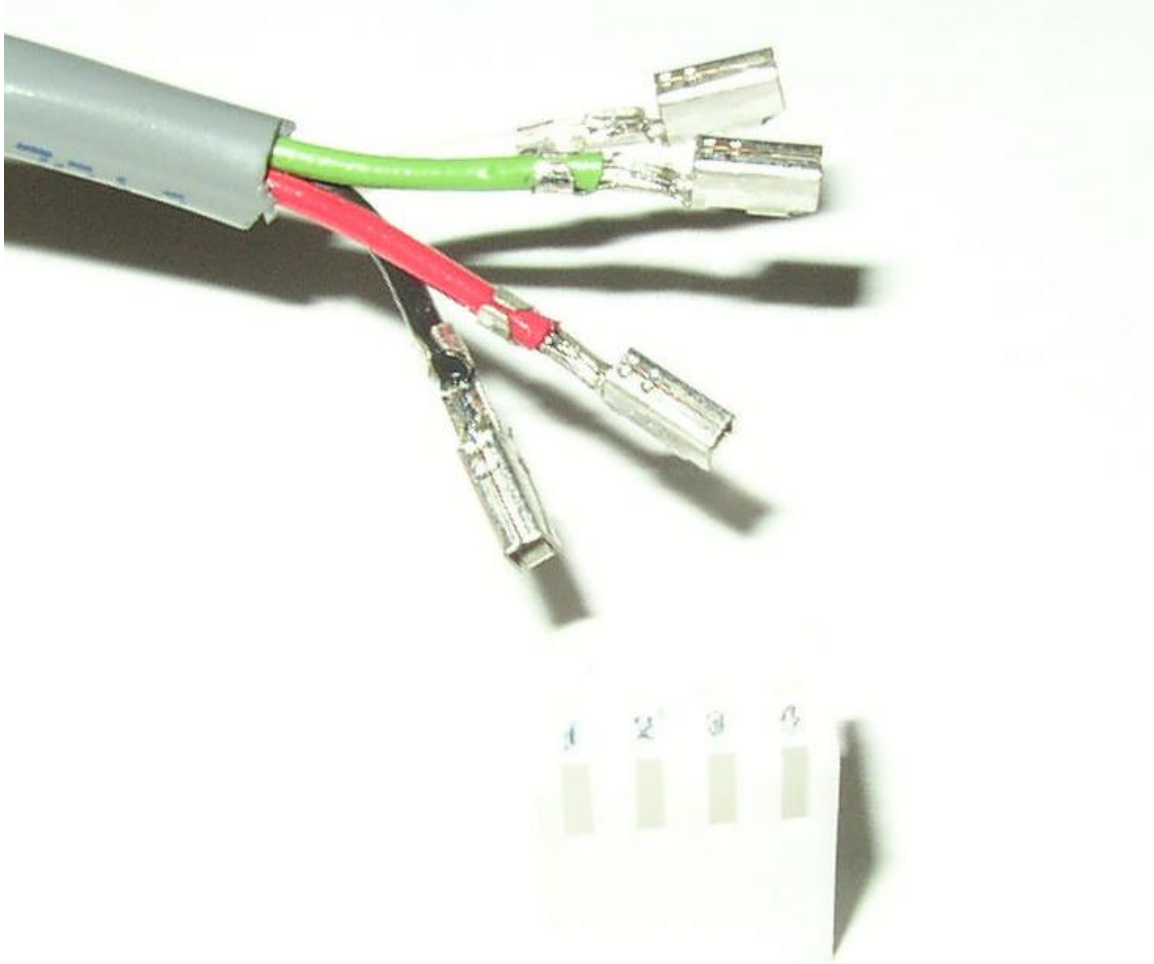
Black = 1

Red = 2

Green = 3

White = 4

You should feel a click as it locks into position. Give it a slight pull to make sure that it is locked into position.



Step 4: Take the other end of the cable with the RJ-11 jack connected (telephone connector) and connect it to the RJ-11 to DB-9 connector.

4 Configure and Test

The board is now completely assembled. Now we need to test and configure the board.

Step 1: Connect the power to the board for both main power (connection near the 'Arm' label) and deployment power (connection adjacent to the 'MnApSt' label). Use the 9v battery connectors supplied or other connectors you supply. The board can handle up to 15 volts. Connect the positive battery connection (Red) to the '+' label and the negative battery connection (black) to the '-' label.

Step 2: Connect the communication cable to the 'COMM' port on the board to your computer's serial connection.

Step 3: Open AcceloGraph v211 software. Select your communication port by opening the Connect->Port Configuration menu. Open the Configuration->Configure Altimeter menu. Another window will appear for configuration and testing.

Step 4: Power the board, you should see the red LED flash on then off. Press the 'Read' button to read the current settings and firmware version of the altimeter. Make the necessary changes and press the 'Write' button.

Step 6: Test the output channels by connecting an LED or buzzer to the 12-pin connector. The positive lead is capital letter of the channel (Mn Ap or St).

Step 7: Read the real-time acceleration and barometric data by pressing the 'Poll' button. The values for acceleration are in Gs and the values for the barometric data are in Psi. To stop the polling press the same button again ('Stop').

Please follow the user's guide for further instructions about using your new AcceloRocket.