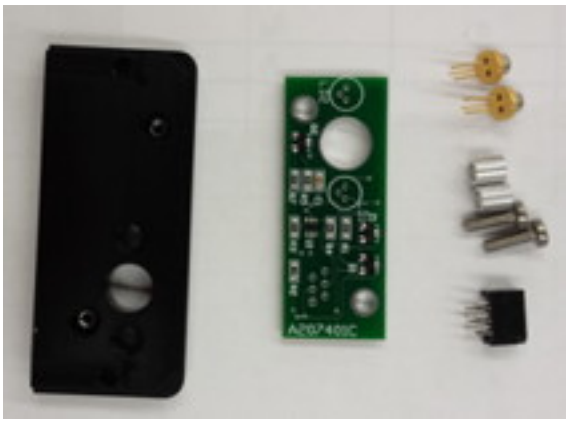
NBCAM Laser Head Assembly Manual
Brandeis University HEP Lab
Michael MacKenzie, August 2015

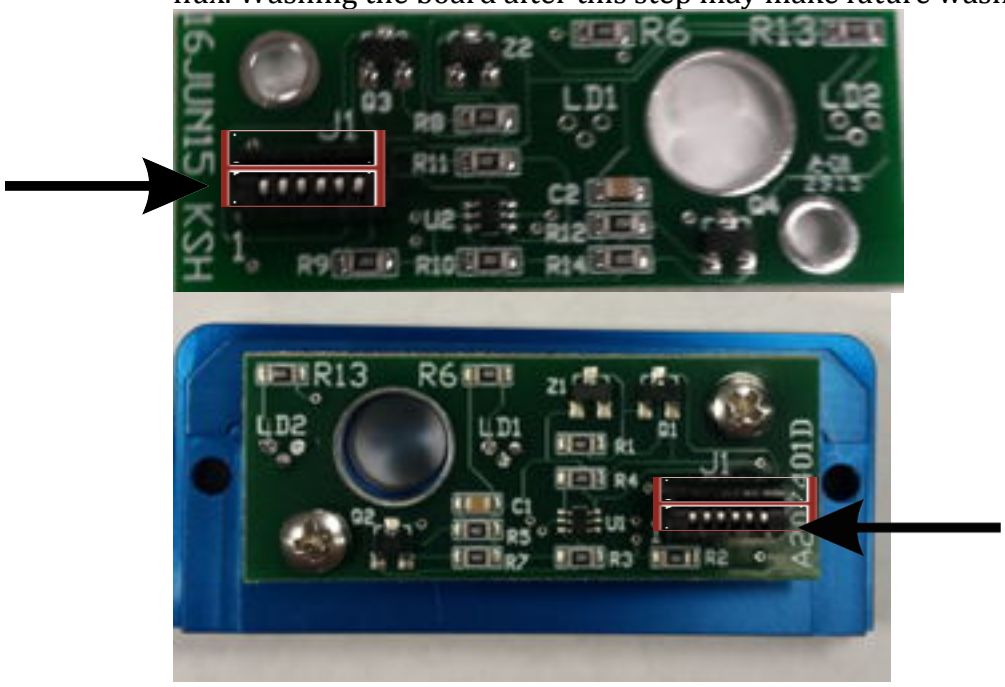
Parts:



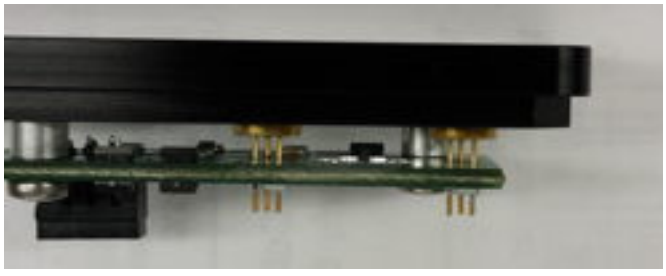
- 1 A2074 laser head board, partially assembled
- 1 Straight 6 way flex cable connector
- 2 5mm aluminum standoffs
- 2 10mm pan head M2.5 screws
- 2 Laser diodes
- 1 NBCAM face plate

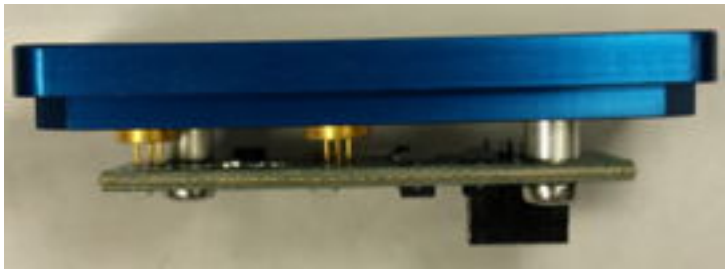
Assembly:

- Solder in the flex cable connector, pin side on the bottom, with water-soluble flux. Washing the board after this step may make future washing easier



- Place in the laser diodes in L1 and L2, but not soldered in
- Screw the board into the face plate, ensuring the laser diodes can lay flat in their holes
- Solder the diodes in place with water-soluble flux, checking that they are flush with the plate holes
- Wash the board
- Inspect that the diodes are in fact flush and level with the face plate holes





- Clip the laser diode leads so they can not bend and short during installation

Testing:

- Plug a 6 way flex cable into the laser head and connect the other end to a BCAM (or connect an NBCAM flex connector into the laser head)
- Using LWDAQ Diagnostic, send 1080 to turn on one diode and 0880 to turn on the other, or 1880 to turn on both at once
- Measure the power output of each diode with a photodiode on the outward face of the aluminum. Both diodes can be on at once for this measurement, but a 2-5% drop in power can be noticed in the diodes when both are on
- Make sure each diode's power is between 1.1mW and 1.4mW outside of the face plate, which corresponds to a current between 430uA and 550uA across the photodiode (SD445, http://alignment.hep.brandeis.edu/Electronics/Data/SD445.pdf) when pressed against the face plate
- If the diode is outside of this range, the photodiode resistor will have to be replaced with a different resistor value. Use the table below to determine the resistor change. Laser source 3 has photoresistor R6, and Laser source 4 has photoresistor R13. They are both P0805.
- If a resistor was switched, retest to ensure the power is now within the expected range
- Using the resistance setting on the DVM, measure the resistance between the pins of the laser diode and the chasis to check for a short between the face plate and the laser diode. If a short is found,

Percent Change	New Resistor Value (P0805 5%)
+40	24K
+25	27K
+10	30K
-10	36K
-15	39K
-35	43K