The Brain Machine

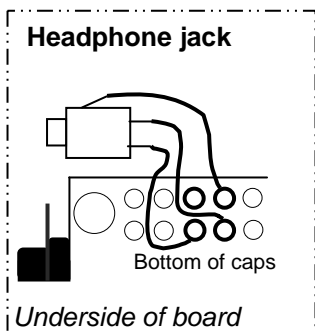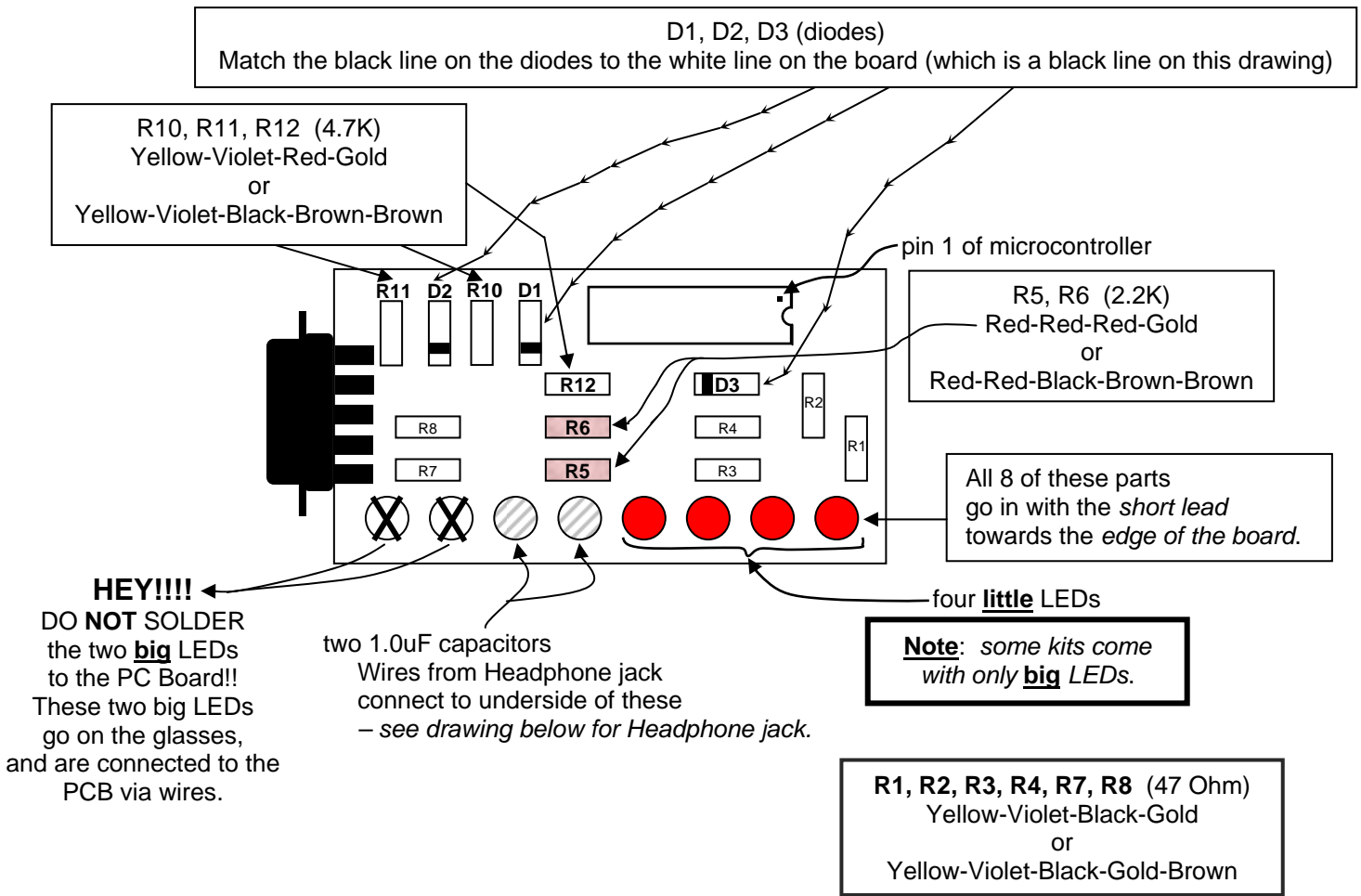MAKE Magazine #10, by Mitch Altman

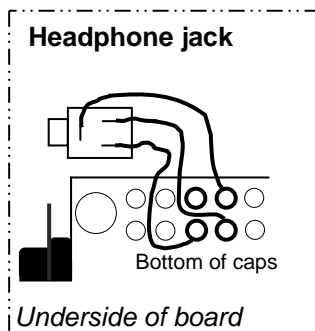## Assembly Instructions

2-Oct-12

This kit has all of the components you need to build your own Brain Machine,
except the following:

- 3 feet of wire (1½ foot each of 2 colors)
- 2 AA batteries
- 1 pair headphones
- 1 stick of hot glue

This drawing shows where all of the parts go for the Brain Machine board:

D1, D2, D3 (diodes)
Match the black line on the diodes to the white line on the board (which is a black line on this drawing)

R10, R11, R12 (4.7K)
Yellow-Violet-Red-Gold
or
Yellow-Violet-Black-Brown-Brown

pin 1 of microcontroller

R5, R6 (2.2K)
Red-Red-Red-Gold
or
Red-Red-Black-Brown-Brown

R11 D2 R10 D1

R12   D3   R2

R8   R6   R4   R1

R7   R5   R3

All 8 of these parts
go in with the *short lead*
towards the *edge of the board*.

HEY!!!!
DO **NOT** SOLDER
the two **big** LEDs
to the PC Board!!
These two big LEDs
go on the glasses,
and are connected to the
PCB via wires.

two 1.0uF capacitors
Wires from Headphone jack
connect to underside of these
– *see drawing below for Headphone jack*.

four **little** LEDs

Note: *some kits come
with only **big** LEDs.*

R1, R2, R3, R4, R7, R8 (47 Ohm)
Yellow-Violet-Black-Gold
or
Yellow-Violet-Black-Gold-Brown

Headphone jack

Bottom of caps

Underside of board

— or —

(depending on
Headphone jack
supplied with kit)

Headphone jack

Bottom of caps

Underside of board

**Please see other side of page
for Notes**

The Brain Machine
Assembly Instructions (cont'd)

Notes:
- An annotated version of the original article is available for free download from my website:
  > http://www.tvbgone.com/mfaire/slm/BM_article_updated.pdf
  > **Changes from the original are highlighted with arrows.**

- Some differences between the updated assembly instructions from the original:
  - R5 and R6 are 2.2k resistors (Red-Red-Red-Gold) instead of 1k resistors (brown-black-red-gold) because they work better.
  - No need for cable ties or silicone adhesive – hot glue is where it's at!

- The four **little** LEDs are only for testing purposes, and go on the MiniPOV board
  > (the two **big** LEDs are mounted on the glasses, in front of your eyes)
  *Note: some kits come with only **big** LEDs, so use four of them for these test LEDs.*

- The battery pack has a switch on it. *Make sure it is off when you first install the batteries.*

- After placing the microcontroller chip in its socket and turning on power for the first time, the microcontroller will run the firmware that I already programmed into it: the four test LEDs will blink quickly in sequence. If no LEDs light up, turn off power immediately and debug (chip in backwards? power attached backwards? bad solder connections?)

- If you want to change or hack the firmware, please use the latest firmware at:
  > http://CornfieldElectronics.com
  > click on the "maker faire" button and then click on the link to the latest SLM firmware.

- **Optional:** cool graphix for the Brain Machine glasses are available at:
  > http://CornfieldElectronics.com
  click on the "maker faire" button and click on the link to cool graphix.
  Use hot glue instead of silicone adhesive to glue the graphix (it's easier – hot glue rocks!).

- Feel free to email me with any questions:
  > mitch@CornfieldElectronics.com