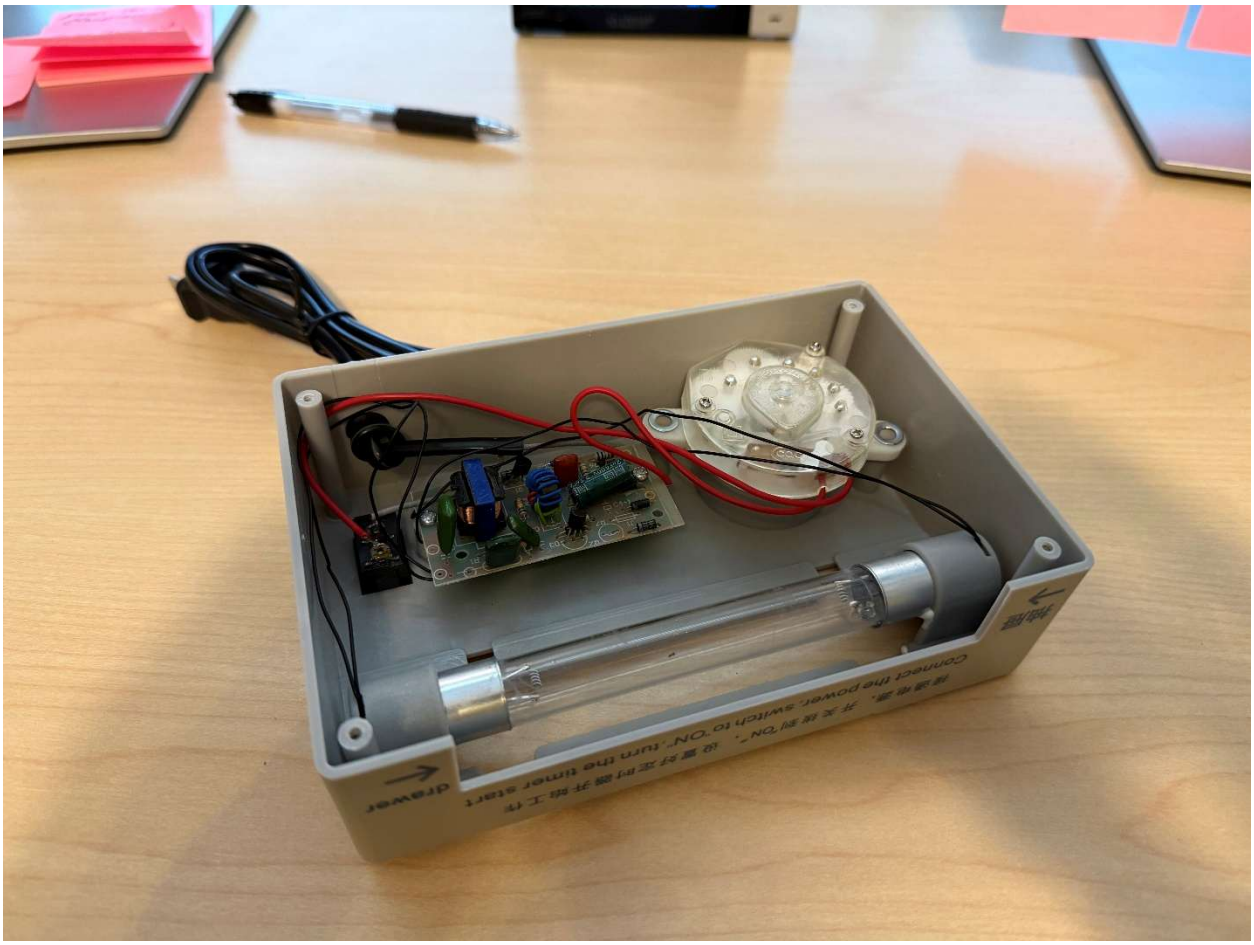


The guts of the cheap EProm eraser. Connected with wire-wrap wire, crappy soldering, no lamp sockets. Everything just kind of glued together.

To get a sense of how far the 600um fiber cable would have to be distanced from the lamp, in conjunction with the B&W spectrometer, I took this partially disassembled unit and mocked up a unit with cardboard. What I found out, is that the B&W spectrometer is so sensitive, particularly with a 600um fiber cable, that the fiber cable would have to be spaced at least 6” from the lamp in order to prevent spectrometer saturation.

Printed housing design for the final unit.

Some key features:

- To reduce the distance the fiber cable would have to be placed from the lamp, and provide more all-around flexibility for the unit, I devised an assembly with different pinhole inserts. These establish the coarse amplitude of the output illumination, and then the fiber cable is mounted on a screw-adjustable cap that allows for fine tuning of the output amplitude.

- I was concerned about lamp heat dissipation in a fully enclosed housing that prevents leakage of dangerous SWUV emissions. Even though the lamp is small, it is dissipating about 3 – 4 watts of energy as waste heat, which is not insignificant in an enclosed space. It won't damage the lamp, but potentially it could melt the PLA plastic. So, I created a series of baffles in the housing and cover between the lamp area and the rear of the unit. The rear of the unit has vents top and bottom, to provide adequate ventilation.

For further heat protection and to also increase lamp efficiency, I lined the lamp chamber with aluminum foil.

I scraped all the glue and crud off the fluorescent lamp cleaned up the lamp prongs.

I added a couple of quality T5 lamp holders that we happen to manufacture at Bruce Aerospace. This makes the unit re-lampable should the 4W, T5 SWUV lamp fail.

I also cleaned up the wiring and got everything properly mounted.

Finished unit front.

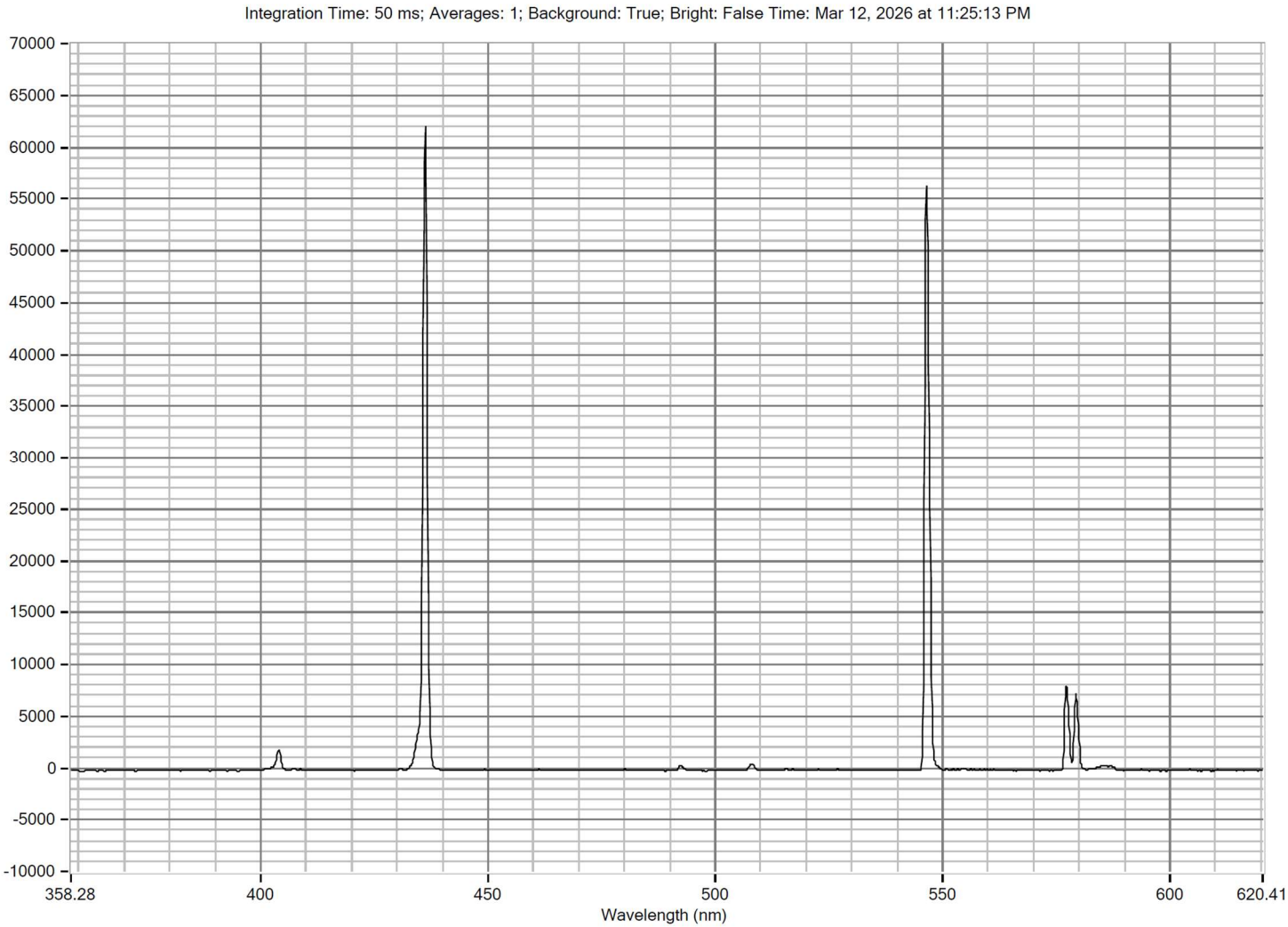
There are rubber feet on the bottom to elevate the unit, so that you can get flow-thru (chimney effect) ventilation in the rear of the housing.

Finished unit back.

I didn’t like the quality of the power switch that came with the EProm eraser, so I replaced it. I also added a standard C14 Power Entry for conventional AC power cords.

The next image is the response of my B&W Tek spectrometer using a 600um fiber cable and a 50msec integration time.

The dominant Hg peaks are at 435.84nm and 546.07nm. The 576.96nm and 579.07nm peaks can also be used.


Integration Time: 50 ms; Averages: 1; Background: True; Bright: False Time: Mar 12, 2026 at 11:25:13 PM
70000
65000
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50000
45000
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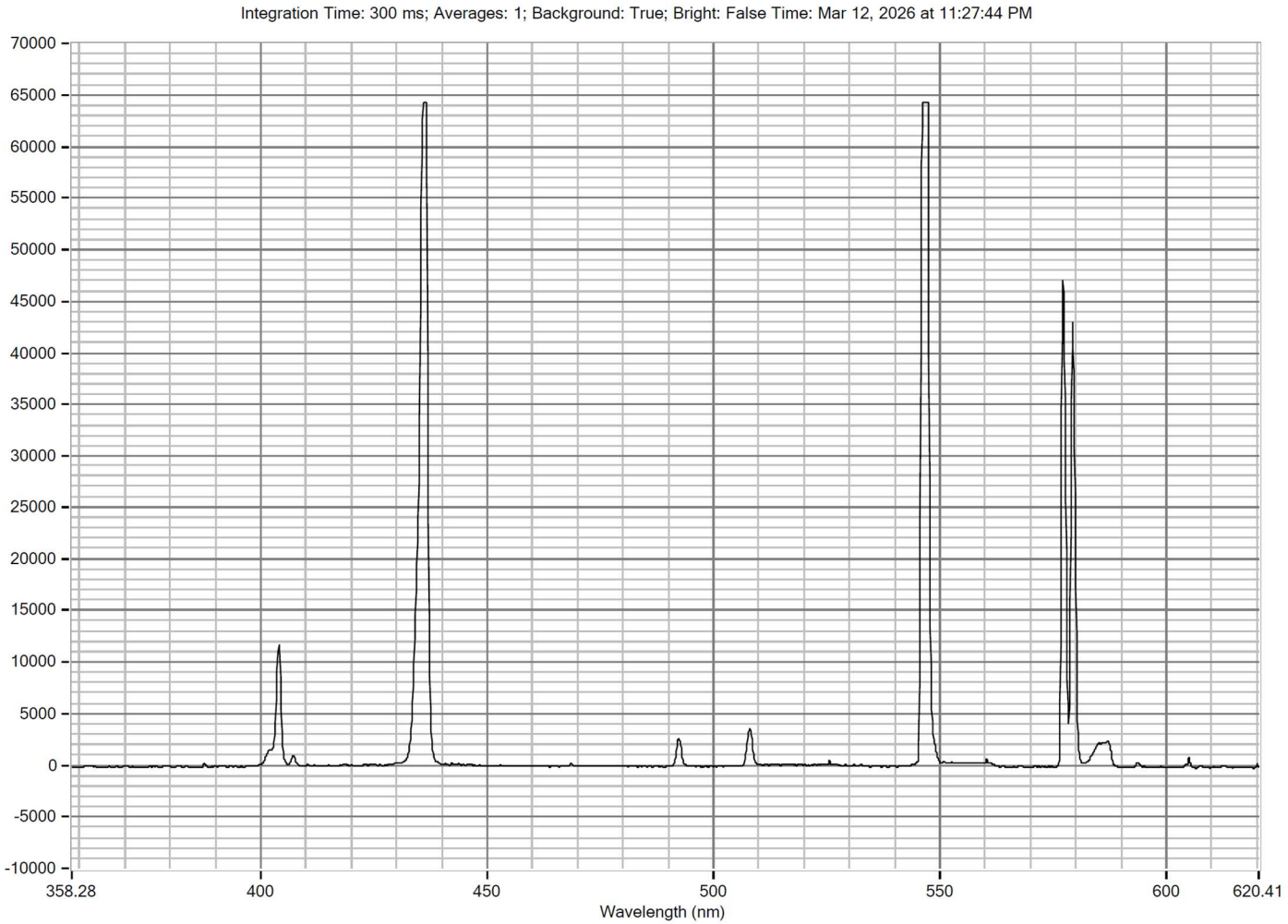
35000
30000
25000
20000
15000
10000
5000
0
-5000
-10000
358.28
400
450
500
550
600
620.41
Wavelength (nm)

If you want some more peaks, you can simply increase the integration time on the spectrometer. The next image is with the integration time on my spectrometer set to 300msec. The dominant peaks become saturated, but that doesn't hurt anything.

Now, the 404.66nm peak comes up to a useful amplitude, and if you want to, you could also use the little 491.6nm peak for calibration. Four to five peaks though, spread across the usable range of the spectrometer, is more than adequate for a good polynomial calibration.

I was able to achieve less than 0.5nm error across the entire spectrum after calibration, which is pretty darn good.


Integration Time: 300 ms; Averages: 1; Background: True; Bright: False Time: Mar 12, 2026 at 11:27:44 PM
70000
65000
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55000
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45000
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35000
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-5000
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358.28
400
450
500
550
600
620.41
Wavelength (nm)