Logging and Plotting GPS Data on My Maps

The code from pages 46-47 can easily be modified to allow for logging of GPS data.

Declare a global file and include the <SD.h> library

```
1 #include <Wire.h>
2 #include <SPI.h>
3 #include <SD.h>
4 unsigned long startTime;
5 File outputfile;
6
```

Inside the Set up:

```
125   if(!SD.begin(10)) // 10 is our Chip Select.
126   {
127     Serial.println("Failed!");
128     pinMode(LED_BUILTIN, OUTPUT);
129     digitalWrite(LED_BUILTIN, LOW); // Common Anode LED
130   }
131
132   startTime = millis();
133   outputfile = SD.open("data.txt", FILE_WRITE);
134   outputfile.print("Lat, Lon, SIV, groundSpeed, Heading");
135   outputfile.close();
136 }
```

Inside the loop:

```
138 void loop()
139 {
140   if ((millis() - startTime) > 500)
141   {
142     NavData data = readNavPVT();
143     outputfile = SD.open("data.txt", FILE_WRITE);
144     outputfile.print(data.lat);          outputfile.print(", ");
145     outputfile.print(data.lon);          outputfile.print(", ");
146     outputfile.print(data.SIV);          outputfile.print(", ");
147     outputfile.print(data.groundSpeed);  outputfile.print(", ");
148     outputfile.println(data.heading);
149     outputfile.close();
150     startTime = millis();
151   }
152 }
```

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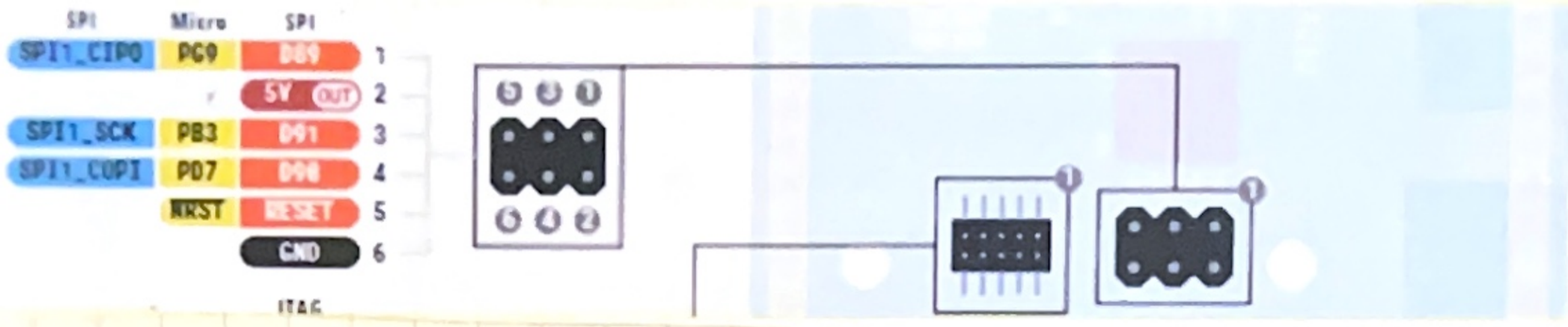
06/10/24
Wesley Loda

The default SPI pins for the ~~Giga~~ giga are on the SPI header, not the 11-13 pins.

Since the SPI header doesn't have a chip select, I have chosen pin 10.



The I2C pins are the normal SDA and SCL (20 + 21)

Plotting on My Mars:

```
334683153, -819912078, 5, 1162, 34177162
334683153, -819912078, 5, 1162, 34177162
334683175, -819912091, 5, 1201, 32297905
334683389, -819912094, 5, 848, 34314576
334683389, -819912094, 5, 848, 34314576
334683558, -819912120, 5, 823, 33268791
334683558, -819912120, 5, 823, 33268791
```

This is what the data looks like in a .txt file.

Lets copy and paste into excel.

Lat, Lon, S peed, Heading603984476, 134483527, 0, 134481429, 134489125
603984476, 134483527, 0, 134481429, 134489125
0, 0, 0, 0, 0
Lat, Lon, SIV, groundSpeed, Heading603984476, 134483527, 0, 134481429, 134489125
0, 0, 0, 0, 0
0, 0, 0, 0, 0
0, 0, 0, 0, 0

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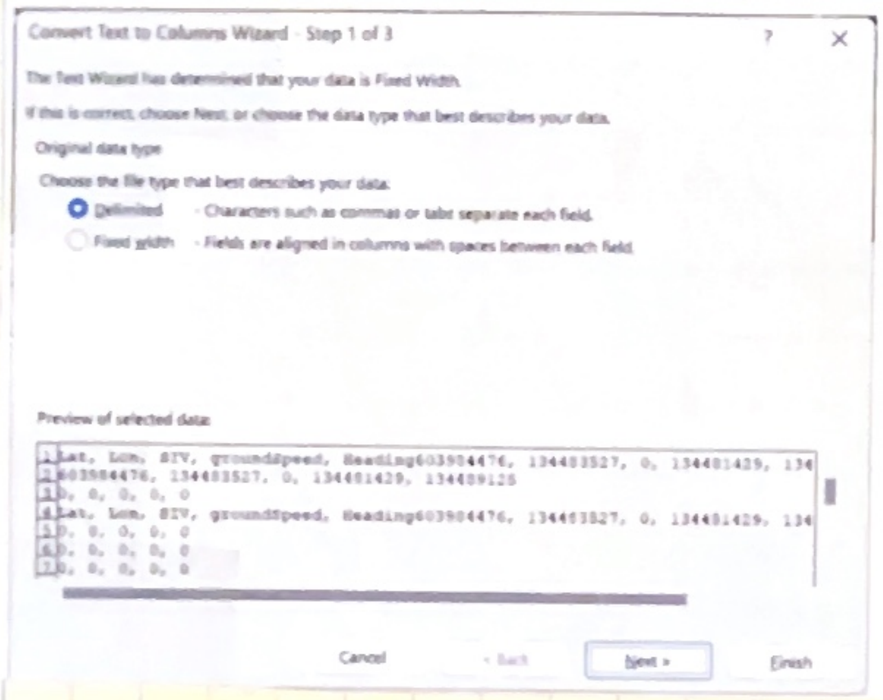
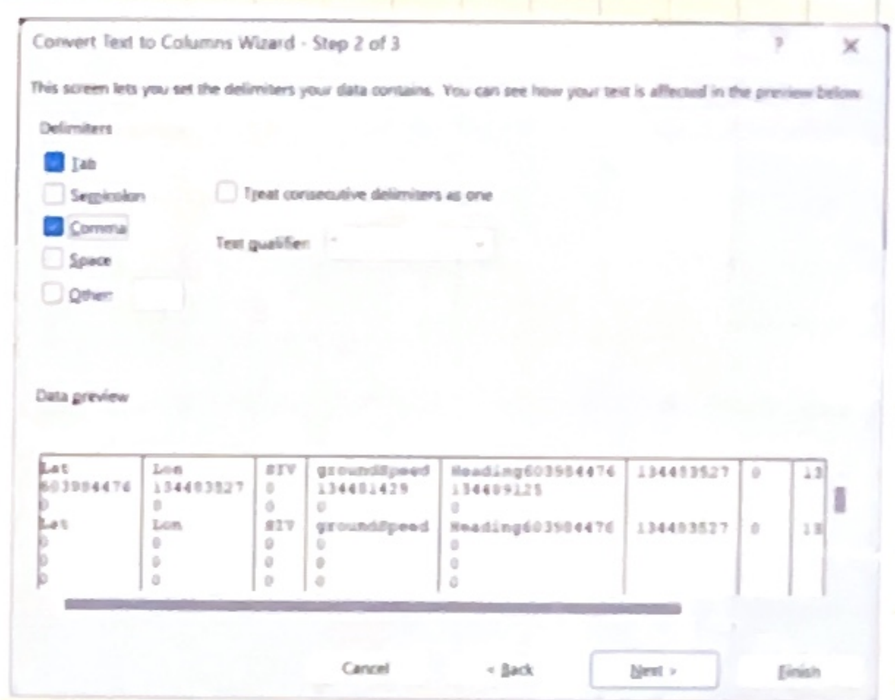
Oh, looks like we need to format it...

Text to columns → Delimeted → comma → finish





	A	B	C	D	E
1	Lat	Lon	SIV	groundSpeed	Heading
2	334683153	-819912078	5	1162	34177162
3	334683153	-819912078	5	1162	34177162
4	334683175	-819912091	5	1201	32297905
5	334683389	-819912094	5	848	34314576
6	334683389	-819912094	5	848	34314576
7	334683558	-819912120	5	823	33268791
8	334683558	-819912120	5	823	33268791
9	334683484	-819912174	5	1034	34323722

After removing data where the gps didn't have a good signal, we are left with nice and neat data.

Logging and Plotting GPS Data on My Maps

06/10/24
Writing code

My Maps expects an unscalled ~~latitude~~ latitude and longitude. See page 45 for the data sheet of the gps. We need to divide by 10^7.

=A2:A877/10000000

	B	C	D	E	F	G	H	I
	Lon	SIV	groundSpeed	Heading		Head	Latitude	Longitude
34683153	-819912078	5	1162	34177162		341.7716	=A2:A877/10000000	
34683153	-819912078	5	1162	34177162		341.7716	33.46832	-81.9912
34683175	-819912091	5	1201	32297905		322.9791	33.46832	-81.9912
34683389	-819912094	5	848	34314576		343.1458	33.46834	-81.9912
34683389	-819912094	5	848	34314576		343.1458	33.46834	-81.9912

=B2:B877/10000000

	B	C	D	E	F	G	H	I	J
	Lon	SIV	groundSpeed	Heading		Head	Latitude	Longitude	
34683153	-819912078	5	1162	34177162		341.7716	33.46832	=B2:B877/10000000	
34683153	-819912078	5	1162	34177162		341.7716	33.46832	-81.9912	
34683175	-819912091	5	1201	32297905		322.9791	33.46832	-81.9912	
34683389	-819912094	5	848	34314576		343.1458	33.46834	-81.9912	
34683389	-819912094	5	848	34314576		343.1458	33.46834	-81.9912	

We can also fix the scaling on the heading:

=E2:E877/100000

	B	C	D	E	F	G	H	I
	Lon	SIV	groundSpeed	Heading		Head	Latitude	Longitude
34683153	-819912078	5	1162	34177162		=E2:E877/100000		-81.9912
34683153	-819912078	5	1162	34177162		341.7716	33.46832	-81.9912
34683175	-819912091	5	1201	32297905		322.9791	33.46832	-81.9912
34683389	-819912094	5	848	34314576		343.1458	33.46834	-81.9912
34683389	-819912094	5	848	34314576		343.1458	33.46834	-81.9912

Results

The excel file can be uploaded directly to my maps.

This path represents walking from CSM to lot 69.