LAB 1 HOMEWORK ASSIGNMENT

LAB 1
SECTION 3

SUBMITTED BY:

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SUBMISSION DATE:

2/3/2022

1. Old Computers

Report the I/O devices, amount of RAM (memory) available in the system in kilobytes as well as in bytes and bits, and what CPU is used for each system.

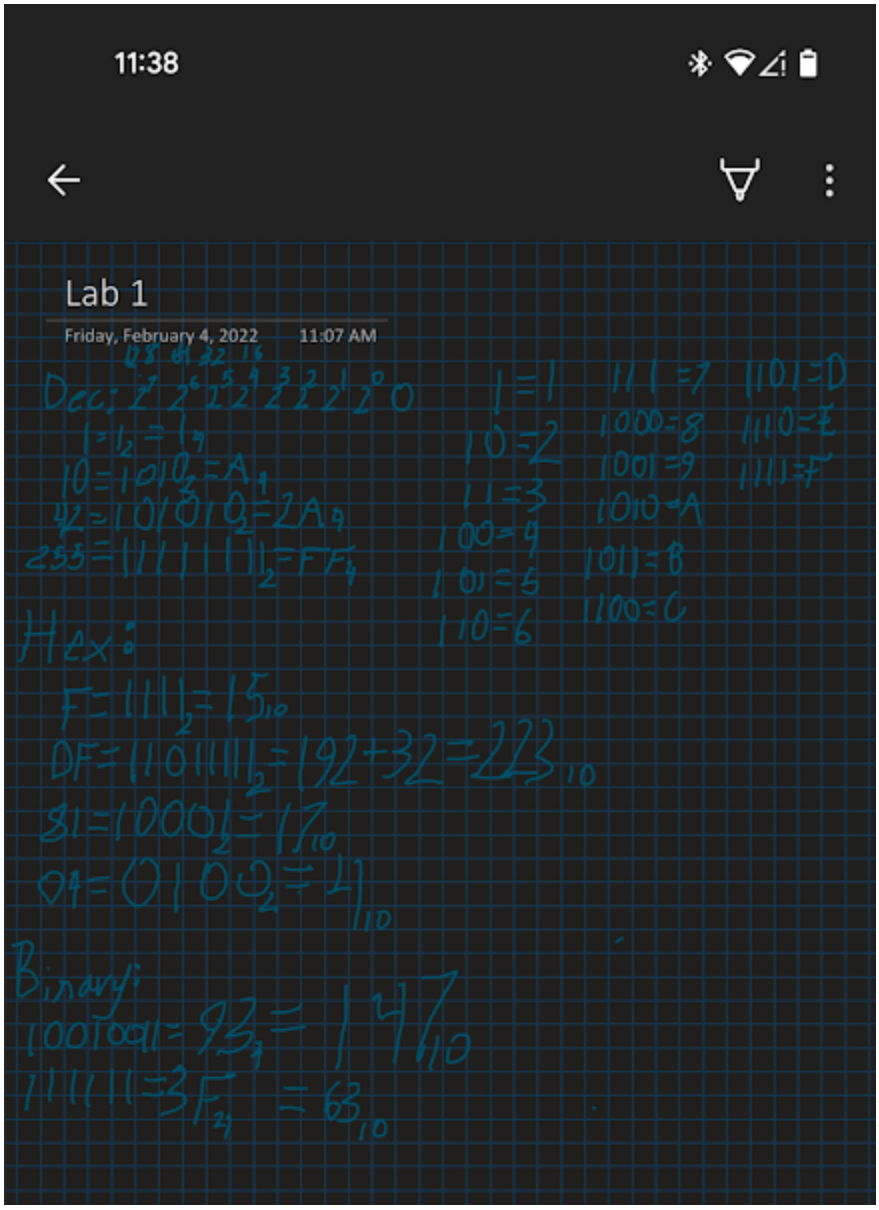
1.1 MITS Altair 8800
I/O: users had to flip switches on the front panel, writing their own programs in machine language (OS), and watch the LEDs on the front panel light up in response to their commands.
RAM: 0.25 kilobytes, 64 kilobytes max; 256 bytes, 65,563 bytes max; 2048 bits, 524,288 bits max.
CPU: Intel 8080, 2.0 MHz
1.2 MOS KIM-1
I/O: A number pad on the board. A serial teletype/teleprinter can be used through the 20mA (or 60mA) current-loop. An ASCII terminal or video monitor could also be used through the serial port. Data could be stored on a cassette recorder, or paper-tape reader - another abandoned technology. Edge connector with 30 digital I/O lines. OS was Machine code (HEX)
RAM: 1.0 kilobytes; 1024 bytes; 8192 bits.
CPU: MOS 6502, 1MHz
1.3 Apple 1
I/O: ASCII keyboard, one vertical expansion slot, and composite video output. An optional board providing a cassette interface for storage was later released.
RAM: 4 Kilobytes, 64 Kilobytes max; 4096 bytes, 65,563 bytes max; 32,768 bits, 524,288 bits max. OS was firmware in ROM (HEX) & Apple BASIC on cassette.
CPU: MOS 6502, 1.0 MHz
1.4 IBM Personal Computer (PC) 5150
I/O: Dual 160KB 5.25-inch disk drives, cassette & keyboard only, 5 internal expansion slots, and 80 X 24 text video monitor. OS was PC-DOS v1.0
RAM: original IBM 5150 "PC" supported only 64K of RAM memory on the motherboard, later versions used higher capacity memory chips, allowing up to 256K onboard - up to 640K with internal expansion cards.
16 Kilobites, 640 Kilobites; 16,384 Bytes, 655,360 Bytes; 131,072 Bits, 5,242,880 Bits.
CPU: MOS 6502, 1.0 MHz
1.5 Apple Macintosh
I/O: A small hand-operated device called a "mouse", keyboard, floppy port, Two DB9 serial ports, 9-inch monochrome screen 512x342 pixels monitor. Printer port. OS was Macintosh GUI.
RAM: 128 Kilobytes, later 512 Kilobytes; 131,072 Bytes, later 524,288 Bytes; 1,048,576 Bits , later 4,194,304 Bits
CPU: Motorola 68000, 7.83 Mhz

2. Base Conversion

Decimal 1, 10, 42, 255

Hexadecimal F, DF, 81, 04

Binary 10010011, 111111



3. Exploration

1. What do you think each column of data represents in the graphs?

    I believe that each column represents a different gyroscope, and the direction of the forces on them. One for each axis, x y & z

2. How does this relate to the flags (-t and -g) that you used?

    -t is time and -g are the gyroscope data, therefore the data is direction of force over time

3. What unit of measure are the data in?

    I believe that they are in the unit of milliseconds for time and N/deg so each point on the graph represents something like 1 N/mS*deg or more likely (1 G * sin(angle * pi/180))/each millisecond

4. On each of your plots, explain what is going on. Try to understand why the graphs look like they do and then relate the graphs to what you did when you took the data. Label, on your computer or by hand (scan and include in your PDF), parts of the graphs and then describe what is going on.

    See Graphs

4. Joystick Calibration

1. What are your vertical and horizontal joystick equations? Are they similar or not? Why or why not?

fy = -y/127 Vertical

fx = x/127 Horizontal

Similar but not without differences. The variable has to be changed for the different axis, and the vertical equation has to be multiplied by -1 to make the upper position a positive value and bottom a negative value. I chose 127 because if it were an integral (int) division that would return 1 when 128 or 127 were divided by it.

2. What did you find as the center point? Explain why it is or is not 0?

I found my controllers center for both joysticks to be from (6,2) to (3,3). This is most likely because of joystick drift. Though, the x coordinate would most likely be just below 0 (-0.5) or so due to the max values being -128 and 127

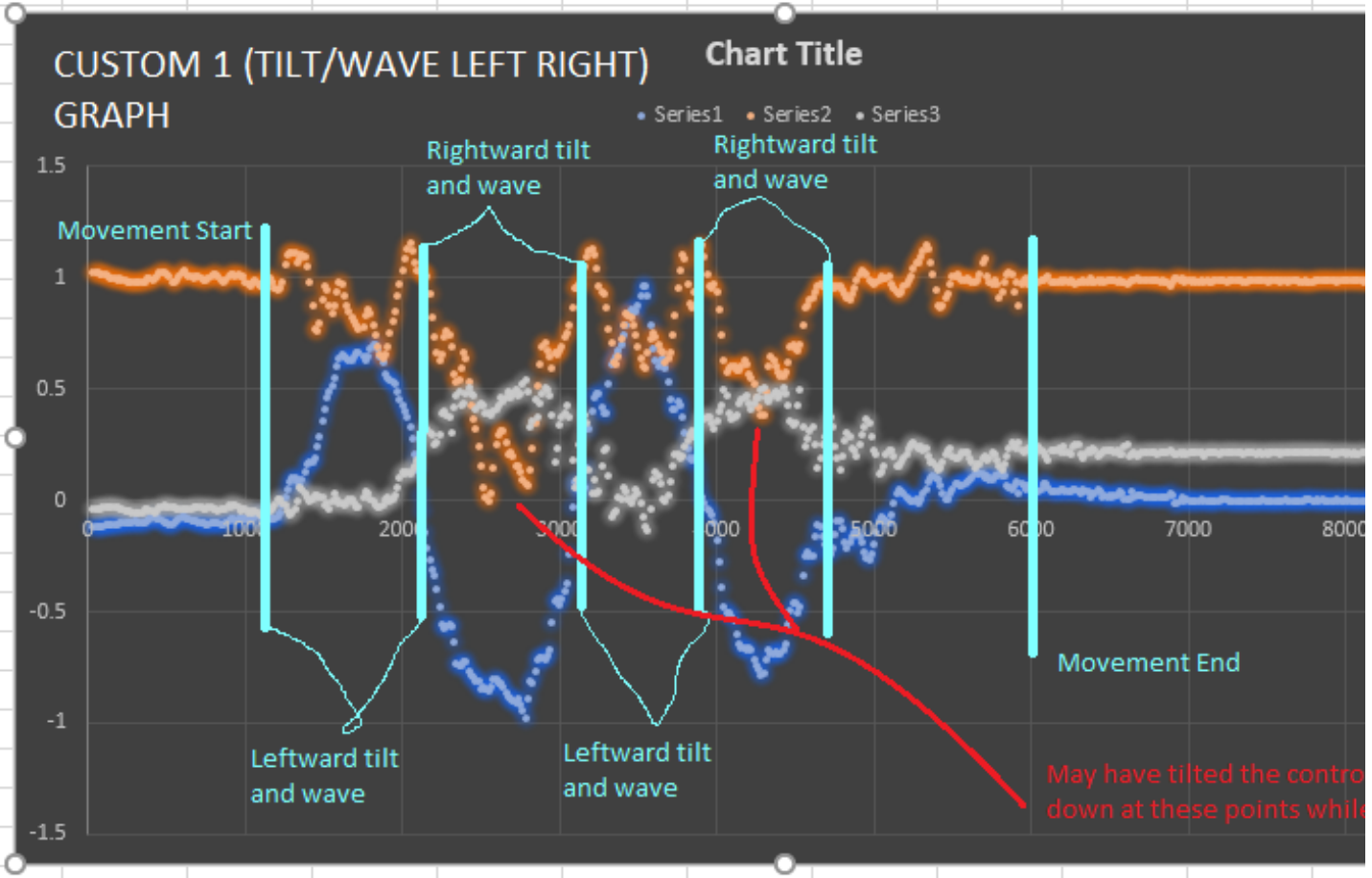
3. What could cause the center to not be 0?

This is most likely because of joystick drift. Though, the x coordinate would most likely be just below 0 (-0.5) or so due to the max values being -128 and 127

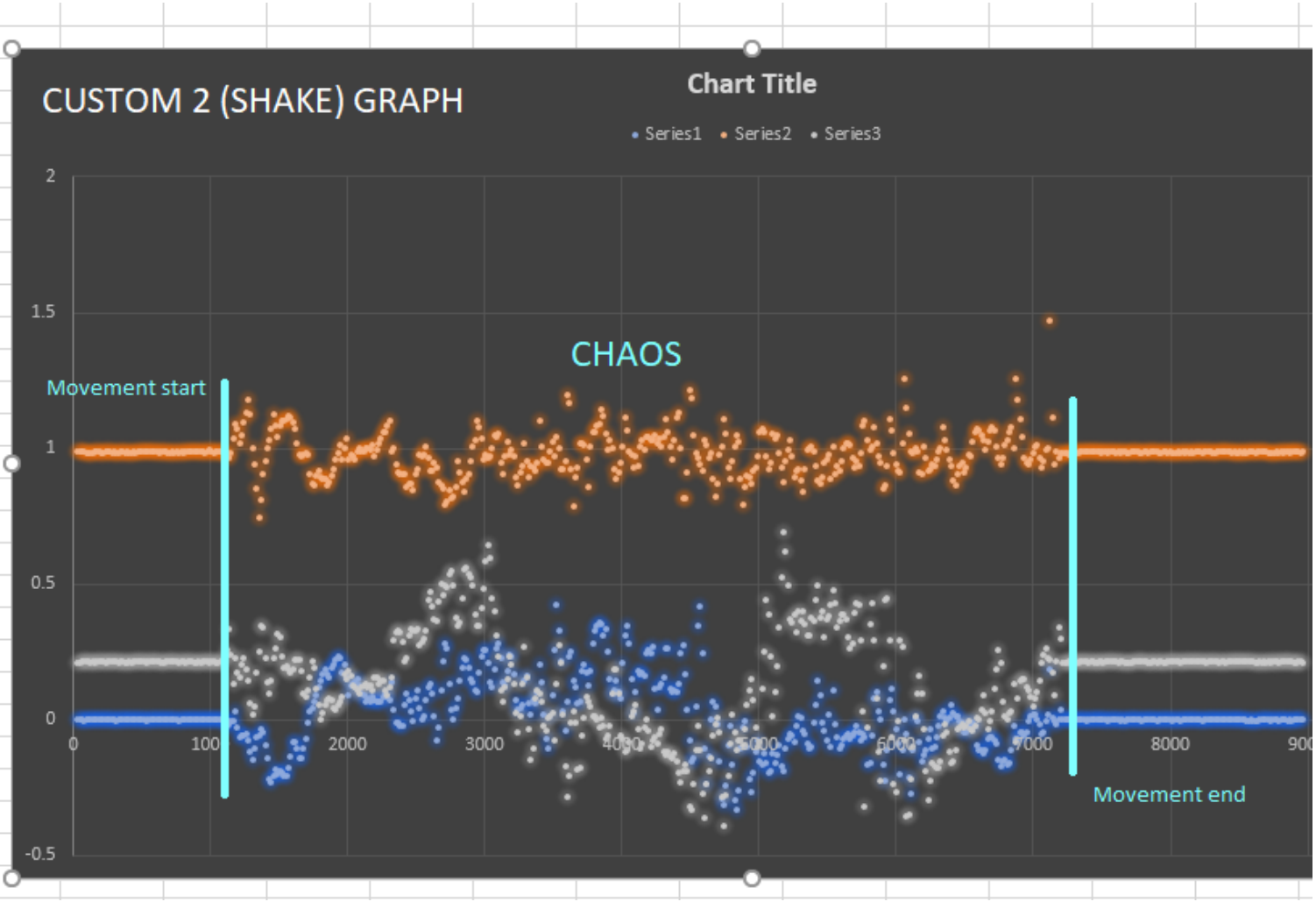
4. What could you change to make the center be 0?

Add .5 to the reported value

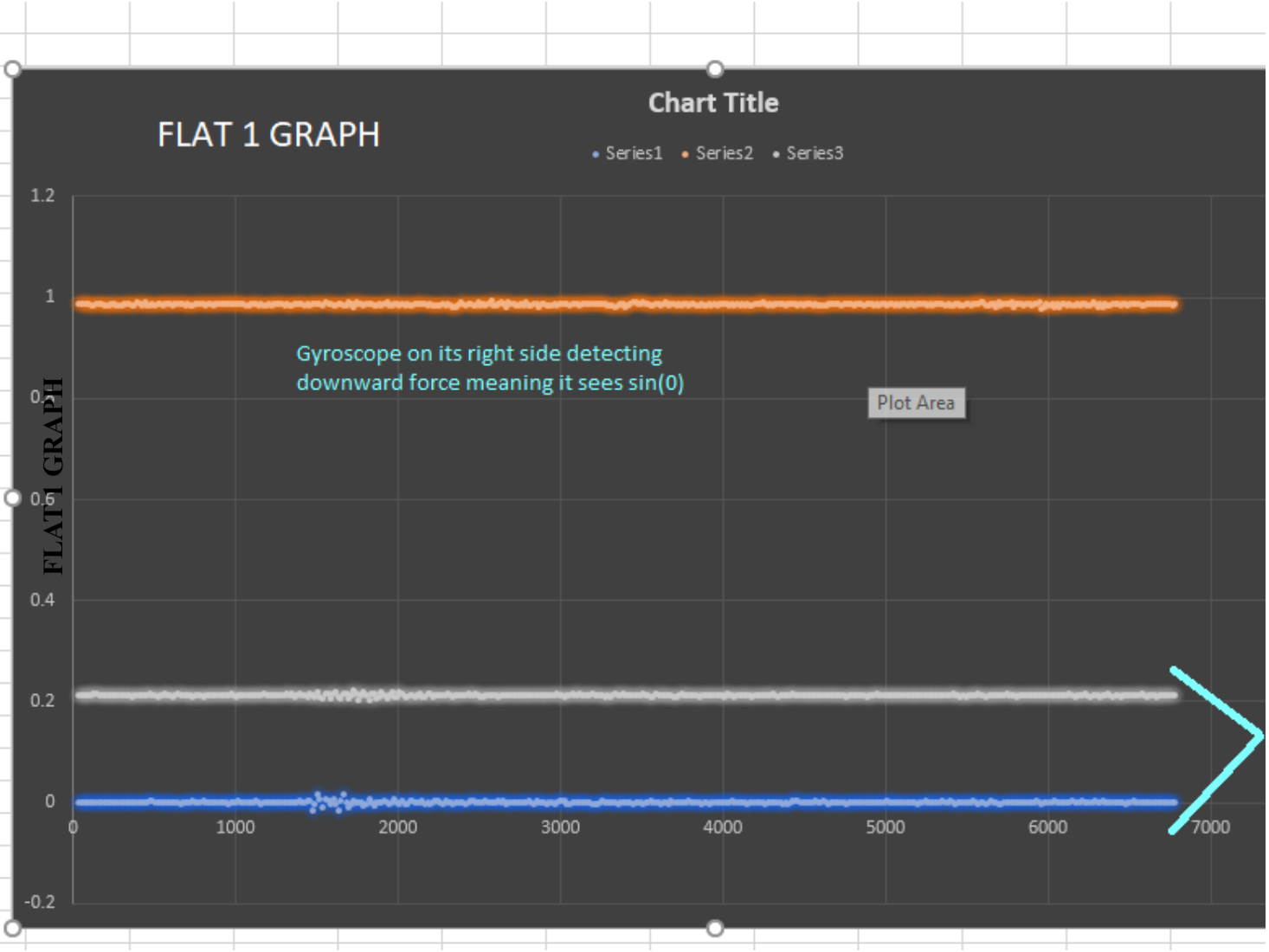
.028444	-0.03766
.026979	-0.03754
.023927	-0.03595
1.0188	-0.03473
.017091	-0.03131
.015138	-0.02912
.009644	-0.03131
.002442	-0.03083
.998169	-0.03388
.994384	-0.03253
.994018	-0.03351
.995239	-0.03522
.992431	-0.039
.987548	-0.04364
.983886	-0.0467
0.98181	-0.05072
.980956	-0.05231
.980712	-0.05268
.982787	-0.05463
.982421	-0.05744
.979491	-0.05365
.983642	-0.04242
.994995	-0.03498
.996216	-0.04486
.993408	-0.05024
.996826	-0.05585



0.988891	0.211378
0.989745	0.212232
0.989379	0.212843
0.988525	0.212721
0.985595	0.214674
0.980834	0.214308
0.983031	0.212598
0.985106	0.214308
0.98706	0.21211
0.988647	0.215528
0.985961	0.213209
0.985717	0.214796
0.982665	0.213331
0.987426	0.212354
0.989868	0.213087
0.988036	0.213087
0.984984	0.215284
0.986327	0.213453
0.983642	0.214918
0.985229	0.21211
0.986327	0.213941
0.987914	0.215162
0.984008	0.211133
0.988281	0.211866
0.985595	0.21443
0.984984	0.211988
0.988281	0.213453
0.985106	0.215162

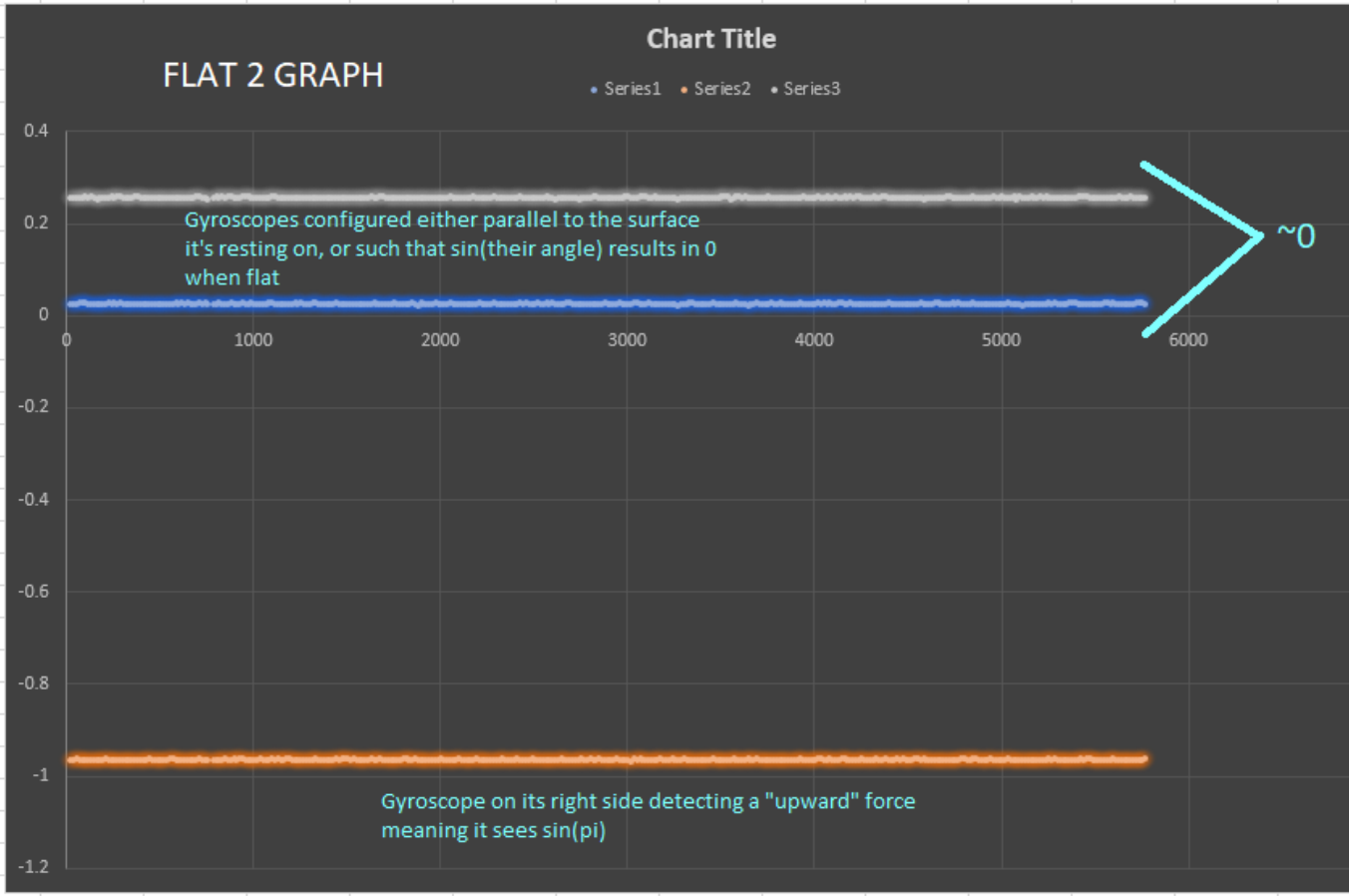


18	0.986449	0.213697
51	0.988036	0.213209
18	0.987182	0.213209
51	0.986327	0.213087
18	0.986938	0.213331
16	0.984618	0.212354
05	0.985106	0.214308
51	0.98706	0.214308
18	0.987304	0.211133
57	0.987182	0.212232
16	0.985961	0.212843
55	0.985961	0.212965
48	0.985595	0.213819
51	0.987304	0.211866
43	0.98767	0.2115
43	0.985717	0.213331
38	0.984984	0.211256
71	0.985351	0.212721
77	0.988403	0.213087
32	0.987304	0.211866
77	0.986449	0.213575
05	0.984252	0.211011
16	0.985961	0.213087
31	0.98999	0.212476
51	0.986205	0.213575
33	0.984984	0.212598
38	0.989257	0.213209
26	0.984374	0.2115
38	0.983886	0.214308

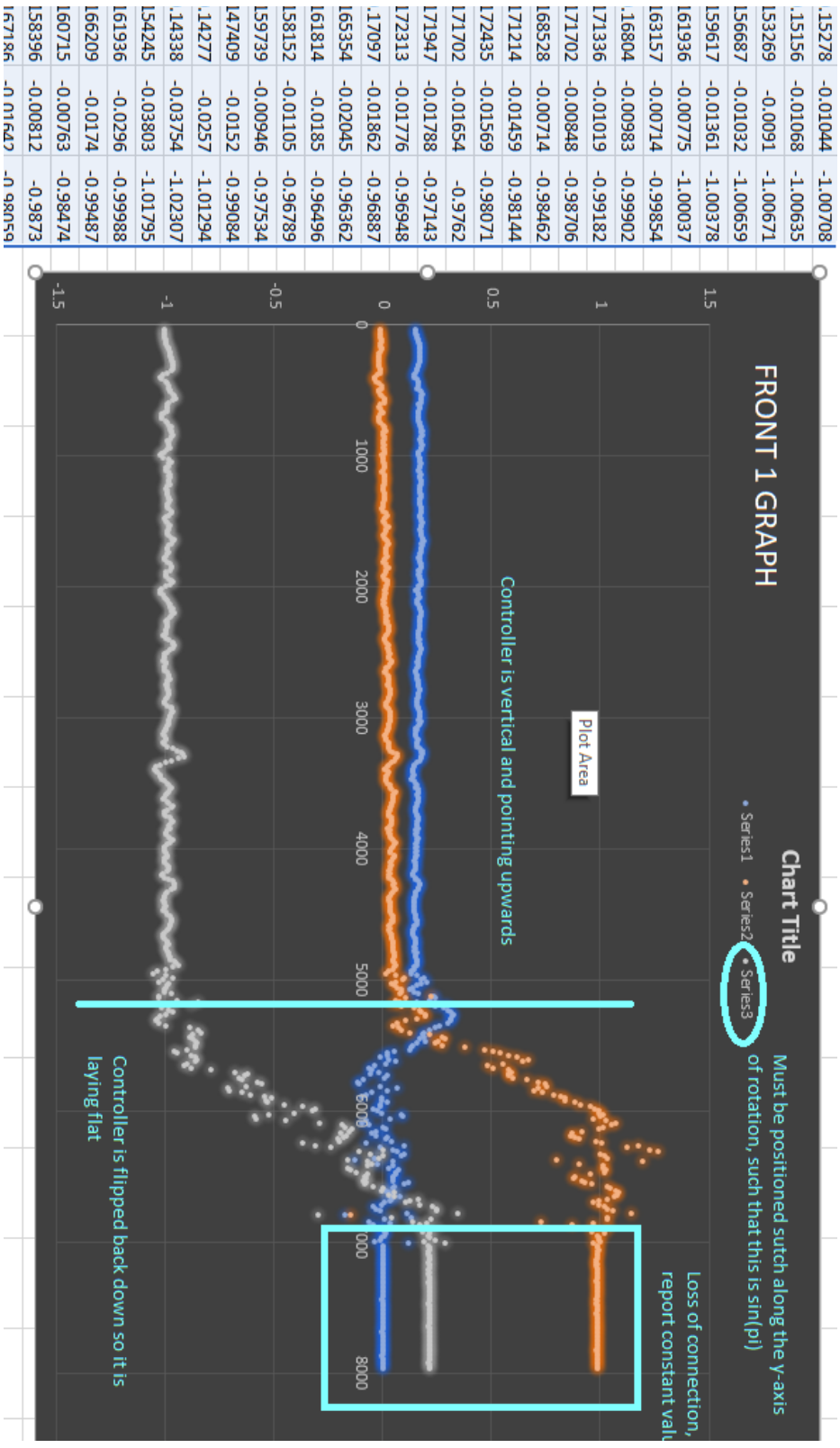


FLAT 2 GRAPH (UPSIDE DOWN)

).026186	-0.96448	0.257401
).026674	-0.9624	0.256913
).027406	-0.96448	0.255936
).027529	-0.96277	0.255692
).027529	-0.96411	0.258622
).025575	-0.96399	0.257157
).025331	-0.96362	0.259354
).026064	-0.9657	0.255814
).024477	-0.96338	0.252884
).024354	-0.96472	0.257645
).025697	-0.96484	0.257645
).025575	-0.96203	0.254715
).027284	-0.96411	0.256791
).025087	-0.96289	0.259232
).028505	-0.96313	0.25557
).025209	-0.9635	0.258378
).027284	-0.96618	0.258622
).026064	-0.96582	0.256668
).025941	-0.96521	0.256424
).025453	-0.96338	0.256424
).025819	-0.96399	0.255936
).025941	-0.9646	0.259843
).025697	-0.96423	0.2585
).026674	-0.96423	0.255936
).026308	-0.96362	0.257401
).026918	-0.96435	0.256302
).025331	-0.96252	0.255326
).025575	-0.96411	0.257279



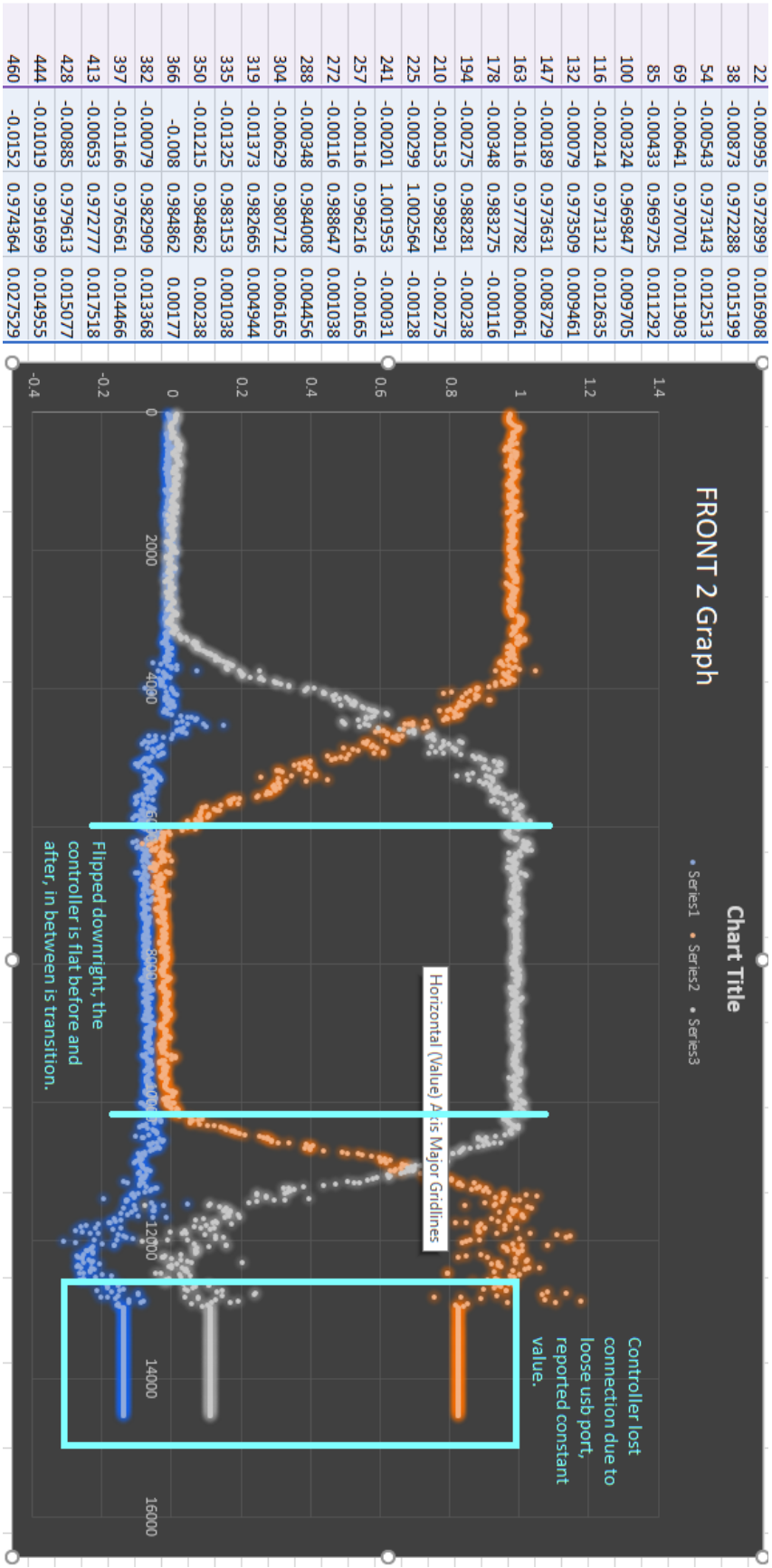
FRONT 1 GRAPH (UPWARD)



.15278	-0.01044	-1.00708
.15156	-0.01068	-1.00635
153269	-0.0091	-1.00671
156687	-0.01032	-1.00659
159617	-0.01361	-1.00378
161936	-0.00775	-1.00037
163157	-0.00714	-0.99854
.16804	-0.00983	-0.99902
171336	-0.01019	-0.99182
171702	-0.00848	-0.98706
168528	-0.00714	-0.98462
171214	-0.01459	-0.98144
172435	-0.01569	-0.98071
171702	-0.01654	-0.9762
171947	-0.01788	-0.97143
172313	-0.01776	-0.96948
.17097	-0.01862	-0.96887
165354	-0.02045	-0.96362
161814	-0.0185	-0.96496
158152	-0.01105	-0.96789
159739	-0.00946	-0.97534
147409	-0.0152	-0.99084
.14277	-0.0257	-1.01294
.14338	-0.03754	-1.02307
154245	-0.03803	-1.01795
161936	-0.0296	-0.99988
166209	-0.0174	-0.99487
160715	-0.00763	-0.98474
158396	-0.00812	-0.9873
167186	-0.01642	-0.98059

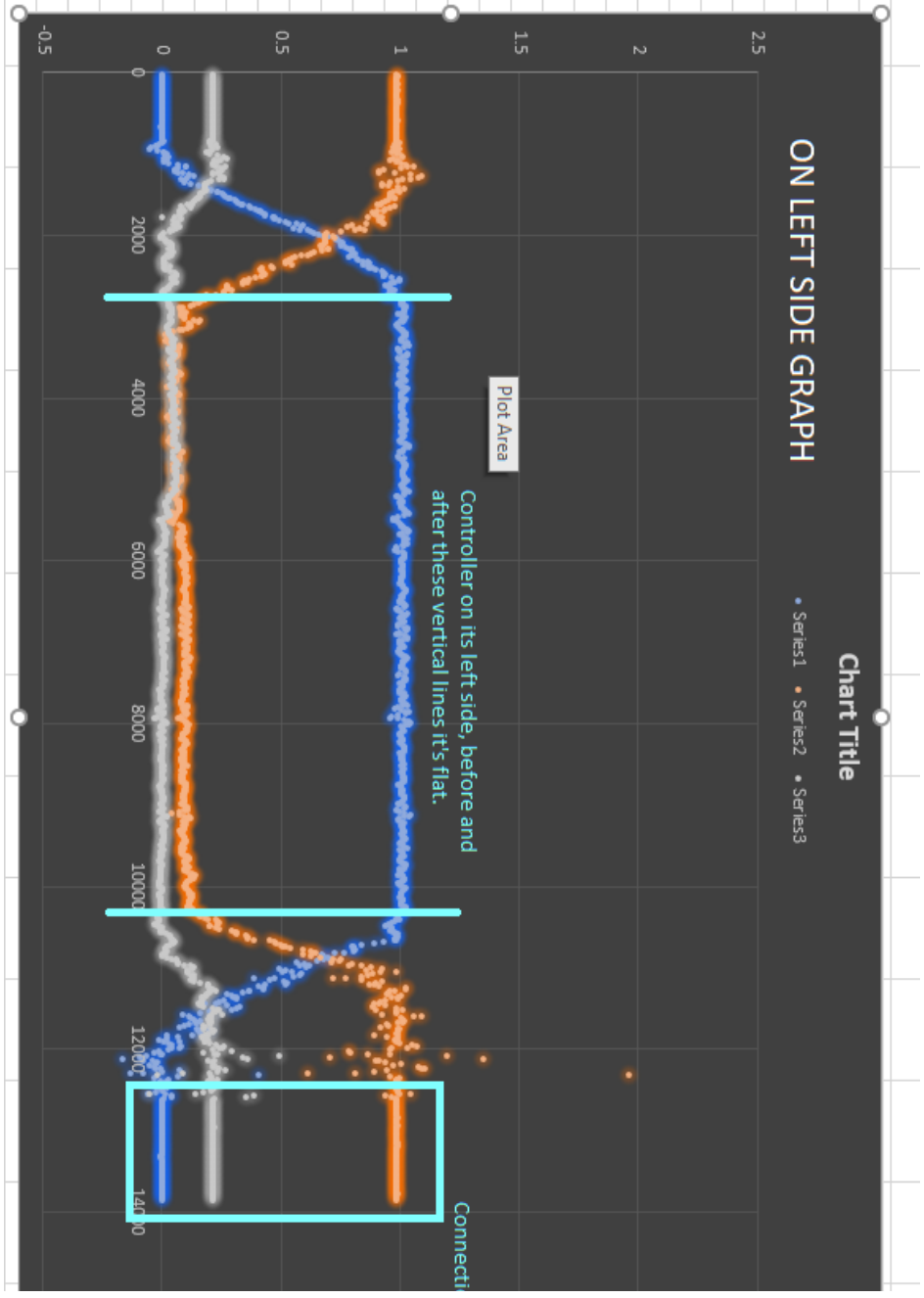
FRONT 2 GRAPH (DOWNWARD)

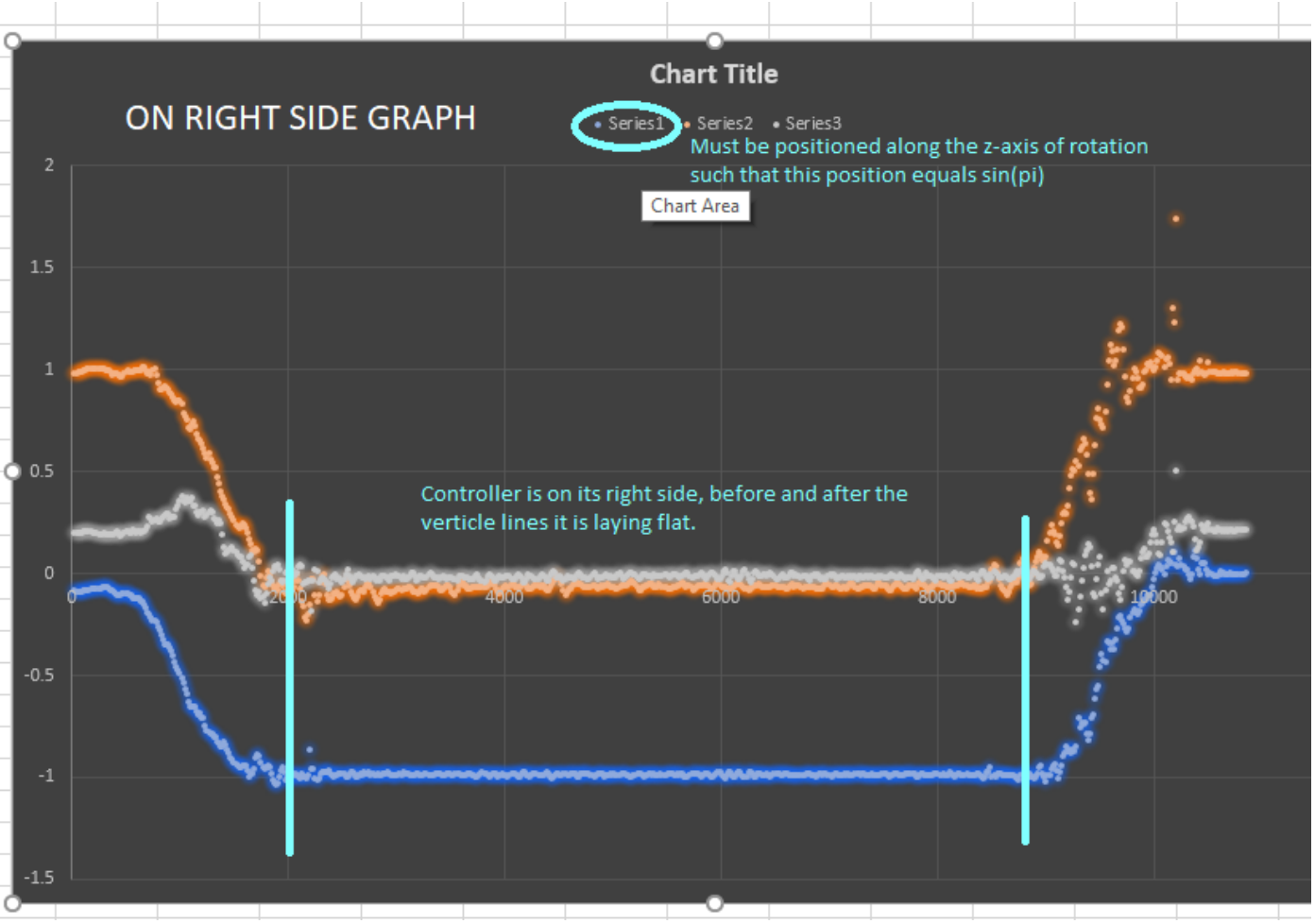
22	-0.00995	0.972899	0.016908
38	-0.00873	0.972288	0.015199
54	-0.00543	0.973143	0.012513
69	-0.00641	0.970701	0.011903
85	-0.00433	0.969725	0.011292
100	-0.00324	0.969847	0.009705
116	-0.00214	0.971312	0.012635
132	-0.00079	0.973509	0.009461
147	-0.00189	0.973631	0.008729
163	-0.00116	0.977782	0.000061
178	-0.00348	0.983275	-0.00116
194	-0.00275	0.988281	-0.00238
210	-0.00153	0.998291	-0.00275
225	-0.00299	1.002564	-0.00128
241	-0.00201	1.001953	-0.00031
257	-0.00116	0.996216	-0.00165
272	-0.00116	0.988647	0.001038
288	-0.00348	0.984008	0.004456
304	-0.00629	0.980712	0.006165
319	-0.01373	0.982665	0.004944
335	-0.01325	0.983153	0.001038
350	-0.01215	0.984862	0.00238
366	-0.008	0.984862	0.00177
382	-0.00079	0.982909	0.013368
397	-0.01166	0.976561	0.014466
413	-0.00653	0.972777	0.017518
428	-0.00885	0.979613	0.015077
444	-0.01019	0.991699	0.014955
460	-0.0152	0.974364	0.027529



ON LEFT SIDE GRAPH

0.00092	0.985229	0.212721
0.00055	0.99121	0.213087
0.00177	0.98767	0.213819
0.00238	0.987426	0.214918
0.00043	0.987304	0.214063
0.00549	0.983642	0.215528
0.00018	0.982421	0.213819
0.00031	0.987304	0.215528
0.00549	0.988647	0.21443
0.00128	0.984374	0.213697
0.00128	0.985229	0.213087
0.00116	0.983764	0.213819
0.01648	0.987182	0.214063
0.00549	0.987792	0.212232
0.01648	0.987548	0.212721
0.00793	0.984862	0.213697
0.00671	0.986205	0.210767
0.00092	0.983642	0.212476
0.00104	0.98474	0.212721
0.00214	0.986938	0.212476
0.00177	0.988647	0.215772
0.00153	0.984862	0.214185
0.00263	0.983153	0.210401
0.0014	0.988036	0.213087
0.00031	0.985595	0.213941
0.00067	0.98181	0.211866
0.01038	0.986938	0.214674
0.01165	0.985351	0.214552
0.00427	0.986449	0.213453



ON RIGHT SIDE GRAPH

.08381	0.98352	0.201123
.08759	0.985961	0.197827
.08784	0.989257	0.197705
.08674	0.990966	0.196606
.08686	0.991333	0.200635
.08442	0.99646	0.204541
.08393	0.999756	0.206128
.08088	1.00293	0.208326
.07941	1.00586	0.209669
.07343	1.007691	0.206739
.07123	1.005738	0.202466
.07343	1.006592	0.197339
.07416	1.00647	0.196362
.07343	1.006226	0.192089
.07294	1.006348	0.19392
.06904	1.005493	0.195874
.06611	1.004761	0.197583
.06696	1	0.194531
.06928	0.998779	0.192211
.07331	0.995727	0.192211
.07783	0.990356	0.190624
.08259	0.976195	0.190258
.09113	0.980834	0.194775
.10017	0.979125	0.198315
.10822	0.9812	0.207715
.10737	0.973265	0.197339
.10456	0.964842	0.182689
.10029	0.96887	0.191601
.09809	0.986327	0.201611