

ENCKE FLYBY INFO for Tracking Tests													
130km	130km	130km	130km	130km				100km	100km	100km	115km	115km	115km
CFI Resol.	CI Resol.	4 km	4km	Range	Time	Time	Tilt	Angle to	Phase	Filter	Angle to	Phase	Filter
(km/43urad)	(m/20 urad)	Nucleus	Nucleus	(km)		(sec)		Nucleus	Angle		Nucleus	Angle	
		(CI pix)	(deg)										
416102.4	198374.4	0.0	0.00	9676800	-96hr	-345600	6 or 3	0.0	12.0		0.0	12.0	
364089.6	173577.6	0.0	0.00	8467200	-84hr	-302400	6 or 3	0.0	12.0		0.0	12.0	
312076.8	148780.8	0.0	0.00	7257600	-72hr	-259200	6 or 3	0.0	12.0		0.0	12.0	
260064.0	123984.0	0.0	0.00	6048000	-60hr	-216000	6 or 3	0.0	12.0		0.0	12.0	
208051.2	99187.2	0.0	0.00	4838400	-48hr	-172800	6 or 3	0.0	12.0		0.0	12.0	
156038.4	74390.4	0.1	0.00	3628800	-36hr	-129600	6 or 3	0.0	12.0		0.0	12.0	
104025.6	49593.6	0.1	0.00	2419200	-24hr	-86400	6 or 3	0.0	12.0		0.0	12.0	
78019.2	37195.2	0.1	0.00	1814400	-18hr	-64800	6 or 3	0.0	12.0		0.0	12.0	
72817.9	34715.5	0.1	0.00	1693440	-16.8hr	-60480	6 or 3	0.0	12.0		0.0	12.0	
67616.6	32235.8	0.1	0.00	1572480	-15.6hr	-56160	6 or 3	0.0	12.0		0.0	12.0	
62415.4	29756.2	0.1	0.00	1451520	-14.4hr	-51840	6 or 3	0.0	12.0		0.0	12.0	
57214.1	27276.5	0.1	0.00	1330560	-13.2hr	-47520	6 or 3	0.0	12.0		0.0	12.0	
52012.8	24796.8	0.2	0.00	1209600	-12 hr	-43200	6 or 3	0.0	12.0		0.0	12.0	
46811.5	22317.1	0.2	0.00	1088640	-10.8	-38880	6 or 3	0.0	12.0		0.0	12.0	
41610.2	19837.4	0.2	0.00	967680	-9.6	-34560	6 or 3	0.0	12.0		0.0	12.0	
36409.0	17357.8	0.2	0.00	846720	-8.4	-30240	6 or 3	0.0	12.0		0.0	12.0	
31207.7	14878.1	0.3	0.00	725760	-7.2	-25920	6 or 3	0.0	12.0		0.0	12.0	
26006.4	12398.4	0.3	0.00	604800	-6 hr	-21600	6 or 3	0.0	12.0		0.0	12.0	
21672.0	10332.0	0.4	0.00	504000	-5 hr	-18000	6 or 3	0.0	12.0		0.0	12.0	
20805.1	9918.7	0.4	0.00	483840	-4.8hr	-17280	6 or 3	0.0	12.0		0.0	12.0	
18204.5	8678.9	0.5	0.00	423360	-4.2hr	-15120	6 or 3	0.0	12.0		0.0	12.0	
17337.6	8265.6	0.5	0.00	403200	-4 hr	-14400	6 or 3	0.0	12.0		0.0	12.0	
15603.8	7439.0	0.5	0.00	362880	-3.6hr	-12960	6 or 3	0.0	12.0		0.0	12.0	
13003.2	6199.2	0.6	0.00	302400	-3 hr	-10800	6 or 3	0.0	12.0		0.0	12.0	
11919.6	5682.6	0.7	0.00	277200	-2:45	-9900	6 or 3	0.0	12.0		0.0	12.0	
10836.0	5166.0	0.8	0.00	252000	-2:30	-9000	6 or 3	0.0	12.0		0.0	12.0	
9752.4	4649.4	0.9	0.00	226800	-2:15	-8100	6 or 3	0.0	12.0		0.0	12.0	
8668.8	4132.8	1.0	0.00	201600	-2 hr	-7200	6 or 3	0.0	12.0		0.0	12.0	

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7585.2	3616.2	1.1	0.00	176400	-1.45	-6300	6 or 3	0.0	12.0		0.0	12.0	
6501.6	3099.6	1.3	0.00	151200	-1:30	-5400	6 or 3	0.0	12.0		0.0	12.0	
5418.0	2583.0	1.5	0.00	126000	-1:15	-4500	6 or 3	0.0	12.0		0.1	11.9	
4334.4	2066.4	1.9	0.00	100800	-1 hr	-3600	2.5	0.1	11.9		0.1	11.9	
3612.0	1722.0	2.3	0.00	84000	-50m	-3000	2.5	0.1	11.9		0.1	11.9	
3250.8	1549.8	2.6	0.00	75600	-45m	-2700		0.1	11.9		0.1	11.9	
2889.6	1377.6	2.9	0.00	67200	-40m	-2400	2.5	0.1	11.9		0.1	11.9	
2167.2	1033.2	3.9	0.00	50400	-30m	-1800	2.5	0.1	11.9		0.1	11.9	
1444.8	688.8	5.8	0.01	33600	-20m	-1200	2.5	0.2	11.8		0.2	11.8	
963.2	459.2	8.7	0.01	22400		-800	2.5	0.3	11.7		0.3	11.7	
842.8	401.8	10.0	0.01	19600		-700	2.5	0.3	11.7		0.3	11.7	
830.8	396.1	10.1	0.01	19320		-690	2.5	0.3	11.7		0.3	11.7	
818.7	390.3	10.2	0.01	19040		-680	2.5	0.3	11.7		0.3	11.7	
806.7	384.6	10.4	0.01	18760		-670	2.5	0.3	11.7		0.4	11.6	
794.7	378.8	10.6	0.01	18480		-660	2.5	0.3	11.7		0.4	11.6	
782.6	373.1	10.7	0.01	18200		-650	2.5	0.3	11.7		0.4	11.6	
782.6	373.1	10.7	0.01	18200		-650	2.5	0.3	11.7		0.4	11.6	
770.6	367.4	10.9	0.01	17920		-640	2.5	0.3	11.7		0.4	11.6	
758.5	361.6	11.1	0.01	17640		-630	2.5	0.3	11.7		0.4	11.6	
746.5	355.9	11.2	0.01	17360		-620	2.5	0.3	11.7		0.4	11.6	
734.5	350.2	11.4	0.01	17080		-610	2.5	0.3	11.7		0.4	11.6	
722.4	344.4	11.6	0.01	16801	-10m	-600	2.5	0.3	11.7		0.4	11.6	
710.4	338.7	11.8	0.01	16521		-590	2.5	0.3	11.7		0.4	11.6	
698.3	332.9	12.0	0.01	16241		-580	2.5	0.4	11.6		0.4	11.6	
686.3	327.2	12.2	0.01	15961		-570	2.5	0.4	11.6		0.4	11.6	
674.3	321.5	12.4	0.01	15681		-560	2.5	0.4	11.6		0.4	11.6	
662.2	315.7	12.7	0.01	15401		-550	2.5	0.4	11.6		0.4	11.6	
650.2	310.0	12.9	0.02	15121	-9m	-540	2.5	0.4	11.6		0.4	11.6	
638.1	304.2	13.1	0.02	14841		-530	2.5	0.4	11.6		0.4	11.6	
626.1	298.5	13.4	0.02	14561		-520	2.5	0.4	11.6		0.5	11.5	
614.1	292.8	13.7	0.02	14281		-510	2.5	0.4	11.6		0.5	11.5	
602.0	287.0	13.9	0.02	14001		-500	2.5	0.4	11.6		0.5	11.5	
547.8	261.2	15.3	0.02	12741		-455	2.5	0.4	11.6		0.5	11.5	
541.8	258.3	15.5	0.02	12601	-8m	-450	2.5	0.5	11.5		0.5	11.5	
535.8	255.4	15.7	0.02	12461		-445	2.5	0.5	11.5		0.5	11.5	
529.8	252.6	15.8	0.02	12321		-440	2.5	0.5	11.5		0.5	11.5	
523.8	249.7	16.0	0.02	12181		-435	2.5	0.5	11.5		0.5	11.5	

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517.8	246.8	16.2	0.02	12041		-430	2.5	0.5	11.5		0.5	11.5	
511.7	244.0	16.4	0.02	11901		-425	2.5	0.5	11.5		0.6	11.4	
505.7	241.1	16.6	0.02	11761	-7m	-420	2.5	0.5	11.5		0.6	11.4	
499.7	238.2	16.8	0.02	11621		-415	2.5	0.5	11.5		0.6	11.4	
493.7	235.4	17.0	0.02	11481		-410	2.5	0.5	11.5		0.6	11.4	
487.7	232.5	17.2	0.02	11341		-405	2.5	0.5	11.5		0.6	11.4	
481.6	229.6	17.4	0.02	11201		-400	2.5	0.5	11.5		0.6	11.4	
469.6	223.9	17.9	0.02	10921		-390	2.5	0.5	11.5		0.6	11.4	
457.6	218.1	18.3	0.02	10641		-380	2.5	0.5	11.5		0.6	11.4	
451.5	215.3	18.6	0.02	10501		-375	2.5	0.5	11.5		0.6	11.4	
445.5	212.4	18.8	0.02	10361		-370	2.5	0.6	11.4		0.6	11.4	
439.5	209.5	19.1	0.02	10221		-365	2.5	0.6	11.4		0.6	11.4	
433.5	206.7	19.4	0.02	10081	-6m	-360	2.5	0.6	11.4		0.7	11.3	
427.5	203.8	19.6	0.02	9941		-355	2.5	0.6	11.4		0.7	11.3	
421.4	200.9	19.9	0.02	9801		-350	2.5	0.6	11.4		0.7	11.3	
415.4	198.0	20.2	0.02	9661		-345	2.5	0.6	11.4		0.7	11.3	
409.4	195.2	20.5	0.02	9521		-340	2.5	0.6	11.4		0.7	11.3	
403.4	192.3	20.8	0.02	9381		-335	2.5	0.6	11.4		0.7	11.3	
397.4	189.4	21.1	0.02	9241		-330	2.5	0.6	11.4		0.7	11.3	
391.3	186.6	21.4	0.03	9101		-325	2.5	0.6	11.4		0.7	11.3	
385.3	183.7	21.8	0.03	8961		-320	2.5	0.6	11.4		0.7	11.3	
379.3	180.8	22.1	0.03	8821		-315	2.5	0.6	11.4		0.7	11.3	
373.3	178.0	22.5	0.03	8681		-310	2.5	0.7	11.3		0.8	11.2	
367.3	175.1	22.8	0.03	8541		-305	2.5	0.7	11.3		0.8	11.2	
361.2	172.2	23.2	0.03	8401	-5m	-300	2.5	0.7	11.3		0.8	11.2	
355.2	169.4	23.6	0.03	8261		-295	2.5	0.7	11.3		0.8	11.2	
349.2	166.5	24.0	0.03	8121		-290	2.5	0.7	11.3		0.8	11.2	
343.2	163.6	24.4	0.03	7981		-285	2.5	0.7	11.3		0.8	11.2	
337.2	160.7	24.9	0.03	7841		-280	2.5	0.7	11.3		0.8	11.2	
331.1	157.9	25.3	0.03	7701		-275	2.5	0.7	11.3		0.9	11.1	
325.1	155.0	25.8	0.03	7561		-270	2.5	0.8	11.2		0.9	11.1	
319.1	152.1	26.3	0.03	7421		-265	2.5	0.8	11.2		0.9	11.1	
313.1	149.3	26.8	0.03	7281		-260	2.5	0.8	11.2		0.9	11.1	
307.1	146.4	27.3	0.03	7141		-255	2.5	0.8	11.2		0.9	11.1	
301.1	143.5	27.9	0.03	7001		-250	2.5	0.8	11.2		0.9	11.1	
295.0	140.7	28.4	0.03	6861		-245	2.5	0.8	11.2		1.0	11.0	
289.0	137.8	29.0	0.03	6721	-4m	-240	2.5	0.9	11.1		1.0	11.0	

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283.0	134.9	29.6	0.03	6581		-235	2.5	0.9	11.1		1.0	11.0	
277.0	132.0	30.3	0.04	6441		-230	2.5	0.9	11.1		1.0	11.0	
271.0	129.2	31.0	0.04	6301		-225	2.5	0.9	11.1		1.0	11.0	
264.9	126.3	31.7	0.04	6161		-220	2.5	0.9	11.1		1.1	10.9	
258.9	123.4	32.4	0.04	6021		-215	2.5	1.0	11.0		1.1	10.9	
252.9	120.6	33.2	0.04	5881		-210	2.5	1.0	11.0		1.1	10.9	
246.9	117.7	34.0	0.04	5741		-205	2.5	1.0	11.0		1.1	10.9	
240.9	114.8	34.8	0.04	5602		-200	2.5	1.0	11.0		1.2	10.8	
228.8	109.1	36.7	0.04	5322		-190	2.5	1.1	10.9		1.2	10.8	
222.8	106.2	37.7	0.04	5182		-185	2.5	1.1	10.9		1.3	10.7	
216.8	103.4	38.7	0.05	5042	-3m	-180	2.5	1.1	10.9		1.3	10.7	
210.8	100.5	39.8	0.05	4902		-175	2.5	1.2	10.8		1.3	10.7	
204.8	97.6	41.0	0.05	4762		-170	2.5	1.2	10.8		1.4	10.6	
198.7	94.7	42.2	0.05	4622		-165	2.5	1.2	10.8		1.4	10.6	
192.7	91.9	43.5	0.05	4482		-160	2.5	1.3	10.7		1.5	10.5	
186.7	89.0	44.9	0.05	4342		-155	2.5	1.3	10.7		1.5	10.5	
180.7	86.1	46.4	0.05	4202		-150	0.5	1.4	10.6		1.6	10.4	
174.7	83.3	48.0	0.06	4062		-145	0.5	1.4	10.6		1.6	10.4	
168.7	80.4	49.7	0.06	3922		-140	0.5	1.5	10.5		1.7	10.3	
162.6	77.5	51.6	0.06	3782		-135	0.5	1.5	10.5		1.7	10.3	
156.6	74.7	53.6	0.06	3642		-130	0.5	1.6	10.4		1.8	10.2	
150.6	71.8	55.7	0.07	3502		-125	0.5	1.6	10.4		1.9	10.1	
3362.5	68.9	58.0	0.07	3363	-2m	-120	0.5	1.7	10.3		2.0	10.0	
138.6	66.1	60.5	0.07	3223		-115	0.5	1.8	10.2		2.0	10.0	
132.6	63.2	63.3	0.07	3083		-110	0.5	1.9	10.1		2.1	9.9	
126.5	60.3	66.3	0.08	2943		-105	0.5	1.9	10.1		2.2	9.8	
120.5	57.5	69.6	0.08	2803		-100	0.5	2.0	10.0		2.4	9.6	
114.5	54.6	73.3	0.09	2663		-95	0.5	2.2	9.8		2.5	9.5	
108.5	51.7	77.3	0.09	2523		-90	0.5	2.3	9.7		2.6	9.4	
102.5	48.9	81.9	0.10	2384		-85	0.5	2.4	9.6		2.8	9.2	
96.5	46.0	87.0	0.10	2244		-80	0.5	2.6	9.4		2.9	9.1	
90.5	43.1	92.7	0.11	2104		-75	0.5	2.7	9.3		3.1	8.9	
89.3	42.6	94.0	0.11	2076		-74	0.5	2.8	9.2		3.2	8.8	
88.1	42.0	95.3	0.11	2048		-73	0.5	2.8	9.2		3.2	8.8	
86.9	41.4	96.6	0.11	2020		-72	0.5	2.8	9.2		3.3	8.7	
85.7	40.8	97.9	0.12	1992		-71	0.5	2.9	9.1		3.3	8.7	
84.5	40.3	99.3	0.12	1964		-70	0.5	2.9	9.1		3.4	8.6	

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83.3	39.7	100.8	0.12	1936		-69	0.5	3.0	9.0		3.4	8.6	
82.1	39.1	102.2	0.12	1908		-68	0.5	3.0	9.0		3.5	8.5	
80.9	38.6	103.8	0.12	1880		-67	0.5	3.1	8.9		3.5	8.5	
79.7	38.0	105.3	0.12	1853		-66	0.5	3.1	8.9		3.6	8.4	
78.5	37.4	106.9	0.13	1825		-65	0.5	3.1	8.9		3.6	8.4	
77.3	36.8	108.6	0.13	1797		-64	0.5	3.2	8.8		3.7	8.3	
76.1	36.3	110.3	0.13	1769		-63	0.5	3.2	8.8		3.7	8.3	
74.9	35.7	112.1	0.13	1741		-62	0.5	3.3	8.7		3.8	8.2	
73.7	35.1	113.9	0.13	1713		-61	0.5	3.4	8.6		3.9	8.1	
72.5	34.5	115.8	0.14	1685	-1m	-60	0.5	3.4	8.6		3.9	8.1	
71.3	34.0	117.7	0.14	1657		-59	0.5	3.5	8.5		4.0	8.0	
70.1	33.4	119.8	0.14	1629		-58	0.5	3.5	8.5		4.1	7.9	
68.9	32.8	121.9	0.14	1601		-57	0.5	3.6	8.4		4.1	7.9	
67.7	32.3	124.0	0.15	1573		-56	0.5	3.6	8.4		4.2	7.8	
66.5	31.7	126.3	0.15	1545		-55	0.5	3.7	8.3		4.3	7.7	
65.3	31.1	128.6	0.15	1518		-54	0.5	3.8	8.2		4.3	7.7	
64.1	30.5	131.0	0.15	1490		-53	0.5	3.9	8.1		4.4	7.6	
62.9	30.0	133.5	0.16	1462		-52	0.5	3.9	8.1		4.5	7.5	
61.7	29.4	136.1	0.16	1434		-51	0.5	4.0	8.0		4.6	7.4	
60.5	28.8	138.8	0.16	1406		-50	0.5	4.1	7.9		4.7	7.3	
59.3	28.3	141.6	0.17	1378		-49	0.5	4.2	7.8		4.8	7.2	
58.1	27.7	144.5	0.17	1350		-48	0.5	4.3	7.7		4.9	7.1	
56.9	27.1	147.6	0.17	1322		-47	0.5	4.3	7.7		5.0	7.0	
	26.5	150.7	0.18	1295		-46	0.5	4.4	7.6		5.1	6.9	
	26.0	154.0	0.18	1267		-45	0.5	4.5	7.5		5.2	6.8	
	25.4	157.5	0.18	1239		-44	0.5	4.6	7.4		5.3	6.7	
	24.8	161.1	0.19	1211		-43	0	4.7	7.3		5.5	6.5	
	24.3	164.9	0.19	1183		-42	0	4.9	7.1		5.6	6.4	
	23.7	168.9	0.20	1155		-41	0	5.0	7.0		5.7	6.3	
	23.1	173.1	0.20	1128		-40	0	5.1	6.9		5.9	6.1	
	22.5	177.4	0.21	1100		-39	0	5.2	6.8		6.0	6.0	1
	22.0	182.0	0.21	1072		-38	0	5.4	6.6		6.2	5.8	2
	21.4	186.9	0.22	1044		-37	0	5.5	6.5		6.3	5.7	3
	20.8	192.0	0.23	1016		-36	0	5.7	6.3		6.5	5.5	4
	20.3	197.4	0.23	989		-35	0	5.8	6.2		6.7	5.3	5
	19.7	203.1	0.24	961		-34	0	6.0	6.0	1	6.9	5.1	6
	19.1	209.1	0.25	933		-33	0	6.2	5.8	2	7.1	4.9	7

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	18.6	215.5	0.25	905		-32	0	6.4	5.6	3	7.3	4.7	8
	18.0	222.3	0.26	878		-31	0	6.6	5.4	4	7.5	4.5	9
	17.4	229.6	0.27	850		-30	0	6.8	5.2	5	7.8	4.2	10
	16.9	237.3	0.28	822		-29	0	7.0	5.0	6	8.1	3.9	1
	16.3	245.5	0.29	795		-28	0	7.3	4.7	7	8.3	3.7	2
	15.7	254.4	0.30	767		-27	0	7.5	4.5	8	8.6	3.4	1
	15.2	263.9	0.31	740		-26	0	7.8	4.2	9	9.0	3.0	1
	14.6	274.1	0.32	712		-25	0	8.1	3.9	10	9.3	2.7	1
	14.0	285.1	0.33	684		-24	0	8.5	3.5	1	9.7	2.3	1
	13.5	297.0	0.35	657		-23	0	8.8	3.2	2	10.1	1.9	1
	12.9	309.9	0.36	630		-22	0	9.2	2.8	1	10.6	1.4	1
	12.3	324.0	0.38	602		-21	0	9.7	2.3	1	11.1	0.9	1
	11.8	339.4	0.40	575		-20	0	10.1	1.9	1	11.6	0.4	1
	11.2	356.3	0.42	548		-19	0	10.6	1.4	1	12.2	0.2	1
	10.7	374.9	0.44	520		-18	0	11.2	0.8	1	12.9	0.9	1
	10.1	395.4	0.46	493		-17	0	11.9	0.1	1	13.6	1.6	1
	9.6	418.3	0.49	466		-16	0	12.6	0.6	1	14.4	2.4	1
	9.0	443.8	0.52	440		-15	0	13.4	1.4	1	15.3	3.3	1
	8.5	472.5	0.55	413		-14	0	14.3	2.3	1	16.3	4.3	1
	7.9	504.8	0.59	387		-13	0	15.4	3.4	1	17.5	5.5	1
	7.4	541.6	0.64	360		-12	0	16.6	4.6	1	18.9	6.9	1
	6.9	583.7	0.69	334		-11	0	18.0	6.0	1	20.5	8.5	1
	6.3	632.1	0.74	309		-10	0	19.7	7.7	1	22.3	10.3	1
	5.8	688.1	0.81	284		-9	0	21.6	9.6	1	24.5	12.5	1
	5.3	753.4	0.88	259		-8	0	24.1	12.1	1	27.2	15.2	1
	4.8	829.6	0.97	235		-7	0	27.0	15.0	1	30.4	18.4	1
	4.4	918.5	1.08	212		-6	0	30.8	18.8	1	34.4	22.4	
	3.9	1021.3	1.20	191		-5	0	35.5	23.5		39.4	27.4	
	3.5	1137.1	1.34	172		-4	0	41.8	29.8		45.8	33.8	
	3.2	1260.7	1.48	155		-3	0	50.0	38.0		53.9	41.9	
	2.7	1500.9	1.76	130	-0s	0	0	90.0	78.0		90.0	78.0	
	4.4	918.5	1.08	212	6s	6	0	30.8	198.8		34.4	202.4	
	6.3	632.1	0.74	309	10s	10	0	19.7	187.7		22.3	190.3	
	11.8	339.4	0.40	575	20s	20	0	10.1	178.1		11.6	179.6	
	17.4	229.6	0.27	850	30s	30	0	6.8	174.8		7.8	175.8	
	23.1	173.1	0.20	1128	40s	40	0	5.1	173.1		5.9	173.9	
	28.8	138.8	0.16	1406	50s	50	0	4.1	172.1		4.7	172.7	

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	34.5	115.8	0.14	1685	1m	60	0	3.4	171.4		3.9	171.9	
	68.9	58.0	0.07	3363	2m	120	0	1.7	169.7		2.0	170.0	
	103.4	38.7	0.05	5042	3m	180	0	1.1	169.1		1.3	169.3	
	172.2	23.2	0.03	8401	5m	300	0	0.7	168.7		0.8	168.8	
	344.4	11.6	0.01	16801	10m	600	0	0.3	168.3		0.4	168.4	
	688.8	5.8	0.01	33600	20m	1200	0	0.2	168.2		0.2	168.2	
	1033.2	3.9	0.00	50400	30m	1800	0	0.1	168.1		0.1	168.1	
Note 1: The angle given in columns H, K, N, Q, and T is angle between the spacecraft look direction to the comet and the spacecraft velocity vector (direction parallel to spacecraft motion). Inbound, to determine if the comet is viewable by CFI or CRISP you need to check the tilt angle (column H). A positive tilt is the angle that the s/c +Z is tilted off velocity away from the comet; it combines with the Angle of Nucleus to make the comet appear at a higher CRISP mirror angle from +Z. For instance, if Tilt is .5 and Angle to Nucleus is 5.5, the comet will appear at an angle of 6 deg off +Z (approximately the boundary where unvignetted viewing begins). To determine whether the comet is viewable by CFI, you must again consult both the Tilt and Angle to Nucleus. The CFI field-of-view is 2.54 deg on each side, but has been rotated so that the diagonal lies in the CRISP mirror viewing plane (s/c Z-Y). The center of the boresight is fixed at 3 deg off +Z (toward the comet). Therefore, 3 deg - tilt angle gives the look direction of CFI field-of-view center off velocity toward the comet. From that subtract and add 1.8 deg (the half CFI fov diagonal) and you get the range of Angle to Nucleus values that will allow CFI to view the comet for a given tilt angle.													
Note 2: Using the above formula I've listed the CFI viewing for each different tilt angle:													
Tilt = 2.5; CFI center looks .5 deg off velocity toward comet. Comet center viewable for Angle to Nucleus values of 0 to 2.3.													
Tilt = .5; CFI center looks 2.5 deg off velocity toward comet. Comet center viewable for Angle to Nucleus values of .7 to 4.3.													
Tilt = 0; CFI center looks 3 deg off velocity toward comet. Comet center viewable for Angle to Nucleus values of 1.2 to 4.8.													
Note 3: The above tilt profile assumes we do the slew from 2.5 to .5 at -150 seconds and the slew from .5 to 0 at -44 seconds.													

Additional Miss Distances																
130km	130km	130km	145km	145km	145km	160km	160km	160km	Tilt	Time (sec)	180km	180km	180km	180km	400km	
Angle to Nucleus	Phase Angle	Filter	Angle to Nucleus	Phase Angle	Filter	Angle to Nucleus	Phase Angle	Filter			Angle to Nucleus	Phase Angle	Filter	Range	Angle to Nucleus	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-345600	0.0	12.0		9676800	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-302400	0.0	12.0		8467200	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-259200	0.0	12.0		7257600	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-216000	0.0	12.0		6048000	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-172800	0.0	12.0		4838400	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-129600	0.0	12.0		3628800	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-86400	0.0	12.0		2419200	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-64800	0.0	12.0		1814400	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-60480	0.0	12.0		1693440	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-56160	0.0	12.0		1572480	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-51840	0.0	12.0		1451520	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-47520	0.0	12.0		1330560	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-43200	0.0	12.0		1209600	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-38880	0.0	12.0		1088640	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-34560	0.0	12.0		967680	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-30240	0.0	12.0		846720	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-25920	0.0	12.0		725760	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-21600	0.0	12.0		604800	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-18000	0.0	12.0		504000	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-17280	0.0	12.0		483840	0.0	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-15120	0.0	12.0		423360	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-14400	0.0	12.0		403200	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-12960	0.0	12.0		362880	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-10800	0.0	12.0		302400	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-9900	0.0	12.0		277200	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-9000	0.0	12.0		252000	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-8100	0.0	12.0		226800	0.1	
0.0	12.0		0.0	12.0		0.0	12.0		6 or 3	-7200	0.1	11.9		201600	0.1	

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0.0	12.0		0.0	12.0		0.1	11.9		6 or 3	-6300	0.1	11.9		176400	0.1
0.0	12.0		0.1	11.9		0.1	11.9		6 or 3	-5400	0.1	11.9		151200	0.2
0.1	11.9		0.1	11.9		0.1	11.9		6 or 3	-4500	0.1	11.9		126000	0.2
0.1	11.9		0.1	11.9		0.1	11.9		2.5	-3600	0.1	11.9		100800	0.2
0.1	11.9		0.1	11.9		0.1	11.9		2.5	-3000	0.1	11.9		84000	0.3
0.1	11.9		0.1	11.9		0.1	11.9			-2700	0.1	11.9		75600	0.3
0.1	11.9		0.1	11.9		0.1	11.9		2.5	-2400	0.2	11.8		67200	0.3
0.1	11.9		0.2	11.8		0.2	11.8		2.5	-1800	0.2	11.8		50400	0.5
0.2	11.8		0.2	11.8		0.3	11.7		2.5	-1200	0.3	11.7		33600	0.7
0.3	11.7		0.4	11.6		0.4	11.6		2.5	-800	0.5	11.5		22401	1.0
0.4	11.6		0.4	11.6		0.5	11.5		2.5	-700	0.5	11.5		19601	1.2
0.4	11.6		0.4	11.6		0.5	11.5		2.5	-690	0.5	11.5		19321	1.2
0.4	11.6		0.4	11.6		0.5	11.5		2.5	-680	0.5	11.5		19041	1.2
0.4	11.6		0.4	11.6		0.5	11.5		2.5	-670	0.5	11.5		18761	1.2
0.4	11.6		0.4	11.6		0.5	11.5		2.5	-660	0.6	11.4		18481	1.2
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-650	0.6	11.4		18201	1.3
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-650	0.6	11.4		18201	1.3
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-640	0.6	11.4		17921	1.3
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-630	0.6	11.4		17641	1.3
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-620	0.6	11.4		17361	1.3
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-610	0.6	11.4		17081	1.3
0.4	11.6		0.5	11.5		0.5	11.5		2.5	-600	0.6	11.4		16801	1.4
0.5	11.5		0.5	11.5		0.6	11.4		2.5	-590	0.6	11.4		16521	1.4
0.5	11.5		0.5	11.5		0.6	11.4		2.5	-580	0.6	11.4		16241	1.4
0.5	11.5		0.5	11.5		0.6	11.4		2.5	-570	0.6	11.4		15961	1.4
0.5	11.5		0.5	11.5		0.6	11.4		2.5	-560	0.7	11.3		15681	1.5
0.5	11.5		0.5	11.5		0.6	11.4		2.5	-550	0.7	11.3		15401	1.5
0.5	11.5		0.5	11.5		0.6	11.4		2.5	-540	0.7	11.3		15121	1.5
0.5	11.5		0.6	11.4		0.6	11.4		2.5	-530	0.7	11.3		14841	1.5
0.5	11.5		0.6	11.4		0.6	11.4		2.5	-520	0.7	11.3		14561	1.6
0.5	11.5		0.6	11.4		0.6	11.4		2.5	-510	0.7	11.3		14281	1.6
0.5	11.5		0.6	11.4		0.7	11.3		2.5	-500	0.7	11.3		14001	1.6
0.6	11.4		0.7	11.3		0.7	11.3		2.5	-455	0.8	11.2		12741	1.8
0.6	11.4		0.7	11.3		0.7	11.3		2.5	-450	0.8	11.2		12601	1.8
0.6	11.4		0.7	11.3		0.7	11.3		2.5	-445	0.8	11.2		12461	1.8
0.6	11.4		0.7	11.3		0.7	11.3		2.5	-440	0.8	11.2		12321	1.9
0.6	11.4		0.7	11.3		0.8	11.2		2.5	-435	0.8	11.2		12181	1.9

0.6	11.4		0.7	11.3		0.8	11.2		2.5	-430	0.9	11.1		12041	1.9
0.6	11.4		0.7	11.3		0.8	11.2		2.5	-425	0.9	11.1		11901	1.9
0.6	11.4		0.7	11.3		0.8	11.2		2.5	-420	0.9	11.1		11761	1.9
0.6	11.4		0.7	11.3		0.8	11.2		2.5	-415	0.9	11.1		11621	2.0
0.6	11.4		0.7	11.3		0.8	11.2		2.5	-410	0.9	11.1		11481	2.0
0.7	11.3		0.7	11.3		0.8	11.2		2.5	-405	0.9	11.1		11341	2.0
0.7	11.3		0.7	11.3		0.8	11.2		2.5	-400	0.9	11.1		11201	2.0
0.7	11.3		0.8	11.2		0.8	11.2		2.5	-390	0.9	11.1		10921	2.1
0.7	11.3		0.8	11.2		0.9	11.1		2.5	-380	1.0	11.0		10642	2.2
0.7	11.3		0.8	11.2		0.9	11.1		2.5	-375	1.0	11.0		10502	2.2
0.7	11.3		0.8	11.2		0.9	11.1		2.5	-370	1.0	11.0		10362	2.2
0.7	11.3		0.8	11.2		0.9	11.1		2.5	-365	1.0	11.0		10222	2.2
0.7	11.3		0.8	11.2		0.9	11.1		2.5	-360	1.0	11.0		10082	2.3
0.7	11.3		0.8	11.2		0.9	11.1		2.5	-355	1.0	11.0		9942	2.3
0.8	11.2		0.8	11.2		0.9	11.1		2.5	-350	1.1	10.9		9802	2.3
0.8	11.2		0.9	11.1		0.9	11.1		2.5	-345	1.1	10.9		9662	2.4
0.8	11.2		0.9	11.1		1.0	11.0		2.5	-340	1.1	10.9		9522	2.4
0.8	11.2		0.9	11.1		1.0	11.0		2.5	-335	1.1	10.9		9382	2.4
0.8	11.2		0.9	11.1		1.0	11.0		2.5	-330	1.1	10.9		9242	2.5
0.8	11.2		0.9	11.1		1.0	11.0		2.5	-325	1.1	10.9		9102	2.5
0.8	11.2		0.9	11.1		1.0	11.0		2.5	-320	1.2	10.8		8962	2.6
0.8	11.2		0.9	11.1		1.0	11.0		2.5	-315	1.2	10.8		8822	2.6
0.9	11.1		1.0	11.0		1.1	10.9		2.5	-310	1.2	10.8		8682	2.6
0.9	11.1		1.0	11.0		1.1	10.9		2.5	-305	1.2	10.8		8542	2.7
0.9	11.1		1.0	11.0		1.1	10.9		2.5	-300	1.2	10.8		8402	2.7
0.9	11.1		1.0	11.0		1.1	10.9		2.5	-295	1.2	10.8		8262	2.8
0.9	11.1		1.0	11.0		1.1	10.9		2.5	-290	1.3	10.7		8122	2.8
0.9	11.1		1.0	11.0		1.1	10.9		2.5	-285	1.3	10.7		7982	2.9
0.9	11.1		1.1	10.9		1.2	10.8		2.5	-280	1.3	10.7		7842	2.9
1.0	11.0		1.1	10.9		1.2	10.8		2.5	-275	1.3	10.7		7702	3.0
1.0	11.0		1.1	10.9		1.2	10.8		2.5	-270	1.4	10.6		7562	3.0
1.0	11.0		1.1	10.9		1.2	10.8		2.5	-265	1.4	10.6		7422	3.1
1.0	11.0		1.1	10.9		1.3	10.7		2.5	-260	1.4	10.6		7282	3.1
1.0	11.0		1.2	10.8		1.3	10.7		2.5	-255	1.4	10.6		7142	3.2
1.1	10.9		1.2	10.8		1.3	10.7		2.5	-250	1.5	10.5		7002	3.3
1.1	10.9		1.2	10.8		1.3	10.7		2.5	-245	1.5	10.5		6862	3.3
1.1	10.9		1.2	10.8		1.4	10.6		2.5	-240	1.5	10.5		6722	3.4

1.1	10.9		1.3	10.7		1.4	10.6		2.5	-235	1.6	10.4		6582	3.5
1.2	10.8		1.3	10.7		1.4	10.6		2.5	-230	1.6	10.4		6443	3.6
1.2	10.8		1.3	10.7		1.5	10.5		2.5	-225	1.6	10.4		6303	3.6
1.2	10.8		1.3	10.7		1.5	10.5		2.5	-220	1.7	10.3		6163	3.7
1.2	10.8		1.4	10.6		1.5	10.5		2.5	-215	1.7	10.3		6023	3.8
1.3	10.7		1.4	10.6		1.6	10.4		2.5	-210	1.8	10.2		5883	3.9
1.3	10.7		1.4	10.6		1.6	10.4		2.5	-205	1.8	10.2		5743	4.0
1.3	10.7		1.5	10.5		1.6	10.4		2.5	-200	1.8	10.2		5603	4.1
1.4	10.6		1.6	10.4		1.7	10.3		2.5	-190	1.9	10.1		5323	4.3
1.4	10.6		1.6	10.4		1.8	10.2		2.5	-185	2.0	10.0		5183	4.4
1.5	10.5		1.6	10.4		1.8	10.2		2.5	-180	2.0	10.0		5043	4.5
1.5	10.5		1.7	10.3		1.9	10.1		2.5	-175	2.1	9.9		4903	4.7
1.6	10.4		1.7	10.3		1.9	10.1		2.5	-170	2.2	9.8		4763	4.8
1.6	10.4		1.8	10.2		2.0	10.0		2.5	-165	2.2	9.8		4624	4.9
1.7	10.3		1.9	10.1		2.0	10.0		2.5	-160	2.3	9.7		4484	5.1
1.7	10.3		1.9	10.1		2.1	9.9		2.5	-155	2.4	9.6		4344	5.3
1.8	10.2		2.0	10.0		2.2	9.8		0.5	-150	2.5	9.5		4204	5.4
1.8	10.2		2.0	10.0		2.3	9.7		0.5	-145	2.5	9.5		4064	5.6
1.9	10.1		2.1	9.9		2.3	9.7		0.5	-140	2.6	9.4		3924	5.8
2.0	10.0		2.2	9.8		2.4	9.6		0.5	-135	2.7	9.3		3784	6.0
2.0	10.0		2.3	9.7		2.5	9.5		0.5	-130	2.8	9.2		3644	6.3
2.1	9.9		2.4	9.6		2.6	9.4		0.5	-125	2.9	9.1		3505	6.5
2.2	9.8		2.5	9.5		2.7	9.3		0.5	-120	3.1	8.9		3365	6.8
2.3	9.7		2.6	9.4		2.8	9.2		0.5	-115	3.2	8.8		3225	7.1
2.4	9.6		2.7	9.3		3.0	9.0		0.5	-110	3.3	8.7		3085	7.4
2.5	9.5		2.8	9.2		3.1	8.9		0.5	-105	3.5	8.5		2946	7.7
2.7	9.3		3.0	9.0		3.3	8.7		0.5	-100	3.7	8.3		2806	8.1
2.8	9.2		3.1	8.9		3.4	8.6		0.5	-95	3.9	8.1		2666	8.6
3.0	9.0		3.3	8.7		3.6	8.4		0.5	-90	4.1	7.9		2526	9.0
3.1	8.9		3.5	8.5		3.8	8.2		0.5	-85	4.3	7.7		2387	9.5
3.3	8.7		3.7	8.3		4.1	7.9		0.5	-80	4.6	7.4		2247	10.1
3.5	8.5		3.9	8.1		4.4	7.6		0.5	-75	4.9	7.1		2108	10.8
3.6	8.4		4.0	8.0		4.4	7.6		0.5	-74	5.0	7.0		2080	10.9
3.6	8.4		4.1	7.9		4.5	7.5		0.5	-73	5.0	7.0		2052	11.1
3.7	8.3		4.1	7.9		4.5	7.5		0.5	-72	5.1	6.9		2024	11.2
3.7	8.3		4.2	7.8		4.6	7.4		0.5	-71	5.2	6.8		1996	11.4
3.8	8.2		4.2	7.8		4.7	7.3		0.5	-70	5.2	6.8		1968	11.5

3.8	8.2		4.3	7.7		4.7	7.3		0.5	-69	5.3	6.7		1940	11.7
3.9	8.1		4.4	7.6		4.8	7.2		0.5	-68	5.4	6.6		1912	11.9
4.0	8.0		4.4	7.6		4.9	7.1		0.5	-67	5.5	6.5		1885	12.0
4.0	8.0		4.5	7.5		4.9	7.1		0.5	-66	5.6	6.4		1857	12.2
4.1	7.9		4.6	7.4		5.0	7.0		0.5	-65	5.6	6.4		1829	12.4
4.1	7.9		4.6	7.4		5.1	6.9		0.5	-64	5.7	6.3		1801	12.6
4.2	7.8		4.7	7.3		5.2	6.8		0.5	-63	5.8	6.2		1773	12.8
4.3	7.7		4.8	7.2		5.3	6.7		0.5	-62	5.9	6.1		1745	13.0
4.4	7.6		4.9	7.1		5.4	6.6		0.5	-61	6.0	6.0		1717	13.2
4.4	7.6		4.9	7.1		5.4	6.6		0.5	-60	6.1	5.9		1690	13.4
4.5	7.5		5.0	7.0		5.5	6.5		0.5	-59	6.2	5.8		1662	13.6
4.6	7.4		5.1	6.9		5.6	6.4		0.5	-58	6.3	5.7		1634	13.8
4.7	7.3		5.2	6.8		5.7	6.3		0.5	-57	6.4	5.6		1606	14.1
4.7	7.3		5.3	6.7		5.8	6.2		0.5	-56	6.5	5.5		1578	14.3
4.8	7.2		5.4	6.6		5.9	6.1		0.5	-55	6.7	5.3		1550	14.6
4.9	7.1		5.5	6.5		6.0	6.0	1	0.5	-54	6.8	5.2	1	1523	14.8
5.0	7.0		5.6	6.4		6.2	5.8	2	0.5	-53	6.9	5.1	2	1495	15.1
5.1	6.9		5.7	6.3		6.3	5.7	3	0.5	-52	7.0	5.0	3	1467	15.4
5.2	6.8		5.8	6.2		6.4	5.6	4	0.5	-51	7.2	4.8	4	1439	15.6
5.3	6.7		5.9	6.1		6.5	5.5	5	0.5	-50	7.3	4.7	5	1412	15.9
5.4	6.6		6.0	6.0	1	6.7	5.3	6	0.5	-49	7.5	4.5	6	1384	16.3
5.5	6.5		6.2	5.8	2	6.8	5.2	7	0.5	-48	7.6	4.4	7	1356	16.6
5.6	6.4		6.3	5.7	3	6.9	5.1	8	0.5	-47	7.8	4.2	8	1328	16.9
5.8	6.2		6.4	5.6	4	7.1	4.9	9	0.5	-46	8.0	4.0	9	1301	17.3
5.9	6.1		6.6	5.4	5	7.2	4.8	10	0.5	-45	8.1	3.9	10	1273	17.6
6.0	6.0	1	6.7	5.3	6	7.4	4.6	1	0.5	-44	8.3	3.7	1	1245	18.0
6.2	5.8	2	6.9	5.1	7	7.6	4.4	2	0	-43	8.5	3.5	2	1217	18.4
6.3	5.7	3	7.0	5.0	8	7.7	4.3	1	0	-42	8.7	3.3	1	1190	18.8
6.5	5.5	4	7.2	4.8	9	7.9	4.1	1	0	-41	8.9	3.1	1	1162	19.2
6.6	5.4	5	7.4	4.6	10	8.1	3.9	1	0	-40	9.1	2.9	1	1134	19.7
6.8	5.2	6	7.6	4.4	1	8.3	3.7	1	0	-39	9.4	2.6	1	1107	20.1
7.0	5.0	7	7.8	4.2	2	8.6	3.4	1	0	-38	9.6	2.4	1	1079	20.6
7.2	4.8	8	8.0	4.0	1	8.8	3.2	1	0	-37	9.9	2.1	1	1052	21.1
7.3	4.7	9	8.2	3.8	10	9.0	3.0	1	0	-36	10.1	1.9	1	1024	21.6
7.6	4.4	10	8.4	3.6	1	9.3	2.7	1	0	-35	10.4	1.6	1	996	22.2
7.8	4.2	1	8.7	3.3	2	9.5	2.5	1	0	-34	10.7	1.3	1	969	22.8
8.0	4.0	2	8.9	3.1	1	9.8	2.2	1	0	-33	11.0	1.0	1	941	23.4

8.3	3.7	1	9.2	2.8	1	10.1	1.9	1	0	-32	11.4	0.6	1	914	24.1
8.5	3.5	10	9.5	2.5	1	10.4	1.6	1	0	-31	11.7	0.3	1	886	24.7
8.8	3.2	1	9.8	2.2	1	10.8	1.2	1	0	-30	12.1	0.1	1	859	25.5
9.1	2.9	2	10.1	1.9	1	11.1	0.9	1	0	-29	12.5	0.5	1	832	26.2
9.4	2.6	1	10.5	1.5	1	11.5	0.5	1	0	-28	12.9	0.9	1	804	27.0
9.8	2.2	1	10.9	1.1	1	11.9	0.1	1	0	-27	13.4	1.4	1	777	27.9
10.1	1.9	1	11.3	0.7	1	12.4	0.4	1	0	-26	13.9	1.9	1	750	28.8
10.5	1.5	1	11.7	0.3	1	12.9	0.9	1	0	-25	14.4	2.4	1	723	29.7
10.9	1.1	1	12.2	0.2	1	13.4	1.4	1	0	-24	15.0	3.0	1	696	30.8
11.4	0.6	1	12.7	0.7	1	14.0	2.0	1	0	-23	15.6	3.6	1	669	31.8
11.9	0.1	1	13.2	1.2	1	14.6	2.6	1	0	-22	16.3	4.3	1	642	33.0
12.5	0.5	1	13.9	1.9	1	15.2	3.2	1	0	-21	17.0	5.0	1	615	34.2
13.1	1.1	1	14.5	2.5	1	15.9	3.9	1	0	-20	17.8	5.8	1	588	35.5
13.7	1.7	1	15.2	3.2	1	16.7	4.7	10	0	-19	18.7	6.7	10	562	36.9
14.5	2.5	1	16.1	4.1	1	17.6	5.6	1	0	-18	19.7	7.7	1	535	38.4
15.3	3.3	1	16.9	4.9	10	18.6	6.6	2	0	-17	20.7	8.7	2	509	40.0
16.2	4.2	1	17.9	5.9	1	19.7	7.7	1	0	-16	21.9	9.9	1	483	41.8
17.2	5.2	1	19.0	7.0	2	20.9	8.9	1	0	-15	23.2	11.2	1	457	43.6
18.3	6.3	1	20.3	8.3	1	22.2	10.2	1	0	-14	24.7	12.7	1	431	45.6
19.7	7.7	1	21.7	9.7	1	23.7	11.7	1	0	-13	26.3	14.3	1	406	47.7
21.2	9.2	1	23.3	11.3	1	25.5	13.5	1	0	-12	28.2	16.2	1	381	50.0
22.9	10.9	1	25.2	13.2	1	27.5	15.5	1	0	-11	30.3	18.3	1	357	52.4
24.9	12.9	1	27.4	15.4	1	29.7	17.7	1	0	-10	32.7	20.7	1	333	55.0
27.3	15.3	1	29.9	17.9	1	32.4	20.4		0	-9	35.5	23.5		310	57.8
30.1	18.1	1	32.9	20.9		35.5	23.5		0	-8	38.8	26.8		287	60.8
33.6	21.6		36.5	24.5		39.2	27.2		0	-7	42.6	30.6		266	63.9
37.7	25.7		40.8	28.8		43.6	31.6		0	-6	47.0	35.0		246	67.2
42.9	30.9		46.0	34.0		48.8	36.8		0	-5	52.1	40.1		228	70.7
49.3	37.3		52.3	40.3		55.0	43.0		0	-4	58.1	46.1		212	74.4
57.1	45.1		59.9	47.9		62.3	50.3		0	-3	65.0	53.0		199	78.1
90.0	78.0		90.0	78.0		90.0	78.0		0	0	90.0	78.0		180	90.0
37.7	205.7		40.8	208.8		43.6	211.6		0	6	47.0	215.0		246	67.2
24.9	192.9		27.4	195.4		29.7	197.7		0	10	32.7	200.7		333	55.0
13.1	181.1		14.5	182.5		15.9	183.9		0	20	17.8	185.8		588	35.5
8.8	176.8		9.8	177.8		10.8	178.8		0	30	12.1	180.1		859	25.5
6.6	174.6		7.4	175.4		8.1	176.1		0	40	9.1	177.1		1134	19.7
5.3	173.3		5.9	173.9		6.5	174.5		0	50	7.3	175.3		1412	15.9

[illegible]

Additional Miss Distances																
400km	400km	400km	700km	700km	700km	700km	830km				80km	115km	143km	330km	530km	830km
Phase	Filter	Range	Angle to	Phase	Filter	Range	Angle to	Tilt	Time		Angle to	Angle to	Angle to	Angle to	Angle to	Angle to
Angle			Nucleus	Angle			Nucleus		(sec)		Nucleus	Nucleus	Nucleus	Nucleus	Nucleus	Nucleus
12.0		9676800	0.0	12.0		9676800	0.0	6 or 3	-345600		0.0	0.0	0.0	0.0	0.0	0.0
12.0		8467200	0.0	12.0		8467200	0.0	6 or 3	-302400		0.0	0.0	0.0	0.0	0.0	0.0
12.0		7257600	0.0	12.0		7257600	0.0	6 or 3	-259200		0.0	0.0	0.0	0.0	0.0	0.0
12.0		6048000	0.0	12.0		6048000	0.0	6 or 3	-216000		0.0	0.0	0.0	0.0	0.0	0.0
12.0		4838400	0.0	12.0		4838400	0.0	6 or 3	-172800		0.0	0.0	0.0	0.0	0.0	0.0
12.0		3628800	0.0	12.0		3628800	0.0	6 or 3	-129600		0.0	0.0	0.0	0.0	0.0	0.0
12.0		2419200	0.0	12.0		2419200	0.0	6 or 3	-86400		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1814400	0.0	12.0		1814400	0.0	6 or 3	-64800		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1693440	0.0	12.0		1693440	0.0	6 or 3	-60480		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1572480	0.0	12.0		1572480	0.0	6 or 3	-56160		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1451520	0.0	12.0		1451520	0.0	6 or 3	-51840		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1330560	0.0	12.0		1330560	0.0	6 or 3	-47520		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1209600	0.0	12.0		1209600	0.0	6 or 3	-43200		0.0	0.0	0.0	0.0	0.0	0.0
12.0		1088640	0.0	12.0		1088640	0.0	6 or 3	-38880		0.0	0.0	0.0	0.0	0.0	0.0
12.0		967680	0.0	12.0		967680	0.0	6 or 3	-34560		0.0	0.0	0.0	0.0	0.0	0.0
12.0		846720	0.0	12.0		846720	0.1	6 or 3	-30240		0.0	0.0	0.0	0.0	0.0	0.1
12.0		725760	0.1	11.9		725760	0.1	6 or 3	-25920		0.0	0.0	0.0	0.0	0.0	0.1
12.0		604800	0.1	11.9		604800	0.1	6 or 3	-21600		0.0	0.0	0.0	0.0	0.1	0.1
12.0		504000	0.1	11.9		504000	0.1	6 or 3	-18000		0.0	0.0	0.0	0.0	0.1	0.1
12.0		483840	0.1	11.9		483841	0.1	6 or 3	-17280		0.0	0.0	0.0	0.0	0.1	0.1
11.9		423360	0.1	11.9		423361	0.1	6 or 3	-15120		0.0	0.0	0.0	0.0	0.1	0.1
11.9		403200	0.1	11.9		403201	0.1	6 or 3	-14400		0.0	0.0	0.0	0.0	0.1	0.1
11.9		362880	0.1	11.9		362881	0.1	6 or 3	-12960		0.0	0.0	0.0	0.1	0.1	0.1
11.9		302400	0.1	11.9		302401	0.2	6 or 3	-10800		0.0	0.0	0.0	0.1	0.1	0.2
11.9		277200	0.1	11.9		277201	0.2	6 or 3	-9900		0.0	0.0	0.0	0.1	0.1	0.2
11.9		252000	0.2	11.8		252001	0.2	6 or 3	-9000		0.0	0.0	0.0	0.1	0.1	0.2
11.9		226800	0.2	11.8		226801	0.2	6 or 3	-8100		0.0	0.0	0.0	0.1	0.1	0.2
11.9		201600	0.2	11.8		201601	0.2	6 or 3	-7200		0.0	0.0	0.0	0.1	0.2	0.2

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11.9		176400	0.2	11.8		176401	0.3	6 or 3	-6300	0.0	0.0	0.0	0.1	0.2	0.3
11.8		151201	0.3	11.7		151202	0.3	6 or 3	-5400	0.0	0.0	0.1	0.1	0.2	0.3
11.8		126001	0.3	11.7		126002	0.4	6 or 3	-4500	0.0	0.1	0.1	0.2	0.2	0.4
11.8		100801	0.4	11.6		100802	0.5	2.5	-3600	0.0	0.1	0.1	0.2	0.3	0.5
11.7		84001	0.5	11.5		84003	0.6	2.5	-3000	0.1	0.1	0.1	0.2	0.4	0.6
11.7		75601	0.5	11.5		75603	0.6		-2700	0.1	0.1	0.1	0.3	0.4	0.6
11.7		67201	0.6	11.4		67204	0.7	2.5	-2400	0.1	0.1	0.1	0.3	0.5	0.7
11.5		50402	0.8	11.2		50405	0.9	2.5	-1800	0.1	0.1	0.2	0.4	0.6	0.9
11.3		33602	1.2	10.8		33607	1.4	2.5	-1200	0.1	0.2	0.2	0.6	0.9	1.4
11.0		22404	1.8	10.2		22411	2.1	2.5	-800	0.2	0.3	0.4	0.8	1.4	2.1
10.8		19604	2.0	10.0		19612	2.4	2.5	-700	0.2	0.3	0.4	1.0	1.5	2.4
10.8		19324	2.1	9.9		19333	2.5	2.5	-690	0.2	0.3	0.4	1.0	1.6	2.5
10.8		19044	2.1	9.9		19053	2.5	2.5	-680	0.2	0.3	0.4	1.0	1.6	2.5
10.8		18764	2.1	9.9		18773	2.5	2.5	-670	0.2	0.4	0.4	1.0	1.6	2.5
10.8		18484	2.2	9.8		18493	2.6	2.5	-660	0.2	0.4	0.4	1.0	1.6	2.6
10.7		18204	2.2	9.8		18213	2.6	2.5	-650	0.3	0.4	0.5	1.0	1.7	2.6
10.7		18204	2.2	9.8		18213	2.6	2.5	-650	0.3	0.4	0.5	1.0	1.7	2.6
10.7		17924	2.2	9.8		17934	2.7	2.5	-640	0.3	0.4	0.5	1.1	1.7	2.7
10.7		17645	2.3	9.7		17654	2.7	2.5	-630	0.3	0.4	0.5	1.1	1.7	2.7
10.7		17365	2.3	9.7		17374	2.7	2.5	-620	0.3	0.4	0.5	1.1	1.7	2.7
10.7		17085	2.3	9.7		17094	2.8	2.5	-610	0.3	0.4	0.5	1.1	1.8	2.8
10.6		16805	2.4	9.6		16815	2.8	2.5	-600	0.3	0.4	0.5	1.1	1.8	2.8
10.6		16525	2.4	9.6		16535	2.9	2.5	-590	0.3	0.4	0.5	1.1	1.8	2.9
10.6		16245	2.5	9.5		16255	2.9	2.5	-580	0.3	0.4	0.5	1.2	1.9	2.9
10.6		15965	2.5	9.5		15975	3.0	2.5	-570	0.3	0.4	0.5	1.2	1.9	3.0
10.5		15685	2.6	9.4		15696	3.0	2.5	-560	0.3	0.4	0.5	1.2	1.9	3.0
10.5		15405	2.6	9.4		15416	3.1	2.5	-550	0.3	0.4	0.5	1.2	2.0	3.1
10.5		15125	2.7	9.3		15136	3.1	2.5	-540	0.3	0.4	0.5	1.3	2.0	3.1
10.5		14845	2.7	9.3		14857	3.2	2.5	-530	0.3	0.4	0.6	1.3	2.0	3.2
10.4		14565	2.8	9.2		14577	3.3	2.5	-520	0.3	0.5	0.6	1.3	2.1	3.3
10.4		14286	2.8	9.2		14297	3.3	2.5	-510	0.3	0.5	0.6	1.3	2.1	3.3
10.4		14006	2.9	9.1		14017	3.4	2.5	-500	0.3	0.5	0.6	1.4	2.2	3.4
10.2		12746	3.1	8.9		12759	3.7	2.5	-455	0.4	0.5	0.6	1.5	2.4	3.7
10.2		12606	3.2	8.8		12619	3.8	2.5	-450	0.4	0.5	0.7	1.5	2.4	3.8
10.2		12466	3.2	8.8		12480	3.8	2.5	-445	0.4	0.5	0.7	1.5	2.4	3.8
10.1		12326	3.3	8.7		12340	3.9	2.5	-440	0.4	0.5	0.7	1.5	2.5	3.9
10.1		12187	3.3	8.7		12200	3.9	2.5	-435	0.4	0.5	0.7	1.6	2.5	3.9

Sheet1

10.1		12047	3.3	8.7		12060	3.9	2.5	-430	0.4	0.5	0.7	1.6	2.5	3.9
10.1		11907	3.4	8.6		11921	4.0	2.5	-425	0.4	0.6	0.7	1.6	2.6	4.0
10.1		11767	3.4	8.6		11781	4.0	2.5	-420	0.4	0.6	0.7	1.6	2.6	4.0
10.0		11627	3.4	8.6		11641	4.1	2.5	-415	0.4	0.6	0.7	1.6	2.6	4.1
10.0		11487	3.5	8.5		11501	4.1	2.5	-410	0.4	0.6	0.7	1.6	2.6	4.1
10.0		11347	3.5	8.5		11362	4.2	2.5	-405	0.4	0.6	0.7	1.7	2.7	4.2
10.0		11207	3.6	8.4		11222	4.2	2.5	-400	0.4	0.6	0.7	1.7	2.7	4.2
9.9		10927	3.7	8.3		10942	4.3	2.5	-390	0.4	0.6	0.8	1.7	2.8	4.3
9.8		10648	3.8	8.2		10663	4.5	2.5	-380	0.4	0.6	0.8	1.8	2.9	4.5
9.8		10508	3.8	8.2		10523	4.5	2.5	-375	0.4	0.6	0.8	1.8	2.9	4.5
9.8		10368	3.9	8.1		10384	4.6	2.5	-370	0.4	0.6	0.8	1.8	2.9	4.6
9.8		10228	3.9	8.1		10244	4.6	2.5	-365	0.4	0.6	0.8	1.8	3.0	4.6
9.7		10088	4.0	8.0		10104	4.7	2.5	-360	0.5	0.7	0.8	1.9	3.0	4.7
9.7		9948	4.0	8.0		9965	4.8	2.5	-355	0.5	0.7	0.8	1.9	3.1	4.8
9.7		9808	4.1	7.9		9825	4.8	2.5	-350	0.5	0.7	0.8	1.9	3.1	4.8
9.6		9668	4.1	7.9		9685	4.9	2.5	-345	0.5	0.7	0.8	2.0	3.1	4.9
9.6		9528	4.2	7.8		9546	5.0	2.5	-340	0.5	0.7	0.9	2.0	3.2	5.0
9.6		9389	4.3	7.7		9406	5.1	2.5	-335	0.5	0.7	0.9	2.0	3.2	5.1
9.5		9249	4.3	7.7		9266	5.1	2.5	-330	0.5	0.7	0.9	2.0	3.3	5.1
9.5		9109	4.4	7.6		9127	5.2	2.5	-325	0.5	0.7	0.9	2.1	3.3	5.2
9.4		8969	4.5	7.5		8987	5.3	2.5	-320	0.5	0.7	0.9	2.1	3.4	5.3
9.4		8829	4.5	7.5		8848	5.4	2.5	-315	0.5	0.7	0.9	2.1	3.4	5.4
9.4		8689	4.6	7.4		8708	5.5	2.5	-310	0.5	0.8	0.9	2.2	3.5	5.5
9.3		8549	4.7	7.3		8569	5.6	2.5	-305	0.5	0.8	1.0	2.2	3.6	5.6
9.3		8410	4.8	7.2		8429	5.6	2.5	-300	0.5	0.8	1.0	2.2	3.6	5.6
9.2		8270	4.8	7.2		8290	5.7	2.5	-295	0.6	0.8	1.0	2.3	3.7	5.7
9.2		8130	4.9	7.1		8150	5.8	2.5	-290	0.6	0.8	1.0	2.3	3.7	5.8
9.1		7990	5.0	7.0		8011	5.9	2.5	-285	0.6	0.8	1.0	2.4	3.8	5.9
9.1		7850	5.1	6.9		7871	6.0	2.5	-280	0.6	0.8	1.0	2.4	3.9	6.0
9.0		7710	5.2	6.8		7732	6.2	2.5	-275	0.6	0.9	1.1	2.5	3.9	6.2
9.0		7571	5.3	6.7		7592	6.3	2.5	-270	0.6	0.9	1.1	2.5	4.0	6.3
8.9		7431	5.4	6.6		7453	6.4	2.5	-265	0.6	0.9	1.1	2.5	4.1	6.4
8.9		7291	5.5	6.5		7314	6.5	2.5	-260	0.6	0.9	1.1	2.6	4.2	6.5
8.8		7151	5.6	6.4		7174	6.6	2.5	-255	0.6	0.9	1.1	2.6	4.2	6.6
8.7		7011	5.7	6.3		7035	6.8	2.5	-250	0.7	0.9	1.2	2.7	4.3	6.8
8.7		6872	5.8	6.2		6896	6.9	2.5	-245	0.7	1.0	1.2	2.8	4.4	6.9
8.6		6732	5.9	6.1		6756	7.0	2.5	-240	0.7	1.0	1.2	2.8	4.5	7.0

8.5		6592	6.1	5.9		6617	7.2	2.5	-235	0.7	1.0	1.2	2.9	4.6	7.2
8.4		6452	6.2	5.8		6478	7.3	2.5	-230	0.7	1.0	1.3	2.9	4.7	7.3
8.4		6313	6.3	5.7		6339	7.5	2.5	-225	0.7	1.0	1.3	3.0	4.8	7.5
8.3		6173	6.5	5.5		6200	7.7	2.5	-220	0.7	1.1	1.3	3.1	4.9	7.7
8.2		6033	6.6	5.4		6061	7.9	2.5	-215	0.8	1.1	1.4	3.1	5.0	7.9
8.1		5894	6.8	5.2		5922	8.0	2.5	-210	0.8	1.1	1.4	3.2	5.2	8.0
8.0		5754	7.0	5.0		5783	8.2	2.5	-205	0.8	1.1	1.4	3.3	5.3	8.2
7.9		5614	7.1	4.9		5644	8.4	2.5	-200	0.8	1.2	1.5	3.4	5.4	8.4
7.7		5335	7.5	4.5		5366	8.9	2.5	-190	0.9	1.2	1.5	3.5	5.7	8.9
7.6		5195	7.7	4.3		5227	9.1	2.5	-185	0.9	1.3	1.6	3.6	5.8	9.1
7.5		5056	7.9	4.1		5088	9.4	2.5	-180	0.9	1.3	1.6	3.7	6.0	9.4
7.3		4916	8.1	3.9		4950	9.6	2.5	-175	0.9	1.3	1.7	3.9	6.2	9.6
7.2		4777	8.4	3.6		4811	9.9	2.5	-170	1.0	1.4	1.7	4.0	6.4	9.9
7.1		4637	8.6	3.4		4673	10.2	2.5	-165	1.0	1.4	1.8	4.1	6.5	10.2
6.9		4498	8.9	3.1		4534	10.5	2.5	-160	1.0	1.5	1.8	4.2	6.7	10.5
6.7		4358	9.2	2.8		4396	10.8	2.5	-155	1.1	1.5	1.9	4.3	7.0	10.8
6.6		4219	9.5	2.5		4258	11.2	0.5	-150	1.1	1.6	2.0	4.5	7.2	11.2
6.4		4080	9.8	2.2		4120	11.6	0.5	-145	1.1	1.6	2.0	4.6	7.4	11.6
6.2		3940	10.1	1.9		3982	12.0	0.5	-140	1.2	1.7	2.1	4.8	7.7	12.0
6.0		3801	10.5	1.5		3844	12.4	0.5	-135	1.2	1.7	2.2	5.0	8.0	12.4
5.7		3662	10.9	1.1		3707	12.8	0.5	-130	1.3	1.8	2.2	5.2	8.3	12.8
5.5		3523	11.3	0.7		3569	13.3	0.5	-125	1.3	1.9	2.3	5.4	8.6	13.3
5.2		3384	11.8	0.2		3432	13.9	0.5	-120	1.4	2.0	2.4	5.6	9.0	13.9
4.9		3245	12.3	0.3		3295	14.5	0.5	-115	1.4	2.0	2.5	5.9	9.3	14.5
4.6		3106	12.8	0.8		3159	15.1	0.5	-110	1.5	2.1	2.7	6.1	9.8	15.1
4.3		2967	13.4	1.4		3022	15.8	0.5	-105	1.6	2.2	2.8	6.4	10.2	15.8
3.9		2828	14.0	2.0		2886	16.5	0.5	-100	1.6	2.4	2.9	6.7	10.7	16.5
3.4		2690	14.7	2.7		2751	17.3	0.5	-95	1.7	2.5	3.1	7.1	11.3	17.3
3.0		2552	15.5	3.5		2615	18.2	0.5	-90	1.8	2.6	3.2	7.5	11.9	18.2
2.5		2413	16.4	4.4		2481	19.2	0.5	-85	1.9	2.8	3.4	7.9	12.6	19.2
1.9		2275	17.4	5.4		2347	20.3	0.5	-80	2.0	2.9	3.7	8.4	13.3	20.3
1.2		2138	18.4	6.4		2214	21.6	0.5	-75	2.2	3.1	3.9	8.9	14.2	21.6
1.1		2110	18.7	6.7		2187	21.8	0.5	-74	2.2	3.2	3.9	9.0	14.3	21.8
0.9		2083	18.9	6.9		2161	22.1	0.5	-73	2.2	3.2	4.0	9.2	14.5	22.1
0.8		2055	19.1	7.1		2134	22.4	0.5	-72	2.3	3.3	4.1	9.3	14.7	22.4
0.6		2028	19.4	7.4		2108	22.7	0.5	-71	2.3	3.3	4.1	9.4	14.9	22.7
0.5		2000	19.7	7.7		2081	23.0	0.5	-70	2.3	3.4	4.2	9.6	15.1	23.0

0.3		1973	19.9	7.9		2055	23.2	0.5	-69	2.4	3.4	4.2	9.7	15.3	23.2
0.1		1946	20.2	8.2		2029	23.6	0.5	-68	2.4	3.5	4.3	9.8	15.6	23.6
0.0		1918	20.5	8.5		2002	23.9	0.5	-67	2.4	3.5	4.4	10.0	15.8	23.9
0.2		1891	20.7	8.7		1976	24.2	0.5	-66	2.5	3.6	4.4	10.1	16.0	24.2
0.4		1863	21.0	9.0		1950	24.5	0.5	-65	2.5	3.6	4.5	10.3	16.2	24.5
0.6		1836	21.3	9.3		1924	24.9	0.5	-64	2.6	3.7	4.6	10.4	16.5	24.9
0.8		1809	21.6	9.6		1898	25.2	0.5	-63	2.6	3.7	4.6	10.6	16.7	25.2
1.0		1781	22.0	10.0		1872	25.6	0.5	-62	2.6	3.8	4.7	10.8	17.0	25.6
1.2		1754	22.3	10.3		1846	25.9	0.5	-61	2.7	3.9	4.8	10.9	17.2	25.9
1.4		1727	22.6	10.6		1820	26.3	0.5	-60	2.7	3.9	4.9	11.1	17.5	26.3
1.6		1700	23.0	11.0		1794	26.7	0.5	-59	2.8	4.0	4.9	11.3	17.8	26.7
1.8		1673	23.3	11.3		1768	27.1	0.5	-58	2.8	4.1	5.0	11.5	18.1	27.1
2.1		1645	23.7	11.7		1743	27.5	0.5	-57	2.9	4.1	5.1	11.7	18.4	27.5
2.3		1618	24.1	12.1		1717	27.9	0.5	-56	2.9	4.2	5.2	11.9	18.7	27.9
2.6		1591	24.4	12.4		1692	28.3	0.5	-55	3.0	4.3	5.3	12.1	19.0	28.3
2.8	1	1564	24.8	12.8	1	1666	28.8	0.5	-54	3.0	4.3	5.4	12.3	19.3	28.8
3.1	2	1537	25.3	13.3	2	1641	29.2	0.5	-53	3.1	4.4	5.5	12.5	19.7	29.2
3.4	3	1510	25.7	13.7	3	1616	29.7	0.5	-52	3.1	4.5	5.6	12.8	20.0	29.7
3.6	4	1483	26.1	14.1	4	1590	30.2	0.5	-51	3.2	4.6	5.7	13.0	20.4	30.2
3.9	5	1456	26.6	14.6	5	1565	30.7	0.5	-50	3.3	4.7	5.8	13.3	20.7	30.7
4.3	6	1429	27.0	15.0	6	1540	31.2	0.5	-49	3.3	4.8	6.0	13.5	21.1	31.2
4.6	7	1402	27.5	15.5	7	1515	31.7	0.5	-48	3.4	4.9	6.1	13.8	21.5	31.7
4.9	8	1375	28.0	16.0	8	1491	32.2	0.5	-47	3.5	5.0	6.2	14.1	21.9	32.2
5.3	9	1349	28.5	16.5	9	1466	32.8	0.5	-46	3.6	5.1	6.3	14.4	22.4	32.8
5.6	10	1322	29.1	17.1	10	1441	33.4	0.5	-45	3.6	5.2	6.5	14.7	22.8	33.4
6.0	1	1295	29.6	17.6	1	1417	34.0	0.5	-44	3.7	5.3	6.6	15.0	23.3	34.0
6.4	2	1269	30.2	18.2	2	1393	34.6	0	-43	3.8	5.5	6.8	15.3	23.8	34.6
6.8	1	1242	30.8	18.8	1	1369	35.2	0	-42	3.9	5.6	6.9	15.7	24.3	35.2
7.2	1	1216	31.4	19.4	1	1345	35.9	0	-41	4.0	5.7	7.1	16.0	24.8	35.9
7.7	1	1189	32.0	20.0	1	1321	36.5	0	-40	4.1	5.9	7.3	16.4	25.3	36.5
8.1	1	1163	32.7	20.7	1	1297	37.2	0	-39	4.2	6.0	7.5	16.8	25.9	37.2
8.6	1	1137	33.3	21.3	1	1274	38.0	0	-38	4.3	6.2	7.7	17.2	26.5	38.0
9.1	1	1111	34.0	22.0	1	1250	38.7	0	-37	4.4	6.3	7.9	17.7	27.1	38.7
9.6	1	1084	34.8	22.8	1	1227	39.5	0	-36	4.5	6.5	8.1	18.1	27.7	39.5
10.2	1	1058	35.5	23.5	1	1204	40.3	0	-35	4.7	6.7	8.3	18.6	28.4	40.3
10.8	1	1033	36.3	24.3	1	1182	41.1	0	-34	4.8	6.9	8.5	19.1	29.1	41.1
11.4	1	1007	37.1	25.1	1	1159	41.9	0	-33	4.9	7.1	8.8	19.7	29.8	41.9

12.1	1	981	38.0	26.0	1	1137	42.8	0	-32	5.1	7.3	9.1	20.2	30.6	42.8
12.7	1	956	38.9	26.9	1	1115	43.7	0	-31	5.3	7.5	9.4	20.8	31.4	43.7
13.5	1	930	39.8	27.8	1	1093	44.7	0	-30	5.4	7.8	9.7	21.4	32.2	44.7
14.2	1	905	40.8	28.8	1	1072	45.6	0	-29	5.6	8.1	10.0	22.1	33.1	45.6
15.0	1	880	41.8	29.8	1	1051	46.6	0	-28	5.8	8.3	10.3	22.8	34.1	46.6
15.9	1	855	42.8	30.8	1	1030	47.7	0	-27	6.0	8.6	10.7	23.6	35.0	47.7
16.8	1	831	43.9	31.9	1	1010	48.7	0	-26	6.3	9.0	11.1	24.4	36.1	48.7
17.7	1	806	45.0	33.0	1	990	49.9	0	-25	6.5	9.3	11.5	25.2	37.1	49.9
18.8	1	782	46.2	34.2	1	970	51.0	0	-24	6.8	9.7	12.0	26.2	38.3	51.0
19.8	1	758	47.4	35.4	1	951	52.2	0	-23	7.1	10.1	12.5	27.1	39.5	52.2
21.0	1	734	48.7	36.7	1	932	53.4	0	-22	7.4	10.6	13.1	28.2	40.7	53.4
22.2	1	711	50.0	38.0	1	914	54.7	0	-21	7.7	11.1	13.7	29.3	42.0	54.7
23.5	1	688	51.3	39.3	1	896	56.0	0	-20	8.1	11.6	14.3	30.5	43.4	56.0
24.9	10	666	52.8	40.8	10	879	57.3	0	-19	8.6	12.2	15.0	31.8	44.9	57.3
26.4	1	643	54.2	42.2	1	863	58.7	0	-18	9.0	12.9	15.8	33.2	46.4	58.7
28.0	2	622	55.8	43.8	2	847	60.2	0	-17	9.5	13.6	16.7	34.7	48.1	60.2
29.8	1	601	57.4	45.4	1	831	61.6	0	-16	10.1	14.4	17.7	36.4	49.8	61.6
31.6	1	580	59.0	47.0	1	816	63.2	0	-15	10.8	15.3	18.8	38.2	51.6	63.2
33.6	1	560	60.8	48.8	1	802	64.7	0	-14	11.5	16.3	20.0	40.1	53.5	64.7
35.7	1	541	62.5	50.5	1	789	66.3	0	-13	12.4	17.5	21.4	42.2	55.5	66.3
38.0	1	522	64.4	52.4	1	776	68.0	0	-12	13.4	18.9	23.1	44.5	57.6	68.0
40.4	1	505	66.3	54.3	1	765	69.6	0	-11	14.6	20.5	24.9	47.0	59.8	69.6
43.0	1	488	68.2	56.2	1	754	71.4	0	-10	15.9	22.3	27.1	49.7	62.2	71.4
45.8		473	70.2	58.2		744	73.1	0	-9	17.6	24.5	29.6	52.6	64.6	73.1
48.8		458	72.3	60.3		735	74.9	0	-8	19.7	27.2	32.6	55.8	67.1	74.9
51.9		445	74.4	62.4		727	76.7	0	-7	22.2	30.4	36.1	59.3	69.7	76.7
55.2		434	76.5	64.5		720	78.6	0	-6	25.5	34.4	40.4	63.0	72.4	78.6
58.7		424	78.7	66.7		714	80.4	0	-5	29.7	39.4	45.6	67.0	75.2	80.4
62.4		415	80.9	68.9		709	82.3	0	-4	35.5	45.8	51.9	71.3	78.1	82.3
66.1		409	83.2	71.2		705	84.2	0	-3	43.6	53.9	59.6	75.7	81.0	84.2
78.0		400	90.0	78.0		700	90.0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
235.2		434	76.5	244.5		720	78.6	0	6	25.5	34.4	40.4	63.0	72.4	78.6
223.0		488	68.2	236.2		754	71.4	0	10	15.9	22.3	27.1	49.7	62.2	71.4
203.5		688	51.3	219.3		896	56.0	0	20	8.1	11.6	14.3	30.5	43.4	56.0
193.5		930	39.8	207.8		1093	44.7	0	30	5.4	7.8	9.7	21.4	32.2	44.7
187.7		1189	32.0	200.0		1321	36.5	0	40	4.1	5.9	7.3	16.4	25.3	36.5
183.9		1456	26.6	194.6		1565	30.7	0	50	3.3	4.7	5.8	13.3	20.7	30.7

[illegible]