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2.16 - 2	= .16	1.145
1.90 - 2	= - 0.10	
1.00 - 2	= - 1.00	
2.32 - 2	= .32	1.309
2.38	= .38	1.240
3.32	= .32	1.209
1.56	= - .44	
2.30	= .30	1.200
2.24	= .24	1.173
2.00	= 0.0	1.000
2.48	= .48	1.302
2.26	= .26	
2.16	= .16	
2.10	= .10	
1.78	= - .22	
1.98	= - .02	
1.96	= - .04	
2.08	= .02	
2.16	= .16	
2.26	= .26	
2.06	= .06	
2.10	= .10	
1.98	= - .02	
2.32	= 0.32	

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1931phae.proj.232M

	1	2	3	4	5	6
A						
B			4 4	5		
C						
D					3 2	
					2 2	
E						
F	5	5	5	4	6	4
F	2	7	4	2	3	4

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A 14689

14.8 + br.

hyper □

	1	2	3	4	5	6	
A	3	3	3	4	2	4	19
B	3	2	5	5	3	4	22
C	3	4	4	4	3	4	22
D	1	5	2	6	1	1	16
E	8	4	6	5	4	4	31
F	7	4	3	3	5	4	26
	25	22	23	27	18	21	136

16.5 + br.

No. □ deg.

	1	2	3	4	5	6	
A	13	10	7	10	7	14	61
B	9	10	13	11	8	8	59
C	14	16	11	11	9	8	69
D	9	12	9	12	8	10	60
E	18	12	17	11	10	12	80
F	24	12	22	17	7	11	93
							422

Center □ deg.

	1	2	3	4	5	6	
A	4	9	10	9	8	11	51
B	12	10	8	10	9	9	58
C	8	10	14	8	8	9	57
D	11	12	14	10	11	11	68
E	15	11	8	9	15	12	70
F	9	7	13	10	9	14	62
							366

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1931phae.proj.2321A

For Index see page 215

Plate Counts for Sequences - H. Ames & R. W. Ford

Coma Virgo Extension

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1931pfae.proj.2321A

A14707 $13^h\ 10^m$ $-14.0°$ 180 m.
$282°$ $+46°$

Recount
Done

A	52	45	39	29	40	46	251
B	56	53	36	38	43	52	278
C	50	46	33	51	42	45	267
D	39	47	48	47	46	36	263
E	51	48	49	51	49	51	299
F	48	41	42	48	46	59	284
	296	280	247	264	266	289	=1642 = 1642 + 33 = 1675
	1	2	3	4	5	6	

log = 3.224 − .07 = 3.154

18.6

A	38	33	44	51	37	44	247
B	53	44	46	41	35	30	249
C	40	34	36	45	34	32	221
D	45	33	36	36	26	31	207
E	42	37	40	34	39	32	224
F	42	45	31	45	31	35	225
	260	226	229	252	202	204	=1373 = 1373 + 27 = 1400

log = 3.146 − .07 = 3.076

18.2

Mean = 1507 + 30 = 1537
log mean = 3.178 − .07 = 3.108

18.4

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A 14654 $13^h\ 10^m$ $-14.0°$ 60^{mi}

$282°$ $+46°$

Recount.

A	17	15	21	30	24	26	133
B	19	18	27	21	20	24	129
C	22	26	21	21	31	22	143
D	24	21	19	23	12	17	116
E	33	22	32	25	23	17	152
F	26	26	29	23	25	19	148
	141	128	149	143	135	125 =	821 + 16 = 837
	1	2	3	4	5	6	

$\log 837 = 2.923 - .02$

$= 2.903$

17.5

A	25	22	11	21	23	12	114
B	17	23	16	27	24	21	128
C	15	18	27	22	21	13	116
D	12	11	14	10	11	18	76
E	14	15	22	13	16	19	99
F	17	21	18	18	16	21	111
	100	110	108	111	111	104 =	644 + 13 = 657

$\log 657 = 2.818 - .02$

2.798

17.1

Mean = 732 + 14 = 746

$\log 746 = 2.873 - .02 = 2.853$

17.3

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1931phae.proj.2220A

A3708 $13^h\ 9^m$ $-12.1°$ 60^m

$282°$ $+49°$

Record

A	15	17	12	15	19	15	93
B	4	8	11	7	12	15	57
C	10	14	14	13	15	14	80
D	24	17	12	12	15	12	92
E	18	2	15	12	13	9	69
F	12	11	14	12	12	16	77
	83	69	78	71	86	81	= 468 + 9 = 477
	1	2	3	4	5	6	

Log. 477 = 2.678

16.7

A	8	10	9	17	22	9	75
B	13	11	8	12	8	14	66
C	11	10	12	13	12	13	71
D	11	12	17	15	9	15	79
E	12	8	9	12	18	13	72
F	15	9	17	11	12	9	73
	70	60	72	80	81	73	= 436 + 9 445

Log 445 = 2.648

16.6

Mean = 452 + 9. = 461

Log. 461 = 2.664

16.7

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1931phae.proj.2320A

A3466 $13^h\ 8^m$ -12.1° 11^m

282° $+49^\circ$

A	8	3	7	4	6	5	33
B	6	7	10	7	11	4	45
C	4	5	15	67 (3)	5	5	101
D	5	0	6	2	6	4	23
E	4	3	8	3	7	3	28
F	14	9	6	2	2	4	37
	41	27	54	83	37	25	= 267 + 5 = 272
	1	2	3	4	5	6	

Log 272 = 2.435

15.8

Record

A	7	7	5	0	0	4	23
B	4	3	4	3	6	4	24
C	7	2	5	5	8	6	33
D	3	13	6	2	2	1	27
E	7	9	5	6	4	5	36
F	33 (3)	14	9	2	6	6	70
	61	48	34	18	26	26	= 213 + 4 = 217

Log 217 = 2.336

15.5

mean 240 + 5 = 245

Log 245 = 2.389

15.7

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A14703 Done

$12^{h}\ 50^{m}$ -12.5° 180^{m}

274° $+49^{\circ}$

A	31	19	27	30	25	24	156
B	16	36	27	24	51	35	189
C	31	24	22	36	30	29	172
D	18	35	33	41	30	24	181
E	21	27	31	29	27	38	173
F	24	25	21	25	26	32	153
	141	166	161	185	189	182	1024 + 20 = 1044
	1	2	3	4	5	6	

Log 1044 = 3.019 − .07
= 2.949

17.8

A	27	28	44	32	38	27	196
B	37	26	33	26	31	28	181
C	34	42	35	19	28	31	189
D	34	27	20	23	27	36	167
E	33	21	30	24	30	26	164
F	37	23	27	31	22	37	177
	202	167	189	155	176	185	1074 + 21 = 1095

Recount

Log 1095 = 3.039 − 0.7
= 2.969

17.9

Mean 1049 + 20 = 1069
Log 1069 = 3.029 − .07
= 2.959

17.8

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1931phae.proj.2322A

A 4315 $12^h\ 46^m$ -12.5° 10^m

274° $+49^\circ$

A	2	1	5	2	4	2	16
B	5	3	2	1	1	3	15
C	6	0	1	2	1	2	12
D	3	5	0	3	2	4	17
E	4	2	2	6	3	6	23
F	3	3	4	1	3	1	15
	23	14	14	15	14	18	$=98+2=100$
	1	2	3	4	5	6	

Log 100 = 2.000 − 0.7
= 1.930

14.2

A	2	2	4	1	3	5	17
B	6	3	5	0	1	1	16
C	1	4	3	2	3	3	16
D	3	5	2	2	3	0	15
E	5	3	8	2	2	2	22
F	6	2	1	1	2	6	18
	23	19	23	8	14	17	$=104+2=106$

Log 106 = 2.025 − 0.7
= 1.955

14.2

Mean = 101 + 2 = 103

Log mean 103 = 2.013 − 0.7
= 1.943

14.2

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A 10039 $12^h\ 51^m$ $-12.3°$ 60^m

$274°$ $+49°$

Record.

A	8	4	6	5	2	1	26
B	4	4	6	3	2	5	24
C	6	8	11	6	6	4	41
D	6	3	2	4	5	7	27
E	7	8	9	5	8	8	45
F	6	4	5	3	10	4	32
	37	31	39	26	33	29	= 195 + 4 = 199
	1	2	3	4	5	6	

Log 199 = 2.299 − .07
= 2.229

15.1

A	9	8	12	6	7	6	48
B	5	2	6	11	7	5	36
C	4	10	5	6	11	6	42
D	12	12	5	3	9	2	43
E	7	9	7	8	11	7	49
F	8	3	5	4	7	7	34
	45	44	40	38	52	33	= 252 + 5 = 257

Log 257 = 2.410 − 0.7
= 2.340

15.5

mean = 223 + 4 = 227

Log mean 227 = 2.356 − .07 = 2.286

15.3

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A 14649 $12^h\ 50^m$ $-7.5°$ 180^m

$275°$ $+55°$

See A1944 pg 23 } A 8267 pg 22 } A 14689 pg 17 }

A	18	19	19	22	17	11	106
B	13	14	12	21	26	18	104
C	14	18	11	16	11	10	80
D	12	23	17	23	8	22	105
E	17	20	21	19	20	10	107
F	15	20	14	17	12	17	95
	89	114	94	118	97	88	= 597
	1	2	3	4	5	6	

Log 597 = 2.776 − .08
= 2.696

17.1

A	12	14	15	19	16	16	92
B	17	17	24	16	20	13	107
C	18	15	17	19	16	14	99
D	14	16	13	19	22	17	101
E	22	17	17	15	21	20	112
F	20	13	26	17	15	20	111
	103	92	112	105	110	100	= 622

Log 622 = 2.794 − .08
= 2.714

17.2

Log Mean 609 = 2.785 − 0.08
= 2.705

Seares
17.1

Log 597 = 2.776 } at $+60°\beta$ mag 17.3
Log 622 = 2.794 } at $\beta = +50°$ mag 16.8
Log 609 = 2.785 } at $\beta = 55°$ mag 17.05 Van Rhijn

Adopted mean mag 17.1

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1931phae.proj.2326A

A 14689 H $12^h\ 50^m$ $-7.5°$ 180^m

$275° + 55°$

A	22	21	23	17	19	27	129
B	23	21	17	22	19	22	124
C	33	26	18	23	18	28	146
D	24	23	26	21	19	18	131
E	21	27	21	23	25	24	141
F	33	18	24	29	21	17	142
	156	136	129	135	121	136	= 813
	1	2	3	4	5	6	

Log 813 = 2.910 − .08
= 2.830

17.6

A	24	20	23	20	17	18	122
B	16	22	16	21	17	18	110
C	14	24	22	21	19	24	124
D	25	27	29	11	20	21	133
E	24	26	21	25	21	20	137
F	19	12	17	15	15	22	100
	122	131	128	113	109	123	= 726

Log 726 = 2.861 − .08
= 2.781

17.4

Mean = 769.

Log mean = 2.886 − .08
= 2.806

Scan ✓
17.5

at β = +60 = 17.7
β = +50 = 17.3

Log mean 769 = 2.886

at β = +55 [17.5] / Van R

Adopted mean mag. 17.5

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18

A 15305 $12^h\ 50^m$ $-17.5°$ 180^m

$273° + 45°$

See A8857 pg 24
A 8838 pg 25

A	29	26	39	31	38	32	195	
B	32	37	38	46	42	27	222	Log 1332 = 3.125 − .06
C	43	39	33	29	29	43	216	
D	45	42	43	33	46	34	243	
E	36	37	24	44	29	41	211	
F	45	48	47	28	30	47	245	18.2
	230	229	224	211	214	224		
	1	2	3	4	5	6	1332	

A	32	50	36	39	32	40	229	
B	44	38	41	43	30	35	231	Log. 1324 = 3.122 − .06
C	28	39	33	43	22	35	200	= 3.062
D	28	31	38	35	39	35	206	
E	33	39	43	39	34	29	217	
F	39	28	42	35	33	38	215	18.1
	204	225	233	234	190	212	= 1298 + 26 = 1324	

Mean 1315 + 26 = 1341

Log. mean 1341 = 3.127 − .06
= 3.067

18.2

Log 1315 = 3.119

$\beta = 40°$	17.4
$\beta = 50°$	18.2
$\beta = 45°$	17.8

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A 15312 $13^h\ 30^m$ $-7.5°$ 180^m

$290°$ $+53°$

A	12	21	16	13	15	14	91
B	9	13	16	15	16	17	86
C	17	22	23	18	11	18	109
D	15	17	18	27	22	15	114
E	22	15	18	16	23	23	117
F	21	14	21	9	14	17	96
	96	102	112	98	101	104	
	1	2	3	4	5	6	613 +12 = 625

Log 625 = 2.796 − .10
= 2.696

17.0

A	27	24	19	16	20	12	118
B	18	16	26	17	14	15	106
C	17	18	22	21	17	23	118
D	25	13	14	17	23	19	111
E	21	26	19	16	21	16	113
F	12	27	17	18	19	16	109
	120	118	117	105	114	101	675 +13 = 688

Log 688 = 2.838 − .10
= 2.738

17.2

Means 644 +12 = 656

Log means 656 = 2.817 − .10
= 2.717

17.1

Log 644 = 2.81

$\beta = 60°$ 17.4

$\beta = 50°$ 17.0

$\beta = 53°$ 17.1

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1931phae.proj.23:2A

A6412 $13^h\ 29^m\ -7.3°$ 10^m

$290°\ +53°$ Oct. 1, 1931

(A15312)

A	3	5	6	10	4	5	33
B	10	6	6	4	6	8	40
C	6	6	10	7	9	6	44
D	7	7	10	4	9	5	42
E	4	3	12	11	5	5	40.
F	6	10	6	12	6	6	46
	36	37	50	48	39	35	
	1	2	3	4	5	6	

Log 250 = 2.398 − .10
= 2.298

15.5

245 + 5 = 250

A	5	5	6	7	4	6	33
B	6	11	5	8	4	6	40
C	4	7	7	6	7	10	41
D	8	2	8	10	7	4	39
E	5	6	6	5	6	6	34
F	8	5	8	9	3	11	44
	36	36	40	45	31	43	

Log 235 = 2.371 − .10
= 2.271

15.4

231 + 4 = 235

Mean 238 + 4 = 242

log mean 242 = 2.384 − .10

= 2.284

15.4

Log 238 = 2.38

$\beta = 50°$ 15.4

$\beta = 60°$ 15.8

$\beta = +55°$ 15.5

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1931phae.proj.232A

A4464 $13^h\ 26^m$ $-7.4°$ 60^m

$290°$ $+53°$ 10/21/31

(A15312)

A	10	5	4	6	3	4	32
B	8	11	9	6	8	5	47
C	6	5	5	9	10	8	43
D	6	2	9	7	7	7	38
E	11	5	6	3	10	4	39
F	6	2	3	11	5	10	37
	47	30	36	42	43	38	236

Log 236 = 2.373 -.025
= 2.348

15.6

A	3	8	7	6	8	5	37
B	9	5	5	8	7	12	46
C	6	9	11	11	5	6	48
D	2	8	7	5	6	9	37
E	9	10	9	5	6	7	46
F	10	10	8	8	6	8	50
	39	50	47	43	38	47	264

Log 274 = 2.438 -.025
= 2.413

15.9

Mean = 250 Log 250 = 2.398 -.025 = 2.373

15.7

Log 250 = 2.40

$\beta = +50°$ = 15.5
$\beta = +60°$ = 15.9
$\beta = +53$ = 15.6

Adopted 15.6

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1931phae.proj.23220A

A8267 $12^h\ 48^m$ $-7.2°$ 60^m

$275° + 55°$ 10|2|31

(A14689)

A	18	9	13	17	12	11	80
B	9	8	11	8	12	10	58
C	7	14	12	9	8	14	64
D	15	12	10	15	13	11	76
E	12	18	13	7	15	9	74
F	8	5	10	7	10	17	57
	69	66	69	63	70	72	= 409

Log 409 = 2.612 −.02
= 2.592

(16.7)

A	11	7	11	13	11	7	60
B	6	12	6	12	10	10	56
C	9	9	12	9	9	11	59
D	6	14	6	8	9	13	56
E	12	7	14	15	13	13	74
F	14	18	4	12	7	7	62
	58	67	53	69	59	61	= 367

Log 367 = 2.565 −.02
2.545

(16.5)

mean = 388. Log = 2.589 −.02 = Seares
2.569

(16.6)

Log 388 = 2.59

mag β = +60	16.6 ✓
β = +50	16.1 ✓
β = +55	16.35

Adopted mean 16.5

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1931phae.proj.2320A

A1944 $12^h\ 48^m$ $-7.3°$ 10^m

$275°$ $+55°$

Sat. 10/3/31

(A14689)

A	3	2	4	5	4	6	24
B	3	3	2	0	5	2	15
C	2	7	3	4	5	3	24
D	3	4	3	4	0	6	20
E	5	9	1	2	7	6	30
F	3	4	4	4	2	3	20
	19	29	17	19	23	26	= 133 +

Log 133 = 2.124 −.02
= 2.104

14.9

A	5	4	6	6	0	3	24
B	0	1	2	4	3	2	12
C	2	2	2	5	4	3	18
D	1	8	5	5	1	8	28
E	4	4	2	3	3	5	21
F	4	11	3	3	4	6	31
	16	30	20	26	15	27	= 134 +

Log 134 = 2.127 −.02
= 2.107

14.9

mean 134 Log 134 = 2.127 −.02
2.107

14.9

Log 134 = 2.13

β = +60 = 15.0
β = +50 = 14.6
β = +55 = 14.8

Adopted mean 14.8

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1931phae.proj.2312A

24

A8857 $12^h\ 44^m$ $-17.2°$ 60^m

$272°$ $+45°$ 10/5/31

(A15305)

A	10	10	11	15	11	7	64
B	11	10	10	15	20	10	76
C	22	18	10	9	15	18	92
D	16	18	6	11	10	17	78
E	14	17	12	21	16	17	97
F	15	14	18	10	14	25	96
	88	87	67	81	86	94	= 503

Log 50.3 = 2.702
−.01
= 2.692

(16.6)

A	23	19	17	14	19	19	111
B	15	16	25	18	13	17	104
C	13	15	19	18	14	19	98
D	19	18	22	11	16	22	108
E	14	15	21	16	18	12	96
F	19	25	26	11	19	21	121
	103	108	130	88	99	110	= 638

Log 638 = 2.804
−.01
= 2.794

(17.0)

Mean 570 Log 570 = 2.756 −.01 = 2.746

(16.8)

Log 570 = 2.76

β = +40 16.0
β = +50 16.7
1' = 45 16.35

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1931phae.proj..232A

A8838 $12^h\ 43^m$ $-17.2°$ 10^m

$272° +45°$ 10/6/31

(A15305)

A	1	7	2	5	4	4	23
B	1	4	6	4	11	2	28
C	10	3	3	3	4	7	30
D	7	5	1	3	5	4	25
E	2	4	8	9	6	4	33
F	8	5	6	7	7	5	38
	29	28	26	31	37	26	177

Log 177 = 2.248 ±0

15.0

A	8	5	8	4	6	6	37
B	3	4	5	5	4	5	26
C	8	3	9	5	1	5	31
D	5	7	6	4	4	5	31
E	3	6	8	5	3	5	30
F	8	10	6	5	5	3	37
	35	35	42	28	23	29	192

Log 192 = 2.283 ±0

15.2

Mean 184 Log 184 = 2.265 ±0

15.1

Log 184 = 2.26

$\beta = +40° = 14.5$

$\beta = +50° = 15.0$

$\beta = +45° = 14.75$

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1931phae.proj.2312A

A6720 $12^h\,30^m$ $+12.5°$ 227^m

263 +74 10/6/31

A	11	21	7	17	20	11	87
B	9	5	8	15	14	19	70
C	15	12	11	21	24	12	95
D	13	22	10	14	17	19	95
E	17	13	17	19	10	18	94
F	7	15	13	22	22	23	102
	72	88	66	108	107	102	543

Log 543 = 2.735 -.05
= 2.685

17.7

A	26	11	16	15	19	23	110
B	22	11	15	16	15	17	96
C	20	15	13	6	18	23	95
D	15	16	14	17	10	22	94
E	9	16	21	11	12	22	91
F	9	20	12	12	14	13	80
	101	89	91	77	88	120	566

Log 566 = 2.753 -.05
= 2.703

17.8

mean 554 Log 554 = 2.744 -.05 = 2.694

17.8

Log 554 = 2.74

$\beta = +70° = 17.5$
$\beta = +80° = 17.6$
$\beta = +74 = 17.5$

Adopted mean 17.6.

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1931phae.proj.2324A

A1535 $13^h 10^m$ $-17.5°$ 180^m

280 +44

10/7/31

A	26	22	17	23	20	18	126
B	20	13	26	29	32	28	148
C	27	28	25	19	31	23	153
D	23	19	31	21	24	23	141
E	25	20	22	16	18	24	125
F	18	29	29	27	18	16	137
	139	131	150	135	143	132	830

Log 830 = 2.919
−.07
= 2.849

17.1

A	37	24	27	21	33	16	158
B	25	24	30	26	30	19	154
C	19	23	31	15	17	22	127
D	39	23	26	22	29	26	165
E	42	21	20	21	23	27	154
F	27	20	30	24	18	28	147
	189	135	164	129	150	138	905

Log 905 = 2.957
−.07
= 2.877

17.3

Mean 867 Log 867 = 2.938 −.07 = 2.868

17.2

Log 867 = 2.94

B = +40° = 16.6
B = +50° = 17.4
B = +44° = 16.9

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1931phae.proj.2322A

A60793

$12^h 29^m$ $+13.0°$ 60^m

263 +75 10/7/31

A	4	8	10	11	2	4	39
B	4	3	5	9	8	5	34
C	9	8	9	12	5	2	45
D	6	7	7	8	6	8	42
E	12	9	7	8	6	5	47
F	3	5	8	9	8	8	41
	38	40	42	57	35	36	248

Log 248 = 2.394 -.05
2.344

A	8	7	10	7	10	11	53
B	7	6	15	10	6	6	50
C	7	3	6	2	7	5	30
D	5	5	7	8	5	11	41
E	4	6	10	4	7	7	38
F	5	11	4	5	9	6	40
	36	38	52	36	44	46	252

Log 252 = 2.401 -.05
2.351

Mean 250 Log 250 = 2.398 -.05
= 2.348

16.3

Log 250 = 2.40

$\beta = +70° = 16.2$
$\beta = +80° = 16.4$
$\beta = +75° = 16.3$

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1931phae.proj.2320A

A4250 $12^h 31^m$ $+12.7^\circ$ 10^m

$263^\circ + 74^\circ$ 10/7/31

A	0	0	0	1	0	0	1
B	1	1	2	3	1	2	10
C	1	2	1	0	0	1	5
D	1	1	0	1	1	1	5
E	0	2	2	0	0	3	7
F	3	0	0	0	1	1	5
	6	6	5	5	3	8	33 +1 = 34

Log 33 = 1.519

A	0	0	1	0	1	1	3
B	2	1	0	0	1	0	4
C	1	1	0	0	1	0	3
D	2	1	0	1	1	1	6
E	0	1	1	0	2	2	6
F	0	1	0	0	2	1	4
	5	5	2	1	8	5	26 +1 = 27

Log 26 = 1.415

Mean 29. Log 29 = 1.462

Log 29 = 1.46

$\beta = +70^\circ$ 13.0

$\beta = +80$ 13.2

$\beta = 74^\circ$ 13.1

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1931phae.proj.2322A

A 7738 $13^{h}\ 8^{m}$ $-17.0°$ 60^{m}

280 +44

10/8/31

A	17	18	12	11	10	14	82
B	9	17	13	12	18	22	91
C	16	18	12	13	11	18	88
D	10	18	12	11	16	11	78
E	14	16	8	16	7	11	72
F	9	10	12	17	17	16	81
	75	97	69	80	79	92	492

Log 472 = 2.674
−.02
= 2.654

16.4

A	12	19	10	15	18	10	84
B	15	11	11	12	14	17	80
C	7	13	8	11	12	13	64
D	17	14	10	12	10	11	74
E	13	15	23	10	7	9	77
F	20	8	11	11	12	17	79
	84	80	73	71	73	77	458

Log 458 = 2.661
−.02
= 2.641

16.3

Mean 475 Log 475 = 2.677 −.02 = 2.657

16.4

Log 475 = 2.68

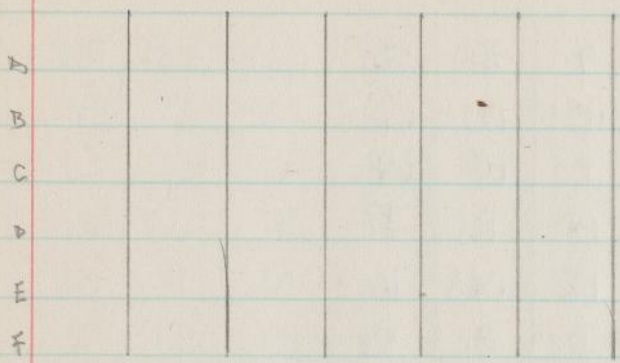
$\beta = 40° = 15.8$

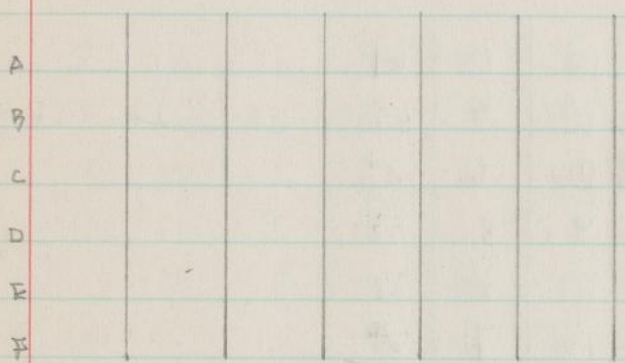
$\beta = 50° = 16.4$

$\beta = 44° = 16.2$ ×

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1931phae.proj.2322A

λ15361 $12^h\ 30^m$ $+27.5°$ 180^m

$195°$ $+73°$ 10/9/31

A	8	12	11	9	7	8	55
B	8	9	7	15	10	12	61
C	6	10	13	11	8	16	64
D	14	12	9	17	14	11	77
E	11	9	16	15	12	13	76
F	14	9	7	9	7	8	54
	61	61	63	76	58	68	387

$\log 387 = 2.588$
$+.05$
$= 2.638$

17.5

A	9	3	12	10	14	13	61
B	13	10	8	14	10	7	62
C	16	7	15	13	12	6	69
D	12	7	10	12	9	8	58
E	12	16	14	10	10	10	72
F	9	7	12	13	14	9	64
	71	50	71	72	69	53	386

$\log 386 = 2.587$
$+.05$
$= 2.637$

17.5

mean = 386 $\log 386 = 2.587 + .05 = 2.637$

17.5

$\log 386 = 2.59$

$\beta = +70° = 17.3$

$\beta = +80° = 17.3$

$\beta = +73° = 17.3$

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1931phae.proj.232.A

A15363 $12^h 50^m$ $+17.5°$ 180m

$280°$ $+78°$ 10/10/31

A	15	13	3	17	16	14	78
B	14	7	8	10	11	12	62
C	13	14	15	8	9	10	69
D	15	16	10	14	11	7	73
E	13	9	10	16	15	13	76
F	5	10	10	18	16	12	71
	75	69	56	83	78	68	429

Log 429 = 2.632
+.05
2.682

17.8

A	5	13	11	9	10	7	55
B	7	16	13	11	9	11	67
C	10	12	13	13	6	10	64
D	14	11	9	11	10	12	67
E	16	9	8	12	13	17	75
F	9	11	10	12	11	8	61
	61	72	64	68	59	65	389

Log 389 = 2.590
+.05
2.640

17.6

mean 409 Log 409 = 2.612 +.05 = 2.662 17.7

Log 409 = 2.61 —

$\beta = +70° = 17.0$

$\beta = +80° = 17.2$

$\beta = +78° = 17.2$

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1931phae.proj.23424A

A6752 $12^h\ 29^m$ +23.0 60^m

195° +73° 10/9/31

A	7	10	8	12	5	6	48
B	11	10	4	5	10	7	47
C	9	5	9	8	3	6	40
D	12	7	8	8	11	10	56
E	10	10	7	12	13	11	63
F	5	11	7	12	2	2	39
	54	53	43	57	44	42	293

Sog 293 = 2.467 ±0

16.8

A	11	5	6	4	7	10	43
B	11	10	4	8	8	5	46
C	8	9	7	10	11	14	59
D	4	11	5	2	11	8	41
E	7	6	11	11	9	4	48
F	4	4	4	5	4	3	24
	45	45	37	40	50	44	261

Sog 261 = 2.417 ±0

16.6

Mean 277 Log 277 = 2.442 ±0

16.7

Log 277 = 2.44

β = +70° = 16.6

β = +80° = 16.6

β = +73° = 16.6

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1931phae.proj.2322A

A 6726 $12^h\ 48^m$ $+18.0°$ 60^m

$280°$ $+78°$

10/10/31

A	6	7	9	0	7	5	34
B	6	9	5	4	2	9	35
C	10	9	8	9	4	7	47
D	12	5	11	7	10	7	52
E	4	11	11	8	10	8	52
F	6	4	7	9	11	8	45
	44	45	51	37	44	44	265

Log 265 = 2.423 ±0.0

16.7

A	7	0	10	9	4	8	38
B	2	6	10	10	8	7	43
C	10	9	9	13	12	4	57
D	5	5	8	8	7	6	39
E	5	13	6	4	9	9	46
F	8	5	10	9	8	5	45
	37	38	53	53	48	39	268

Log 268 = 2.428 ±.00

16.7

Mean 266 Log 266 = 2.425 ±.00

16.7

Log 271 = 2.43

$\beta = +70° = 16.3$

$\beta = +80° = 16.5$

$\beta = +78° = 16.5$

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1931phae.proj.2312A

A3063 $12^h\ 30^m$ $+22.5°$ 10^m

$195°$ $+73°$ 10/10/31

A	3	4	9	5	3	2	26
B	0	3	3	4	0	7	17
C	2	7	3	4	3	4	23
D	2	3	4	2	3	5	19
E	1	4	7	5	2	3	22
F	3	0	4	6	4	4	21
	11	21	30	26	15	25	128

Log 128 = 2.107 ±0.0

15.4

A	6	1	2	5	4	1	19
B	1	3	2	3	2	6	17
C	4	4	1	1	2	0	12
D	3	4	3	2	0	6	18
E	4	3	0	4	4	5	20
F	3	6	2	1	3	3	18
	21	21	10	16	15	21	104

Log 104 = 2.017 ±0.0

15.1

mean = 116 Log 116 = 2.064 ±0.0 (15.2)

Log 116 = 2.06

$\beta = +70° = 15.2$

$\beta = +80° = 15.3$

$\beta = +73° = 15.2$

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1934phae.proj.2220A

A5934 $12^h\ 48^m$ $+17.9°$ 10 m

$280°$ $+78°$ 10|13|31

3	0	2	0	2	0	7
3	2	0	1	3	0	9
1	2	0	3	1	2	9
4	1	0	4	1	1	11
0	4	3	2	1	2	12
0	0	0	1	2	1	4
11	9	5	11	10	6	52

Log 52 = 1.716 ±0.0

14.1

3	1	1	2	2	0	9
1	0	2	0	2	4	9
3	3	2	3	1	2	14
0	0	0	1	2	2	5
0	5	0	1	2	2	10
1	0	3	2	0	4	10
8	9	8	9	9	14	57

Log 57 = 1.756 ±0.0

14.3

Mean = 54 Log 54 = 1.732 ±0.0

14.2

Log 54 = 1.73

$\beta = +70° = 13.9$

$\beta = +80° = 14.0$

$\beta = +78° = 14.0$

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1931phae.proj.2322A

A 15365 14ᴴ 50ᵐ −7.5° 180ᵐ

315° +42°

10/13/31

17	18	21	16	23	22	117
16	17	16	19	20	19	107
18	25	18	18	27	21	127
23	17	16	29	24	21	133
28	21	22	21	18	24	134
19	19	25	22	20	21	126
121	117	118	125	135	128	744

Log 744 = 2.872
−.10
= 2.772

16.7

28	24	19	24	23	15	133
20	28	18	28	24	22	140
19	24	28	25	17	24	137
27	29	33	31	22	12	154
24	20	18	29	25	21	137
30	25	21	21	28	26	151
148	150	137	158	139	120	852

Log 852 = 2.930
− .10
= 2.830

16.9

Mean = 798 Log 798 = 2.902 − .10 = 2.802

16.8

Log 798 = 2.90

β = +40° = 16.8
β = +50° = 17.3
β = +42° = 16.9

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1934phae.proj.2320A

A15389 $12^h\ 7^m$ $+7.7°$ 180 mm (?)

$250°$ $+68°$ 10/15/31

21	16	16	20	22	23	118
12	15	13	18	17	11	86
11	17	11	11	16	22	88
17	13	13	19	18	18	98
12	18	17	17	20	12	96
18	13	16	12	19	20	98
91	92	86	97	112	106	584

Log 584 = 2.766
-.04
= 2.726

17.7

22	14	13	7	14	7	77
21	18	9	15	16	14	93
19	22	17	15	14	13	100
17	19	20	10	10	12	88
12	15	14	10	22	26	99
11	12	11	13	21	19	87
102	100	84	70	97	91	544

Log 544 = 2.736
-.04
2.696

17.6

Mean = 564 Log 564 = 2.751 - .04 = 2.711

17.6

Log 564 = 2.75

$\beta = +60° = 17.3$
$\beta = +70° = 17.6$
$\beta = +68° = 17.6$

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1931phae.proj.2322A

A 3777 $14^h\ 48^m$ $-7.3°$ 60^m

$315°$ $+42°$ 10/14/31

7	16	9	9	15	10	66
12	12	14	11	9	12	70
15	9	16	14	9	14	77
10	15	16	9	6	11	67
14	19	5	11	10	11	70
15	17	13	12	12	8	77
73	88	73	66	61	66	427

Log 427 = 2.630

13	10	17	12	13	11	76
14	9	12	21	16	8	80
13	12	8	12	17	12	74
19	17	14	16	17	8	91
12	10	11	16	17	10	76
15	14	15	22	14	9	89
86	72	77	99	94	58	480

Log 486 = 2.687

Mean = 457 Log 457 = 2.660

Log 457 = 2.66

$\beta = +40° = 16.0$

$\beta = +50° = 16.5$

$\beta = +42° = 16.1$

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1931phae.proj.2320A

A6789 $12^h\ 8^m$ $+7.7°$ 60^m

250° +68°

10/15/31

8	8	5	7	5	5	38
6	4	8	3	4	4	29
5	5	15	4	6	7	42
5	7	5	5	6	9	37
5	8	5	7	8	6	39
7	9	2	7	7	3	35
36	41	40	33	36	34	220

Log 220 = 2.342
∓.00

16.1

9	12	9	5	8	6	49
4	3	9	7	6	7	36
7	10	5	8	7	4	41
2	9	4	3	2	7	27
4	9	13	6	3	7	42
8	3	4	2	7	9	33
34	46	44	31	33	40	228

Log 228 = 2.358
∓0.0

16.2

Mean = 224 Log 224 = 2.350 16.1

224 = 2.35

Log 228 = 2.36

β = +60° = 15.9

β = +70° = 16.1

β = +68° = 16.1

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1931phae.proj.2322A

A1950 $14^h 48^m$ $-7.3°$ 10^m

$315°$ $+48°$ 10/16/31

3	6	2	1	4	2	18
3	2	4	7	7	2	25
3	3	9	4	3	6	28
5	2	5	2	3	7	24
2	7	3	6	0	1	19
4	5	2	7	5	5	28
20	25	25	27	22	23	142

Log 142 = 2.152
+.09
= 2.242

15.1

5	4	1	6	4	4	24
3	2	5	7	8	1	26
5	1	3	4	3	4	20
7	5	4	3	6	5	30
2	2	2	4	4	1	15
5	4	2	6	7	4	28
27	18	17	30	32	19	143

Log 143 = 2.155
+.09
= 2.245

15.1

Mean = 142 = 2.152 +.09 = 2.242

15.1

Log 142 = 2.15

$\beta = +40° = 14.5$

$\beta = +50° = 14.8$

$\beta = +48° = 14.8$

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1931phae.proj.2328A

Δ 3723 $12^h\ 9^m$ $+7.5°$ 10^m

250° +68° 10/16/31

4	6	4	3	1	5	23
4	4	4	2	3	2	19
2	5	3	5	1	4	20
3	3	1	1	2	3	13
3	2	2	3	4	1	15
5	3	4	2	3	3	20
21	23	18	16	14	18	110

Log 110 = 2.041
−.02
= 2.021

15.0

5	2	7	5	2	6	27
3	4	3	3	2	0	15
2	6	2	3	4	6	23
3	2	1	3	3	0	12
5	5	3	5	2	2	22
3	2	3	3	1	6	18
21	21	19	22	14	20	117

Log 117 = 2.068
−.02
= 2.048

15.1

15.0

Mean = 114 Log 114 = 2.057 −.02 = 2.037

Log 114 = 2.06

β = +60° = 14.8
β = +70° = 15.0
β = +68° = 15.0

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1931phae.proj.2312A

A15370 $12^h\ 50^m$ $+12.5°$ 180^m

$280 + 74^0$ 10/16/31

23	12	9	13	12	11	80
13	16	14	12	19	29	103
15	18	11	13	19	18	94
9	15	11	7	22	18	82
15	18	13	11	14	15	86
17	14	9	15	19	22	96
92	93	67	71	105	113	541

Log 541 = 2.733
+.04
= 2.773

(18.1)

17	22	9	13	11	17	89
15	18	16	11	14	6	80
11	8	17	19	19	14	88
14	15	14	11	9	11	74
15	8	17	15	13	17	85
17	18	13	19	10	15	92
89	89	86	88	76	80	508

Log 508 = 2.706
+.04
= 2.746

(18.0)

Mean = 524 Log 524 = 2.719 +.04 = 2.759

(18.1)

Log 524 = 2.72

$\beta = +70° = 17.4$
$\beta = +80° = 17.6$
$\beta = +74° = 17.5$

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1931phae.proj.2320A

A1273 $12^h\ 49^m$ $+12\frac{1}{2}.8^\circ$ 10^m

280° $+74^\circ$ 10/17/31

3	1	0	2	1	1	8
1	5	4	1	5	3	19
3	2	3	0	1	1	10
0	0	2	1	3	5	11
1	3	1	4	1	2	12
3	0	1	3	4	3	14
11	11	11	11	15	15	74

Log 74 = 1.869 ± 0.0

(14.6)

3	1	1	1	0	2	8
6	1	3	3	3	2	18
1	3	1	1	0	0	6
2	0	3	3	1	4	13
2	1	0	2	0	0	5
0	1	5	3	1	3	13
14	7	13	13	5	11	63

Log 63 = 1.799 ± 0.0

(14.3)

Mean = 69. Log 69 = 1.839 ± 0.0 (14.5)

Log 69 = 1.84

$\beta = +70^\circ = 14.3$

$\beta = +80^\circ = 14.4$

$\beta = +74^\circ = 14.3$

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1931phae.proj.2342A

A15377 $11^h\ 30^m$ $+12.5°$ 180^m

220° +67° 10/17/31

15	7	9	13	9	14	67
17	12	8	8	13	13	71
16	18	13	8	12	19	86
11	9	15	14	18	13	80
15	14	16	8	12	12	77
17	13	8	11	5	12	66
91	73	69	62	69	83	447

Log 447 = 2.650
− .01
= 2.640

17.3

15	10	16	18	15	18	92
14	19	20	12	16	10	91
14	9	9	15	15	9	71
17	10	9	8	12	7	63
7	15	12	11	15	14	74
14	10	13	18	11	19	85
81	73	79	82	84	77	476

Log 476 = 2.678
− .01
= 2.668

17.4

Mean = 462 Log 462 = 2.665 − .01 = 2.655

17.4

Log 462 = 2.66

β = +60° = 17.2
β = +70° = 17.4
β = +67° = 17.3

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1934phae.proj.2328A

A4244 $11^h\ 32^m$ $+12.7°$ $10.^m$

$220°$ $+67°$ 10/17/31

1	3	2	2	3	2	13
2	2	2	0	1	1	8
2	1	1	1	1	3	9
1	3	2	1	2	1	10
4	1	0	0	1	1	7
0	1	2	0	3	1	7
10	11	9	4	11	9	54

Log 54 = 1.732
+ .06
1.792

(14.2)

3	1	3	1	3	0	11
4	3	3	3	3	1	17
4	2	1	1	2	1	11
2	2	1	4	3	2	14
0	5	0	2	2	1	10
0	2	0	2	2	1	7
13	15	8	13	15	6	70

Log 70 = 1.845
+ .06
1.905

(14.6)

Mean = 62

Log 62 = 1.793 + .06 = 1.853

(14.4)

Log 62 = 1.79

$\beta = +60°$ = 14.1

$\beta = +70°$ = 14.2

$\beta = +67°$ = 14.2

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1931phae.proj.23324A

A15384 $13^h\ 10^m$ $+12.5°$ 180^m

295° +73° 10/19/34

11	13	13	14	11	17	79
11	18	16	13	16	10	84
21	16	12	20	19	9	97
12	15	13	20	10	17	87
11	13	9	5	14	7	59
18	6	16	17	14	16	87
84	81	79	89	84	76	493

Log 493 = 2.692
+.05
2.742

(18.0)

9	16	10	21	14	14	84
23	14	13	14	13	2	79
12	12	12	21	19	12	88
19	14	14	16	9	11	83
20	18	7	13	10	17	85
10	11	14	9	17	13	74
93	85	70	94	82	69	493

Log

Mean = 493 = 2.692

(18.0)

Log 493 = 2.69

$\beta = +70° = 17.3$
$\beta = +80° = 17.5$
$\beta = +73° = 17.4$

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1931phae.proj.2926A

A 4258 $13^h\ 9^m$ $+12.9°$ 10^m

$295°$ $+73°$ 10/19/31

1	2	0	1	2	0	6
2	2	1	0	1	0	6
0	0	0	1	0	1	2
1	0	3	2	1	0	7
2	2	0	0	0	0	4
3	3	2	1	1	0	10
9	9	6	5	5	1	35

Log 35 = 1.544

1	2	2	1	2	2	10
3	3	1	2	2	2	13
2	2	1	2	1	3	11
3	2	2	0	0	0	7
1	1	2	2	2	0	8
3	1	1	4	0	0	9
13	11	9	11	7	7	58

Log 58 = 1.763

mean = 46 Log 46 = 1.663

Log 46 = 1.66

$\beta = +70° = 13.7$

$\beta = +80° = 13.8$

$\beta = +73° = 13.7$

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1931phae.proj.23323A

A 15413 10 48 −7.0 180

229° +46° 10/20/31

23	25	27	14	23	15	127
16	17	21	21	20	10	105
17	12	13	25	24	13	104
22	16	17	27	24	23	129
14	23	20	21	22	24	124
31	21	18	25	27	11	133
123	114	116	133	140	96	722

Log 722 = 2.858 ±0.0

17.3

23	19	14	14	17	19	106
19	23	35	16	24	17	134
19	15	26	33	15	18	126
20	22	18	21	22	20	123
23	21	26	13	26	25	134
15	19	19	23	15	19	110
119	119	138	120	119	118	733

Log 733 = 2.865 ±0.0

17.3

Mean = 728

Log 728 = 2.862 ±0.0 (17.3)

Log 728 = 2.86

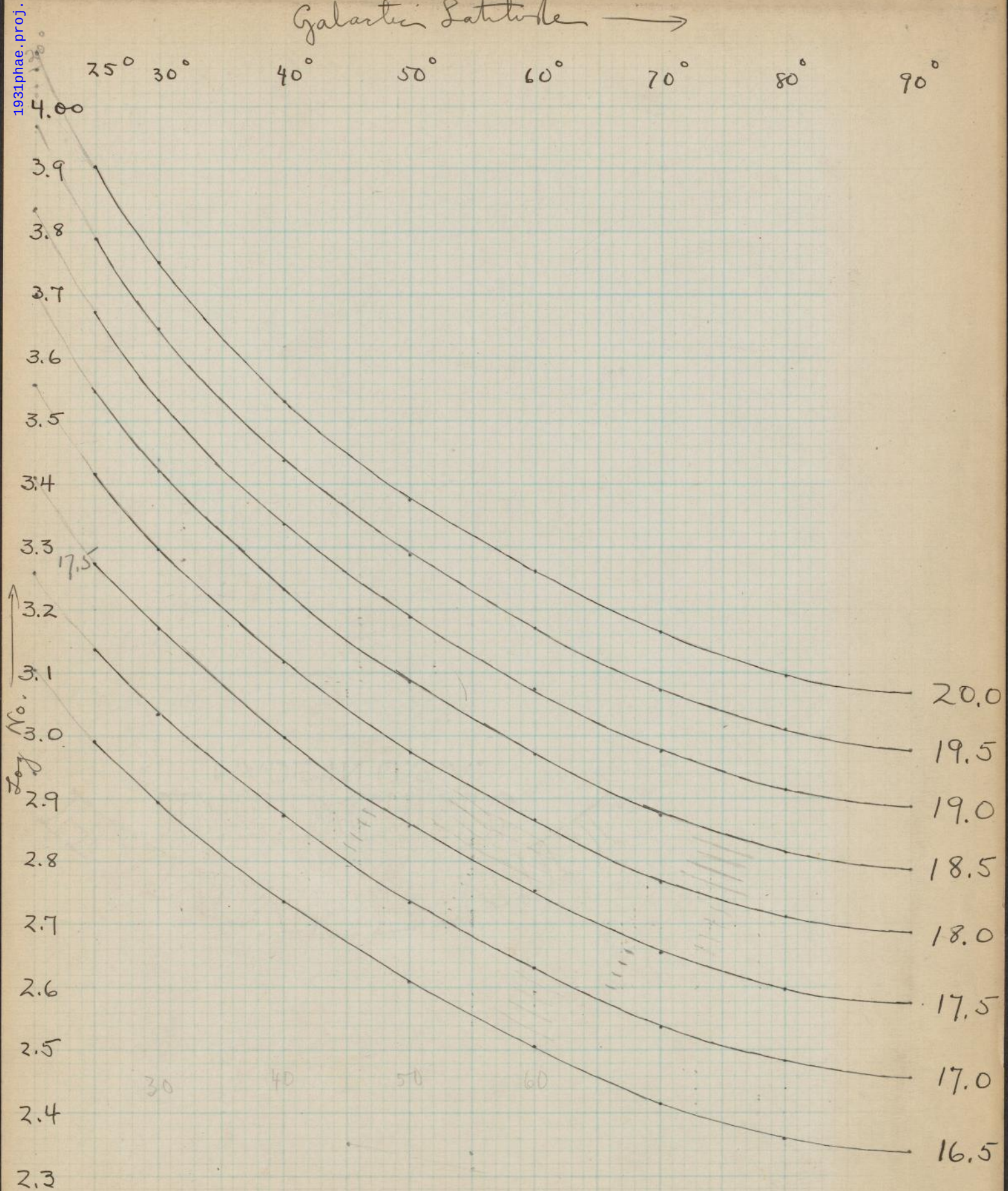
β = +40° = 17.0

β = +50° = 17.6

β = +46° = 17.4

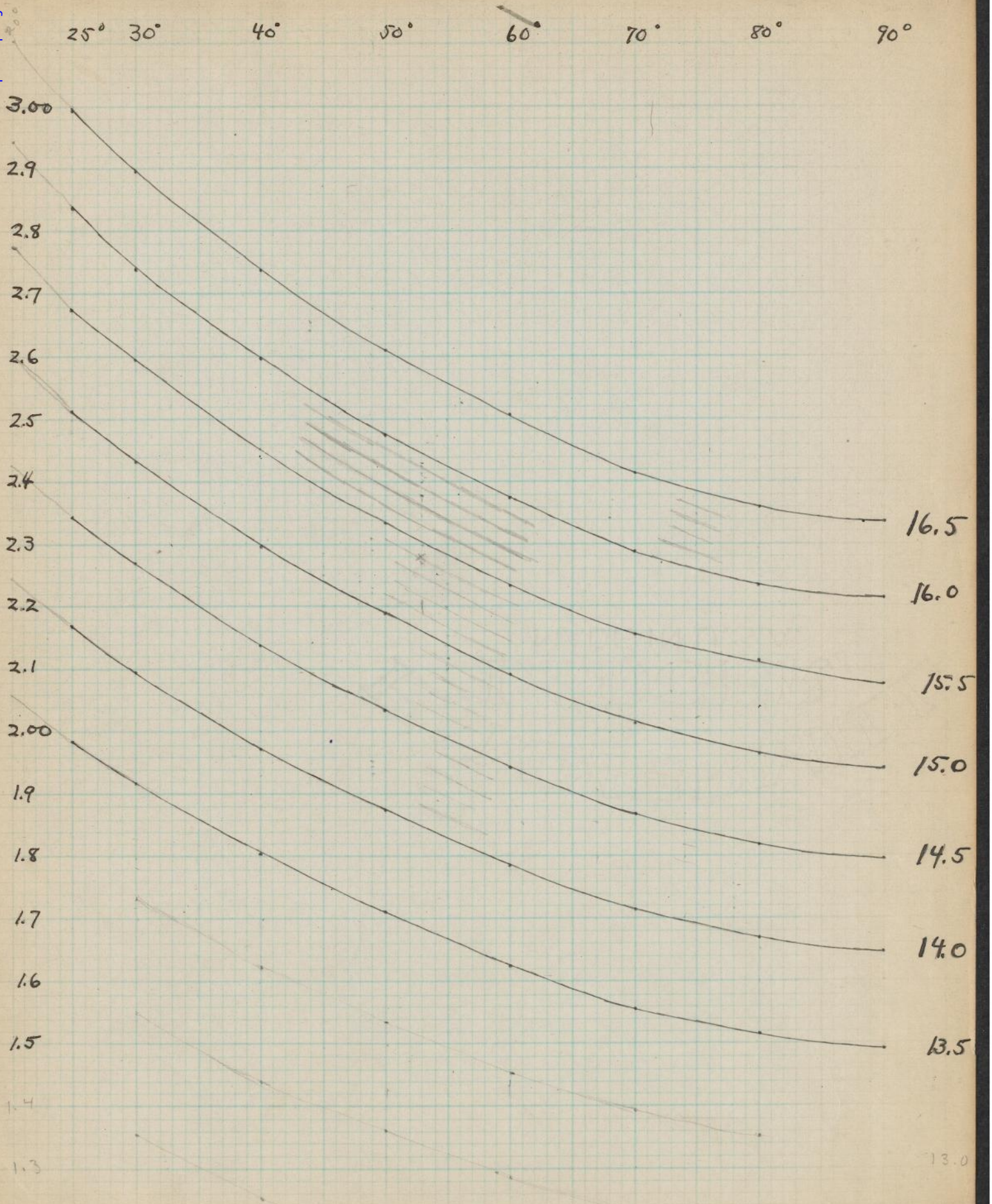
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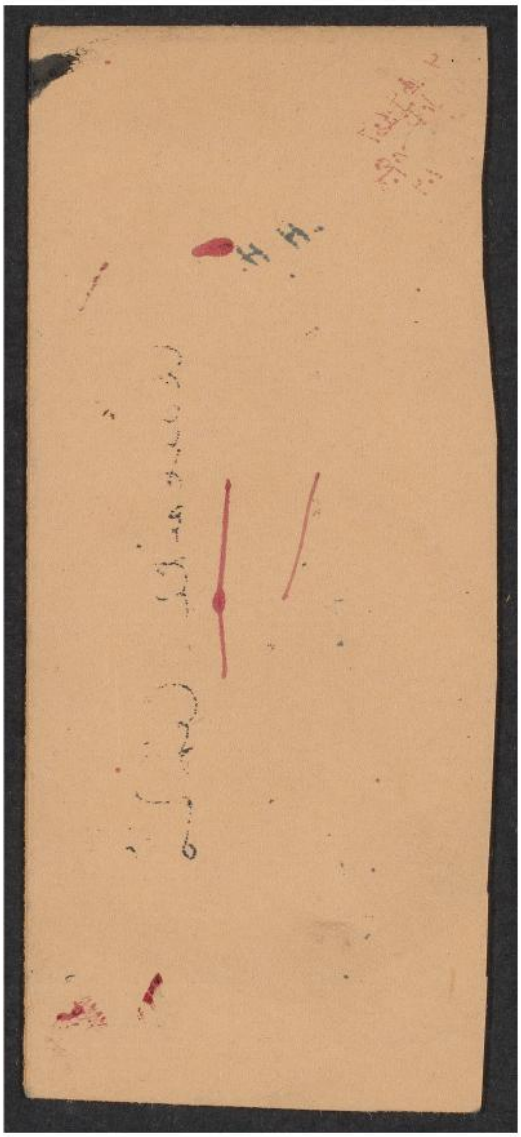
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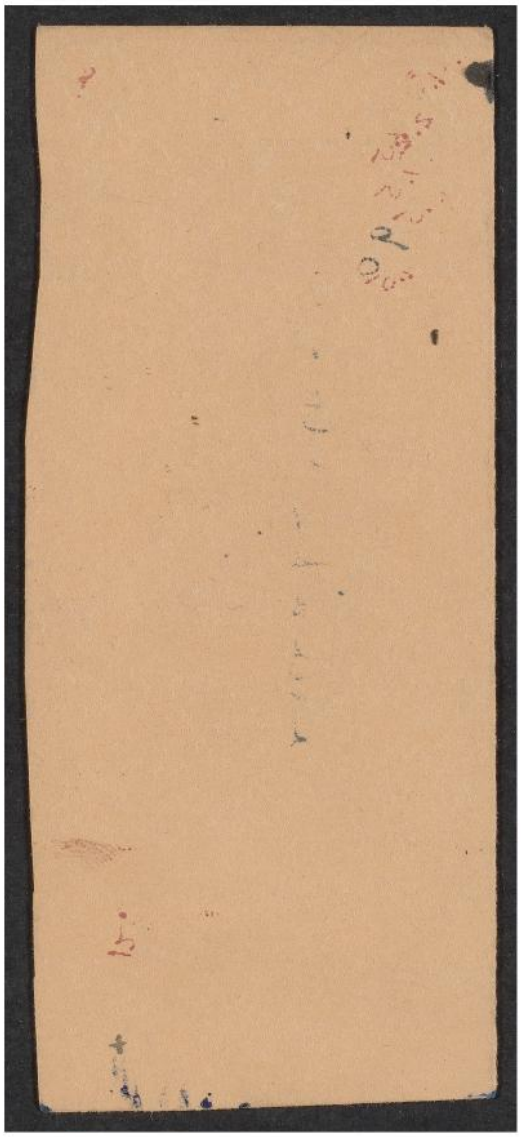
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1931phae.proj.232rA

A 15431 $11^h\ 10^m$ $-7.5°$ 180^m

$235° + 48°$

10/22/31

17	18	20	10	10	12	87
17	17	7	11	10	22	84
15	13	11	16	21	9	85
15	15	13	17	24	23	107
17	17	13	9	16	12	84
11	16	19	23	18	15	102
92	96	83	86	99	93	549

Log 549 = 2.740
−.01
2.730

24	12	19	16	15	13	99
23	18	19	17	17	15	109
19	18	17	19	20	14	107
17	17	14	13	16	18	95
17	12	21	11	10	16	87
10	10	23	19	28	24	114
110	87	113	95	106	100	611

Log 611 = 2.786
−.01
= 2.776

mean = 580

Log 580 = 2.763 −.01 = 2.753

Log 580 = 2.76

$\beta = +40° = 16.5$
$\beta = +50° = 17.1$
$\beta = +48° = 17.0$

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1931phae.proj.2342A

A7645 $10^h 48^m$ $-7.2°$ 60^m

$229° +46°$ 10/22/31

7	7	9	5	12	14	54
8	16	12	15	11	13	75
14	13	16	10	12	9	74
16	12	12	15	11	8	74
19	10	6	8	6	4	53
15	7	8	11	11	16	68
79	65	63	64	63	64	398

Log 398 = 2.600

8	11	17	9	11	5	61
12	10	11	15	9	11	68
12	9	5	11	12	11	60
11	3	15	10	9	9	57
13	7	8	4	8	16	58
7	11	8	11	6	9	52
63	51	64	62	55	61	356

mean = 377

Log 377 = 2.58

$\beta = +40° = 15.9$

$\beta = +50° = 16.4$

$\beta = +46° = 16.2$

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1931phae.proj.2326A

A 8783 $11^h\ 8^m$ $-7.2°$ 60 m

$235° +48°$

10/23/31

11	12	12	5	15	12	67
12	11	8	10	14	11	66
14	12	10	16	12	15	79
15	14	9	8	7	14	67
6	11	16	17	20	12	82
17	12	14	13	17	14	87
75	72	69	69	85	78	448

16	10	19	7	16	8	76
10	13	11	9	19	16	78
11	13	13	10	8	16	71
13	12	12	11	9	12	69
7	10	15	15	14	19	80
12	11	7	10	16	8	64
69	69	77	62	82	79	438

Mean = 443

Log 443 = 2.165

$\beta = +40° = 16.1$

$\beta = +50° = 16.7$

$\beta = +48° = 16.6$

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1931phae.proj.2322A

A 4439 $10^h\ 47^m$ $-7.2°$ 10^m

229° + 46°. 10/24/31

1	4	2	1	3	4	15
4	4	6	5	3	4	26
6	3	4	3	4	3	23
1	6	4	2	5	2	20
4	0	2	2	1	3	12
1	2	3	3	3	3	15
17	19	21	16	19	19	111

8	4	1	3	3	6	25
3	3	6	5	3	4	24
4	1	4	3	2	4	18
3	5	3	4	1	1	17
1	4	5	6	2	1	19
1	2	2	4	3	4	16
20	19	21	25	14	20	119

Mean = 115

Log 115 = 2.06

$\beta = +40° = 14.3$

$\beta = +50° = 14.7$

$\beta = +46° = 14.5$

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1931phae.proj.232cA

A 5247 $11^{h}\ 8^{m}$ $-7.3°$ 10^{m}

235° +48° 10/24/31

3	5	5	2	4	1	20
4	3	3	4	5	3	22
3	5	5	3	1	5	22
1	3	10	6	4	1	25
4	3	1	6	6	5	25
3	1	5	5	3	6	23
18	20	29	26	23	21	137

5	4	2	1	3	5	20
4	3	5	5	5	3	25
3	3	8	3	2	6	25
2	4	6	3	3	4	22
5	4	6	0	5	4	24
4	2	5	1	8	4	24
23	20	32	13	26	26	140

Mean = 138

Log 138 = 2.14

β = + 40° = 14.5
β = + 50° = 14.9
β = +48° = 14.8

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1931phae.proj.2322A

A1470 3 $12^h\ 46^m$ $-12.0°$ 180^m

$274°$ $+49°$ 10/20/31

A10039 pg61	27	24	23	22	31	32	159
	20	28	28	31	34	24	165
A4315 pg. 62	26	29	27	31	32	28	123
	17	38	32	46	27	41	201
	20	27	22	28	33	32	168
	25	20	41	31	21	32	170
	141	166	173	189	178	189	1036

Log 1036 = 3.015-.07

2.945

17.9

27	29	32	27	28	33	176
49	33	41	29	28	24	204
26	37	24	24	23	32	166
32	20	29	21	33	27	162
29	27	28	21	29	28	162
24	21	26	33	31	32	167
187	167	180	155	172	176	1037

Mean = 1036.5

Log 1036 = 3.02

$\beta = +40° = 16.9$

$\beta = +50° = 17.8$

$\beta = +49° = 17.7$

Adopted magnitude 17.8.

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1931phae.proj.2326A

D 14707 $13^h 10^m$ $-14.0°$ 180^m

$282° +46°$ 10/21/31

29	12	24	19	31	27	142
29	26	19	17	28	21	140
21	24	25	35	29	21	155
33	37	25	19	35	24	173
36	24	24	32	29	28	173
29	41	26	30	35	33	194
177	164	143	152	187	154	977

21	14	30	31	21	28	145
33	27	17	32	30	32	171
30	29	21	30	25	27	162
31	28	26	24	15	31	155
27	29	35	25	34	31	181
27	26	27	29	30	26	165
169	153	156	171	155	175	979

Mean = 978

Log 978 = 2.99

$\beta = +40° = 16.9$

$\beta = +50° = 17.6$

$\beta = +46° = 17.3$

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1931phae.proj.2312A

58

A14654 $13^h\ 10^m$ $-14.0°$ 60^m

$282°$ $+46°$ 10/26/31

14	10	9	19	18	12	82
16	20	13	11	14	15	89
14	12	15	15	17	18	91
19	15	14	17	11	12	88
21	19	20	17	15	13	105
13	18	28	12	19	9	99
97	94	99	91	94	79	554

16	17	7	20	17	10	87
17	12	20	24	19	13	105
11	15	20	15	14	16	91
9	13	14	6	11	16	69
18	15	19	18	10	13	93
15	17	17	20	21	17	107
86	89	97	103	92	85	552

Mean = 553

Log. 553 = 2.74

$\beta = +40° = 16.0$

$\beta = +50° = 16.6$

$\beta = +46° = 16.4$

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1931phae.proj.2323A

A3708 $13^h\ 9^m\ -12.1°$ 60^m

$282°\ +49°$ 10|26|31

16	7	7	9	12	12	63
16	6	10	8	14	11	65
13	17	12	14	11	6	73
11	17	18	8	9	9	72
13	12	15	14	11	11	76
21	14	9	7	10	14	75
90	73	71	60	67	63	424

12	12	15	16	10	13	78
8	21	11	8	9	15	72
16	8	12	11	10	6	63
12	15	10	7	10	13	67
15	10	12	10	8	13	68
16	15	13	7	10	6	67
79	81	73	59	57	66	415

Mean = 420

Log 420 = 2.62

$\beta = +40° = 15.6$

$\beta = +50° = 16.2$

$\beta = +49° = 16.14$

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1931phae.proj.23:2A

A3466 $13^h\ 8^m\ -12.1°$ 11^m

$282° +49°$ 10/22/31

0	2	1	3	0	3	9
1	2	2	1	1	1	8
3	1	2	1	2	2	11
1	0	1	1	2	2	7
3	1	3	2	1	0	10
3	2	2	1	2	3	13
11	8	11	9	8	11	58

3	2	2	2	2	3	14
2	0	1	3	0	0	6
3	2	0	1	2	0	8
2	0	1	1	0	3	7
4	0	2	1	4	0	11
1	0	2	4	2	2	11
15	4	8	12	10	8	57

Mean = 58

Log 58 = 1.76

$\beta = +40° = 13.2$

$\beta = +50° = 13.6$

$\beta = +49° = 13.6$

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1931phae.proj.2323A

A10039 $12^h\ 51^m$ $-12.3°$ 60^m

$274° +49°$ 10/28/31

7	4	6	5	5	5	32
3	4	8	0	3	4	22
7	6	12	6	4	5	40
5	4	5	3	7	8	32
5	9	7	7	9	5	42
6	6	6	4	8	5	35
33	33	44	25	36	32	203

Log 203 = 2.308 + 0

15.4

11	9	9	6	7	5	47
4	8	4	18	7	6	47
6	7	8	3	12	4	40
11	9	5	3	6	5	39
11	9	7	6	9	8	50
4	3	7	8	6	8	36
47	45	40	44	47	36	259

Log 259 2.413 + 0

15.7.

Mean = 231

Log 231 = 2.36

$\beta = +40° = 14.8$

$\beta = +50° = 15.3$

$\beta = +49° = 15.3$

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1931phae.proj.2312A

AH315

$12^h\ 46^m$ $-12.5°$ 10^m

$274° +49°$

10/28/31

3	1	2	2	1	2	11
3	3	2	1	3	3	15
5	1	0	2	1	0	9
3	4	1	5	3	6	22
2	4	2	5	4	4	21
4	4	4	1	2	1	16
20	17	11	16	14	16	94

4	1	4	3	5	3	20
4	4	4	2	2	1	17
5	5	1	4	2	3	20
6	4	1	2	3	2	18
5	3	8	1	1	3	21
4	3	2	3	5	4	21
28	20	20	15	18	16	117

mean = 106

Log 106 = 2.03

$\beta = +40° = 13.9$

$\beta = +50° = 14.3$

$\beta = +49° = 14.3$

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1931phae.proj.2312A

A 15243 $10^h\ 27^m$ $-7.2°$ 180^m

223 + 43

11/3/31

13	18	10	14	21	18	94
15	16	15	14	16	15	91
13	15	14	18	9	14	83
17	15	15	12	12	11	82
6	14	14	13	13	16	76
14	11	15	13	11	14	78
78	89	83	84	82	88	504

Log 504 =

15	13	16	14	11	20	89
26	9	15	7	14	14	85
23	11	16	16	23	17	106
14	11	19	7	9	14	74
14	10	12	7	15	17	75
17	19	17	12	19	16	100
109	73	95	63	91	98	529

Mean = 516

Log 516 = 2.71

$\beta = +50° = 17.1$

$\beta = +40° = 16.8$

$\beta = +43° = 16.9$

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1931phae.proj.2312A

A 5138 $10^h\ 28^m$ $-7.2°$ 60^m

223 +43 11/3/31

10	8	6	10	10	14	58
5	12	5	11	6	11	50
8	11	10	6	5	6	46
9	8	11	8	7	5	48
12	3	9	9	6	10	49
8	8	9	7	9	6	47
52	50	50	51	43	52	298

11	11	9	10	10	11	62
10	10	7	8	5	6	46
13	16	11	12	12	10	74
6	6	6	10	5	4	37
9	7	7	8	5	8	44
5	9	10	11	7	10	52
54	59	50	59	44	49	315

Mean = 306

Log 306 = 2.48

$\beta = +50° = 16.2$
$\beta = +40° = 15.8$
$\beta = +43° = 15.9$

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1931phae.proj.2342A

A5246 $10^h\ 29^m$ $-7.1°$ 10^m

223 +43 11/3/31

2	4	6	3	6	10	31
3	3	5	6	4	5	26
4	6	7	3	3	4	27
6	6	6	4	3	1	26
8	3	8	3	3	7	32
3	6	0	5	4	1	19
26	28	32	24	23	28	161

4	7	6	0	5	3	25
6	5	1	3	3	4	22
9	8	7	8	6	4	42
6	3	0	5	2	1	17
6	4	2	1	4	3	20
6	5	8	7	4	4	34
37	32	24	24	24	19	160

Mean = 160.5

Log 160 = 2.20

β = +40° = 14.8
β = +50° = 15.2
β = +43° = 14.9

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1931phae.proj.2312A

A15291 $12^h\ 29^m\ -7.2°$ 180^m

$265°\ +56$ 11/4/31

26	19	17	9	22	18	111
20	24	17	16	12	21	110
16	19	24	21	18	19	117
19	15	14	14	20	24	106
26	15	14	13	16	13	97
21	18	14	15	22	14	104
128	110	100	88	110	109	645

21	14	21	18	9	22	105
16	18	13	17	21	16	101
21	21	11	18	20	17	108
28	24	23	17	15	25	132
18	15	19	23	13	19	107
21	20	13	16	23	13	106
125	112	100	109	101	112	659

Mean = 652

Log 652 = 2.81

$\beta = +50° = 16.9$

$\beta = +60° = 17.4$

$\beta = +56° = 17.2$

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1931phae.proj.2942A

A1535g $13^h\ 28^m$ $+2.8°$ 180^m

297 +62 11/4/31

14	19	17	22	7	16	95
18	25	19	22	21	17	122
14	18	17	14	8	12	83
19	6	15	14	21	14	89
25	12	17	11	19	18	102
10	14	17	10	18	12	81
100	94	102	93	94	89	572

29	14	20	12	13	13	101
16	8	22	18	20	19	103
14	17	14	17	16	15	93
12	16	20	15	17	23	103
19	17	16	17	15	12	96
9	14	13	23	16	16	91
99	86	105	102	97	98	587

Mean = 580

Log 580 = 2.76

$\beta = +60° = 17.3$

$\beta = +70° = 17.5$

$\beta = +62° = 17.3$

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1931phae.proj.2312A

A8272 $12^h\ 27^m$ −7.2 60m

265 + 56 11|5|31

7	8	13	15	11	9	63
12	6	10	12	9	13	62
16	11	13	11	13	16	80
11	11	11	11	9	15	68
12	12	7	8	8	13	60
5	9	8	9	14	8	53
63	57	62	66	64	74	386

8	6	15	9	15	7	60
7	9	16	10	14	10	66
10	11	10	13	12	11	67
11	8	16	11	11	5	62
12	12	7	2	20	5	58
10	11	9	3	14	9	56
58	57	73	48	86	47	369

Mean = 378

Log 378 = 2.58

$\beta = +50° = 16.1$
$\beta = +60° = 16.5$
$\beta = +56° = 16.3$

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1934phae.proj.2312A

A6837 13^h 27^m $+2.8°$ 60^m

297 +62

11/5/31

11	7	12	15	14	16	75
7	8	10	10	14	8	57
13	19	14	8	10	10	74
13	17	13	10	8	10	71
14	9	7	18	6	11	65
9	10	6	14	11	10	60
67	70	62	75	63	65	402

15	11	7	18	15	10	76
16	12	15	12	11	16	82
11	6	3	9	10	10	49
8	13	18	14	13	11	77
11	10	12	13	9	9	64
14	11	13	14	8	16	76
75	63	68	80	66	72	424

mean = 413

Log 413 = 2.62

$\beta = +60° = 16.8$

$\beta = +70° = 17.0$

$\beta = +62° = 16.8$

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1931phae.proj.23..A

70

A3760 $12^h\ 28^m$ $-7.1°$ 10^m

$265°$ $+56°$ 11/6/31

4	1	2	1	1	2	11
0	2	0	0	0	4	6
1	1	2	1	3	0	8
0	3	0	0	0	2	5
4	2	0	2	1	2	11
1	0	4	1	2	3	11
10	9	8	5	7	13	52

3	0	2	0	2	1	8
2	2	3	0	1	3	11
1	2	0	1	3	1	8
2	1	4	4	2	3	16
1	6	3	1	2	4	17
2	1	3	1	2	1	10
11	12	15	7	12	13	70

Mean = 61

Log 61 = 1.78

$\beta = +50° = 13.6$

$\beta = +60° = 13.8$

$\beta = +56° = 13.7$

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1931phae.proj.2323A

A 5964 $10^h\ 28^m$ $+17.8°$ 10^m

$192° +58°$ 11/6/31

1	4	6	2	5	4	22
4	5	1	1	1	0	12
3	1	1	4	3	1	13
1	5	3	2	4	5	20
9	1	3	5	4	3	25
4	3	4	3	8	4	26
22	19	18	17	25	17	118

7	3	6	2	6	5	29
6	1	4	6	2	4	23
0	3	2	1	2	5	13
6	2	4	1	6	3	22
4	0	1	0	3	3	11
2	2	4	2	7	3	20
25	11	21	12	26	23	118

Mean = 118

log 118 = 2.07

$\beta = +50° = 14.9$

$\beta = +60° = 15.2$

$\beta = +58° = 15.1$

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1931phae.proj.2312A

72

A 15280 $12^h\ 52^m$ $+2.5°$ 180^m

275 $+65°$ 11/7/31

15	16	15	21	16	16	99
21	17	16	15	19	17	105
14	17	19	22	16	13	101
17	15	15	22	16	9	94
13	10	16	11	13	15	78
15	16	14	15	15	9	84
95	91	95	106	95	79	561

18	11	7	15	18	20	89
15	14	12	22	18	15	96
17	16	14	17	13	15	92
18	15	17	19	24	18	111
15	18	11	24	12	20	100
18	17	17	19	13	10	94
101	91	78	116	98	98	582

Mean = 572

Log 572 = 2.76

$\beta = +60° = 17.2$
$\beta = +70° = 17.5$
$\beta = +65° = 17.4$

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1931phae.proj.2323A

A 15422 $14^h\ 10^m$ -7.5° 180^m

305 +48

11/9/31

27	28	31	18	35	28	167
28	25	23	27	35	25	163
44	18	19	24	17	23	145
27	27	25	17	28	27	151
31	20	29	21	32	30	163
31	16	22	24	28	14	135
188	134	149	131	175	147	924

19	24	17	22	30	22	134
27	23	27	30	23	29	159
31	24	25	22	28	31	161
33	26	23	33	22	26	163
28	25	26	19	26	28	152
23	26	29	36	25	27	166
161	148	147	162	154	163	935

Mean = 930

Log 930 = 2.97

$\beta = +40^\circ = 17.0$
$\beta = +50^\circ = 17.6$
$\beta = +48^\circ = 17.5$

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1931phae.proj.2342A

74

A 6002 $12^h\ 47^{mm}$ $+2.2°$ 60^{mm}

275 +65

11/9/31

2	2	5	3	2	4	18
4	4	4	5	2	2	21
4	2	0	5	4	2	17
5	1	7	0	1	8	22
3	3	2	1	5	2	16
6	5	6	2	4	4	27
24	17	24	16	18	22	121

3	4	3	5	2	6	23
4	4	4	2	3	3	20
3	0	8	3	5	2	21
3	5	5	3	5	5	26
4	2	2	6	4	3	21
3	2	5	6	4	1	21
20	17	27	25	23	20	132

Mean = 126

Log 126 = 2.10

$\beta = +60° = 14.9$
$\beta = +70° = 15.1$
$\beta = +65° = 15.0$

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1934phae.proj.2322A

A 7724 $14^h\ 7^m$ $-7.2°$ 60^m

305 + 48

11/10/31

10	14	13	11	17	8	73
18	8	9	11	22	11	79
18	14	13	12	13	8	78
15	22	12	12	8	9	78
12	14	7	7	14	12	66
17	9	10	9	14	14	73
90	81	64	62	88	62	447

14	12	10	13	12	6	67
9	11	10	12	10	17	69
16	12	15	11	11	17	82
13	9	10	14	11	13	70
15	13	11	14	13	10	76
10	15	13	10	14	11	73
77	72	69	74	71	74	437

mean = 442

Log 442 = 2.65

$\beta = +40° = 15.9$
$\beta = +50° = 16.4$
$\beta = +48° = 16.3$

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1931phae.proj.2312A

176

A8738 $12^h 47^m$ $+3.0^\circ$ 10

275 +65 11/10/31

4	4	3	4	4	6	25
2	2	5	5	5	4	23
2	6	3	1	5	0	17
2	4	1	4	0	0	11
2	3	3	3	6	2	19
4	3	5	2	3	3	20
16	22	20	19	23	15	115

5	3	6	3	2	5	24
2	3	2	2	3	3	15
4	5	6	3	4	2	24
6	7	5	1	5	4	28
2	7	3	4	5	4	25
1	4	6	5	4	4	24
20	29	28	18	23	22	140

Mean = 128

$\log 128 = 2.11$

$\beta = +60^\circ = 14.9$
$\beta = +70^\circ = 15.2$
$\beta = +65^\circ = 15.1$

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1931phae.proj.2320A

A 3762 $14^h\ 8^m$ $-7.2°$ 10^m

305 +48 11/13/31

5	1	4	3	1	2	16
1	2	4	2	2	5	16 ×
3	5	4	0	5	1	18
1	6	2	1	2	4	16
3	4	1	0	4	1	13
4	5	1	2	0	2	14
17	23	16	8	14	15	93

2	2	3	1	2	2	12
3	3	3	3	0	1	13
1	0	4	3	2	2	12
5	3	2	2	0	3	15
3	1	5	4	3	2	18
1	4	1	3	4	3	16
15	13	18	16	11	13	86

mean = 90

Log 90 = 1.95

$\beta = +40° = 13.8$
$\beta = +50° = 14.2$
$\beta = +48° = 14.1$

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1931phae.proj.2332A

78

A15258 $12^h\ 25^m$ $-2.0°$ 180^m

263 +60

11/16/31

9	16	17	12	13	15	82
13	12	8	19	12	10	74
14	17	14	20	12	11	88
10	11	13	18	9	13	74
13	13	11	10	12	18	77 ×
17	19	12	13	15	8	84
76	88	75	92	73	75	479

24	19	12	17	11	14	97
17	12	15	19	15	19	97
19	13	17	17	21	12	99
14	20	9	14	17	14	88
8	15	19	11	10	14	77
15	13	8	18	14	12	80
97	92	80	96	88	85	538

Mean = 508

Log 508 = 2.71

$\beta = +60° = 17.0$

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1931phae.proj.2220A

A15367 $14^h\ 27^m$ $-7.3°$ 180^m

310 +46 11/16/31

32	36	20	34	46	20	188
29	16	18	27	41	27	158
27	20	32	25	30	20	154
36	20	29	33	19	27	164
30	28	34	29	21	33	175
21	29	26	29	27	25	157
175	149	159	177	184	152	996

34	25	27	28	25	39	178
32	31	31	29	23	21	167
22	33	23	24	24	25	151
28	30	30	30	28	24	170
25	26	34	31	23	21	160
32	28	22	27	23	31	163
173	173	167	169	146	161	989

mean = 992

Log 992 = 2.99

$\beta = +40° = 17.1$
$\beta = +50° = 17.7$
$\beta = +46° = 17.5$

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1931phae.proj.2312A

A10156 $12^h\ 30^m\ -2.2°$ 60^m

263+60 11/24/31

3	5	6	6	4	5	29
2	6	6	6	3	6	29
5	8	4	10	5	3	35
6	7	5	9	3	3	33
4	6	3	6	5	4	28
10	6	6	9	8	9	48
30	38	30	46	28	30	202

5	4	8	4	14	10	45
3	4	8	7	5	10	37
9	6	7	6	7	11	46
5	8	12	10	5	8	48
10	9	6	7	7	8	47
12	6	4	7	8	7	44
44	37	45	41	46	54	267

mean = 234

log 234 = 2.37

$\beta = +60° = 15.8$

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1951pfae.proj..2522A

A10390 $14^h\ 30^m$ $-7.1°$ 60^m

310 +46

11/23/31

3	5	5	3	5	9	30
9	5	7	4	6	7	38
6	7	8	5	2	10	38
4	11	6	6	3	6	36
10	9	7	5	5	5	41
7	11	8	5	8	10	49
39	48	41	28	29	47	232

7	19	12	10	12	8	68
12	12	12	10	8	6	60
9	11	6	5	10	11	52
10	10	15	10	10	10	65
17	8	15	7	8	8	63
7	14	7	10	13	8	59
62	74	67	52	61	57	367

Mean = 300

Log 300 = 2.48

$\beta = +40° = 15.4$

$\beta = +50° = 15.9$

$\beta = +46° = 15.7$

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1931phae.proj.2312A

82

A 4387 $12^h\ 26^m$ $-2.1°$ 10^m

263 +60 11/24/31

1	1	5	2	2	6	17
7	1	1	4	2	3	18
1	2	3	3	1	2	12
3	4	2	3	2	2	16
5	3	5	3	2	2	20
9	4	1	2	0	3	19
26	15	17	17	9	18	102

5	3	7	3	2	3	23
4	6	6	3	3	3	25
5	3	3	4	1	5	21
6	1	2	3	5	3	20
8	1	1	3	2	1	16
2	3	1	5	2	2	15
30	17	20	21	15	17	120

Mean = 111

Log 111 = 2.05

$B = +60° = 14.7$

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1934phae.proj.2928A

A5989 $14^h 28^m$ $-7.1°$ 10-in
310 +46 11/25/31

5	3	7	4	4	3	26
8	10	7	7	10	4	46
3	7	9	7	9	4	39
6	8	5	7	0	1	27
3	3	5	2	4	1	18
5	3	3	6	4	5	26
30	34	36	33	31	18	182

5	6	2	0	6	7	26
4	3	2	1	2	3	15
10	6	5	3	3	8	35
4	5	7	6	6	0	28
3	2	4	5	2	9	25
4	1	6	5	5	5	26
30	23	26	20	24	32	155

Mean = 168

Log 168 = 2.23

$\beta = +40° = 14.7$
$\beta = +50° = 15.1$
$\beta = +46° = 14.9$

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1931phae.proj.2312A

84

A15445

$11^h\ 50^m$ $+2.5°$

243 +62

180mm

11/24/31

12	12	11	8	14	9	66
5	14	13	9	6	10	57
11	12	12	11	17	10	73
13	12	9	8	10	9	61
16	17	15	14	10	8	80
7	16	15	13	6	9	66
64	83	75	63	63	55	403

11	9	16	12	16	11	75
14	14	8	10	6	13	65
8	13	18	19	13	16	87
8	10	16	14	12	15	75
18	13	8	13	10	12	74
10	10	17	6	14	12	69
69	69	83	74	71	79	445

$\bar{q}_{mean} = 424$

$\log 424 = 2.63$

$\beta = +60° = 16.9$

$\beta = +70° = 17.2$

$\beta = +62° = 17.0$

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1931phae.proj.2922A

A 15439 $11^h 27^m 30^s$ -7.0 180m

240 +61 11/28/31

23	21	18	18	11	12	103
28	14	22	17	19	16	116
14	20	21	18	23	19	115
18	15	15	21	16	20	105
24	21	17	16	26	19	123
10	28	28	14	16	19	115
117	119	121	104	111	105	677

27	20	18	19	20	15	119
20	17	16	22	17	21	113
13	20	19	21	31	18	122
17	26	21	18	17	22	121
27	16	20	28	28	24	143
17	25	26	25	16	25	134
121	124	120	133	129	125	752

mean = 714

log 714 = 2.85

β +60° = 17.8
β +70° = 18.0
β +61° = 17.8

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1931phae.proj.2312A

86

A7683 $11^h\ 48^m$ $+2.5°$ 60^m

243 +62 12/2/31

6	6	6	10	13	9	50
12	11	8	5	6	3	45
13	11	9	16	7	5	61
3	6	13	5	8	9	44
13	8	6	14	9	12	62
7	5	9	6	13	9	49
54	47	51	56	56	47	311

5	8	10	16	7	9	55
7	6	10	12	5	12	52
13	5	5	9	7	8	47
6	5	12	3	7	10	43
3	9	10	14	7	7	50
9	10	9	11	6	10	55
43	43	56	65	39	56	302

Mean = 306

Log 306 = 2.49

β = +60° = 16.4
β = +70° = 16.6
β = +62°2 = 16.4

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1931phae.proj.2320A

A 5158 $11^h\ 27^m$ $-7.5°$ 60^m

240 +60

12/2/31

6	4	5	2	8	6	31
6	9	4	6	6	4	35
3	3	4	6	6	6	28
7	6	4	5	3	5	30
7	8	3	7	6	2	33
5	8	5	3	7	0	28
34	38	25	29	36	33	185

3	6	4	5	4	2	24
6	2	6	7	8	7	36
6	6	6	12	5	3	38
3	7	8	3	8	5	34
6	1	2	6	1	4	20
5	5	6	2	3	4	25
29	27	32	35	29	25	177

Mean = 181

log 181 = 2.26

$B = +60° = 15.5$

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1931phae.proj.2322A

88

A5165 $11^h\ 46^m$ $+3.2°$ 10^m

2+3+6 2 12/2/31

2	1	4	1	1	1	10
2	0	3	2	0	0	7
5	1	3	4	2	2	17
1	1	6	5	1	2	16
4	4	3	0	3	2	15
3	1	2	1	0	3	10
17	8	21	13	6	10	75

2	1	0	2	2	4	11
0	2	5	0	0	1	8
2	3	0	1	0	3	9
3	3	5	3	2	2	18
2	2	2	3	0	4	13
0	1	3	2	2	2	10
9	12	15	11	6	16	69

Mean = 72

Log 72 = 1.86

$\beta = +60° = 14.2$
$\beta = +20° = 14.3$
$\beta = +62° = 14.2$

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1931phae.proj.2320A

A6039 $11^h\ 28^m$ $-7.2°$ 10 m

240 +60

12/3/31

3	5	1	1	4	3	17
7	1	5	5	6	6	30
2	6	1	6	3	5	23
1	1	4	6	8	2	22
2	3	4	6	2	5	22
4	4	6	4	3	3	24
19	20	21	28	26	24	138

5	1	1	1	3	3	14
1	2	4	3	7	4	21
0	6	1	3	2	6	18
3	2	5	1	5	3	19
4	3	1	4	1	2	15
2	7	4	3	6	6	28
15	21	16	15	24	24	115

Mean = 126

Log 126 = 2.10

$\beta = +60° = 15.0$

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1931phae.proj.2322A

A15447 $11^h\ 50^m$ $-7.5°$ 180^m

249 +53

12/8/31

15	22	23	19	18	16	113
25	19	22	14	19	16	115
21	18	18	17	17	15	106
14	24	16	11	18	14	97
27	20	22	14	25	21	129
12	22	16	16	16	18	100
114	125	117	91	113	100	660

16	13	21	18	16	27	111
16	22	18	22	16	23	117
15	16	14	17	28	25	115
18	15	26	14	16	21	110
27	24	25	21	20	12	129
18	19	16	27	27	17	124
110	109	120	119	123	125	706

Mean = 683

$\log 683 = 2.83$

$\beta = +50° = 17.2$
$\beta = +60' = 17.6$
$\beta = +53° = 17.3$

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1931phae.proj.2320A

A15454 $12^h\ 10^m$ $-22.5°$ 180^m

261 +39 12/9/31

38	28	32	26	31	25	180
37	29	30	30	24	34	184
29	27	31	37	31	35	190
32	34	37	33	37	23	196
26	33	42	39	33	40	213
30	37	31	46	32	37	213
192	188	203	211	188	194	1176

33	23	33	34	27	30	180
34	40	34	32	22	32	194
29	37	32	33	34	38	203
38	27	34	33	37	28	197
29	40	25	38	36	33	201
34	21	37	31	35	38	196
197	188	195	201	191	199	1171

Mean = 1174

Log 1174 = 3.069

$\beta = +39 = 17.2$

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1931phae.proj.2322A

A4463 $11^h 46^m$ $-7.5°$ 60^m

249 +53 12/10/31

6	7	12	5	7	4	41
8	9	7	8	9	4	45
8	5	8	6	3	5	35
4	12	4	2	4	4	30
4	4	7	10	6	8	39
6	10	6	4	7	7	40
36	47	44	35	36	32	230

6	6	12	7	1	9	41
11	5	5	7	9	6	43
4	1	8	11	3	7	34
5	11	9	4	8	6	43
12	8	4	6	7	6	43
10	8	7	4	5	8	42
48	39	45	39	33	42	246

Mean = 238

log 238 = 2.38

β = +50° = 15.5
β = +60° = 15.8
β = +58° = 15.6

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1931phae.proj.23200A

A 3181 $12^h\ 8^m$ $-22.2°$ 60^m

261 +39 12/11/31

7	5	11	6	4	6	39
9	5	7	8	10	8	47
4	11	12	5	10	8	50
13	16	8	12	11	6	66
10	13	6	15	11	8	63
8	9	11	6	8	7	49
51	59	55	52	54	43	314

10	8	11	8	13	6	56
9	6	12	7	8	10	52
12	8	12	12	9	9	62
9	7	15	8	12	9	60
7	13	8	10	9	9	56
13	7	8	7	10	11	56
60	49	66	52	61	54	342

Mean = 328

log 328 = 2.52

$\beta 2 + 39° = 15.4$

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1931phae.proj.2322A

A6040 $11^h\ 48^m$ $-7.1°$ 10^m

249 +53 12/11/31

6	2	2	4	1	3	18
3	7	0	2	3	4	19
2	3	5	1	6	4	21
2	4	7	4	6	2	25
3	5	4	6	5	1	24
5	1	5	3	1	7	22
21	22	23	20	22	21	129

2	0	1	3	5	2	13
2	3	0	0	3	2	10
1	3	6	5	2	2	19
1	6	2	3	1	2	15
3	2	6	2	3	1	17
1	3	3	0	1	3	11
10	17	18	13	15	12	85

mean = 107

log 107 = 2.03

β = +50° = 14.4
β = +60° = 14.7
β = +53° = 14.5

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1931phae.proj.2320A

A6022 $12^h 8^m$ -22.0° 10^m

261 +39 12/11/31

5	3	3	6	5	1	23
3	8	4	1	7	5	28
5	2	4	7	4	6	28
7	2	4	2	4	3	22
7	5	7	1	5	5	30
6	7	5	6	5	0	29
33	27	27	23	30	20	160

3	1	1	1	7	2	15
2	2	4	1	3	7	19
2	2	2	2	8	2	18
2	2	5	1	5	2	17
6	2	2	3	1	3	17
3	3	3	5	3	2	19
18	12	17	13	27	18	105

Mean = 132

Log 132 = 2.12

$\beta = +39^\circ = 14.2$

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1931phae.proj.2322A

A14586 $12^h\ 40^m$ $+7.5°$ 180^{mo}

$\lambda = 270°$ $\beta = +68°$ 12/15/31

25	26	15	22	21	14	123
15	14	13	13	19	16	90
17	13	26	20	13	19	108
23	18	24	21	19	23	128
24	17	17	26	14	22	120
16	26	15	9	16	17	99
120	114	110	111	102	111	668

21	14	15	15	22	14	101
21	15	13	18	15	22	104
21	20	17	15	11	17	101
19	15	15	14	14	23	100
15	18	19	16	17	14	99
16	21	18	19	18	15	107
113	103	97	97	97	105	612

mean = 640

Log 640 = 2.81

$\beta = +60° = 17.4$
$\beta = +70° = 17.7$
$\beta = +68° = 17.6$

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1931phae.proj.2320A

A14699 $12^h\ 20^m$ $+2.5°$ 180°

258 +64 12/22/31

16	20	18	10	24	16	104
21	15	19	14	23	22	114
22	20	18	21	22	23	126
18	19	21	17	14	16	105
21	22	24	20	19	18	124
18	19	16	11	14	15	93
116	115	116	93	116	110	666

26	13	19	25	19	10	112
27	21	17	25	20	21	131
18	14	19	22	22	16	111
18	29	28	18	20	32	145
17	20	12	19	12	17	97
20	23	18	15	16	17	109
126	120	113	124	109	113	705

mean = 686

Log 686 = 2.84

β = +60° = 17.6
β = +70° = 17.9
β = +64° = 17.7

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1931phae.proj.23228A

A 15251 $12^h\ 4^m\ +2.7^\circ$ 180mm

250 +64 12/22/31

10	17	7	8	15	15	72
16	10	8	16	5	10	65
8	11	10	12	15	8	64
13	17	13	9	9	14	75
9	17	11	12	4	15	68
16	9	9	11	14	12	71
72	81	58	68	62	74	415

8	11	12	12	7	14	64
9	8	9	10	14	10	60
16	8	9	6	16	6	61
18	8	9	14	10	16	75
24	17	12	8	13	16	90
13	13	14	8	13	14	75
88	65	65	58	73	76	425

Mean = 420

Log 420 = 2.62

$\beta = +60^\circ = 16.8$
$\beta = +70^\circ = 17.1$
$\beta = +64^\circ = 16.9$

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1931phae.proj.2328A

A15289 $12^h\ 42^m - 2.2^\circ$ 180^m

$270 + 60$ 12/22/31

17	17	19	7	19	15	94
16	13	23	15	16	12	95
18	12	23	20	20	25	118
20	12	14	13	13	9	81
23	13	18	10	22	13	99
20	18	17	27	10	12	104
114	85	114	92	100	80	591

16	15	19	18	20	12	100
17	15	14	18	8	13	85
15	18	23	18	14	14	102
16	25	15	15	27	14	112
15	18	24	14	13	18	102
16	16	8	16	23	10	89
95	107	103	99	105	81	590

Mean = 590

Log 590 = 2.77 $\delta = +60^\circ = 17.3$

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1931phae.proj.2312A

100

A15295 $13^h\ 00^m$ -2.2° 180^m

280 +59 12/24/31

21	21	22	20	11	10	105
22	18	16	14	10	15	95
24	8	19	10	15	17	93
17	27	20	18	14	22	118
21	17	11	16	19	18	102
27	11	13	22	19	17	109
132	102	101	100	88	99	622

16	11	16	13	21	13	90
23	26	23	22	19	9	122
12	10	10	8	23	11	74
15	16	11	19	13	21	95
20	23	24	21	16	17	121
15	20	12	19	16	25	107
101	106	96	102	108	96	609

mean = 616

log 616 = 2.79

$\beta = +59^\circ = 17.3$

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1931phae.proj.2320A

A 15296 13^h 38^m -14.5° 180^m

290 +45 12/23/31

16	25	25	26	27	19	138
23	31	23	25	24	26	152
25	20	21	24	28	26	144
18	34	19	20	21	18	130
40	21	28	21	19	26	155
30	23	23	24	22	35	157
152	154	139	140	141	150	876

25	19	24	26	18	27	139
21	20	24	23	21	21	130
29	25	29	22	21	14	140
24	26	27	21	37	19	154
26	25	20	26	25	27	149
29	22	27	32	23	31	164
154	137	151	150	145	139	876

Mean = 876

Log 876 = 2.94

$\beta = +40^\circ = 16.8$
$\beta = +50^\circ = 17.4$
$\beta = +45^\circ = 17.1$

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1931phae.proj.232A

A15299 $12^h\ 59^m$ $-7.3°$ 180^m

279 +55 12/23/31

21	25	17	20	21	19	123
23	24	21	12	12	14	106
22	17	18	13	17	15	102
24	14	14	20	18	26	116
24	22	21	17	19	21	124
15	18	19	9	19	22	102
129	120	110	91	106	117	673

19	18	10	8	17	13	85
16	12	27	23	12	19	109
18	14	21	17	22	10	102
23	10	16	18	19	18	104
13	18	16	22	19	13	101
16	17	19	22	19	11	104
105	89	109	110	108	84	605

$q_{mean} = 639$

$\text{Log } 689 = 2.181$

$\beta = +50° = 16.9$
$\beta = +60° = 17.4$
$\beta = +55° = 17.2$

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1934phae.proj.2320A

A14689

275 +55

Count of stars on A14689 plate to limit of A1944 (14.8 on that plate)

3	3	3	4	2	4	19
3	2	5	5	3	4	22
3	4	4	4	3	4	22
1	5	2	6	1	1	16
8	4	6	5	4	4	31
7	4	3	3	5	4	26
25	22	23	27	18	21	= 136

log 136 = 2.134 −.02

= 2.114

15.0

2	4	6	4	4	5	25
6	3	3	6	7	5	30
3	2	5	8	1	3	22
5	4	3	0	4	5	21
6	3	2	4	4	2	21
5	2	5	5	4	8	29
27	18	24	27	24	28	= 148

log 148 = 2.170

15.1

Mean = 142

log 142 = 2.152

15.0

log 142 = 2.15

β = 60 15.0

β = 50 14.7

β = 55 14.8

Adopted value 14.9

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1931phae.proj.2312A

104

A 14689

275 +55

Count of stars to limit of A 8267 (16.5)

15	11	7	9	7	11	60
10	12	16	11	9	8	66
12	15	14	9	10	9	69
9	9	8	16	11	9	62
15	9	14	12	9	14	73
19	13	17	14	13	7	83
80	69	76	71	59	58	413 ✓

Log 413 = 2.616 -.02

= 2.596

16.8

6	10	9	9	8	12	54
12	11	9	10	12	13	67
8	11	13	13	7	10	62
11	14	14	8	11	16	74
15	14	9	9	16	10	73
8	8	12	9	8	17	62
60	68	66	58	62	78	392

Log 392 = 2.593 -.02

= 2.573

16.8

Mean 402

Log 402 = 2.604 -.02

= 2.584

Scores

16.8

Log 402 = 2.604

+50° = 16.1

+60° = 16.7

+55 = 16.4

Adopted mag 16.6

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1931phae.proj.2220A

A 14689

275 +55

Count to get intermediate magnitude.

12	4	5	8	5	5	39
11	8	11	8	5	5	48
3	11	8	8	7	7	44
5	6	6	9	6	6	38
13	7	10	8	6	8	52
16	8	9	9	10	5	57
60	44	49	50	39	36	278

log 278 = 2.444 -.02
= 2.424

15.9

3	10	7	8	6	9	43
9	9	5	8	8	9	48
6	9	9	9	4	8	45
9	10	9	1	8	13	50
12	6	5	5	11	3	42
7	5	8	9	4	12	45
46	49	43	40	41	54	273

log 273 = 2.436 -.02
= 2.416

15.9

log mean 276 = 2.441 -.02
= 2.421

15.9

log 276 = 2.441

β = +50°	15.6
+60°	16.0
+55°	15.8

Adopted mag 15.8

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1931phae.proj.2312A

106

A14689

275 +55

Count of stars on A14689, to limit of A14649.

22	15	13	14	14	24	102
15	15	18	24	15	12	99
28	18	17	18	16	17	114
16	25	18	20	16	13	108
23	18	20	21	25	18	125
25	16	16	13	18	12	100
129	107	102	110	104	96	648
						108

$\Sigma \log 648 = 2.812 - .09$
$= 2.722$

17.2

16	16	21	17	15	20	105
21	19	18	15	21	21	115
17	22	24	22	12	17	114
						334
						668

$\Sigma \log 668 = 2.838 - .09$
$= 2.748$

17.3

$\Sigma \log 658 = 2.818$

$+60° = 17.4$
$+50° = 16.9$
$+55° = 17.2$

Adopted mean 17.2.

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1931phae.proj.2320A

A 14703

Count of stars on A 14703 to limit of A 10039.

8	5	9	3	5	6	36
5	9	2	7	4	9	36
11	7	8	9	8	7	50
3	9	7	8	7	6	40
6	7	3	6	9	7	38
5	4	6	8	7	5	35
38	41	35	41	40	40	235

5	6	7	6	7	5	36
8	4	7	7	7	2	35
6	12	5	6	6	6	41
14	3	8	6	12	11	54
9	3	9	10	7	3	41
7	4	9	7	4	7	38
49	32	45	42	43	34	245

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1931phae.proj.2323A

Count of stars on A 14703 for intermediate maps.

9	6	10	7	10	12	54
7	12	8	10	10	10	57
13	11	13	16	15	11	79
5	14	14	13	13	11	70
10	13	9	9	11	12	64
8	8	13	12	9	8	58
52	64	67	67	68	64	382 ✓

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1931phae.proj..223A

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1931phae.proj.2322A

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1994phae.proj.2242A

Index

					Limit Count
A	6720	12	30	+12.5	26
B	6718	12	10	+12.5	
C	6719	12	30	+17.5	
D	13810	12	18	+7.5	
E	14551	12	10	+17.5	
F	14586	12	40	+7.5	96
G	14699	12	20	+2.5	97
H	14689	12	50	-7.5	17
I	14703	12	50	-12.5	56
J	14707	13	10	-14.0	57
1a	15251	12	7	+2.5	98
1					
2	15280	12	55	+2.5	72
3	15258	12	25	-2.5	78
4	15289	12	45	-2.5	99
5	15295	13	08	-2.5	100
6	15291	12	32	-7.2	66
7	15299	13	07	-7.5	102
8	15305	12	47	-17.2	18
9	15357	13	10	-17.5	27
10	15361	12	30	+22.5	32
11	15377	11	30	+12.5	46
12	15359	13	30	+2.5	67
13	15296				
14	15296	13	40	-15.0	101
15	15389	12	10	+7.5	39
16	15370	12	50	+12.5	44
17	15363	12	50	+17.5	33

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1931phae.proj.2322A

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1931phae.proj.2323A

R.W.F. Oct 1st

A 14703

	1	2	3	4	5	6	
A	37	35	35	38	38	39	222
B	27					32	
C	32					34	
D	23					32	
E	39					42	
F	28	25	44	35	32	35	199
	186					214	
	1	2	3	4	5	6	

222
199
140
121
682
34 141

1224

+25
+15
+23
+25

A	26	33	40
B	46	34	39
C	37	47	30
D	40	25	36
E	39	27	28
F	28	26	37
	216	192	210 / 618

X2 = 1236

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1931phae.proj.2372A

14703

X	1	2	3	4	5	6	
A	10 5	34	79	106	95	67	169
B	6	106	3	88	86	91	
C	10	5				74	
D	6 5					134	122
E	7	9				101	
F	6 6	54	97	712	49	106	165
	155	2	3	4	5	6	
A	5	98	12	11			
B	6 9	5	13	11	5		
C	10 10	12	16	5	10		
D	9 8	123	11	7			
E	9	74	3	6			
F	14 6	2	9	10	8		
	8 11	83	13	7			
	5 5	85	5	10			
	208	185	191				

584 × 2 = 1168

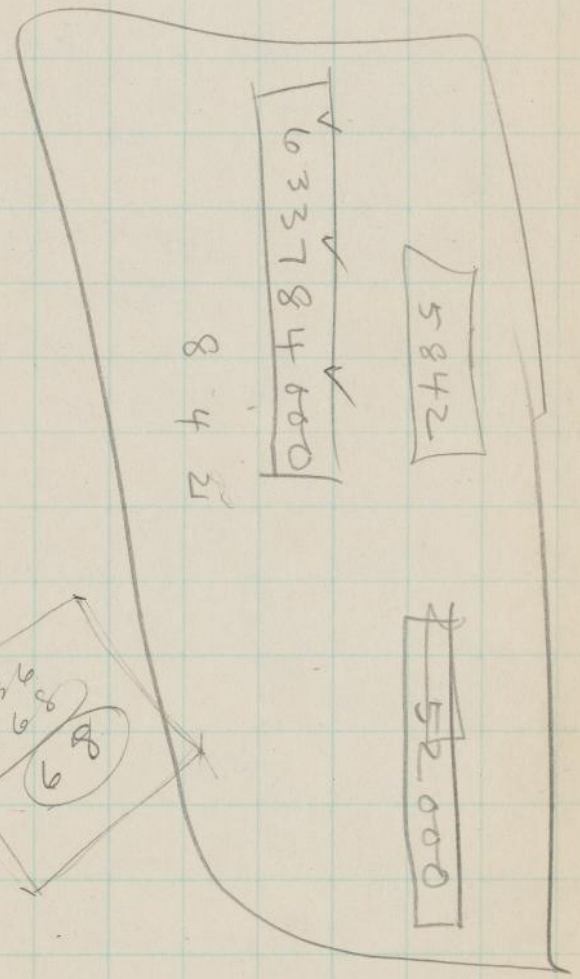
334
340
337
24
97
96

834
540
102
122
898

169
165
102
122
558
279

1008

1st Count AA
October 1st



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1931phae.proj.2522A

	1	2	3	4	5	6
A	8	7				
	5	10				
	10	10				
B	11	4				
	5	11				
C	7	3				
	7	9				
D	13	6				
	5	13				
E	8	10				
	5	7				
F	14	5				
	98	95				
	193					

36

33

30

25

42

455

1777

4709257

000523737

848

6504128976

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