

1962phase.proj.2459W

\$1.75

THIS BOOK BELONGS TO

CLASS OF _____

HARVARD COOPERATIVE SOCIETY
CAMBRIDGE, MASS.

1978

Ph 5
1962

Orb P
as a double 78 ! ... 8 ?

NGC 1846

5 7.7 - 67° 35.0

Time of day
57
57

No - error in ident. I seen
QFW on May 27, 62

poss. var. a numbered #1, 2

comp stars: lettered

#3 prob. good (?)

use: a, i, k, l, c

l, m, g, h

var. (yes)
= AV 2315

C (blue)

See my
marked copy
✓ PW 145
II
other side
two
grape

506 - 67.5

11703

23043

07

44

15

46

May 25, 62

No. 8 letters above

PW 145 paper II

b

42

V B-V B
1486 +.82 15.68

3

26

1426 +.17 14.43

2

18

1613 +.99 17.12

Adapted log for #2315
 May 25 '62 NGC 1846
 Brn B V
 1518 close to #108 + 227

INDEX

1

7 routes piece Seg for NGC
 1846 at vars.

a 1568 + 82 = #42 PW II Page 2 NGC 1846 NGC 1978
 b 1638 PW II ADH 51661 3 NGC 2315
 c 1704 " " 4 NGC 1846 { HR 5612
 5 { + Var 1, 34

a is like #108 in color
 b is bluer than a
 & c are both
 bluer than b
 (b is much redder)

B-V = +1.66 for #108

8, 9 NGC 1846, 1978 &
 #3 Var 1, 34, HR 5612
 NGC 2315

12 NGC 2315

Day Runs

14, 15 HR 5612 NGC 1953
 1, 3, 4 A, F

16, 17 " "

18, 19 " "

Plates at 5h 26m - 69°

20 HR 2439 NGC 1953
 Anom 2

30 " " + Anom 3
 40, 41 " " Var

48, 49 " " N

58, 59 " " & V

66, 67 " "

74, 75

82, 83 " "

Plates at 5h 04 - 70° 92 HR 2439

100 " "
 105 " "

#109

#4 1873 β q c ± 2

HY 2315
 $\mu = .414403$
 $P = 2.41311$

582.15
 15.75

1589 Cod
 1631 aq b
 1638 b.c
 1638 aq b
 1582
 1582 b.c
 1624 b.c
 1582 a2c b3c
 1589 a2c b3c
 1631 b.c b3c
 1638 b.c
 1548 b.c
 1638

A5B:
 B1C
 L A from
 poor
 poor
 "
 A0:
 A0:
 Bo
 Co

ROOTS
 $\alpha 77$
 $\mu 00$
 $\mu 2W$
 $\mu 5V$
 $\alpha 6V S_0$

A2 $\alpha 8V T_{55}$ $S_0 A_2$

$P = 2.4205855$

$\mu .413123$

1644
 1631
 1617
 1631
 1631
 1575
 1589
 1568
 1638
 1553
 1603
 1558
 1638

$\alpha 8V T_{55} S_5 S$

$\alpha 8V T_{55} S_5 S$
 $\alpha 6V T_{55} S_5 W$
 $\alpha 6V T_{55} S_5 S$
 $\alpha 6V T_{55} S_5 S$
 $\mu, W T_{65} S_5 S$

~~11772.606~~
 11772.606
 11778.828
 11804.45
 805.701
 905.220
 905.618
 918.875
 919.296
 937
 925.082
 926.779
 954.036

11736.243
 742.445
 768.983
 769.236
 868.453
 868.844
 882.061
 480
 920
 888.248
 889.939
 917.112

May
 for
 HY
 2315
 ✓

4

5104-666

NGC 46

#3

#2
HV5612Jan 60
#3 = 133#4
#24#7
#109

20326	45 34 29	104.6582
57	45 400	113.6225
98	45 441	128.5788
419	45 312	134.5984
477	60 224	160.5658
549	30 105	203.5829
599	60 346	229.3186
21498	45 443	586.2986
511	45 391	597.3183
524	40 111	602.3999
605	45 2026	674.2722
600	45 205	690.2971
22319	60 449	962.2703
22329	60 024	970.4459
336	60 255	988.2782
339	60 231	994.2839
7408	60 133 30	058.2726
984	60 254	314.3864
991	60 341	318.3429
999	45 109	319.4402
23006	45 049	322.4457
23010	45 504	324.2637
014	45 403	325.3032
032	60 215	351.3119
034	60 204	365.2811
037	60 156	367.2811
052	30 105	380.2705
054	30 153	380.3938

23431 60

22403 60 30057.2636

23431	60 300	30605.5851
23484	60 118	665.4919
23488	45 154	669.4507
23509	60 202	701.3628
23517	60 211	725.4729
23921	60 319	990.5181
23943	25 322	31048.3452
23961	60 204	31076.3346
23972	45 139	31107.3932
23980	45 141	31108.3975
24349	45	31284.6517
24409	60	295.6441
24448	60	303.5982
24484	45	317.6414
24486	60	321.5818
24485	60	324.5914

a₂ba₂ba₂ba₂ba₁b

fuzz

a₂b

A,B

A₅BA₁BA₁BA₁BA₁B

A

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1978 #2315 #2315
#2 may C y leg

$$P = .411692$$

$$H, \frac{1}{P} = .4144409$$

$$P = 2.412829$$

$$\frac{1}{P} = .414455$$

1558 a g b a g b
1589 b g b 4 g
BT 1563 b o a g b
1624 b g g b g g
FT 1575 b o a 2 g

11982.155
985.845
992.003
994.481
12005.172

BT
FT

12062.161
12065.846
12072.074
12074.569
12085.331
12103.159

12062.455
12066.170
12072.369
12074.863
12085.626
103.454

1624 b g g b g g
BT 1638 g g b g g
BT 1558 a g b a g b
1596 b g g b g g
1568 b o b g g

12033.477
12180.442
12184.979
187.071
12216.660

BT
1624

12113.825
12261.772
12266.339
12268.445
12298.232
12304.873

12114.120
12262.071
12266.638
12268.944
12298.532
12305.173

FT 1631 g o b g g
1603 g o b g g
FT 1563 b o a g b
1603 b o g g
1582 b o g g

12335.227
12338.593
12343.934
12348.407
12374.750

BT ?

12417.590
12420.978
12428.369
12430.858
12457.378
12563.522

12417.893
12421.281
12428.672
12431.161
12457.681
12563.828

Bo 1638 g o b g g
B3 1575 b g b g g
Bo 1631 b g g g h
B1 1644 g h g o h
1603 b o g i
B5 1568 b o
B8 1624 b g g
1644 g h
Co 1603 b o g
1631 b g g
1624 b g g

12480.190
81.819
82.271
83.508
84.257
85
495.392
501.143
967
507.314
365

12565.161
12565.616
12566.862
12567.615
12568.046
12578.825
12584.614
12585.443
12590.827
12590.878

12565.468
12565.922
12567.168
12567.921
12568.352
12579.132
12584.921
12585.750
12591.133
12591.185

1575 b g

12456.959

12457.263

1563 a g b

12684.206

12684.515

1568 b o g

12709.034

12709.344

1631 b g g

12710.675

12710.985

1603 b o g

12723.900

12724.211

1603 b o g

12733.893

12734.203

1638 i g o i

12843.738

12844.051

1558 a g b

12867.704

12868.018

1575 b g

12879.304

12879.618

bal flat

12892.176

12892.490

12892.592

12892.906

adapted
May 25 62

MCC 1846 $P = 2.412889$
 HVR 2315 $P = 0.414409$
 may Accepted 5/25/62

1873
β ♀ b

40 q e

7

1631	12965.639
1558	12970.195
1631	12973.491
1568	12979.311
1596	12980.945
1558	12982.194
1631	12984.698
1631	13037.597

[illegible]

—	$R_5 S$	≈ 8
X_0	R_0	$= 8$
X_1	R_0	≈ 8
X_2	R_0	≈ 9
S_0	$R_2 S$	≈ 8
$S_5 X$	R_0	≈ 8
$X_4 Y$	R_1	$= 8$
$X_2 Y$	R_1	≈ 8

x_{2W} T_{5S}
 x_{7W} T_{5S}
 x_{4Y}
 x_{5S} bad poor pl.
 x_{3W}
 P_{001}
 x_{4Y} T_{5S}
 x_{6Y}
 x_{6Y} bad pl.
 x_{6Y}
 x_{6Y} T_{5S}
 x_{5Y} T_{9S}
 x_{10} T_{5S}
 x_{9Y} T_{5S}

See page 12 for additional				NGC 1978		NGC 1978		NGC 1978	
7120	5h 04.1	-66.10	31330 6377	#3	NGC 1978	#2315	mag	p. 411692	
24528	45		2431669.5885	a ₂ b	b ₀	1568	B ₈	13038.116	
24975	60		670.5926	a ₂ b	b ₀	16.24	B ₀	.530	
982	60		674.5923	a ₂ b	b ₂ g	15.82	C ₀	40.176	
992	60		676.5944	a ₀ b	a ₀ b	1558	—	41.001	
25004	60	4 34	680.5765	a ₂ b	b ₉ g	1631	B ₀	42.640	
25021	60	4 17	681.5856	a ₀ b	b ₉ g	1575	B ₀	43.055	
027	60	4 09	682.5884	a ₂ b	b ₉ g	1631	B ₂	43.468	
032	60	4 19	683.5788	a ₀ b	b ₀	1568	B ₈	.876	
038	60	2 19	688.6430	a ₃ b	a ₉ b	1563	B ₈	45.961	
039	45	4 49	697.5745	a ₃ b	g ₀	1638	?	49.613	
049	45	4 44	698.5206	a ₂ b	g ₀	1568	B ₀	50.027	
057	60	5 06	699.4973	a ₂ b	g ₀	1638	B ₀	.429	
059	45	5 00	701.4960	a ₂ b	b ₀	1568	B ₇ C	51.252	
067	45	4 40	702.5124	a ₂ b	g ₀	1638	B	671	
075	60	4 52	704.4957	a ₂ b	g ₁ g ₀	1644	B ₉ ?	52.488	
084	60	2 56	705.5680	a ₀ b	a ₉ b	1563	C ₀ only	54.164	
090	60	4 24	710.5016	g ₀	a ₉ b	1558	B ₇ C	960	
096	60	5 24	711.4522	a ₂ b	b ₉ g	1624	B ₀	55.351	
101	45	5 14	712.4616	where?	g ₂ g	1582	C ₀	55.767	
108	60	4 19	713.4969	a ₀ trailed	b ₉ g	1589	C ₀	56.193	
112	60	3 51	734.4590	a ₅ b	b ₀	1568	C ₀	64.823	
128	60	0 15	859.2825	b ₀ b ₁ b	g ₀ h	1638	B ₂ C	116.212	
213	45	0 50	860.3084	a ₅ b	a ₉ b	1553	C ₀ and B ₂ C	.634	
215	60	0 56	870.2801	a ₀ b	a ₉ b	1563	B ₂ C	120.739	
216	45	5 10	92024.6042	a ₅ b	b ₀ g	1568	C ₀	184.273	
471	45	3 22	030.6554	a ₃ b	b ₀ g	1624	B ₇ C	186.765	
478	45	3 42	056.5783	a ₀ b	g ₀ h	1638	B ₉ C	197.437	
532	45	3 24	063.6181	g ₀ h	b ₉ g	1631	B ₂ C	200.335	
560	60	—	502.3854	where?	Disc	1558	B ₂ C	381.766	
26043	44 60	4 44	504.3142	g ₀ a ₁ b	a ₉ b	1644	B ₂ C	383.409	
046	44 60	4 34	508.3041	g ₀ a ₁ b	g ₀ h	1631	B ₉ C	388.352	
054	45	3 44	520.3120	b ₀ a ₁ b	b ₉ g	1631	C ₀ E	396.197	
065	60	3 44	539.3672	a ₂ b	b ₉ g	1631	B ₉ C	402.764	
082	50	small	555.3174	a ₂ b	g ₀ h	1644	B ₁ C	406.072	
084	45	"	563.3534	a ₃ b	a ₉ b	1558	B ₁ C	.478	
090	60	small	564.3402	a ₀ b	a ₉ b	1558	B ₁ C		
093	60		807.5747	where?	Disc				
548	45		808.6288	"	"				
550	45		837.5545	a ₂ b	a ₉ b	1563	C ₀ E		
592	45		870.3327	1.4082	a ₉ b	1563	where?		
27021	120	8 10	14584.780		g ₀ h	1638			
3348	240		13922.694		b ₉ g	1575			
2194	90								
11574	57	gating	21134.884						
11585	60		154.692						
26969									

a is after here!

Jan 1960 new vers. 1, 2, 3, 4 near 5 ^h 07 ^m - 67.50					HV2315 p=414164		p=413123 R=2.420585	
#	#1	#2	#3	#4	#1			
	sl>A		b ₀	A	B	13116.403	13083.435	
	>A		b ₁ c	—	—	.819	850	
	>A		e	A	B	118.476	85.503	
BT	>A		asb	A:	—	119.305	13086.330	
	>A		b ₀	—	AsB:	120.954	87.975	
	>A		b ₁ c	—	—	121.872	88.392	
	>A		b ₀	—	B	.788	1806	
	>A		b ₁	A:	B	122.198	89.215	
BT	A		b ₁ c	—	—	124.295	91.307	
BT?	A		Coorfter	>A:	>A	127.969	94.972	
	>A		b ₁ c	—	—	128.386	95.388	
	A		b ₁ c	—	—	.791	.791	
	A		b ₁ c	—	A:	29.618	96.617	
	>A		b ₀	—	—	130.039	97.037	
	>A		b ₁ c	—	—	.862	.858	
	A		b ₁ c	A	?	132.547	99.539	
	>A		b ₁ c	LA:	A,B	133.345	100.337	
SL	A:		asb	—	—	.742	37.736	
	sl>A		b ₀	LA	BT?	134.160	101.147	
	>A		b ₁ c	—	—	134.589	101.575	
FT	A		b ₁ c	A	B	143.270	110.235	
	A		b ₁ c	A	B:	194.968	161.802	
	A		b ₁ c	A:	A:	195.393	162.226	
	sl>A		b ₁ c	A	B	199.523	166.346	
	AsB		b ₁ c	A	C	13263.438	230.101	
			c ₁ d	—	—	65944	232.600	
FT	FT		b ₁ c	—	—	76.681	243.310	
Next			b ₁ c	—	—	79.596	246.218	
				—	—	461.318		
FT	FT			—	—	462.117	428.280	
100	AsB		b ₁ c	A	C	463.769	429.928	
102	AsB		b ₁ c	A	C	468.742	434.889	
97	A,B:		b ₁ c	A:	B	476.634	442.761	
764	A,B		b ₁ c	A	AsB:	483.240	449.350	
72	A		b ₁ c	A	C	486.569	452.670	
178	AsB		b ₁ c	A	C	.977	453.078	
	A		b ₁ c	A	C	600.133		

10

SB

1626
1628
1634
1637
1638
1639
1641

#3
c8d
—
c5d
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—
c5d
c8d
end

#1
b5c
b5c
b3c
b4c
b5c
b2c
#1 is old.

18634.916

18637.852

18638.442

18639.025

18642.004

18647.223

18647.815

18648.389

18649.565

18650.163

18651.332

18653.726

18654.863

18655.422

18656.016

18656.625

18668.957

18742.389

18839.646

19121.852

19124.200

7056221

10 = 1.4171891

#2315

6285259

p = 1.5910243

#2315

44891.724

44897.368

44898.798

44900.219

44901.623

44908.799

44921.372

44922.798

44924.182

44927.015

44928.455

44931.270

44937.037

44939.777

44941.124

44942.555

44944.022

44973.729

45150.628

45152.042

45166.214

45384.920

45393.496

45430.233

46114.437

46137.041

46148.429

46149.828

47151.877

50398.231

404.567

406.173

407.768

409.344

417.401

431.516

433.117

434.671

437.850

439.468

442.628

449.102

452.179

453.691

455.297

456.944

490.295

688.893

690.525

706.390

951.923

961.551

51002.795

013.996

51770.924

51796.301

51809.087

51810.657

52935.619

.4132356
1/p = 2.4199270
#2315

1873

β

Q

$\alpha 82$ T₅S₁
 $\alpha 82$ T₅S₁ C
 $\gamma_2 W$ T₅S₁
 $\alpha 52$ T₅S₁
 $\gamma_2 W$ T₅S₁
 $\alpha 82$ T₅S₁
 $\alpha 52$ T₅S₁
 $\alpha 72$ T₅S₁
 $\alpha 92$ T₅S₁
 $\gamma_0 W$ T₈S₁
 $\alpha 92$ T₅S₁
 $\gamma_0 W$ T₀S₁
 $\alpha 52$ T₆S₁
 $\alpha 52$ T₅S₁
 $\alpha 52$ T₃S₁
 $\gamma_2 W$ T₅S₁
 $\alpha 92$ T₄S₁
 $\gamma_1 W$ T₅S₁
 $\alpha 92$ T₅S₁
 $\alpha 62$ T₅S₁
 $\alpha 92$ T₅S₁
 $\alpha 92$ T₅S₁
 $\gamma_0 W$ T₅S₁
 $\alpha 72$ T₅S₁ S₀
 $\gamma_2 W$ T₅S₁ S₀
 $\gamma_1 W$ T₃S₁ S₁
 $\gamma_0 W$ T₅S₁ S₁S₅
 $\alpha 82$ T₅S₁
 $\alpha 72$ T₅S₁
 $\alpha 92$ T₅S₁ S₅S₅
 $\alpha 72$ T₅S₁
 $\alpha 72$ T₅S₁
 $\alpha 72$ T₅S₁
 $\alpha 82$ T₈S₁ $\alpha bter?$
 $\alpha 82$ T₈S₁
 $\alpha 82$ T₁₀S₁
 $\alpha 82$ T₁₀S₁

76732.420
76737.099
76739.399

77097.138
77099.621
77123.751

77574.579

$\alpha 82$ T₅S₁
 $\alpha 82$ T₅S₁ S₁S₅

$\alpha 92$ T₅S₁ S₀S

8.12	HR 2315	$P = 2.4496855$	$P = 2.412586$	$P = 2.412829$	(2.41281)
$\frac{1}{P} = .424091$	$\frac{1}{P} = .408216$	$\frac{1}{P} = .414493$	$\frac{1}{P} = .414450$		
13430.787	12928.033	13126.823	13125.493	13125.173	13125.589
31.213	.443	127.239	.909	13125.589	13127.247
32.910	.075	.897	27.1566	13127.247	13128.076
33.759	30.893	129.727	28.396	13128.076	13129.727
35.447	32.518	131.377	30.047	13129.727	13130.145
.875	.930	.795	30.465	13130.145	13130.560
.301	.340	132.211	130.880	13130.560	13130.971
36.721	.744	622	131.291	13130.971	13133.070
38.868	35.811	134.721	133.390	13133.070	13136.746
42.631	39.433	138.398	137.067	13136.746	13137.163
43.057	.843	.815	137.484	13137.163	13137.568
.472	40.242	139.220	.888	13137.568	13138.397
44.319	41.058	140.048	138.717	13138.397	13138.818
.750	41.473	.469	139.138	13138.818	13139.641
45.543	42.284	141.293	.961	13139.641	13141.327
47.318	43.945	142.979	141.648	13141.327	13142.129
48.138	44.734	143.781	142.449	13142.129	13142.523
.541	45.122	144.175	142.843	13142.523	13142.941
.970	534	144.593	143.261	13142.941	13143.370
49.409	.957	145.022	.691	13143.370	13152.058
		153.711	152.378	13152.058	13203.790
		205.450	204.111	13203.790	13204.215
		.875	.537	13204.215	13208.348
		210.008	208.669	13208.348	13272.306
		273.974	272.629	13272.306	13274.814
		276.482	275.137	13274.814	13285.557
		287.227	285.881	13285.557	13288.475
		290.145	288.799	13288.475	13470.318
		472.011	470.646	13470.318	13471.117
		472.811	471.446	13471.117	13472.771
		474.464	473.099	13472.771	13477.747
		479.442	478.076	13477.747	13485.645
		487.340	485.973	13485.645	13492.255
		493.951	492.584	13492.255	13495.585
		497.282	495.914	13495.585	13495.994
		.691	496.323	13495.994	13596.801
		598.510	597.132	13596.801	13597.238
		.947	.569	13597.238	13609.226
		610.936	13609.557	13609.226	13789.032
		790.766	789.368	13789.032	

6044680
5770.274

6044.533
5770.134

ADH
meas in
ph 6
Not

adopted
May 25 62
1300.4144409

42889
 04144409
 HV2315 m NAC1846
 5/25/62

#40

♀

$b = R + L$

X_5Y

R_{35}

✓

X_2Y

✓

=

X_2Y

✓

=

X_2Y

± 8

=

X_2Y

R_{35}

=

X_1Y

"

=

$X_3Y: Yns$

"

=

LX quite sure

"

=

LX

"

=

LX

"

"

LX

"

"

$X_2Y:$

"

"

X_6Y

"

"

X_5Y

"

"

LX

$> R$

=

LX

$> R$

=

X_1Y

R_{35}

=

X_1Y

R_{25}

=

X_1Y

= R

=

X_1Y

= R

=

S_0

R_2

=

X_0Y

$> R$

=

X_0Y

$> R$

=

X_1Y

R_1

=

S_0

R_{35}

=

X_1Y

R

=

S_0

R_{25}

=

X_2Y

R_{25}

=

S_5X

$> R_0$

=

X_2Y

R_{25}

=

X_0Y

✓

=

$X_0:$

L

X_5Y

R_{35}

$L?$

14

Rau

Jan '60

NGC 1953

Mag

	5426 ^m - 69° 17'	#2	#3	#4	#1	A	F	
						(90 HES)		
16677	27410.266							
78	300	jon						
79	413.340	bo				B ₅ H 90	E ₁ J	
80	374	ast				S ₅ B	E ₂ J	
81	421.312					B ₂ H		
82	344					H ₁ E		
84	422.272	fi:				E ₀	H ₉ E	
87	426.264 ^{rook pl.}							
88	296	bo				S ₀ B	E ₁ J	
89	329	bo b ₂				S ₀ B	E ₂ J	
90	363	bo:✓				S ₀ B	E ₃ J	
91	396	bo:bo				S ₀ B	E ₄ J	
92	448	bo:yi					E ₅ J	
93	555	bo:bo					E ₆ J	
16701	449.273	jon				S ₀ B	E ₇ J	
02	307	bo:ag				B ₂ H:jon	E ₈ J	
03	339	bo:ag				E ₁ J	E ₉ J	
04	381	bo:bo				H ₆ E	E ₀ J	
05	434	bo				E ₁ J	E ₁ J	
06	462	jon				E ₀ J	H ₀ H ₃ E B ₅ H	
07	454.363					E ₀ J	H ₃ E	
12	456.276 X ₅	bo:				B ₃ H	E ₇ J: Jns	
13	309	bo:				E ₂ J	E ₅ J: E ₂ J	
14	354	bo:				E ₇ J	E ₀ J: E ₇ J	
15	387	bo:				E ₁ J	E ₅ J	
16	533					poor	E ₁ J	
17	452.277	bo:				E ₅ J	E ₁ J	
18	311 X ₈	bo: bsc				H ₈ E	E ₁ J	
19	349 X ₂	bo:				E ₃ J	E ₅ J	
20	382	bo:				E ₀	E ₄ J	
21	436	bo:				H ₈ E	E ₀ J	
22	469	bo:				E ₁ J	E ₅ J	
23	502	bo:				E ₀ J	E ₁ J	
24	535 X ₅	bo:				E ₀ J	E ₄ J	
17 212	27728.4636	Bo				H ₅ E	E ₃ J	
215	730.5211	Bo				B ₀ H: prop	E ₈ J	
225	746.4816	ag				E ₀ J	E ₀ J	
228	747.4242	bo				E ₂ J	E ₀ J	
232	749.4091	bo				S ₀ B	H ₁ E	
234	4887	bo:bo				S ₀ B	H ₇ E	
239	750.4402	bo:				S ₀ B	E ₇ J	
247	755.3622	bo				S ₅ B	H ₁ E	
249	4515	ag				S ₀	E ₀ J	
253	756.3358	bo				S ₁	E ₂ J	
258	776.5237	bo				S ₅ B	E ₅ J	
268	786.3149	bo				H ₅ E	H ₄ E	

Var A in 1977
NGC 1953
1978
SBH E J. Seg.

NGC 1928 Var A 1953
6.6034149
p = .1514368
adapted

NGC 1953 Var F
1.8303343
p = .5463483
adapted
14975.552
1.9085
15
50 188739
5298322 5230717
Var F

1639	poor	4151.388		977.232	16681	4524.470	14339.142
1631	M	394		.250	1673	.488	.160
1635	broken	4152.596		981.587			343.312
1647	off	4152.601		.605			.329
1663	"	.741		982.112	1661	4529.203	343.814
		4153.346		984.293			
1629	off	.351		.310	1678	14531.335	14345.919
1629	"	.355		.328	1678		
1629	"	.361		.347	1678		
1629	"	.366		.365	1668		
	"	.374		.393	1688		
1629	B ₂ C	.390		.452	1688	.472	346.055
1635		4156.830	14	996.864	1657	1157.307	14357.938
1668	off	4156.835	14	.882	1659	14543.527	.956
1658	off	4156.840	14	.900	1663		
1668	B ₅ C:	.846	14	.923	1648	.566	.994
1663	B ₂ C:	.854	14	.952	1645	.594	
1663	aqB:	.859		.967	1650	.609	.037
1636	poor	4157.601		999.645	1698:		360.600
1673	off	4157.891		1500.690	1688:		361.601
1698		4157.896	14	.708	1703	14547.237	
1668	poor	4157.902		.732	1688		
	"	.907		.750	1668		
1688	"	.929		.841	1654	14547.355	361.735
1659	"	4158.042	1500	.237	1659	14547.349	362.125
1678		4158.047		.255	1688	14547.767	
1663	7283.11 (B ₂ C) sur	4158.053		.276	1683	14547.788	
1659	LB	.058		.294	1663		
1668	poor	.066		.323	1688		.208
1663	"	.071		.342	1688	.851	14547.624
1663	"	.076		.360	1688:		
1663	aqB:	.081		.378	1683:		
1654				15149.399	1678		14503.975
1633				15150.523	1659:		14505.051
1663				159.243	1688		14513.399
1673				.758	1663		14513.892
1629				160.842	1647		14514.931
1629				.886	1658		14514.972
1630				161.406	1698		14515.470
1631				164.095	1647		14518.044
1629				164.144	1663		14518.091
1629				164.627			14518.554
1631				175.662	1688:		14529.113
1654	off plate			181.006	1658		14534.235

16

	54 26 ^m - 69	0 #3	#1	NBC 1953	VarH	+	NBC 1978 Jan
17280	27 799.2857	bo	A2B	H8 J	H8 J	B2C	34183.436
281	3314	bo	—	H5E	H9E	B2C	34183.436
282	3785	bo	A5:	E1J	H9E	poor	
83	4463	bo	A6:	E0J	H7E	B2C:	
84	4817	bo	—	E3J	E4J	poor	
85	5322	bic	—	E0J	E0J	"	
287	800.2829	B5C	7A:	E2J	E5J	Broken here	
88	3196	cod	7A:	E4J	E8J	B2C	34184.707
89	3771	cod:	—	E3J	E3J	B2C	34184.778
90	4138	dot:	—	H9E	E5J	poor	
91	4720	4d	—	E0J	E5J	"	
92	5066	d:	—	H9E	E2J	poor	
93	5551	d:	—	E2J	H9E	"	
17294	801.2828	agb	C	B2H	E1J	B2C:	
95	3211	bo	4A Bns	S8B	E2J	B2C:	
96	3705 poor	—	—	—	—	—	
97	4084 poor	—	—	—	—	—	
98	802.4991	agb	—	S0B	E0J	poor	
99	5524	bic	—	S0B	E0J	"	
300	807.2832	bo	BnC	H7E	E5J	"	
301	3171	bo	—	—	E6J	—	
302	3649	bo	A3B:	E2J	E0J	B2C:	
303	3989	bic	—	E2J	E3J	B2C	34193.413
304	4432	poor	—	—	—	poor	
305	4764	"	—	—	—	"	
306	5159	bic	—	H5E	E5J	agb poor	34193.556
307	5491	poor	—	H8E	E6	poor	
308	808.2825	bic	B0	S0B	H6H9	H5E	B2C:
309	3165	bic	LA	S0B	H6H9	H5E	B2C fan
310	3677	bic	A7B	S2B	H6H9	H5E	B2C
311	4016	bic	—	S1B	H6H9	H5E	B2C
315	811.2740	bo	—	S2B BnH	H9E	B2C fan	34198.178

Image a bit queer

$P = 1.775$ $\frac{1.830248}{1.836} = P$ 1.88444 1.88617 **137**
 $p.5463740$ 5446623 $.5306616$ $.5301747$ 1.9085 5230717

15661.570 15188.807 15141.223 14752.013 14738.484 14541.020

.832

.858

.895

.508

.533

.569

.587

.614

15661.596 .942 15141.357

14752.144

15662.132 89.352 15141.766

14752.543

14739.012

.149

.541

.372

.403

.423

.455

.032

15662.285 89.500 15141.914

14752.687

.157

.684

15662.692 89.898 15142.311

14753.073

14739.542

542.064

15662.717 15142.331

14753.094

.563

542.084

15663.380 15190.563 15142.973

14753.719

14740.187

542.700

.410

.592 15143.002

.747

14740.215

542.728

15666.076 15193.177 15145.519

14756.257

14742.724

545.203

.141

15145.642

14756.319

14742.785

15193.304

14756.381

14742.847

.225

.322

.639 15193.725 15146.123

14756.788

14743.253

545.342

545.726

.706 15193.788 15146.188

14756.851

14743.317

545.788

.824 195.357 15147.752

14758.375

14744.839

547.290

138	16.0	12	2.4055812	2.000845	2.223101	Var F 1.8303343	aduff
ra T m NGC	1953	1/2	4157000	.4997901	.4498221	1/P - .5463483	
1738.665	11556.163		13893.808		12504.733	15188.092	136
.685	.182					.117	
.705	.202					.143	
.733	.230					.180	
.748	.245					.200	
.769	.266	13893.931		.844	11723.29	.227	
739.086	11556.578	13894.306		12505.182	15188	.637	
.102	.593					.657	
.126	.617					.689	07
.142	.632					.709	78
.166	.656					.741	
.181	.671					.760	
.201	.691	13894.422		12505.304	11723.29	.786	
739.509	11556.993	13894.806		12505.631	15189.184	.825	
.525	.57.009	.825				.205	
.546	57.030						
.562	045						
740.022	57.499	13895.414		12506.179	15189.848		
740.045	.521	.440		12506.203	15189.877		
742.042	59.488	13897.805		12508.331	15192.462		
742.057	.502				.480		
.077	.522				15192.507		
.091	.536	.863			.525		
.110	.554				.549		
.124	.568				.567		
.141	59.584			12508.435	11721.589		
.155	.598	.938		12508.450	11721.607		
742.464	59.903	13898.304		12508.780	15193.008		
.479	.917				.026		
.506	.938				.054		
.515	.953	13898.364		12508.834	11721.073		
743.728	61.147			12510.126	15194.642		

✓ 24666 E0
 ✓ 24483 E9
 ✓ 25636 E2
 ✓ 23471 H8
 ✓ 25533 E1
 ✓ 15796 E,J

Comp 16 310 E,J

posed 16 561 H7

✓ 20568 H5

✓ 23449 H5

✓ 25169 E0

✓ 26657 E1

✓ 4.423861	4.4069611	1.22965	623845	p=81323	1.28895182	17
6283.942	6308.040	15.122	2607.448	34183.436	21567.358	1659
.952	.050	1580	.485	.492		1661
		1572				1661
						1658
						1683
						1663
						1688
6284.176	.274	1562	22608.289	.707	21568.160	1703
.189	.287	1562	.336		.205	1678
						1688
						1688
						1673
						1661
	493	1567	2609.072		.907	1668
		1567				1673
	769		610.061			1663
						1663
						1688
						1693
6285.768	6309.873	1615	614.018	34193.371	21573.626	1693
.776	.881	1624	.046	.413	.652	1703
802	807	1562	.141	34193.556	.743	1688
.810	.915	1567	.168	34193.597	.769	1693
.975	6310.081	1573	.765			1661
.983	.089	1610	.792	34194.541		1659
.995	.108	1610	.834			1656
.002	.108	1610	.861			1658
86.652	6310.760	1567	.197	34198.178	21576.659	

18

5^h 26^m - 69° 0' Run

#2

#3

(1 + 4): on all these plates

#4

#1

NGC 1953

Var A

F

266	43	32 882.2699	27 A	b2c	A	—	B0H	E2J
44		3135	"	b2c	—	—	B0H	E1J
45		884.2769	A	b2c	—	—	H5E	E3J
46		3219	27 A	b2c	—	—	E2J	E6J
47		3648	A	b2c	A	LA:	E1J	E6J
48		4175	A	b2c	—	C	E1J	E6J
49		888.2868	A	b2c	A	C	S1B	E6J
50		3318	A	b2c	A	C	S5B	E8J
51		3837	A	b2c	A	B	H4E	E7J
52		4260	A	b2c	A	—	H0	E9J
56		891.2853	A	b2c	7A:	—	H5E	E9J
57		3291	A	b2c	7A	—	E2J	E5J
58		3755	A	b2c	—	A	E2J	E5J
59		4275	A	b2c	—	B	H2E	E2J
84		915.2924	A	b2c	7A	B	B5H	E0J
85		3360	A	b2c	7A	B	H0E	E4J
86		3790	A	b2c	7A	B	B0H	E2J
87		4371	A	b2c	7A	B	B5H	E4J
88		916.2828	A	b2c	LA:	A	E0J	E2J
89		919.2919	27 A	b2c	7A	C	S0	E5J
90		3348	A	b2c	7A	LA	S2B	E7J
91		3833	A	b2c	7A	C	S0	E6J
92		4256	A	b2c	7A	B	S0	E6J
94		940.3073	A	b2c	7A	LA	S2B	H9E
95		3627	A	b2c	7A	LA	S0	E0J
96		4131	27 A	b2c	7A	LA	S5B	H8J
97		4568	A	b2c	A:	B	S5B	E2J
98		941.2906	A	b2c	7A	—	B0	E6J
99		3426	27 A	b2c	7A	C	S5B	E2J
700		3848	A	b2c	7A	—	B0	E7J
701		4326	A	b2c	7A	—	B0	E7J

1978 Var
4.4238611Var F
P 1.945
P = .5141388Var F
1.8303343
.54624831.88617
5301749
Var F
1.8219
530367374117.438
.447

.879

.889

.899

.910

7418.762

.771

.783

.792

7419.421

.431

.441

.452

7424.703

.712

.722

.735

.921

7425.583

.592

.603

.612

7430.218

.229

.239

30.422

.434

.454

7432.935
.944

33.388

.398

33.408

33.420

34.295

16906.051

16907.053

16907.155

16909.144

16909.216

16910.656

16910.759

16923.029

16923.103

16923.538

16925.055

16925.107

16925.154

16935.919

16935.967

16936.396

16936.469

17965.172

.196

966.269

.293

.317

.346

17968.460

.484

.513

.536

970.098

.122

.147

.175

983.214

.238

.261

.293

983.772

985.399

985.423

.449

.472

996.911

.939

.963

997.418

997.447

.470

.496

17433.354

.377

.418

.493

17436.544

.618

438.134

438.209

450.862

.939

451.387

452.982

453.053

464.154

464.203

464.645

464.672

17996.585

17996.636

17997.092

17997.170

20

5h 26m - 69° HV 2439 $P=4813174$ HV 2439
in Proj 2 $p=0.201763$ Bma

157 198 13875.807 (Nov 15'60) ~~ADOPTED~~ $HV.2439$ \downarrow
14391.543 \downarrow 2990.030 1603
16814.656 cqd 3493.463 1711
1816.644 bqc 93.876 1630
1768 (b4c) .902 1603
823.638 c5d 95.330 1676
855.573
17590.584
21154.744
23024779. *where*
465.597 c4d 4875.283 1668
486.545 cqd 79.635 1711
487.567 c8 1625
489.539 c7d 80.257 1694
490.573 c7d .472 1694
527.510
529.516 c8d 88.563 1703
667.868 c5d 4917.307 1676
681.879 c5d 20.218 1676
682.875 cqd .425 1711
683.871 doe .632 1720
705.769
706.778 c7d 25.391 1694
732.679 c5d 30.773 1676
734.801 cqd 31.213 1643
737.848 (b8c) .847 1625
738.785 b9c 320.41 1630
740.790 c9d .458 1694
741.834 c9d 4932.675 1711
742.852
752.638 (b4c) 34.919 1603
875.527 cc — 4636
876.529
900.501 c8d 65.640 1703
907.499 c0d 67.094 1636
1051.819 c2d 97.078 1651
056.893
065.804
081.749
084.690
353.890
360.895
380.812
408.850
418.800
439.798
13954.583
13847.841
13946.555
948.574
951.504

NGC 1953

NGC 1953 Var A

Var A H. D F $P.1514295$
~~S5B~~ H8E
S0B E1J 2179.904 78
S5B E2J 2546.235
E0J E5J: 2546.536
H0E H5E .555 91
H2E E4J 2547.595 91
B5H E7J 2552.431
S7B — 2663.733
3203.452
3486.631
3553.384
3556.536
3557.009
H1E: .166
3563.063 12
3584.013 12
3586.135
3586.286
E5J .437
3589.906
3593.828
3594.149
3594.610
3594.752 12
3595.056
368
E0J H8E 3596.850
3619.241 13
3620.301
3642.155
3642.914
3644.273
3646.687
3647.133
3647.897
3648.958 13
3691.974
3696.220
3697.727 13
not bright
H0E
E5J
E5J
H5E

[illegible]

22

Quon 3	Van V	Quon 3	Van V	Quon 3	Van V	Quon 3
for a lafter	1.7460979	1.7460979	1.7460979	1.7460979	1.7460979	1.7460979
fo	8242.117	1720	22634.098	8242.117	1720	22634.098
T5	9629.847	1689	26445.015	9629.847	1689	26445.015
for						
T8	9631.057	1706	448.336	9631.057	1706	448.336
T9	34.991	1708	459.141	34.991	1708	459.141
fo	9653.281	1720	509.366	9653.281	1720	509.366

Quon 3
 $P = 1.5727360$
 $P = 1.6358387$
 $1/P = 1.5727259$
 $X 22633.952$
 26449.845

T8
 175
 13438.878 1706 36905.189 .952

f5d
 13452.590 1734 942.844 .606
 13453.182 1734 .470 .233

f5d
 13475.485 1720 37005.717 37005.479
 13554.720 1706 223.308 .069
 13562.744 1706 .344 .104

T8
 13563.885 1706 .477 248.237

S9
 13577.004 1719 .503 37284.264
 13591.837 1706 .239 .999
 13593.053 1715 .576 .336
 13594.798 1706 .368 333.128
 13595.334 1720 37334.842 334.602
 13596.483 1719 .995 337.755
 13597.081 1720 339.637 .397

f5d
 13603.268 1734 356.629 .389

T5S
 13687.950 1689 .178 588.937

for
 11
 T8S
 13791.752 1706 .234 873.990

f5d
 13947.608 1720 .240 .994
 13951.620 1718 .257 .011
 13963.027 1715 .581 .334
 T8S
 13984.783 1706 .326 .079

Vin
 Quon 3

1.7529206 1.7529536

8209.100

9591.271 9592.186

9592.476 9593.391

9596.395 9597.310

9614.611 9615.528

13385.044 13386.321

13398.701

399.291

13509.702

13510.838

13543.910

13550.068

13634.418

13737.814

13893.061

13897.057

13930.090

24 $P = 1.4992604$
 $P = 2.0029628$
 18825.725 $nsL1748$ $nsL1748$

$Var N$ $P = 99617144$ $H99259$
 $P = 1.00384327$
 14446.854 28825.804

$Var N$ $P = 99824$
 14416.917 16844.302

$Var N$ $P = 1.0021154$
 $P = .9978891$ 14361.164

Adapted
Ann 3

.418

17.59 dgF 16920.354

$nsL1748$ $nsL2$ 23576.810

47048.673 $nsL1748$ $nsL2$ 23579.816 47048.802 23530.953 23439.955

23709.597

~~ns~~ ~~$nsL1748$~~ $nsL2$ 23823.890 Def 23774.522

47554.010 17.59 dgF $nsL2$ 23833.080 47554.141 23783.693 23691.717

23942.640

24094.225

24124.208

24396.828

24403.836

24451.885

$P = 4992924$ 401.21174

2.0028344

28823.877

33676.971

33680.953

81.201

694.961

33758.921

42.001

35231.027

42369.449

46114.819

46997.705

47039.660 X

47045.657

47047.728

47121.706

47125.724

47402.820

47430.882

47432.877

47434.872

47480.750

47532.626 X 59.138

47536.876

47542.979

47544.855

47548.871

47550.962 *proposed*

47553.001

47572.600 X

47820.736

47868.746

48171.810

48181.853

48199.820

48237.646

48776.809

48790.839

48830.729

48886.884

48906.813

30

H.V.
2439
Arms 2

$\mu = 0.207763$
Hr 2439

2439
mag

NG-C 1953
Var A

NG-C 1953
Var B

$\mu = .1514295$

13607	24462.426		
623	501.614		
644	637.498		
4093	802.831		
106	821.605		
108	824.683		
26961	33 150.6322	66d	6887.4751685
966	153.6250	68d	6888.0971625
975	160.6233		
27011	207.5947	when	
014	216.5721	when	
14252	25886.539	68d	5378.2651703
315	915.572		
397	952.572		
485	997.359	65d	5401.289
531	26011.336		
611	055.296		
625	060.243		
968	245.582		
985	264.557		
15009	274.482		
039	3043.55	65d	5465.0721608
041	308.518	(68d)	.9371625
-049	309.501	66d	66.1411643
062	319.329	68d	68.1831636
064	322.343	68d	68.8091643
070	323.337	69d	69.0151630
-075	328.446	69d	70.0771660
080	329.398	68d	.2751703
083	330.340	69d	.4701711
086	334.368		
087	335.447	66d	71.5311685
233	410.272		
250	412.253		
254	413.355		
256	414.287		

B₉H
S₃B
E₂J
E₃J
E₄J
S₀B
S₀B
H₃E
H₇E

T

H₆E + 3704.378
E₇J 3710.267
E₂J 3730.844
H₂E 3755.880
E₅J + 3758.723
H₅E 3759.189
E₅J + 5019.924
E₅J 5020.437
E₀J 5021.497
5028.609
5029.969

B₃H
H₂E
H₅E
H₈E
H₀E
B₅H
S₂B
S₂B
E₁J
B₀H
E₁J
S₂B
E₁J
S₂B
E₁J
S₂B
S₂B
B₀H
E₁J
E₁J
E₁J
E₁J

H₅E
H₉E
E₁J
E₂J
E₁J
H₀E +
H₅E
H₀E
H₅E
E₁J
H₁E
H₁E
E₉J
E₀J
E₀J
E₁J
H₅E
E₇J

3919.986
3924.373
3929.976
3936.767
3938.884
3945.540
3946.290
3974.355
3977.229
3978.732
3983.255
3983.886
3984.035
3985.523
3985.979
3986.130
3986.903
3987.048
3987.190
3987.964
3999.294
.594
.761
.902

ADH

59	33633.481	66d	6987.7931685
17	33618.4	66d	
40	33626.371	68d	6986.3161703
95	33659.367	68d	6993.1711676
103	33661.313	69d	6993.5751711
1756	34458.243	69d	7159.1481668

D₅S
H₆E
B₀
S₅H
H₁E
D₅S

J₂S 5093.101
E₇J 90.8301
E₉J 92.025
E₂ 97.021
E₅ 97.316
E₈J 5217.995

Note S is fainter than B

Var A 1.514 Var. 8303673
 6.6034149 68

Var F 1.8303743 5463453
 0 Var F

2 (sum) **31**

15 264	26 21.249	3704557	1643	13364.927	13365.169	1656
266	426.236	3710.446	1630	386.173	13386.415	1698
271	427.255	3731.024	1678		13460.655	1673
278	441.229	3756.061	1678	13550.739	13550.985	1648
287	444.225	3752.847	1683		13561.242	1688
293	452.220	3759.371	1629		13562.923	1654
298	453.220	5020.226	1629		18111.792	1688
303	454.217	5020.679	1650		18113.427	1688
308	455.214	5021.739	1658		18117.250	1663
314	456.214					
631	565.613					
651	567.629	3920.175				
672	570.631	3924.562	1636		14158.896	1654
680	571.611	3930.165	1648		14179.111	1661
686	572.627	3936.957	1654		14203.613	1698
693	573.635	3939.073	1659		14211.249	1673
703	577.631	3945.731	1645		14235.267	1668
739	583.615	3946.480	1639		14237.969	1645
748	594.599	3974.547	1632		14339.229	1654
796	626.518	3977.420	1630		14349.596	1668
806	635.562	3978.923	1668		14354.966	1654
838	679.441	3983.447	1633		14371.340	1668
847	684.383	3984.078	1668		14373.614	1668
851	686.569	3984.227	1630		14374.151	1647
857	689.391	3985.715	1668		14379.521	1688
858	546	3986.171	1648		14381.167	
872	710.335	3986.322	1629		14381.710	1673
878	713.474	3987.096	1678		14384.502	1703
16 203	946.623	3987.240	1631		14385.022	1647
221	956.619	3987.382	1630		14385.536	1708
230	960.603					
254	977.615	3988.156	1629		14388.327	1663
271	988.563	3999.487	1633		14429.197	1663
279	989.568	3999.787	1668		14430.290	1663
310	27059.354	3999.954	1663		14430.892	1654
501	310.577	4000.095	1668		14431.401	1698

dot

677
 678 foot
 see page 14

5093.347 1620 ch
 5091.075 1656
 5092.227 1633
 5097.267 1620 ch
 5097.562 1647
 5218.246 1620 ch

18375.595 1718
 4007698
 18371.711 1711
 18389.738 1673
 18390.801 1673
 18826.202 1703

ADH66 plate

3 ± calcs & Var & bias = needed than comp. data.
 3 may be is different calcs from other
 comp. data

32 Var F in NGC 1953

Aurora
Var V

Aurora 3

1.7460979
57270557.6358346
1/p = 1.5727360Aurora 3
1.6358387
1.5727259

10329.753
346.174
403.553
473367
481.295
482.545
13998.352
13999.615
14002.571
14022.405
14026.196
10930.979
10943.214
10958.837
10977.775
10983.677
11002.240
11004.329
11082.581
11090.603
11094.794
11107.408
11109.166
11109.581
11113.731
11115.004
11115.424
11117.581
11117.983
11118.381
11120.082
11120.538
11152.134
11152.970
11153.435
11153.829

Ssf: 14032.211
Ssf: 110.032
f2d 204.719
f2d 217.234
Ssf: 18985.552
Ssf: 18987.266

diff fraction for plate

f2d 14825.365
Ssf: 14841.958
f2d 14863.148
Ssf: 14896.837
f2d 14922.013
Ssf: 14924.846
f2d 15044.558
Ssf: 15047.542
f2d 15064.651
f2d 15067.035
f2d 15067.598
f2d 15073.226
Ssf: 15074.952
f2d 15075.522
Ssf: 15078.993
f2d 15079.532
Ssf: 15125.310

14032.211
110.032
204.719
217.234
18985.552
18987.266
14825.365
14841.958
14863.148
14896.837
14922.013
14924.846
15044.558
15047.542
15064.651
15067.035
15067.598
15073.226
15074.952
15075.522
15078.993
15079.532
15125.310

38473.410
570
280
305
832
39042.673
52137.193
141.900

38473.163
534.323
748.031
39008.055
39037.581
422
52136.858
141.565

40712.692
758.259
758.259
886.982
908.965
978.102
985.882
41307.214
322.824
369.806
376.353
377.899
393.356
398.096
399.660
407.695
409.192
410.674

40712.430
757.997
40816.188
886.720
908.702
977.839
985.619
41306.949
322.558
369.540
1087
377.634
393.090
397.831
399.394
407.429
408.926
410.408

Boh
Ssf: 19253.491
Ssf: 19258.010
Ssf: 19276.907
Ssf: 19278.021
Ssf: 19734.428

19262.082
19253.491
19258.010
19276.907
19278.021
19734.428

1720
1748
1718
1715
1720
1717

1962phae, p. 2159W
24
19
14
19
01
14
14
9
1
8
8
9
1
0
8
8
5
0
1
7

Quartz
1.7543916 1.7531206 1.7529536

33

18895801

18909.499
18911.206 ✓

18911.302
18913.009

check.

14765.111 ✓

14765.977 ✓

14803.609

14837.163

14837.163 check ←

14987.264

14987.264 ✓

15014.565

15014.565 ✓

15015.132

15015.132 ✓

15019.126

15019.126 ✓

34 Var N 19982
1.0018032

Var N in Aur3
1.0021154
9978891

Aur3 Var N
99617144
p1.00384327

Var N Aur3
99824
p1.0017631

Var N Aur3
3.52139
1/p = 2834957

24866.363

33210.409
217.408
220.419

33080.655 LG
33083.6416 F

33278.039
33281.043

17.76
NSL1762

25932.210 $\frac{1}{2}$ d? 2598602825932.180 X

1776

26351.787
26355.958
26356.942
26366.788
26369.407
26370.803
26375.921
26376.875
26377.819

26219.019
248.829

26263.772
266.779
3467.771

3273.819
3274.759

nsld 26375.462 26320.807
nsld 26405.450 350.732
nsld 26409.629
nsld 26410.616
nsld 26420.481 365.733
nsld 26423.507 368.752
nsld 26424.505 269.748

nsld 26430.589 26375.819
nsld 26431.535 26376.763

7448.703 NSL1748
7457.172 NSL1748
7458.352
7458.630
7461.417 NSL1748
7462.271 NSL1748
7462.553 NSL1748

7464.271 NSL1748
7464.535 NSL1748

nsld 717.893
projns 727.658
727.658
727.714

LG 33762.744
LD 747.686
LD 755.606
LD 788.729
LD 790.683
LD 34590.675

9534.947 46762
9530 (694) 1780
9532, 932 4780
9542.286 4780
8391 1780
9768.764 1776

Var N
36.3424P Var N
42.4239Var N
38.13338.251
.0261431

38.225

38.237

38.029
3576
62

6

748
748748
748
748748
4880
80
80
780
780
776

	✓		L		No. exact		→		approx			
925.462	792.795	2.004	879.283	879.882	879.594	884.416						
0492	1.441	1.611	878.891	879.490	.214	021						
925.267	630	1.821	879.100	879.699	.423							
926.175	793.408	82.686	879.963	880.562	.286							
926.228	793.454	882.739	880.015	880.615	339							

36

$$P = 499226$$

$$P = 2.0031008$$

$$P = 499259$$

$$P = 2.0029683$$

$$P = 4992604$$

$$P = 2.0029628$$

$$4992924$$

$$2.0028344$$

$$35.0409780$$

$$401.31174$$

$$48994.789$$

$$49072.675$$

$$49344.829$$

$$49675.963$$

$$49713.564$$

$$49719.729$$

$$66404.058$$

$$66399.665$$

$$66399.483$$

$$66395.227$$

$$946053$$

$$66410.053$$

$$66405.660$$

$$66405.478$$

$$66401.221$$

$$51853.347$$

$$51849.917$$

$$51849.775$$

$$51846.451$$

$$51904.479$$

$$51978.584$$

$$52068.405$$

$$52096.399$$

$$52184.443$$

$$52194.351$$

$$52630.436$$

$$52626.955$$

$$52626.810$$

$$52623.436$$

$$52690.275$$

$$52686.789$$

$$52686.645$$

$$52683.267$$

$$52698.613$$

$$52695.128$$

$$52694.983$$

$$52691.605$$

$$52700.583$$

$$52697.096$$

$$52696.952$$

$$52693.574$$

$$52720.269$$

$$52716.782$$

$$52716.637$$

$$52713.258$$

$$52726.306$$

$$52722.819$$

$$52722.674$$

$$52719.294$$

$$52728.297$$

$$52724.810$$

$$52724.665$$

$$52721.285$$

$$52740.438$$

$$52736.950$$

$$52736.805$$

$$52733.424$$

$$52742.325$$

$$52738.836$$

$$52738.692$$

$$52735.311$$

$$52898.938$$

$$52898.792$$

$$52895.401$$

$$67366.796$$

$$67366.611$$

$$67362.293$$

$$7521$$

$$352.555$$

$$352.370$$

$$361.250$$

$$418.645$$

$$418.460$$

$$348.053$$

$$422.543$$

$$422.358$$

$$414.138$$

$$69018.768$$

$$69018.579$$

$$418.036$$

$$69014.154$$

$$83.809$$

$$.771$$

$$.791$$

$$.734$$

$$.878$$

$$85.864$$

40

N

HV
2439
A2002 $\frac{1}{p} = 0.207763$
HV 2439

WOC 1953

A ← Van A

 $\lambda_p = 1514295$

Van F

15264 26421.249

266 426.236

271 427.255

278 441.229

287 444.225

293 452.220

298 453.220

303 454.217

308 455.214

314 456.214

631 565.613

657 567.629

→ 672 570.631

680 571.611

686 572.627

693 573.635

703 577.631

739 593.615

748 594.599

796 629.518

806 635.562

838 679.441

847 684.383

851 686.569

857 689.391

858 546

872 710.335

→ 878 713.474

16203 946.623

221 956.619

230 960.603

254 977.615

271 988.563

279 989.568

310 1059.354

561 310.577

677 410.266

678 300

679 413.340

680 374

681 421.312

682 344

684 422.272

687 426.264

688 296

689 329

690 363

15661 26568.622

(47) H8 B₉ HSES₅BH₈EH₈EH₄EH₁E (4)H₅EH₈EH₈ES₀BS₂BE₅JS₀B

—

E₅JE₁JS₀BE₆JS₀BS₀BS₀BH₅ES₂BH₅ES₂BH₂EH₂EE₄JS₄BH₂ES₀BH₆EH₄BH₅EH₂EH₂EB₈HE₀J

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4000.956

171

4001.8166

3.982

4.436

5.646

5.798

5.949

6.100

2.251

22.817

23.123

.577

.726

.880

24.032

24.637

27.058

27.207

32.495

33.410

40.054

40.803

41.134

41.561

.585

44.733

45.208

80.314

82.027

82.631

85.207

86.862

87.017

4097.584

4135.627

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H₅EH₈EE₆JE₃JE₃JH₉EE₁JH₇EH₉EE₆JH₀EH₂E

—

H₉EE₉JH₄EE₅JE₉JE₃JE₂JE₂JE₀JE₁JH₁EE₅JE₀JH₆EE₀JH₉EH₉EH₅EH₉EE₁JE₁JE₁JH₇P. Sel
check
in
page

Quon
Var VVar F adapted
P 1.8303343
p0.5463483Var F
P mayVar A ¹⁹⁵³
66034149
p = .1514368Var A
M61953

13902.007

13957.846

13960.465
- 546

13971.420

14095.016

14100.245

14102.328

14111.227

14116.954

14435.204

14437.929

14438.486

14446.121

14447.574

14452.125

14452.672

14453.216

14453.761

14454.308

14514.078

14515.179

14516.819

14517.354

14517.910

14518.460

14520.644

14529.376

14529.914

14548.942³⁵³

14552.294

14576.267

14578.967

14580.162

14581.703

14593.146

14594.861

14722.242

14727.703

14729.880

14739.174

14745.156

14783.832

14921.087

1654

1659

1693

1678

1678

1661

1668

1658

1661

1693

1645

1648

1661

1708

1652

1688

1708

1678

1673

1668

1663

1668

1647

1663

1688

1663

1656

1663

1663

1661

1661

1654

1661

1668

1658

reep 14

4001.149 ✓

4001.905

4002.059

4004.175

4004.629

4005.840

4005.991

4006.142

4006.293

4006.444

4023.011

4023.317

4023.771

.920

4024.074

4024.226

4024.831

4027.252

4027.401

4032.235

4033.604

4040.249

4040.998

4041.329

4041.756

4041.779

4044.928

4045.403

4080.710

4082.224

4082.827

4085.404

4087.062

4087.214

4097.782

4135.826

4150.923

1631

1658

1659

1652

1647

1654

1659

1659

1629

1630

1688

1629

1688

1668

1630

1693

1629

1629

1630

1654

1632

1654

1632

1648

1650

1683

1631

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1629

42 Aug 3
Var N
99610344
1.00391180

Aug 3 V 1.7460979 Aug 3
may P = .57270557
adafled

Aug 3 V
P = .6358346
41553.649
561.493

Aug 3 2.3104576
P = .6358387
41553.383
.226

TSS def 1689 15144.755

589.785

589.018

"
"
"
"
"

pon
"
"
f-d
pon
"

1734 15218.291

291.727

41634.186

TSS 1712 15230.875

826.283

41826.015

fzd 1724 15254.335

890.707

890.438

1720 15279.464

959.717

959.448

1748 15282.295

967.490

967.220/1547.395

TSS 1718 15285.163

975.366

975.096

1734 15297.158

42008.305

42008.036/1558.625

1711 15298.955

42013.242

012.972

1720 15432.481

379.924

379.652

1720 15438.206

395.645

395.373

1722 15440.488

401.911

401.639

1718 15456.500

445.885

445.612

1720 15457.076

.465

447.193

1715 15497.043

557.220

42556.947

pon
"

pon

pon

TSS

1728 15699.773

43113.947

113.670

1685 15699.792

114.000

.723

27052.033
27062.068
27066.067
27083.146
27094.137
27095.146

43134.375

43134.098

15169.862

15218.257

15221.076

15235.880

15636.882

901



44 Var N
 99617144
 $p=1.00354327$

Var N in
 9982
 $p=1.0017631$

N in
 99824
 $p=1.0017631$

N 36.436
 $p=.0274454/13.80$
 1421
 070373

kon
 kon
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n
 nsl
 jow

26696.809 L 1748

jow
 Ld. v. 26641.488
 nsl
 jow

26781.977 L 1748 26727.549 Ld. v. 26726.480
 26786.938 L 1748 26732.500 Ld. v. 731.430

26791.966 nsl 26737.577 nsl 736.447

26812.940 L 1748 26757.428 733.076 1935.538 1879.686

26816.141 1734 26760.573X .162 1952.660 1896.315

27050.186 1724 26994.133 739.561 53.384 97.018

27060.221 1734 27004.146 .835 53.673 299

27064.220 1748 27008.137 .945 55.699 1899.266

27092.287 1734 036.147 740.712 55.772 .337

27093.296 1745 037.153 740.739

27163.350 1748 27107.062 742.655

27462.772 ns
 27578.731 L 1748 27462.806 Ld.: 27461.707

27527.663 L 1748 27471.720 Ld.: 27470.620

— d. n. s
 — jow

Var N
248^d
.003597

Var N
268⁷
.0037216

Var N
40
.0250000

N
40.12

N
35.66
 $1/p = .0280426$

35.236 N
3488445
 $1/p = .0283798$
34.651
 $1/p = .0288592$

95.966 99.290 666.986 664.990 732.228

	.405	667.758	665.760	749.027	758.034	
96.088	.417	667.837	665.839	.115	.123	
.927	100.285	673.666	671.650	755.653	764.740	777.658
.963	.322	673.915	671.899	.934	765.023	
.977	.337	674.015	671.998	.045	765.137	
97.078	.441	674.714	672.695	756.829	765.930	778.868
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				758.815		

46 Van N. in Aurig

-4492604

1/p = 2.0029628

54992924

2.0028344

52917.386

52927.375

52929.415

52957.403

52963.404

52979.416

52981.419

52983.416

52985.413

52987.415

53206.524

53210.561

53216.574

53218.537

53220.571

53222.590

53230.594

53262.607

53267.992 53264.578

53294.515

53346.620

53437.928 53434.502

53447.826 53444.400

53448.778

53457.857 53454.430

53454.741

53499.807 53496.378

53506.095 53502.662

53973.083 53969.624

993.105 989.644

54001.085 997.623

54031.695

54057.088 54053.622

54059.101 54055.635

54198.879 54195.405

54907.900 54904.380

908.701 54904.448

54925.791 54922.270

Van N. in Aurig 3

N.02755

36.297

Van N. 21154.9990344

p = 0.5273091

p = 0.2834257

732.681

735.019 26623.123

735.155 628.055

7566.328

7771.574 755.238

7774.096

48

 HV 2439 ²⁴³⁹
 Aron ²⁴³⁹ $p = 0.207763$
 H 2439

 NGC 1953
 Var A $\gamma = 1.514295$

 Aug 23 1953
 Var V

NG

 16 691 27426 396 e id 1643 698.190
 92 448 — 201
 93 555 cnd 1676 223

 S₀B 4153.165
 — .173
 S₀B .190

 10
 10

 16 701 449 273 b9c 1635 702.943
 702 307 b9c 1630 950
 703 339 b7c 1619 957
 704 381 b5c 1608 966
 705 434 b5c 1608 977
 706 462 b5c 1608 983
 707 457 363 b5c 1625 001
 712 456 276 c7d 1694 398
 713 309 c8d 1703 405
 714 357 c7d 1694 414
 715 387 c8d 1703 421
 716 533 c7d 1694 452
 717 457 277 — 5704 606
 718 311 c9d 1711 613
 719 349 c9d 1711 621
 720 382 c9d 1711 628
 721 436 c9d 1711 639
 722 469 d0e 1720 646
 723 502 c9d 1711 653
 724 535 c9d 1711 660

 B₂H: 4156.630
 E₁J .635
 H₂E .640
 E₁J .646
 E₀J .654
 E₀J: .658
 B₃H 4157.400
 E₂J .690
 E₁J .695
 E₁J .702
 juv 707
 E₅J: .729
 H₆E
 E₃J .847
 E₀ .853
 H₆E .858
 E₁J .858
 E₀J .871
 E₀ .876
 E₀J .881

 17 212 27728 4636 c0d 1635 769 949
 215 730.5211 c8d 1703 61.376
 225 746 4816 d0e 1720 64.692
 228 747.4242 b7c 1619 888
 232 749.4091 c5d 1676 65.300
 234 4887 c8d 1676 317
 239 750.4402 d0e 1720 515
 247 755.3622 c9d 1711 66.537
 249 457.5 c8d 1703 556
 253 756.3358 c9d 1711 740
 258 776.5237 b3c 1598 70.934
 268 786.3149 b8c 1625 72.968
 280 799.2857 d0e 1720 75.663
 281 3314 d0e 1720 672
 282 3785 c9d 1711 682
 283 4463 c9d 1711 696
 284 4817 c9d 1711 704
 285 307W 5322 c9d 1711 714
 287 249L 800.2829 b9c 1630 870
 288 3196 c0d 1636 878
 289 3771 b9c 1630 890
 290 4138 b0c 1614 897
 291 4720 b5c 1608 909

 H₅E 4198.907
 B₀H: 4199.219
 E₀J 4201.636
 E₂J 4201.779
 S₀B 4202.079
 S₀B 4202.091
 S₂B 4202.235
 S₀B 4202.981
 S₀ 4202.994
 S₁ 4203.128
 S₅B# 4206.185
 H₅E 4207.668
 H₃J 4209.632
 H₅E 4209.639
 E₁J 646
 E₀J 656
 E₃J 662
 E₀J 693
 E₁J 783
 E₄J 788
 E₃J 797
 H₉E 803
 E₀J 812

14752.013

 B₁
 B₂
 a
 29
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NGC 1978A sep 14

NGC 1953
Var A
P = 6.16034149
Sep 14
first

NGC 1953
Var A

49

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4199.421	1633:
4201.838	1663
4201.941	1673
4202.282	1629
4202.294	1629
4202.438	1630
4203.183	1631
.197	1629
4203.331	1629
4206.388	1631
4207.871	1654
4209.835	1659
.842	1654
.849	1668
.859	1663
.865	1688
.872	1663
4209.986	1673
.991	1683
.287	10.000
.296	10.006
.309	.015

P = 8.1323845

P = 4.406961

6308.040

B₁ B₂ 3418 3.436
B₁ .492
a q. hon .550
a q. B₁ .634
B₁ hon .677
a q. hon .739
B₁ hon .707
a q. hon .778
B₁ hon .823
B₁ hon .895

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1.7531206
57041141.7529536
5704058
15645.821

1.7395316

1.7687536

1.7371536

1.7401239

51

57565433 57467172

15658.963

15662.911

.479

663.547

15826.909

15827.447

15828.579

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167

15829.975

15831.026

15828.956

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980.547

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955.653

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15692.046

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15974.068

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15977.494

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46.801

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47.393

50.222

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15857.056

15857.082

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15857.598

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981.015

981.045

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717.018

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16003.353

407

.112

.114

52

7396069/63 58
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 43134.480
 170460

687
 6907

43134.203
 285
 453

43169.873 713

43177.625 465

180.756 596

182.208 183.048
 261 101
 321 161
 373 213
 458 298
 510 350

182.771
 824
 884
 936
 021
 073

15949.857 43627.041 890 36298.377:
 15950.399 43638.524 373 299.610
 15951.540 641.646 495 302.207
 15951.586 771 620 311
 15952.133 643.267 116 303.556
 15954.962 651.008 857 309.995
 15955.013 148 998 310.112

171536 43637.610
 40389.264 40172.901 093
 392.154 40175.775 43642.214
 270 890 340
 393.655 177.268 836
 400.819 184.394 43651.577
 949 523 717

15972.755 699.687 700.538 350488 40445.874 40229.207 257
 15980.211 720.087 720.937 367.456 40464.754 40247.987 657
 721.009 367.516 728
 339 367.578 803
 395 367.667 909
 474 367.713 270 720.965
 721.655 22.506 367.779 40465.113 48.343 721.044
 713 368.761 40466.206 49.430 225
 803 809 283
 861 884 373
 952 803 369.008 40466.481 49.704 722.522

Aurn3 VarV 1.7543916
 VarV .6966322
 VarV adaption 1.7460979
 Aurn3 1.57270557
 15707.250 17.42

15720.444 17.20

15724.407 17.42

15724.935 17.10
15724.977 17.08

und plotted per instal

15725.045 17.18

15817.113
.159

39833.658
772

15890.565 17.48
 15891.104 17.04
 15892.241 17.36
 15892.287 17.13
 15892.832 16.89
 15895.651 17.15
 15895.702 17.02

15845.243

15913.377 17.28
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 15920.832 17.08
 .859 17.08
 .898 17.08
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 .947 17.20
 15921.377 17.18
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 15921.431 17.34
 .452 17.49
 .485 17.49

654
 .683
 15846.111

219

54 $\begin{matrix} \text{Auroz} & \text{Var} & \text{Auroz} \\ \text{Var} & \text{N} & \text{Var} & \text{N} \end{matrix}$
 ,99610344 $\begin{matrix} \text{N} \\ \text{Auroz} \end{matrix}$ (9982)
 78417427475.85

Quon 3
Var V 2.3108576

Reuz
Van N

$N = 99824$
 $\mu = 1.0017631$

Var N
36.436

Ve
.90
1.0
2

used
your
self

27474.751

29-1748

9254174827498.931

21748

.785

27505.863

use of
proof
even

used 27497.830

nsr1748

Don
How

$\Delta d_{\text{vo}} = 27504.684$

41748

you
nsc 1.
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10

21

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9

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44	29
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2

[illegible]

27855.020
27855.967
27857.959
 .036
27858.994
27863.936
27864.025

27796.514
27797.458
27799.447
 .527
27800.480
27805.411
 .500

27806.386
27826.610
27836.419
27849.413

27895.009
27908.031
+ 077
= 124
= 192
= 228
= 278
909.032
= 069
= 127
= 163
= 222

.459
 .506
 .574
 .610
 .660
 27850.412
 .449
 .507
 .544
 .602

: (Po) (Fo) 2795.401 - 761.513 1762
 2319651 796.346 .539 1755
 12008.274 798.934 X .594 1776
 308 414 .596 1755
 638 799.367 .622 1724
 6 .298 .757 1759
 20 804.387 .759 1742

Handwritten notes on graph paper, including circled numbers and calculations:

835.305
 762.6071720
 12029.85
 762.9631748
 8848.299
 9641728
 344
 9651751
 392
 9671759
 460
 9681758
 495
 9691748
 546
 9901755
 49.298
 9911753
 334
 9921739
 392
 9934748
 429
 487
 1759

48 VanN 99617.144
 1.0038432
 27521.803
 VanN 13.80
 278 003597
 N 268.7 0037216
 N 400
 N 40.12
 N 55.35166
 .0249252

48 27554.930

48 27561.798

2	27853.119	2010.621	99.804	103.261	.662	691.587	778.083
55	27854.065	.689	.807	.265	692.656	691.610	.110
76	27856.058		.515	.272	693.735	660	.166
55	27856.137	.839	.815	.272	.737	.662	.168
124	27857.093	.905	.818	.276	.761	685	.194
59	27862.034	2011.265	.836	.294	.884	691.808	.333
42	27862.123		.836	.295	.886	.810	.335

120	27893.105	13.508	.947	.410	694.658	692.579	779.201
748	27906.126		.994	.458			
728	.172		.994	.458			
151	.219	14.454	.994		.984	692.905	.567
159	.287	14.459	.995			.907	.567
158	.323					.905	.570
48	.373				.988	.909	.571
55	27907.127					.928	.592
53	.164		.998	.461		.929	.593
139	.221					.930	.595
48	.258						.596
57	.317					.931	

56^N 34.884 34.651^N 36.297^N
 0288592 1/p: 0.02755
 755.597

.4992604

Amn 3 1mN 4992924
3.52739 2.0025344
 7775.265 54930.529

7781.797

54976.671

54993.899N

54990.374

787.440 800.741
 787.466 .768
 787.523
 .525 828
 .552 856
 .692 .998
 .694 801.000

788.570 .891

788.941 802.268
 .943
 .944

.968 802.295
 .969

calby

there
 are
 on
 extra
 sheets

→ 55571.608
 55573.496
 55577.471
 55577.631
 55581.636
 → 55579.536
 55589.573

55651.387
 55677.366
 55677.457
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 55677.687
 55677.758
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 .625
 .742

99990344

57

27749.161
27750.103
27752.089
 .168
27753.120
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 .132

27788.998
27801.970
 802.016
 802.063
 .131
 .166
 .217
 802.967
 803.004
 .062
 .098
 .156

58

		HR 2439	HR 2439	NGC 1953	NGC 1953	F	151429	
1717	292	27800.5066	(hsc) 1608 57 75.9 17	1661	H ₂ E		4209.817	
44W	293	.5551	h ₂ c 1614 927	1673	E ₂ J		.824	
252	294	801.2528	c ₂ d 1651 76.0 78	1635	B ₂ H		.934	
	295	.3211	c ₂ d 1651 .0 86	1632	S ₂ B		.940	
2001	296	.3705	—	—	—			
2001	297	.4084	—	—	—			
231W	298	802.4991	c ₆ d 1685 .331	1629	S ₀ B		4210 .119	
348W	299	.5524	c ₇ d 1694 .342	1629	S ₀ B		.127	
221E	300	807.2832	c ₉ d 1711 77.325	1658	H ₂ E		4210 .843	
	301	.3171	c ₇ d 1694 .332	1648	H ₂ E	E ₅ J	.848	
	302	.3649	c ₆ d 1685 .342	1673	E ₂ J		.855	
	303	.3989	c ₅ d 1676 .349	1673	E ₂ J		.861	
	304	.4432	c ₅ d 1676 .358	—	—		.867	
	305	.4764	c ₈ d 1703 .365	—	—		.872	
	306	.5159	c ₆ d 1685 .373	1654	H ₅ E		.878	
403W	307	.5491	c ₇ d 1694 .380	1659	H ₂ E		.883	
218E	308	808.2825	c ₉ d 1711 .532	1629	S ₀ B		.994	
	309	.3165	d ₀ e 1720 .539	1629	S ₀ B		.999	
	310	.3677	c ₈ d 1703 .550	1630	S ₂ B		11 .007	
	311	.4016	c ₉ d 1711 .557	1629	S ₁ B		.012	
	315	811.2740	c ₁ d 1643 78.227	1630	S ₂ B H		11 447	
20	520	29189.4694	c ₈ d 1703 64.492	1630	S ₂ B	E ₅ J	4420 .147	
	539	199.4468	d ₀ e 1720 66.565	1650	H ₃ E	H ₉ E	4421 .658	
	542	202.3847	c ₄ d 1668 67.175	1635	B ₂ H	E ₂ J		
	547	203.4561	c ₇ d 1694 .398	1630	S ₃ B	E ₂ J	4422 .265	
	553	204.4838	c ₉ d 1711 .611	1643	B ₉ H	H ₁ E	.420	
	556	205.5746	c ₂ d 1651 .838	1663	E ₂ J	E ₅ J	.586	
—	568	217.4476	c ₇ d 1694 70.305	1634	B ₁ H	H ₁ E	4424 .383	
—	572	219.3425	d ₀ e 1720 .698	1668	E ₂ J	H ₀ E	.670	
	574	220.3999	(hsc) 1608 918	1654	H ₅ E	E ₆ J	.831	
	578	221.3363	(hsc) 1625 71.112	1635	B ₂ H	E ₂ J	.972	
	585	222.4091	c ₆ d 1685 .335	1629	S ₀ B	E ₂ J	4425 .135	
	589	223.4056	c ₉ d 1711 .542	1633	B ₀ H	H ₁ E	.286	
	592	224.3953	c ₉ d 1711 .748	1635	B ₂ H	E ₂ J	.436	
	596	228.4044	d ₀ e 1720 72.581	1629	S ₀ B	B ₈ H	26 .043	
Pro 1619	—	252.2856	—	—	—	—	—	
20	739	349.2417	d ₀ e 1720 97.687	1633	B ₀ H	H ₁ E	4444 .341	
21380	—	517.6237	d ₀ e 1720 32.670	1668	E ₂ J	H ₀ E	4469 .839	
21400	—	519.6126	c ₂ d 1651 33.083	1629	S ₀ B	H ₉ E	4470 .140	
16	—	526.5984	c ₈ d 1703 34.535	1629	S ₀ B	H ₂ E	4471 .198	
45	—	553.5999	c ₅ d 1676 40.145	1629	S ₁ B	E ₄ J	4475 .287	
63	—	574.3851	c ₉ d 1711 44.463	1635	B ₂ H	H ₅ E	4478 .434	
Dbl 109	69	577.3837	—	—	—	—	—	
	91	584.4003	c ₉ d 1711 46.544	1632	S ₂ B	E ₅ J	4479 .950	
	96	585.3875	d ₀ e 1720 46.749	1629	S ₀ B	H ₅ E	4480 .100	
21520	—	600.4303	c ₁ d 1643 49.874	1639	B ₅ H	H ₃ E	4482 .378	
22	—	601.3902	(hsc) 1608 50.074	1647	H ₁ E	E ₅ J	4482 .524	
21395	—	518.6304	—	—	—	—	—	

Mag 1978 Vol.
B5
25
B7
24
40

Var F Var A Lib 034149
scapile $\mu = .1514368$
4210.020
.027
4210.137
4210.143

Var F
18303343
 $\mu = .5463483$
adapted

Var F in 1953
1.836
1.82533
1.5440023
1.5478461

188617
59
5301749

9 mid max
7 B7i
3 B7
8 B7
5 B6.7
1 B6
7 B6
2 max
8 B6
3 B6
4 B6
1 B6
7 B6
2 B6
17 B6

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.051
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.064
.070
.075
.081
.086
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.202
.210
.215
4211.650 - 2 inches

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	22.346	15954.673	905.438	15998.413	15482.371
1673	.478	15955.259	906.022	15999.000	15482.939
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1650	24.597	15962.903	913.642	16006.665	15490.357
1645	24.884	15963.938	914.674	16007.703	15491.362
1693	25.044	15964.516	915.250	16008.282	15491.923
1635	25.186	15965.027	915.760	16008.795	15492.419
1698	25.348	15965.614	916.345	16009.383	15492.988
1647	25.499	15966.158	916.887	16009.929	15493.516
1703	25.649	15966.699	917.426	16010.471	15494.041
1642	26.256	15968.889	919.610	16012.667	15496.166
1647	4444.555	16034.908	985.425	16078.868	15560.231
1645	4470.054	16126.904	16077.137	16171.115	15649.503
1661	4470.356	16127.990	078.220	16172.205	15650.558
1648	4471.414	16131.807	082.025	16176.032	15654.261
	4475.503	16146.559	096.732	16190.824	15668.577
1654	4478.650	16157.915	108.053	16202.212	15679.597
1688	4480.167	16163.387			15684.906
1654	4480.316	16163.926			685.430
1650	4482.594	16172.145			693.405
1688	4482.740	16172.669			.914

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1.88444

Aug 3 V P-23
 not max 12087.188
 S5 1718 .209
 S7 1713 .525
 S8 1715 .542
 15914.224

Quesada Van 1
17401239
57467172
15976. 193
15976. 611
15976. 633

LS	
185	1706 88.077
99.2	1714
1.1 down	1734
4.5-2	1734 90.170
6	1720

$$- 15914.224$$
$$\begin{array}{r} 15977.310 \\ \quad \quad .341 \\ 15980.059 \\ 15980.079 \\ \quad \quad .106 \\ \quad \quad .126 \end{array}$$

SAS

SAS
S₂₀: S₉) 1710 90.568 ✓
TAS 1712;
1704 .606
1704 .620

15918.27

cl 15980.634
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 .642
 .702

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15495.025

SoP	1710
T&S	1706

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15510.392

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(20)	1748
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55 f	1715
50 f	1718
100 f	
(150)	1734
100 f	
100 f	1712
100 f	1706
100 f	1736
100 f	1718

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Amou 3 Ann 3
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1900phac.proj. 2159w

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Accum3 Vain
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27916.060 1759	27857.425	150	27856.310	763.182	789.165
1759:	27857.507	687	27856.392	763.184	789.167
	.541	11	27856.426		

1762: 27858460 22.1 F₀: 27857.345
1755: .512 F₀₁ id 5: .397

NSC 1762 29242.104 NSC F 29240.933

NSC1762-29257.145 NSC1762-29255.974

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1769 29276101 $\approx 6 \text{ Cl}$ 29274929 802.048 829.354

1769 29281.109 F5G⁺ 29279.937 802.185

1759 29402.164 ~~(8%) = 2112.2~~ 805.502 832.926

NSL1748 29570 850 29401.370 8/10.123 837.761
1781 573 842 299571.655

1776	29579.841	Go	29578.657	810.178	837.959
				810.369	

75L1762 29629.714 nsIF 29626.528

1762: 29653806 F₀ 29652.619

Good
Good

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N 268.7
 0037216

N 40d

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 909
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 541

Var N ~~243~~ 30
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58495.495

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801.937 843.247

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58529.642 819.500

802.048 364

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58545.439 109.226

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805.502

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59288.561

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8391.595

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HV
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p=0.2077632439 A 1953
A

F

A 2002 1953

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21 555	29626.2780	c6d	6155.244	1685	S8B	E2J	4486.292	
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61	629.3379	(b5c)	.880	1608	H0E	E0J	.756	
22099	855.6357	(b5c)	6 202.896	1608	S1B	E8J	4521.024	0
131	869.6366	c2d	05.805	1651	S0B	E1J	23.144	
175	881.5745	c5d	08.286	1676	S3B	E5J	24.952	
207	904.5629	b9c	13.062	1630	B2H	E0J	28.433	
225	913.5983	(b4c)	14.939	1603	E1J	E0J	29.801	
251	926.4492	c8d	17.609	1703	E1J	E0J	31.747	
260	927.4471	c5d	.816	1676	B6H8H	H5E	31.898	
269	933.5634	c1d	19.087	1643	H0E	H8E	32.820	
277	938.5407	c1d	20.121	1643	H1E	H9E	33.578	
278	939.4992	c5d	20.320	1676	E3J	E8J	33.723	
305	956.3956	c2d	23.831	1651	S5B	E8J	36.282	
306	956.3956	c2d	23.831	1651	B8H	H5E	46.422	
360	2023.3550	c9d	87.742	1711	S0	E3J	91.123	
995	318.5538	c2d	99.074	1651	H0E	H5E	4631.417	
23 411	584.6444	c6d	63.54357	1685	H0E	E4J	.568	
415	585.6403	d0e	.564	1720	H0E			
422	589.6273	c2d	55.393					
424	590.6211	c9d	.599	1711	B1H	H5E	82.322	
427	593.6364	c2d	56.226	1660	H4E	E0J	.779	
449	619.6166	c2d	.623	1703	E0J	H5 E0J	36.713	
450	620.5349	c5d	61.814	1676	H1E	E7J	36.852	
453	624.6182	d0e	62.663	1720	E0J	E8J	37.471	
458	639.5895	c2d	65.773	1694	H7E	H3E	39.738	
462	640.5979	(b6c)	.983	1614	S3B	E6J	39.890	
466	641.5808	c4d	66.187	1668	S0B	E0J	40.039	
471	647.5821	c2d	67.434	1694	S0B	H5E	40.948	
566	766.2726	c2d	71.317	1660	H0E	H2E	58.921	
23 904	977.5637	(b5c)	6435.992	1625	S8B	E5J	90.917	
953	055.5684	c6d	52.198	1685	E3J	H2E	47.02.729	
954	066.5478	c2d	54.347	1676	H1E	H9E	04.392	
959	066.5648	c2d	.483	1694	H1E	H9E	.394	
968	106.3586	c2d	62.750	1703	H0E	H5E	47.10.420	
971	107.3535	(b5c)	.957	1625	H5E	E3J	10.571	
979	108.3576	c2d	63.166	1636	E0	H0	.723	
987	109.4570	c2d	.394	1685	B0B2H	E9J	10.890	
24425	297.6318	c2d	6502.490	1703	H3E	E5J	39.385	
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467	314.6166	c2d	06.019	1636	S2B	E9J	41.957	
469	316.6063	c9d	.432	1711	H0E	E0J	42.258	
483	317.5994	d0e	.638	1720	H2E	H0E	42.408	
487	321.6266	c9d	07.475	1711	S1B	E7J	43.018	
502	325.6178	c6d	08.304	1685	E4J	E4J	43.623	
509	326.6341	c7d	08.515	1694	E1J	E1J	43.777	
516	327.6344	c9d	08.723	1711	B1H	E0J	43.928	

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Van A NGC 1953 NGC 1953

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Van A

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619

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Ann 3 *Ann 3*
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 187.048
 188.634
 190.180
 199.618
 386.283
 712.582
 841.260
 858.527
 $.554$

921.138

924.282

49227.156
 236.598
 252.305

256.997

269.608

271.207

272.780

49223.519
 232.961
 248.667
 257.796
 253.358

265.968

267.567

269.140

Ann 3
 $Vian V P = .6358346$
 $1/P = 1.5727360$

46594.314
 595.934
 $.126$
 955.033
 977.053
 995.828
 $.983$
 $.193$
 $.404$
 $.973$
 $.593$
 $.421$
 $.928$

47113.562
 218.811
 $.081$

48101.571
 103.138

110.971
 115.713

$.573$
 158.018
 $.440$

187.985
 $.571$
 $.117$

200.556
 $.225$
 719.530

842.210
 859.478
 $.505$

$.090$

$.234$

49224.477
 49233.919
 49249.625

252.754
 $.316$
 $.650$

266.927

268.525

270.098

Bad

ba

72

Quon3 Var N	Quon3 Var N	Quon3 Var N	N	N in Quon3
1762:	29679.740	29678.512	99824 268.7 0037216	99617144 9992924
NSL1748		29679.544	110.257	29740.140 39336.529
NSL1748	29682.766	29681.577	110.269	29741.174
NSL1748	29909.471	29908.274	.1111	29743.211 5934265
NSL1748	29923.498	29922.300	111.163	29970.379
	29935.457	29934.259		29984.434
NSL1748	29958.487	29957.288	111.293	29996.417
NSL1748	29967.539	29966.339	111.326	30019.494
		poor		30028.564
		poor		30041.465
		poor		30042.466
		poor		30048.606
NSL1748	29993.486	29992.286	111.423	20053.603
NSL1748	30016.413	30009.212	111.486	30054.565
		poor		30071.526

NSL1748 30640.792 NSL 30639.566 113.828 30703.189

poor
poor

NSL1748 30695.849 NSL 30694.620 30758.358
 30695.605 30759.345
 Chubrua 1768 30821.750 30701.617 30765.369 113.82032
 30820.517 30824.516
 30832.180 ←

NSL1768 31164.452 NSL 31163.205 115.773 31227.915 62304.889

NSL

31418.916

NSL1768 NSL 31436.964 62723.979

NSL1762 31382.104 NSL 31380.848 116.581 31446.011 62740.025
 NSL1762 31448.035

1962hae.proj. 2459W

92 $N=35.66$ N36.436 N34.884 N Ann 2 N36.297
3.52739

200 2155
21561 1105

8398.922 816.204

65 830.884 813.189 840.875

816.288
8463.944 822.523 (bob)
8467.914 822.905

8477.815 823.871
8480.376 824.120

840.055 822.165 850.157

8487.719 824.833

8670.898 842.634

32 844.393

889 853.781

8819.066 857.035

179 8878.123 862.773

25 859.744 8880.678 863.021

8881.250 863.077

Spent $> 1\frac{1}{2}$ hrs at Inst will
Try to return to it later!

Bayl

re. fingerprints: gone in search of
a "police station, preferably in Cambridge"
to have them taken.

Barry.

Possible places

- ① With other FW²
A plates (in study)
- ② Filed in place
- ③ Lying around
Jim plate & coils
- ④ With GHPA & Co
- ⑤ Right here?

Where?

A 23942 ✓
24630 ✓

22979 ✓

23052

23054

26084

27021

74

HV
2439
ArouzHV 2439 2439 NGC 1953
p = 207763 mmy A

A 1953

6.6037349
.1514295

SBHEJ

F

A 24 526	31 328.6165	(bse)	6 508.927	1608	S ₀ B	E ₀ J	4744	.077
531	332.6256	csd	9.760	1703	E ₁ J	E ₇ J		.684
547	348.5704	bse	6 512.073	1625	S ₀ B	E ₄ J	4747	.098
552	359.6010							
606	438.3633				E ₅ J	E ₄ J	4760	.696
606	496.2768				E ₀ J	E ₁ J	4769	.465
959	657.6490	cob	77.288	1685	S ₀ B	E ₀ J	4793	.902
257 40	740.4956	csd	94.501	1703	H ₅ E	E ₃ J	4806	.447
169	785.3948	c ₂ d	.829	1651	S ₃ B	E ₀ E ₀ E	4813	.246
174	796.4151	c ₂ d	6 606.1	19 1651	H ₂ E	H ₅ E	4814	.915
443	320 11.6492	c ₂ d	.50.8	36 1651	H ₇ E	E ₆ J	4847	.508
444	012.6409	(bse)	.042	1608	H ₆ E	E ₀ J	4847	.658
462	023.6441	c ₉ d	53 328	1711	B ₁ H	H ₀ H ₅	4849	.324
472	024.6456	c ₉ d	.536	1711	B ₅ H	E ₅ J	4849	.476
474	027.6469	c ₂ d	54.1	60 1660	S ₀	E ₂ J	4849	.931
477	030.6151	c ₇ d	.777	1694	H ₁ E	H ₈ E	4850	.380
484	031.6404	(bse)	.990	1608	H ₆ E	E ₅ J	4850	.535
501	035.6384	c ₇ d	55.8	20 1694	S ₀	E ₄ J	4851	.141
504	037.6405	cob	56.2	36 1685	H ₂ E	E ₅ J	4851	.444
507	042.6465	cob	57.2	26 1685	S ₅ B	F ₅ E ₈ qJ	4852	.202
522	053.6281	c ₇ d	59.5	58 1694	B ₁ H	E ₉ J	4853	.865
533	056.6215	c ₁ d	60.1	80 1643	B ₉ H	E ₃ J	4854	.318
538	058.5998	c ₉ d	.591	1211	E ₂ J	E ₀ J	4854	.618
544	059.5064	csd	.779	1676	E ₁ J	E ₃ J	4854	.755
555	061.6096	cob	61.2	16 1636	S ₀ B	E ₀ J	4855	.074
562	067.6209	c ₇ d	2.4	65 1694	S ₀ B	H ₈ E	4855	.984
564	069.5762	cob	.869	1636	B ₀ H	H ₇ E	4856	.278
566	070.6029	cob	3.0	85 1636	H ₂ E	E ₇ J	4856	.435
636 →	129.5785	csd	75.3	36 1703	H ₀ E	E ₃ J	4865	.365
642	151.3409	c ₂ d	79.8	59 1651	E ₁ J	E ₁ J	4868	.661
43	152.3572	(bse)	80.0	70 1625	H ₅ E	E ₃ J	.68	.815
26060	509.3065							
463	779.6403							
549	807.6195							
594	838.6019	c ₇ d	68.22	646 1694	E ₁ J	E ₁ J	4972	.733
519E 643	882.2699	d ₀ e	31.7	19 1720	B ₀ H		4979	.346
416E 44	.3135	csd	.728	1703	B ₁ H			.352
501E 45	884.2769	bse	32.1	36 1630	H ₅ E		4979	.650
356E 46	.3219	bse	.145	1625	E ₂ J			.656
254E 47	.13648	c ₂ d	.154	1651	E ₁ J			.663
134E 48	.14175	bse	.165	1630	E ₁ J		4979	.671
431E 49	888.2868	bse	.969	1619	S ₁ B		4980	.257
326E 50	3318	(bse)	.978	1608	S ₅ B		4980	.264
211E 51	3837	(bse)	.989	1608	H ₄ E		4980	.271
110E 52	4260	(bse)	.998	1608	H ₀		4980	.278
421E 56	891.2855	csd	33.5	92 1703	H ₅ E		4980	.711
318E 57	3291	d ₀ e	.601	1720	E ₂ J			.718

140 ~~574~~ Van F. No. 1953
 1.92657 1.830 1.830248 1.8303673
 .5190572 .5464481

adap. F
 1.8303343
 .5463483

17116.336
 17118.527
 17127.238
 17133.265
 17176.296
 17207.937
 17296.103
 17341.366
 17365.896

7-
 not included
 - al.

16504.158	17375.091	17372.735	17371.603
16615.877	17492.705	17490.333	17489.193
16616.392	17493.247	17491.875	17489.735
16622.103	17499.259	17496.887	17495.746
16622.623	17499.807	17497.434	17496.294
16624.181	17501.447	17499.074	17497.933
16625.721	17503.069	17500.695	17499.555
16626.254	17503.629	17501.255	17500.115
16628.329	17505.814	17503.440	17502.299
16629.368	17506.908	17504.534	17503.293
16631.966	17509.643	17507.269	17506.128
16637.666	17515.644	17513.269	17512.128
16639.220	17517.280	17514.905	17513.763
16640.247	17518.361	17515.985	17514.844
16640.718	17518.856	17516.481	17515.339
16641.809	17520.006	17517.630	17516.488
16644.930	17523.291	17520.914	17519.773
16645.939	17524.354	17521.977	17520.836
16646.477	17524.920	17522.544	17521.402

17521.719
 17553.935
 17565.830
 17566.386
 17761.404
 17909.101
 17924.387
 17941.314

3
 2
 1
 3

Van Am NGC 1953

NGC 1953
Var A

139

P-6.603 4149

47	44.305	1629
	.913	1668
	47.327	1629
	48.998	
	60.925	1688
	69.695	1663
	94.133	1629
48	06.679	1654
48	13.478	1630
48	15.147	1648
48	47.742	1658
48	47.892	1656
48	49.558	1634
48	49.710	1639
48	50.164	1629
48	50.614	1647
48	50.769	1656
48	51.375	1629
48	51.678	1648
48	52.436	1631
48	54.099	1634
48	54.552	1643
48	54.852	1673
48	54.989	1668
	55.308	1629
	3.218	1629
48	56.512	1633
48	56.669	1648
48	65.599	1645
48	68.896	1668
48	69.050	1654
49	23.105	
	49.64.044	
	49.68.281	
	49.72.973	1668
49	79.586	1633
49	79.592	1634
49	79.890	1654
	.896	1673
	.903	1668
	.911	1668
49	80.497	1629
	.504	1631
	.512	1652
	.518	1645
	.951	1654
	.958	1673

NOC 1978 Van Vait = NOC
1.88617 1978 m = 1.9085
16609.646
.772
20.225
p 5239717

Var	Var N in
NBC 1953	Quinn 3 1/2
	99824 p
1693	31383.852
1698	387.866
1683i	403.841

31/01/2023
1.7547736

Var N
75
998259

16609.646
.772
20.225

$\frac{1}{p} 5239717$

1693	383.852
1698	387.868
1683:	403.841
	414.891
1683	493.792
1663	551.808
1663	713.465
1678	796.457

16654.647 1663 ✓ 841.436
16660.422 1654 852.475

16473.198 1693 32068.089
16473.218 1663 32069.082

16779.483	1650	2080.105
16780.008	1688	108

16781.581	1673	084	115
16783.136	1659	088	088

16783.673 1688 088.115
16785.768 1693 092.120

16786.817	1688	094.126
16789.440	1703	099.141

16795.194 1708 110.142
16796762 1668 113.141

16797.799 1663 115.122
16798.274 1678 116.031

16199 376 1663 118.137
16402.526 1659 124.159

16803.545	1658	126.106
16804.088	1698	127.147
	1673	

1667 185 216
1668 208 227
1670 210 227

$$\begin{aligned} & 7618 \quad 284098 \\ & - 2 \quad 2566.624 \\ & = 2838.134 \end{aligned}$$

32865463

See p/8
2/1/15

page 74

343

946.272
4/13/17

216.412

49.276
320

18242.609 32067.478
3.174 68.471

9.445 32079.493
57.015 080.497

51.726	083.503
53.417	086.476

54.002 087.504
56.280 091.509

57.421 093.514
260.274 098.529

266.532 109.530
268.235 112.528

269.365 114.510
269.882 115.418

271.080 117.525
274.506 123.547

275.613 125.793
276.205 126.534
276.800 127.275

309.809 185.603
322.216 207.412

322.193 208.431
566.003
267

713 862

738.753 939.617

739. 897 2941627
923 " 4672

947 2941.715
97732 941.718

742.1829 45.644
689

262 ✓ 783

743 . 891 948.648
692

$\frac{C_0}{C_0}$

$\frac{F + \text{pral}}{\text{pral}}$

$\pm \pm$

C_0

C_0

B_9

B_{6i}

B_8

$I + B_6$

B_5

B_7

0.04
 P. 102
 L B
 L B
 L B
 B6 C.
 B6 C.
 B6 C.
 B6 C.
 L B
 G. L B
 C. L B

See p18
ref tra
page 74

76 *Quon3*

2.106 1.7531206
 1/p = .47 1/p 5704114
 4748338 17870.200
 17872.487
 17881.582

400 S₂ 17932801
 S₅ 17965.835
 S₈ 18057.824
 T₈ 18105.141
 S₈ 18130.752
 S₈ 18137.038

15200.213 18259.810
 .684 18260.375
 205.909 18266.652
 206.384 18267.223
 207.809 18268.935
 209.219 18270.628
 .706 18271.213
 211.604 18273.493
 212.555 18274.635
 214.932 18277.491
 220.146 18283.755
 221.567 18285.462
 222.507 18286.591
 222.937 18287.108
 223.936 18288.308
 226.790 18291.737
 227.714 18292.846
 228.206 18293.437
 256.205 18327.072
 266.543 18339.491
 267.026 18340.071
 18343.679

578.167
 592.878 18731.513
 613.613 756.422
 613.634 756.446
 614.566 757.566
 614.588 757.592
 608 757.617
 .633 .647
 616.470 759.854
 .492 .879
 .516 .909
 .536 .933
 617.894 761.564
 .915 .589

Quon3

V/P = 2217

1/p = .45 10600
 57486739
 18012.105

S₂ S₅ S₈*Quon3* 2.3139574

V/P = 413227213

1/p = .45 10600
 57486739
 18012.105

S₂ S₅ S₈*Quon3* 2.3139574

V/P = 413227213

1/p = .45 10600
 57486739
 18012.105

S₂ S₅ S₈

V in Aur 3		Aur 3		Aur 3		Aur 3		Aur 3	
p = 5704658		p 6358		7644		6907		77	
17871.904		49274.325		4984.582		40929.826		p = 5705114	
17874791		280.630		40929.826				135	
Q = 1.7529536									
17934.511		49446.937		41203.918					
17967.549		49538.024							
18059.606		49791.834		41523.408					
18106.867		49922.137		41582.146					
18132.481		49992.756		41596.563					
18138.767		50010.088		41878.136		416346.674	18263.011		
18261.551	18427.644	50348.613		41879.433		548.110	.577		
262.117	428.215	50.173		41893.828		364.040	269.857		
268.394	434.549	67.479		95.138		365.490	270.425		
268.965	435.126	69.054		99.064		369.835	272.138		
270.677	436.854	73.775		902.947		374.133	273.831		
272.370	438.562	78.443		904.288		375.617	274.416		
272.955	439.152	80.056		909.519		381.406	276.697		
275.236	441.454	86.344		912.138		384.304	277.839		
276.378	442.606	89.493					18280.695		
279.234	445.882	97.367		933.053		407.451	286.960		
285.499	451.810	414.636		936.969		411.785	288.668		
287.206	453.533	419.347		41939.557		414.649	289.797		
288.335	454.672	422.458		940.743		415.962	290.314		
288.852	455.194	423.884		943.495		419.007	291.514		
290.052	456.404	427.192		951.359		427.716	294.943		
293.481	459.648	436.649		953.904		430.526	296.053		
294.591	460.985	439.706		260		432.027	296.645		
295.182		441.337		42032.400		517.399	330.285		
328.820	495.525	534.080		42060.883		548.920	342.707		
341.240		558.323		42062.212		550.392	343.286		
341.820	508.644	569.922				47067.185	18546.930		
545.448	714.123								
733.299	18903.683	.262	42959.968	734.797					
758.210	18928.821	51717.944	43017.095	18759.110					
.235	.846	186.013	.152	.735					
759.355	979.976	21.101	43019.721	47610.070	760.855				
.381		.172			.881				
.405					.905				
.436	18930.057	.322	.905	47610.273	.935				
761.643	.285	27.408	43024.967	47615.875	763.143				
.669		479			.168				
.698		560			.198				
.722	.369	.627	.149	47616.077	.222				
763.353	.011	82.124	43028.890	47620.217	764.853				
.378		.193							

78 Cum →		Cum 3		Cum 3		Cum 3		Cum 3		Cum 3	
9982		1.7396069		1.5065758		1.5779348		1.5786463		1.74	
385.108		18009.021		49.434.671		49.456.805		49.456.805		1/P = 1.3513513	P = .78
389.125		18011.325		440.997		463.133		463.133		1/P = 1.2820512	
31495.053		18072.108				49505.718		49505.718			
31553.071		18105.399				49630.056		49630.056			
31714.734		18198.162				721.481		721.481			
31797.730		18245.786									
31842.710		18271.596									
		18277.931									
92069.373		18401.657		50512.455		50535.072		43258.984			
70.366		02.227		.020		36.637		324.41041.845			
081.389		08.552		5051.383		54.007		275.193		55.951	
082.392		09.128		32.963		35.588		276.54641.57.735			
085.399		18410.853		37.649		560.326		280.602		061.085	
086.373		412.559		42.382		565.012		284.613		064.889	
089.400		413.149		44.000		566.631		285.999		066.203	
093.405		415.447 X		50.309		572.942					
095.411		416.548		53.468		576.103					
1004126		419.475		61.367		584.005					
111.427		425.788		78.696		601.341					
114.426		427.509		83.419		606.067					
116.408		428.646		86.541		609.196					
117.316		429.167		87.991		610.621					
119.423		430.376		91.290		613.941					
125.445		433.832		600.775		623.431					
127.394		434.950		03.845		626.502					
128.433		435.546		05.481		628.139					
32187.505		469.442		698.526		721.223					
32209.316		481.958		732.880		755.595					
32210.334		482.542		734.484		757.200					
32567.927		687.731		51297.729							
32941.563		18877.024		51817.337				44435.498			
.607		18902.127		5886.242				.557			
43 574		.152		.311				438.210			
1.619		18903.280		51889.469		51912.642		.271			
.662		.306		.480		.713		.329			
.715		.331		.548		.781		.400			
32947.591		.361		.631		.864					
.636		18905.525		895.737		918.972		443.629			
.688		18905.611		.808		919.043		.690			
.730		.641		.890		.125		.760			
32950.595		.665		.956		.192		.817			
32950.639		907.309		910.468		923.706		47.681			
		.5		537				.740			

W 36
7538.206
P = .5701837
8591863.066
7865.352

Quam3
1.7543916
17857.255
17859.540

Quam3 V
P = .635847
1/P = 1.5727057
49270.684
276.989

Quam3
P = .6358346
1/P = 1.5727360
49271.643
277.948

Quam3
Var V 79
P = .6358387
49271.327
.632

17925.642
17958.464
18050.675
18097.913
18123.514
18129.798

17919.240
17952.821
18044.803
18092.025
18117.618
18123.899

49443.284
534.365
788.156
918.449
989.062
50006.394

444.246
.328
789.124
420
940.035
50007.367

.928
.010
49788.805
.100
.714
50007.046

78252.521
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18259.931
18261.642
18263.335
18263.919
18266.199
18267.340
18270.195
18276.456
18278.163
18279.291
18279.808
18281.007
18284.4314
18285.544
18286.135
18319.756
18332.171
18332.750
18536.277

18246.582
18247.148
18253.419
18253.990
18255.701
18257.393
18257.977
18260.256
18261.397
18264.251
18270.510
18272.217
18273.344
18273.861
18275.060
18278.486
18279.595
18280.186
18313.796
18326.206
18326.786
18530.246

50344.894
46.453
63.758
65.333
70.053
74.721
76.334
82.622
85.770
93.643
410.914
415.622
18.733
20.159
23.467
32.921
35.980
37.610
530.347
564.587
566.186
57127.562

50345.873
433
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66.313
.033
75.701
77.314
83.602
86.751
.624
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416.603
419.714
.170
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.902
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65.571
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.247
.845
51128.228

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.959
750.079
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752.365
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752.444
754.075
754.100

18717.944
18742.835
860
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46.264
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645.447
714.123
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717.280
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723.586
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728.302
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646.457
715.130
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718.286
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724.593
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745
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729.309
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51646.120
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51717.954
718.025
718.092
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724.260
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413
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728.977
.045

80

Van 2687 3.52739

116.593 8881.528
607 8882.665

117.001 8912.641

117.217

8974.807

8998.294

9011.023

9075.165

9075.447

9078.565

119.183 9078.849

9079.700

9080.542

9080.832

9081.966

119.231 9082.533

119.250 9083.952

119.291 9087.066

302 9087.914

309 9088.475

119.313 9088.732

119.320 9089.328

119.343 9091.033

119.350 9091.584

119.354 .878

119.657 9108.545

119.658 9114.767

9115.055

120.987 9216.249

122.375 9321.982

.994

22.551

.564

122.397 23688

.331

.361

.385

122.408 9324.538

1.7460979

17942.073

17944.369

18004.926

18038.093

18130.512

18177.959

18203.673

18209.984

18333.250

18333.178

18340.119

18340.693

18342.412

18344.112

18344.699

18346.989

18348.135

18351.002

18357.291

18359.006

18360.139

18360.658

18361.862

18365.805

18366.419

18367.013

18400.783

18413.252

18413.834

18618.261

18773.083

18789.106

18806.850

18831.859

.884

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18837.022

.66.8.047

1.7460979

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780.872

783.607

785.051

789.073

798.221

296

798.545

.669

.943

799.018

.067

.090

.142

.292

.340

.366

800.836

801.404

810.301

819.597

.598

.647

747

751

822

W 36.436 Van V 3.5059072

Van N in Aur
H 992604

4992924

99617144

81

859.826

62750.053 *cl*
62758.084

62746.031
62754.060

31449.021 *cl*
.045

NS1748

62969.872

63085.871

63409.093

63575.032 *cl*

63664.963 *cl*

62965.835

63081.827

31559.189

31617.325

31779.318

NSL1762

NSL1748

64118.143

64120.129

142.168

144.174

150.185

156.131

158.184

166.192

170.202

180.229

202.225

208.220

212.183

213.999 X

218.211

230.252

234.148

236.225

64354.331

397.940

399.975 X

65114.932

64140.062

64146.073

64166.088

64176.115

64198.109

64204.104

64208.066

64209.882

64214.095

64226.134

64230.030

64232.107

64350.206

64393.812

64395.847

65110.757

32134.679 NSL1748

.674 NSL1748

.720 NSL1748

172.725 1762:

150.738 1762:

153.717 NSL1748

.747 NSL1748

.760 NSL1748

.770 1762:

165.795 NSL1762

176.819 1769:

179.824 NSL1762

181.810 NSL1762

182.720 1765

184.831 NSL1762

190.865 NSL1762

192.818 NSL1762

193.859 1762:

253.052 1776

274.907 NSL1748

275.927 1765

634.249 1762

879.725

881.809

892.231

- 9366.649

.104

79.117

79.677

.690

.702

80.820

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65861.963

051 X

865.983

866.073

65874.015

.105

65874.294

65880.021

65857.741

65857.829

65861.761

65861.851

65861.937

65862.043

65869.792

65869.882

65869.986

65870.071

65875.798

.885

33008.645 L1762

.689 1776

10.660 NSL1762

10.748 NSL1762

801 1776

14.685 1776

14.731 1776

14.783 1776

14.825 1776

.696 1759

.739 1776

			HV 2439 Anon	HR2439 p=0.207763	2439 m	Var P NGC1953 6.6037749 p= .1514295	Var P 1.7396069 1.57484251 18909.361 .391	Var Vanc 1.7	1.8
26	658 ^{211E}	32891.3755	cqd	6833.611	1703	4980	.725	E ₂ J	1.8
	59056E	.4275	cqd	6221711			.732	H ₂ E	
36	84	915.2924	cqd	38.580	1711	4984	.346	B ₅ H	1.8
	85	.3360	cqd	.589	1711		.353	H ₀ E	
	86	.3790	cqd	.598	1711		.359	B ₀ H	
	87	.4371	d ₀ e	.610	1720		.368	B ₅ H	
2	46E	916.2828	cqd	.786	1703	4984	.496	E ₀ J	1.8
22	88	919.2919	cqd	39.411	1685	4984	.952	S ₀	1.8
	89	.3348	cqd	.420	1703		.958	S ₂ B	
	90	.3833	cqd	.430	1703		.966	S ₀	
	91	.4256	cqd	.439	1703		.972	S ₀	
	92								
	94	940.3073	—	43.77		4988	.134	W ₀	
	95	.3627	cqd	.789	1694		.143	S ₂ B	1.8
157W	96	.4131	cqd	.799	1676		.150	S ₀	.550
3	00W	.4568	cqd	.808	1711		.157	S ₂ B	.575
	97	941.2906	(asc)	.981	1608		.283	B ₀	1.8
	98	.3426	(asc)	.992	1608		.291	S ₅ B	.084
	99	.3848							
2	29W	701.49	b ₀ c	44011	1630		.305	B ₀	.136
	26	711							
	27	038							
	33	347.2597							
ADH	2178	34743.300	cqd	7218.372	1711	5261	.161	B ₀ H	1.8
	79	.348	cqd	.382	1703		.168	B ₀ B ₅	
	80	.399	cqd	.393	1694		.176	S ₀ B ₅	
	81	.445	cqd	.402	1676		.183	S ₅ B	
	84	744.306	cqd	7218.581	1711	5261	.313	H ₂ E	1.8
	85	746.291	b ₅ d	7218.994	1608		.613	E ₀ J	1.8
	86	.388							
	87	.388	b ₅ c	7219.014	1608		.628	E ₀ J	
	88	.425	b ₅ c	7219.021	1608		.634	E ₅ J	
	89	747.294	cqd	7219.202	1660		.765	E ₁ J	1.8
	90	.345	cqd	7219.213	1694		.773	E ₁ J	
	91	.356	cqd	7219.215	1694		.775	E ₄ J	
	92	.440	cqd	7219.232	1703		.788	H ₅ E	
	93	.488	cqd	7219.242	1676		.795	H ₈ E	
	95	748.337	cqd	7219.419	1703	5261	.923	B ₅ H	1.8
	96	.389	cqd	7219.430	1694		.931	S ₅ B	
	97	.455	cqd	7219.443	1685		.941	S ₀ H	
	98	.499	cqd	7219.452	1711		.948	S ₀ B	

17538206	Var A - NGC 1953	Var A	1.7528135	2.3133574	83
$\mu = .5701837$	$\mu = .1514368$	$\mu = .5702829$	$\mu = .5705114$	$\mu = .43227215$	
$P = 6.6034149$	$P = 6.6034149$				
18754.126	4980.965	18757.389	18764.905	16.73	14218.026
.156	.973	.419	.934	16.48	.048
18767.763	4984.587	18771.028	18778.550	1639	14228.364
.788	.593	18771.053	.574	16.45	.383
.813	.600	.078	.599	16.33	.402
.846	.608	.111	.622	16.39	.427
18768.328	4984.737	.593	779.115	16.63	.792
18770.044	.192	773.309	780.831	16.29	14230.093
18770.068	.199	.334	.856	16.30	.112
18770.096	.206	.361	.883	16.29	.133
18770.120	.212	.385	.908	16.29	.151
	4988.975	785.294	792.821		
18782.058	.383	785.326	.852	16.30	14239.201
.087	.391	785.354	.881	16.29	.223
.112	.397	785.379	.906	16.31	.242
18782.587	4988.524	785.855	793.382	16.33	.603
18782.617	.532	.884	.411	16.31	.625
18782.618	.545	.936	.463	16.33	
Var A	Var A	Var A			
1.8303843	6.6034149	99617144			
.5463483	.1514368				
18981.943	5261.414	94876.828		1633	
969	.421			1636	
997	.429			1629	
028	.436			1631	
18982.493	5261.567			1648	
18983.577	5261.867			1678	
630	.882			1668	
650	.887			1688	
125	62.019			1668	
153	.027			1668	
159	.028			1683	
205	.041			1654	
231	.048			1659	
18984.695	62.177	.884		1639	
723	.185			1620	
759	.195			1629	
783	.201	.047		1620	

84 V

84 V
 P = 2.106
 15617.937
 .9607

Aug 23
✓
 $P = 2.217$ $P_{2.1847}$ $P_{2.1847}$
 $1/p = .4510606$ $1/p = .4578333$
Sg 14835.924 15058.774 d7D
Sg 14835.924 15058.774 d7D
Sg 14835.924 15058.774 d7D

V m Queen
 .365817
 2.733607
 12032.224
 .243

T ₇ S ₁ T ₈	846.772	15069.724	f ₅ d	40.974
T ₈ S ₁ T ₆	.791		20	
T ₈ S ₁ T ₇	.811		25D	
T ₈ S ₁ T ₈	.837	.790	67D	41.026
f ₁ d ₁ f ₁	847.219	15070.177	f ₈ d	
f ₁ s ₁ f ₁	848.576	15071.555	20	12042.437
S ₈ J ₁ T ₈ S ₉	.595		22D	.452
S ₉ J ₁ T ₈ S ₈	.617		D ₀ ✓	.470
f ₁ o ₁ f ₁	.636	.616	D ₀ ✓	.456

41.171	18791.019
198	.350
222	.379
242	.404
638	.880
663	.909
	.933
706	.961
18804	.431

Waktu	858.053		
Sg 1	080	81.202	d5D
Sg 2	103		d7D
Sg 3	122	245	d7D
T7 18	58.499	1626	d5D 12050.484
T7 58	522		78
T3 5TH	562	691	d8D 536

Van #3 in 1846
1835 Van #1/163
a w c

[illegible]

Soy
T¹B
T¹S
T¹S

fod
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do-

S8f
S8f
S8f
S9

d_{3F} d_{0F} from h_{11}
 f_{5d}
 d_{2F}
 d_{0F}
 d_{6F}
 d_{9F}
 d_{5F}
 d_{5F}
 d_{5F}
 d_{0F}
 d_{0F}
 d_{0F} f_{9d}

79 d.
 60 d.
 60 d.
 25 F
 25 F
 22 + db
 5 F ^{OK} 60 d.
 60 d.
 25 F
 25 F
 60
 20

off region
a/b
a/b

23
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27
28

$$\begin{array}{r} 10 \\ 597 \text{ } 35 \\ 51 \\ \hline 1915 \end{array}$$

$\frac{fbd}{b^2d}$ $\frac{fbd}{b^2d}$
 $\frac{fbd}{b^2d}$
 $\frac{fbd}{b^2d}$
 $\frac{fbd}{b^2d}$

88
69

V in Auron3	V in Auron3	Mag Auron3	Auron3	Auron3	Auron3
p. 35 54763	1.7460979 59270559	V-6358387	61233 p = 1.633106	62069 1.611110	60233 p = 1.660
11692.104 .123	18837.074 .104	172451729.118 1734 .200	53715.103 .188	52991.624 .708	54606.887 .973
11700 .606 .622 .637 .658	18850.771 .796 .821 .854	1704 766 .733 1706 .801 1706 .869 1706 .960	53754.162 .398	53030.157 .390	54646.594 .834
11702.028 .043 .061 .076	857.339 853.062 .086 .114 .138	1722 768 .290 1718 773 .023 1718 .090 1719 .167 1720 .233	53755.779 53760.693 53760.911	53031.752 53036.600 53036.816	648.238 653.234 653.456
11709.518 536 .552	865.129 865.158 .183	1719 .162 1720 .241 1719 .310	53795.104 .258	53070.548 .699	688.216 .372
11709.848 .867	865.661 865.690	1704 51807.621 1689 .703	796.619	.043 53072.126	689.757
.899	865.742	1685 1807.844	53796.851	271	689992

19897.681 1710
.709 1689
.738 1706
.764 1708
.258 1720

19899.394 1748
.450 —
.471 1748

899.969 1718
.998 1718
.004 1718
.052 —
.080 1719

900.566 1720
.596 1715
.634 1711
.659 1708

Auron3

86

$\frac{1}{P} = 1.5855009$ $\frac{1}{P} = 1.5892675$ $\frac{1}{P} = 1.6030068$ $\frac{1}{P} = 1.5065758$
 $\frac{1}{P} = 1.62922066$ $\frac{1}{P} = 1.6009821$ $\frac{1}{P} = 1.62382766$ $\frac{1}{P} = 1.6571193$
 $\frac{1}{P} = 1.5855009$ $\frac{1}{P} = 1.5892675$ $\frac{1}{P} = 1.6030068$ $\frac{1}{P} = 1.5065758$
 $\frac{1}{P} = 1.62922066$ $\frac{1}{P} = 1.6009821$ $\frac{1}{P} = 1.62382766$ $\frac{1}{P} = 1.6571193$

1.7395316
 5.57486939

63

.848

.930

51961.605

.833

63.168

67.918

063

68.129

52001.182

18936.874

330

52002.647

.955

52002.871

TS 52311.204

T6 .274

T7 .342

T8 .434

T9 .512

T10 .561

T11 .629

T12 .706

T13 .773

T14 .851

T15 .917

T16 .952

T17 .983

T18 .995

T19 .999

T20 .999

T21 .999

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T289 .999

T290 .999

T291 .

Aug 3		Aug 3		Aug 3		Aug 3		Aug 3	
P = .74		P = .6358		P = .6358346		P = .635847		P = .6358105	
1/p = 1.35135		1/p = 1.5728216		1/p = 1.5727360		1/p = 1.5727360		1/p = 1.5727956	
350	44447.803	51732.266	51729.466	51728.444	51731.411	51728.444	51731.411	51728.444	51731.411
129	.873	.348	.532	.526	.492	.526	.492	.526	.492
83	480.123	51769.883	767.065	51766.058	51769.027	51766.058	51769.027	51766.058	51769.027
	.182		.134	.127	.096	.127	.096	.127	.096
	.240		.202	.194	.163	.194	.163	.194	.163
01	.319	770.110	.293	.286	.255	.286	.255	.286	.255
75	481.462	771.441	768.623	767.616	770.585	767.616	770.585	767.616	770.585
09	485.528	776.173	768.623	772.348	775.317	772.348	775.317	772.348	775.317
173		.241	.355	.416	.385	.416	.385	.416	.385
46		.317	.423	.492	.461	.492	.461	.492	.461
10	.709	.384	.499	.558	.528	.558	.528	.558	.528
			.566						
53	514.002	809.314	806.407	51805.486	.458	51805.486	.458	51805.486	.458
85	.070	.893	.494	.566	.537	.566	.537	.566	.537
51	129	.462	.574	.634	.917	.634	.917	.634	.917
30	515.256	810.773	.642	51806.946	.999	51806.946	.999	51806.946	.999
			807.954	807.027		807.027		807.027	
65	.448	.997	808.035	.169	.140	.169	.140	.169	.140
			.177						

88

13108.576	1.7543916	1.7547216	Qum3 V	Aug. 3	1.7687536	1.7371536
VarV	VarV	5698910	Q = 1.8929536	1.76536987	57565433	
	18748.025		yp = .52827496	18595.793	18934.063	
	.054		17375.690	.822	.093	
			.718			
14243.757	18761.657	17388.325	18609.315	18947.831		
.776		.348	.339	.857		
.795		.371		.880		
.820	.740	.401	.396	.914		
244.186	762.222	.848	18609.875	18948.401		
245.488	763.937	390.438	18611.576	.133		
.506		.460		.158		
.527		.486		.186		
.546	64.013	.508	.651	.210		
14254.582		401.540				
.606	18775.947	.569	623.489	18962.262		
.628		.595		.291		
.647	772.001	.618		.317		
55.008	776.476	402.059	624.013	.797		
.030	.506	.086		.827		
		.109				
.069	.557	.134	624.093	.878		
		.026				
		413.682				

NGC 1978 Va → 81323845

P-4.4069611

B5!
B5!

B3

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7469839

40479.260

7469849

.313

7469860

.372

7469870

.424

7474.621

40505.170

.232

.285

506.375

NGC 1978 Va

B5!
B5!
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1.7547736 Van V 3.5059072 89

.56987408

18743.942

9381.701

.972

.716

18757.572

9388.523

.597

.536

.621

.548

.654

.565

18758.136

9388.806

18759.857

9389.664

18759.876

.676

.903

.690

.927

.702

18771.827

.859

9395.674

.888

.689

.913

.701

18772.328

.417

.939

.441

.954

.469

.966

18784.926

9402.215

90

9982 Var N. 99824
 1.0067631
 2950.685 L^{ns} need 32949.366
 .737 Bo: " .418

Quov3
 687
 47876.821
 .897

Quov3
 687
 1.468429
 .762
 .6907
 47620.347
 .423

32974.645 ns IF 32973.325
 .689 ns IF 32973.369
 .732 32973.412
 .790 L G 470
 32975.627 Do 1974.317
 78.652 L G 32977.332
 .744 L G 375
 .551 Bo: 423
 32977.466

47911.635
 .698
 761
 .845
 47913.076
 47917.456
 .651

48333.770
 .982
 48335.214
 48339.633
 .829

47654.974
 .184
 656.408
 660.765
 660.958

32999.761 ns IF 32998.440
 .811 ns IF 490
 .855 ns IF 534
 33000.690 Bo: 32999.369
 .742 ns IF 421
 .8331 ns IF .512

948.127
 264
 949.478
 .684

48370.574
 .712
 48371.937
 48372.145

691.271
 691.344
 691.407
 692.615
 692.820

Bo:

Wade L Dns
 L Dns
 L Dns
 L D

L D seen
 L D but seen

L D but seen
 Do:

L D but seen
 L D
 L D seen

L D

W L D but seen
 L D ns
 L D
 Do

Var N in Aur 3 .4992604	N 40.12	N in Aur 3 99017144	N 4992924	Var N in Aur 3 352739	5016162	91 Var N in Aur 3
65880.202 .306	819.824	786 33017.838	65875.9789324.564 76.082 .578			L1776 1776
65928.106 194 .280 396	.420	33041.795 .839 .882 .940	65923.8809331.344 .356			ns L1762 ns L1762 ns L1762
65930.090 65936.117 936.203 300 820 522 .385 820.523	820.445	33042.789 33045.810 853 901 .944	65924.170 65925.8649331.625 65931.8909332.478 65931.976 65932.0739332.504 65932.1589332.516			L1776 1762 L1786 L1786 L1776 1776
65978.321	821.045	33066.961	65974.092	9338.451	65668.955	ns L1762
65980.180 284	821.047 821.068	.056 067.893 067.945	65974.280 65975.950 76.054	9338.478 9338.714 9338.729	65670.805 .909	ns L1748 1276 1276
.464	.072	068.035	65976.234	9338.754		ns L1762
		34876.828 .876 .927 .973				L1780 L1780 L1780 L1780
		877.838				seen? L1780
		879.830				seen L1780
		879.928 .965				seen L1780 1780
		880.837 .888 .899 .984				seen L1780 L1780 seen L1780
		881.032				L1780
		881.884 .936 82003 .047				seen L1780 L1780 L1780 1780

92

5104² - 70°HV
2439
Cume1/p
0.2077632439
mag

A 17 070

100

117

145

151

172

212

215

253

258

915

925

18 169

847

19 673

84

95 28 761.6068 c8d 59 75.598 1703

701 762.6186 c4d 808 1668

702 763.5888 b7c 76.009 1619

724 776.5839 doe 709 1720

741

859

20 308

320

349

420

441

518

598

21 499

503

606

621

Ry 22 320

7 340

1 404

1 985

1 992 30 318.3931 b8c 6299.040 1625

23 000 319.4794 e2di 266 1651

1 008 322.5160 b8c 897 1625

1 011 324.3043 c5d 6300 268 1676

1 22 330

Ry 23 518

2 24 09

$P_{15} = 1.98 \times 10^{-15}$
 $p = .5122195$

16842.940

.962

43.968

.991

44.013

.040

46.022

.045

.071

.093

47.558

.580

.604

.631

59.855

.877

.899

.929

60.362

61.903

61.920

.950

.972

72.668

.696

.722

.744

73.171

.198

.220

.244

30 p16 Y 1751

20501017
48778068

67040743

X^{5.9}
X¹
X^{2.9}
X^{9.1}
X^{9.8}
X^{9.9}
X⁸

13559.716
.738
.761
.812
.836
13560.202

X^{13559.954}
X^{13559.977}
560.000
.033
.050
.075
.441
.459
.487
.505
.533
.550
.574
560.929
.947

X³³⁵
X^{13560.690}
X⁷⁰⁹

560.929 41438.329
.947

X^{13561.283}

561.522

X^{13563.617}

563.858

41947.273

Do not use

X^{.747}
X^{13564.104}

564.343
.360
.385
.401

P18 Ym
1751.67090743
135

2.0479567

2.0500667

2.0501377

2.05010017

2.0506367

.4877890

.4877721

.48778068

Just phase

X79

16056.136

16039.610

16039.054

164916039.336

16035.151.635

X50

.157

16039.631

.075

1646.357

.172.700

X5

16057.116

16040.589

16040.033

164616040.315

36.129.626

X2

16040.055

16040.610

1642.337

.151.693

X5

16040.076

1640.358

1640.384

36.198.836

X3

16057.185

16040.657

16040.101

1643.384

38.085.603

X5

16059.074

16042.545

16041.989

164616042.271

.670

X9

16042.011

164916042.293

1642.318

38.153.810

X2

16042.036

1642.318

164616042.339

39.547.072

X5

.142

16042.612

16042.057

164616042.339

.137

X8

60.538

16044.007

16043.457

165316043.734

.267

X9

16043.473

165316043.755

16043.495

165216043.778

39.616.284

X5

16043.521

167216043.803

16043.521

165016055.444

.920

X8

.608

.077

16055.161

165016055.444

.984

X9

72.261

16055.718

16055.183

165216055.465

16051.254.855

X6

16055.204

165216055.486

16055.232

165316055.514

.920

X3

.331

16055.788

16055.644

166116055.927

.984

X9

.744

16056.201

16057.112

164516057.395

16051.325.071

X6

474.214

16057.668

16057.133

165216057.416

16051.737.331

X9

16057.157

164816057.439

16057.177

164316057.463

16053.205.817

X3

.279

16057.734

16067.363

16067.645

.880

X6

.502

16067.947

16067.390

165316067.697

.953

X9

.548

16067.992

16067.436

165316067.718

16053.270.016

X3

.001

16068.445

16067.488

164316068.171

16063.453.140

X6

84.475

16068.468

67.91

164316068.194

16063.480.223

X9

.548

16067.992

16067.436

165316067.718

16063.526.363

X3

.001

16068.445

16067.488

164316068.171

16063.978.746

X6

85.025

16068.468

67.91

164316068.194

16064.002.818

136

p48

Van H62439 *Andromeda* P.

2105010	0.7949748	1.9977127
33199.680	21803.294	49304.780
3199.872	.420	.066
33227.372	21821.480	49345.907
.414	.507	.968
.452	.533	46.025
.503	.566	46.101
.567	.608	.196
.601	.631	.246
33233.534	21825.527	49355.057
35.850	21827.048	49358.496
.889 x	.074	.555
.944	.110	.636
.984	.136	.696
36.161	.252	.958
		49360.357
37.148	.901	.425
.188	.927	.484
.254	.970	.581
.294	.996	.641
.334	28.022	.700
.374	.045	.759
33565.333 x	22043.430	49447.811
67.824	43.065	49451.510
87.144	57.754	49480.202
88.285	58.503	49481.497
90.687	60.081	49485.467
.784	.144	.608
91.936	60.901	49487.319

1962phae.proj.2459W

100

5h 04-70°4

HV
2439
amouz1p
0.2077632439
mag

25010	31	677.6438	c7d	6581.442	1703
15		78.6255	—	—	—
22		806217	c7d	582.061	1636
28		816329	c7d	271	1694
33		826371	c8d	480	1703
50		975589	c8d	85.580	1703
60		99.5334	(b7c)	990	1619
68		701.5335	c7d	86.406	1694
76		025616	c9d	.619	1711
81		036292	c2d	.841	1651
85		045492	—	—	—
91		08.6130	c1d	87.877	1643
97		105570	c2d	88.280	1651
109		125169	c8d	.688	1703
113		135453	—	.901	—
129		345107	c2d	93.257	1651
133		38.4425	—	94.074	—
134		.5496	(b8c)	.096	1625
139		404472	c7d	.491	1694
214		859.3794	—	—	—
473	32	027.6002	—	—	—
565		69.6226	—	—	—
26051		507.3939	—	—	—
81		37.3904	—	—	—
720		977.2631	—	—	—
975	33	160.6233	—	—	—

22409 30058.3232

23518

106 Repeat p₄₀ γ β β

A 20326
 57
 98
 419
 477
 529
 599
 21498
 511
 524
 605
 619
 620

γ R_{25} $=8$ $\alpha 8 \gamma$ 29104.6582
 γ_0 R_0 28 γ_0 113.6225
 128.5786

22319
 329
 336
 339

R_{25} R_{25} $=8$ 2γ 29962.2703
 $X_0 Y$ R_{25} $=8$ γ 970.4457
 $X_0 Y$ R_{25} α γ_0 988.2782
 S_0 R_{25} almost α , $\alpha 9 \gamma$ 994.2839

22402

30057.2636

408

058.2726

984

314.3864

991

318.3429

999

319.4402

23006

322.4457

010

324.2637

014

325.3032

032

357.3119

034

365.2811

037

367.2811

052 30

380.2705

054 30

380.3938

S_0 R_{25} $=8$ γ_0
 dqS R_{25} $=8$ $\alpha 8 \gamma$
 S_0 R_{25} almost α , $\alpha 9 \gamma$
 dqS R_{25} " 2γ
 fagged
 $X_2 Y$ R_0 $\alpha 5(8)$ γ
 $X_0 - 2 Y$ R_0 7α $\alpha 7 \gamma$
 $X_5 Y$ R_2 $\alpha 0$ $\alpha 8 \gamma$
 X_0 R_0 7α $\alpha 9$

108

5h 04 -70.4°

HV
2439
Axon

1/P.207763

2439
may

23	015	20	325.3437		
	047		373.3919		
	051		3753584		
	446		619.4340		
	448		5621		
	464		641.3842		
	485		665.5406		
	490		672.5721		
	518		725.5176		
	528		749.2756		
	905		977.6124		
	922		990.5699		
	973	31	107.4491		
	981		108.4534		
4	449		3036469		
	508		326.5932	c8d	6 508.507 1703
Boorpl.	525		328.5699	(c3c)	.918 1598
	530		332.5873	c7d	09.752 1694
	623		458.3285		
	976		669.6326		
	983		670.6372		
	993		674.6474		
	5005		676.6431		

112

5h 44 - 66°

NGC 1978
Vary Range
in miles1978 ran
3.77
2652520

17	17101	24	27680.613 ✓	(1573)	(40)	7339.685
118			681.634 ✓	1638	09	7342.609
173			700.590 ✓	1607	21	7347.637
213			728.4996 ✓	1652	28	7355.040
216			730.5613 ✓	1643	14	7355.587
254			756.3802 ✓	1610	21	7362.435
259			776.5604 ✓	1588	23	7367.788
918	20	28	034.6506 ✓	1652	15	7436.247
948			041.6426 ✓	(1657)	(12)	7438.102
18006			071.6029 ✓	1650	14	7446.049
19725			776.6368 ✓	1631	35	7633.060
731			777.6355 ✓	1648	18	7633.325
746			782.6270 ✓	1654	28	7634.649
750			783.6098 ✓	1631	14	7634.910
816			838.4651 ✓	(1573)	05	7649.460
851			861.4006 ✓	1610	21	7655.544
856			862.4055 ✓	1638	09	7655.811
869			875.3779 ✓	1651	23	7659.252
884			878.4026 ✓	(1638)	(09)	7660.054
20405	29		129.5899 ✓	(1645)	(14)	7726.682
471			158.5759 ✓	(1631)	(14)	
545			203.3633 ✓	1651		
600			229.3671 ✓	1645	12	
21500			586.3823 ✓	1638	28	
22307			956.5033 ✓	1631	07	
331			970.5510 ✓			
334			986.4747 ✓			
341			994.3822 ✓			
361	30		023.4399 ✓	(1567)	43	7963.777
986			314.4933 ✓	(1588)	41	8040.980
993			318.4409 ✓	(1567)	26	8042.027
23001			319.5740 ✓	1588	04	8042.312
23009			322.5616 ✓	1588	04	8043.120
23012			324.4455 ✓	1588	23	8043.621
016			325.3848 ✓	1624	07	8043.869
019			327.5380 ✓			
038			367.3367 ✓	1617	07	
486			665.5873 ✓	1639		
499			680.5397 ✓	1617	14	
501			695.5023 ✓	1610		
519			725.5727 ✓	1631		
529			750.2776 ✓	1631	07	
531			751.2828 ✓	1624		
962	31		076.3796 ✓	1594	23	8243.072
974			107.4891 ✓	1594	23	8251.324
982			108.4913 ✓	low		
988			109.4933 ✓	1631	07	
995			113.4678 ✓	1610	14	

116

5-444-66²

24 002 ²⁴ 31134.3080 ✓ 1580 08
 035 ¹⁰ 165.2680 ✓
 036 165.3216 ✓

30 562 379.4423 ✓
 564 379.5808 ✓ (B8) 1624
 571 402.4488 ✓ 1567
 581 412.3181 ✓
 582 412.3708 ✓ 1562
 584 412.4850 ✓ 1562
 629 461.3333 ✓ 1610 21
 25 051 697.5924 ✓ 1624 21
 061 698.5745 ✓
 069 701.5683 ✓ 1638 16
 077 702.6090 ✓ 1580 15
 079 703.5456 ✓ 1580 08
 086 704.5955 ✓
 098 710.6051 ✓
 110 712.5720 ✓ 1624 21
 114 713.5969 ✓
 115 715.5658 ✓ 1645 12
 130 734.5576 ✓ 1631 14
 156 772.4448 ✓ 1631 07
 158 773.4815 ✓ 1624 21
 188 803.5083 ✓ 1624 21
 217 873.2664 ✓ 1638 14
 539 32058.6402 ✓ 1631 28
 26094 564.3923 ✓ (1645) 13
 26718 976.2556
 26722 978.2579 ✓

4928 15380.628 ✓
 11154 20605.513 ✓
 11587 21155.751 ✓
 17071 27658.646 ✓
 14348 25926.526

26992 33178.6153 ✓

2190 13896.571
 2191 13901.765
 3427 14638.713

7374.090
7374.106

27881
7375.968

7375.999

203
7376.212
7376.225
7376.234
7376.996

122

7n NGC 1978

B	6499	36571.385	16.24
	6505	572.425	16.24
	6511	574.433	16.45
	6515	577.337	
	6524	581.350	16.38

AD	17	33618.	d ₂
	707	661.289	
	40	626.371	cy
	59	633.481	dy
	95	659.367	
dam. feld	102	661.289	E _q d:
	103	661.313	
sp. e	1756	34458.243	chul pt.
	5077	36495.581	
	86	518.498	
	5129	545.460	

A 18972 28456.5254

β NGC 1783
P

24622	60	31458.2790
24630	55	31463.4693
24975	60	31669.5885

 $r_2 W$!
where!Lag
W?

1962phae.proj.2159w

142

ADN 17

~~5-40-69.3~~

40	3	10	440
59	6	51	706
95	5	16	646
103	4	42	457
1756	7	27	737

33618

Dec 10-11 '50 33626.371

Dec 17-18 '50 33633.481

Jan 12-13 '51 33659.367

Jan 14-15 '51 33661.313

Mar 21-22 '53 34458.243

Van N. Quon

$$P = .9982 \text{ } \rho = 1.0118032$$

$$P = .99824 \text{ } \rho = 1.0017631$$

998259

$$33676.030 \pm 33679.0$$

$$33687.006 \quad 33685.658 \quad 33681.202 \quad 33685.015 \quad 33684.006$$

$$33694.129 \quad 692.780 \quad .324 \quad 692.138 \quad 33694.129$$

$$33720.062 \quad 33718.712 \quad .252 \quad 718.069 \quad 33720.062$$

$$33722.011 \quad 33720.661 \quad 33716.201 \quad 720.018 \quad 33722.011$$

$$34520.378 \quad 34518.996 \quad 34514.431 \quad 34518.338 \quad 34520.378$$

144

May N in Aug 3

$$P_{\text{pm}} W_{45} = 1.8544601$$

1	1.00273791
2	2.00547582
3	3.00821373
4	4.01095164
5	5.01368955
6	6.01642746
7	7.01916537
8	8.02190328

$$\begin{array}{r} 7.01916537 \\ 1.8544601 \\ \hline 5.16470527 \end{array}$$

$$\begin{array}{r} 8.02190328 \\ 1.8544601 \\ \hline 6.16744318 \end{array}$$

$$\begin{array}{r} 3.00821373 \\ 1.8544601 \\ \hline 1.15375363 \end{array}$$

72
80
90

$$21) \begin{array}{r} 282 \\ 8038 \\ 67 \\ 173 \\ 16858 \end{array}$$

$$277863149$$

$$7504402$$

$$35,8747$$

$$42$$

$$277504404$$

$$26946.6$$

$$36) \begin{array}{r} 803.8 \\ 72 \\ 83 \\ 72 \\ 118 \\ 108 \end{array}$$

$$225365$$

$$22) \begin{array}{r} 803.8 \\ 66 \\ 143 \\ 132 \end{array}$$

$$26946118$$

$$26988.4$$

$$27798.0$$

$$23) \begin{array}{r} 8038 \\ 69 \\ 113 \\ 115 \end{array}$$

$$12.083$$

$$\begin{array}{r} 67 \\ 84581 \\ 72498 \\ 809561 \end{array}$$

$$988.4$$

$$12.08$$

$$97632$$

$$2416$$

$$952.16$$

$$12.08$$

$$940.08$$

$$27798.0$$

$$26957.2$$

$$840.8$$

$$1226$$

$$66) \begin{array}{r} 809.6 \\ 66 \\ 149 \\ 132 \\ 176 \\ 132 \\ 440 \end{array}$$

$$124396$$

$$65) \begin{array}{r} 809.6 \\ 65 \\ 159 \\ 130 \\ 296 \\ 260 \end{array}$$

$$124396$$

$$132$$

$$176$$

$$132$$

$$440$$

$$124396$$

$$65) \begin{array}{r} 809.6 \\ 65 \\ 159 \\ 130 \\ 296 \\ 260 \end{array}$$

$$124396$$

$$132$$

$$176$$

$$132$$

$$440$$

$$124396$$

$$65) \begin{array}{r} 809.6 \\ 65 \\ 159 \\ 130 \\ 296 \\ 260 \end{array}$$

$$124396$$

$$132$$

$$176$$

$$132$$

$$440$$

$$988.4$$

$$12.08$$

$$97632$$

$$2416$$

$$952.16$$

$$12.08$$

$$940.08$$

$$27798.0$$

$$26957.2$$

$$840.8$$

$$70.07$$

$$12) \begin{array}{r} 840.8 \\ 84 \\ 0080 \\ 84 \end{array}$$

$$84$$

$$0080$$

$$84$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

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$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$68) \begin{array}{r} 840.8 \\ 68 \\ 160 \\ 136 \\ 248 \\ 204 \\ 440 \end{array}$$

$$1236$$

$$120000 \quad 120000 \quad 120000$$

$$2.0 \quad 3.0 \quad 8.6$$

$$5.6 \quad 5.6 \quad 2.4$$

$$30.7 \quad 10.0 \quad 4.6$$

$$13.2 \quad 13.2 \quad 3.2$$

$$30.7 \quad 30.7 \quad 17.5$$

$$10.0 \quad 32.0 \quad 1.3$$

$$32.0$$

$$2775.6$$

$$12$$

$$768$$

$$712$$

$$770$$

$$712$$

$$782$$

$$809.6$$

$$67$$

$$12) \begin{array}{r} 809.6 \\ 72 \\ 89 \\ 89 \end{array}$$

$$72$$

$$89$$

$$12083$$

$$67) \begin{array}{r} 809.6 \\ 67 \\ 139 \\ 134 \end{array}$$

$$67$$

$$139$$

$$134$$

$$5.60$$

$$536$$

$$240$$

$$231$$

$$12.01$$

$$70) \begin{array}{r} 840.8 \\ 70 \\ 110 \end{array}$$

$$70$$

$$110$$

$$12.18$$

$$69) \begin{array}{r} 840.8 \\ 69 \\ 150 \\ 138 \end{array}$$

$$69$$

$$150$$

$$138$$

$$128$$

$$69$$

$$590$$

$$552$$

$$27786.2$$

$$12.36$$

$$2777386$$

$$12.36$$

$$2776150$$

$$12.36$$

$$27749.14$$

$$48$$

$$26$$

$$12.8$$

$$2775622$$

$$12.18$$

$$27774.04$$

$$12.18$$

$$27761.86$$

146

nL

2144

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37

38

39

40

1 50 E

2 11 E

1 01 E

0 10 W

1 15 W

2 02 E

0 47 E

0 28 W

1 30 A

2 38 U

2 00 E

0 55 E

0 24 W

1 55 W

2 59 U

1 33 E

0 39 E

1 25 E

0 17 E

0 29 W

1 33 E

0 39 E

1 25 E

0 17 E

0 29 W

1 33 E

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1 25 E

0 17 E

0 29 W

1 33 E

$n=4$
H. 01095164

Feb Ext 2683

Robert Bailey
John Kew
Wentworth, H. A.
Sem

1.00273791

2.00547582

$n=2$

1.354974

HR 2090

1.00273791

qEC2

$n=3$

1.00 27 3791
3
3.00821373

1.35 77
1.00
90
91

1.6
1.0
6
40

$$\pm \frac{1}{P_{soln}} \pm 1 = \frac{1}{P_{soln}} \pm 1.00273791 = \frac{1}{P_{soln}} \pm 1.00273791$$

$$\pm \frac{1}{P_{soln}} \pm 1 = \frac{1}{P_{soln}} \pm 1.00273791 = \frac{1}{P_{soln}} \pm 1.00273791$$

$$\pm \frac{1}{P_{soln}} \pm 1 = \frac{1}{P_{soln}} \pm 1.00273791 = \frac{1}{P_{soln}} \pm 1.00273791$$

1284378

I mean solar seconds
 I' " sid

$$= I \left(1.00273791 \right)_{8 \text{ places}}$$

$$\text{No Sid sec} = \text{no solar sec} \times \frac{366.2422}{365.2422} = 1.00273791$$

$$\therefore I'(\text{sid}) = I(\text{solar}) + (0.00273791) I_{8 \text{ places}}$$

$$\text{Conversely } I = I' \times \frac{365.2422}{366.2422} = I' \times 0.99726957_{8 \text{ places}}$$

$$= I' - 0.00273043 I'_{8 \text{ places}}$$

sid
 formula

$$\frac{\pm 1 \mp n p_{\text{sid}}}{21} \quad \frac{21}{22}$$

$$21 = \frac{p}{-1+p} \quad -21 + 21p = p$$

$$20p = 21$$

$$p = \frac{21}{20}$$

$$\frac{\pm 1 \mp p_{\text{solar}}(1.00273791)}{p(1.00273791)} = \frac{1}{p_{\text{solar}}(1.00273791)}$$

$$\frac{\pm 1 \mp p_{\text{solar}}(1.00273791)}{p(1.00273791)} = \frac{1}{p_{\text{solar}}}$$

$$P = \frac{p}{\pm 1 \mp n p}$$

$$\text{or } \frac{1}{p_{\text{solar}}} I(1.00273791) = \frac{1}{p_{\text{solar}}} \text{ use sid } 1$$

$$\frac{12990}{.0001833} + 1.00273791 = \frac{1}{p_{\text{solar}}}$$

$$= 1.00892421$$

1.8

$$\frac{\pm 1}{p_{\text{solar}}} \mp n(1.00273791) = \frac{1}{p_{\text{solar}}}$$

into units 10 cm B. min A smaller

1962phae.proj.2459W