

ANNEXURE 1**EXAMINATION NOTES AND DEVIATION CARD**

1. **All** relevant working must be shown in the Answer Book.
2. **All** work done on the chart must be done lightly, using a 2B pencil.
3. Corrections applicable to courses and bearings must be calculated correct to the nearest 1° and plotted to a similar accuracy.

DEVIATION CARD

Comp. Head	Dev.	Mag. Head	Comp. Head	Dev.	Mag. Head
000	2° W	358	180	0°	180
010	4° W	006	190	3° E	193
020	5° W	015	200	5° E	205
030	7° W	023	210	7° E	217
040	9° W	031	220	9° E	229
050	11° W	039	230	11° E	241
060	12° W	048	240	12° E	252
070	13° W	057	250	13° E	263
080	14° W	066	260	14° E	274
090	13° W	077	270	13° E	283
100	12° W	088	280	12° E	292
110	11° W	099	290	11° E	301
120	10° W	110	300	10° E	310
130	9° W	121	310	9° E	319
140	8° W	132	320	7° E	327
150	7° W	143	330	5° E	335
160	5° W	155	340	3° E	343
170	3° W	167	350	1° E	351

ANNEXURE 2

ALTITUDE CORRECTION TABLES 10° – 90° – SUN, STARS, PLANETS

OCT.—MAR. SUN			APR.—SEPT:			STARS AND PLANETS				DIP			
App. Alt.	Lower Limb	Upper Limb	App. Alt.	Lower Limb	Upper Limb	App. Alt.	Corr ⁿ	App. Alt.	Additional Corr ⁿ	Ht. of Eye	Corr ⁿ	Ht. of Eye	Ht. of Eye
°			°			°				m		ft.	m
9 34	+10.8	-21.5	9 39	+10.6	-21.2	9 56	-5.3		1994	2.4	-2.8	8.0	1.0 - 1.8
9 45	+10.9	-21.4	9 51	+10.7	-21.1	10 08	-5.2		VENUS	2.6	-2.9	8.6	1.5 - 2.2
9 56	+11.0	-21.3	10 03	+10.8	-21.0	10 20	-5.1		Jan. 1-July 18	2.8	-3.0	9.2	2.0 - 2.5
10 08	+11.1	-21.2	10 15	+10.9	-20.9	10 33	-5.0		0	3.0	-3.1	9.8	2.5 - 2.8
10 21	+11.2	-21.1	10 27	+11.0	-20.8	10 46	-4.9		0 +0.1	3.2	-3.2	10.5	3.0 - 3.0
10 34	+11.3	-21.0	10 40	+11.1	-20.7	11 00	-4.8		60	3.4	-3.3	11.2	See table
10 47	+11.4	-20.9	10 54	+11.2	-20.6	11 14	-4.7		July 19-Sept. 6	3.6	-3.4	11.9	←
11 01	+11.5	-20.8	11 08	+11.3	-20.5	11 29	-4.6		0	3.8	-3.5	12.6	m
11 15	+11.6	-20.7	11 23	+11.4	-20.4	11 45	-4.5		0 +0.2	4.0	-3.6	13.3	20 - 7.9
11 30	+11.7	-20.6	11 38	+11.5	-20.3	12 01	-4.4		41	4.3	-3.7	14.1	22 - 8.3
11 46	+11.8	-20.5	11 54	+11.6	-20.2	12 18	-4.3		76	4.5	-3.8	14.9	24 - 8.6
12 02	+11.9	-20.4	12 10	+11.7	-20.1	12 35	-4.2		Sept. 7-Sept. 28	4.7	-3.9	15.7	26 - 9.0
12 19	+12.0	-20.3	12 28	+11.8	-20.0	12 54	-4.1		Dec. 10-Dec. 31	5.0	-4.0	16.5	28 - 9.3
12 37	+12.1	-20.2	12 46	+11.9	-19.9	13 13	-4.0		0	5.2	-4.1	17.4	
12 55	+12.2	-20.1	13 05	+12.0	-19.8	13 33	-3.9		0 +0.3	5.5	-4.2	18.3	30 - 9.6
13 14	+12.3	-20.0	13 24	+12.1	-19.7	13 54	-3.8		34	5.8	-4.3	19.1	32 - 10.0
13 35	+12.4	-19.9	13 45	+12.2	-19.6	14 16	-3.7		60	6.1	-4.4	20.1	34 - 10.3
13 56	+12.5	-19.8	14 07	+12.3	-19.5	14 40	-3.6		80	6.3	-4.5	21.0	36 - 10.6
14 18	+12.6	-19.7	14 30	+12.4	-19.4	15 04	-3.5		Sept. 29-Oct. 14	6.6	-4.6	22.0	38 - 10.8
14 42	+12.7	-19.6	14 54	+12.5	-19.3	15 30	-3.4		Nov. 25-Dec. 9	6.9	-4.7	22.9	
15 06	+12.8	-19.5	15 19	+12.6	-19.2	15 57	-3.3		0	7.2	-4.8	23.9	40 - 11.1
15 32	+12.9	-19.4	15 46	+12.7	-19.1	16 26	-3.2		29	7.5	-4.9	24.9	42 - 11.4
15 59	+13.0	-19.3	16 14	+12.8	-19.0	16 56	-3.1		51	7.9	-5.0	26.0	44 - 11.7
16 28	+13.1	-19.2	16 44	+12.9	-18.9	17 28	-3.0		68	8.2	-5.1	27.1	46 - 11.9
16 59	+13.2	-19.1	17 15	+13.0	-18.8	18 02	-2.9		83	8.5	-5.2	28.1	48 - 12.2
17 32	+13.3	-19.0	17 48	+13.1	-18.7	18 38	-2.8		Oct. 15-Nov. 24	8.8	-5.3	29.2	ft.
18 06	+13.4	-18.9	18 24	+13.2	-18.6	19 17	-2.7		0	9.2	-5.4	30.4	2 - 1.4
18 42	+13.5	-18.8	19 01	+13.3	-18.5	19 58	-2.6		26	9.5	-5.5	31.5	4 - 1.9
19 21	+13.6	-18.7	19 42	+13.4	-18.4	20 42	-2.5		46	9.9	-5.6	32.7	6 - 2.4
20 03	+13.7	-18.6	20 25	+13.5	-18.3	21 28	-2.4		60	10.3	-5.7	33.9	8 - 2.7
20 48	+13.8	-18.5	21 11	+13.6	-18.2	22 19	-2.3		73	10.6	-5.8	35.1	10 - 3.1
21 35	+13.9	-18.4	22 00	+13.7	-18.1	23 13	-2.2		84	11.0	-5.9	36.3	See table
22 26	+14.0	-18.3	22 54	+13.8	-18.0	24 11	-2.1		MARS	11.4	-6.0	37.6	←
23 22	+14.1	-18.2	23 51	+13.9	-17.9	25 14	-2.0		Jan. 1-Dec. 14	11.8	-6.1	38.9	
24 21	+14.2	-18.1	24 53	+14.0	-17.8	26 22	-1.9		0	12.2	-6.2	40.1	ft.
25 26	+14.3	-18.0	26 00	+14.1	-17.7	27 36	-1.8		60	12.6	-6.3	41.5	70 - 8.1
26 36	+14.4	-17.9	27 13	+14.2	-17.6	28 56	-1.7		Dec. 15-Dec. 31	13.0	-6.4	42.8	75 - 8.4
27 52	+14.5	-17.8	28 33	+14.3	-17.5	30 24	-1.6		0	13.4	-6.5	44.2	80 - 8.7
29 15	+14.6	-17.7	30 00	+14.4	-17.4	32 00	-1.5		0	13.8	-6.6	45.5	85 - 8.9
30 46	+14.7	-17.6	31 35	+14.5	-17.3	33 45	-1.4		41	14.2	-6.7	46.9	90 - 9.2
32 26	+14.8	-17.5	33 20	+14.6	-17.2	35 40	-1.3		76	14.7	-6.8	48.4	95 - 9.5
34 17	+14.9	-17.4	35 17	+14.7	-17.1	37 48	-1.2			15.1	-6.9	49.8	
36 20	+15.0	-17.3	37 26	+14.8	-17.0	40 08	-1.1			15.5	-7.0	51.3	100 - 9.7
38 36	+15.1	-17.2	39 50	+14.9	-16.9	42 44	-1.0			16.0	-7.1	52.8	105 - 9.9
41 08	+15.2	-17.1	42 31	+15.0	-16.8	45 36	-0.9			16.5	-7.2	54.3	110 - 10.2
43 59	+15.3	-17.0	45 31	+15.1	-16.7	48 47	-0.8			16.9	-7.3	55.8	115 - 10.4
47 10	+15.4	-16.9	48 55	+15.2	-16.6	52 18	-0.7			17.4	-7.4	57.4	120 - 10.6
50 46	+15.5	-16.8	52 44	+15.3	-16.5	56 11	-0.6			17.9	-7.5	58.9	125 - 10.8
54 49	+15.6	-16.7	57 02	+15.4	-16.4	60 28	-0.5			18.4	-7.6	60.5	
59 23	+15.7	-16.6	61 51	+15.5	-16.3	65 08	-0.4			18.8	-7.7	62.1	130 - 11.1
64 30	+15.8	-16.5	67 17	+15.6	-16.2	70 11	-0.3			19.3	-7.8	63.8	135 - 11.3
70 12	+15.9	-16.4	73 16	+15.7	-16.1	75 34	-0.2			19.8	-7.9	65.4	140 - 11.5
76 26	+16.0	-16.3	79 43	+15.8	-16.0	81 13	-0.1			20.4	-8.0	67.1	145 - 11.7
83 05	+16.1	-16.2	86 32	+15.9	-15.9	87 03	0.0			20.9	-8.1	68.8	150 - 11.9
90 00			90 00			90 00				21.4		70.5	155 - 12.1

App. Alt. = Apparent altitude = Sextant altitude corrected for index error and dip.

ANNEXURE 3

CONVERSION OF ARC TO TIME

0°–59°			60°–119°			120°–179°			180°–239°			240°–299°			300°–359°				0°–00	0°–25	0°–50	0°–75
a	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°	h	m		m	s	m	s
0	0	00	60	4	00	120	8	00	180	12	00	240	16	00	300	20	00	0	0	00	0	02
1	0	04	61	4	04	121	8	04	181	12	04	241	16	04	301	20	04	1	0	05	0	06
2	0	08	62	4	08	122	8	08	182	12	08	242	16	08	302	20	08	2	0	09	0	10
3	0	12	63	4	12	123	8	12	183	12	12	243	16	12	303	20	12	3	0	12	0	14
4	0	16	64	4	16	124	8	16	184	12	16	244	16	16	304	20	16	4	0	16	0	18
5	0	20	65	4	20	125	8	20	185	12	20	245	16	20	305	20	20	5	0	20	0	22
6	0	24	66	4	24	126	8	24	186	12	24	246	16	24	306	20	24	6	0	24	0	26
7	0	28	67	4	28	127	8	28	187	12	28	247	16	28	307	20	28	7	0	28	0	30
8	0	32	68	4	32	128	8	32	188	12	32	248	16	32	308	20	32	8	0	32	0	34
9	0	36	69	4	36	129	8	36	189	12	36	249	16	36	309	20	36	9	0	36	0	38
10	0	40	70	4	40	130	8	40	190	12	40	250	16	40	310	20	40	10	0	40	0	42
11	0	44	71	4	44	131	8	44	191	12	44	251	16	44	311	20	44	11	0	44	0	46
12	0	48	72	4	48	132	8	48	192	12	48	252	16	48	312	20	48	12	0	48	0	50
13	0	52	73	4	52	133	8	52	193	12	52	253	16	52	313	20	52	13	0	52	0	54
14	0	56	74	4	56	134	8	56	194	12	56	254	16	56	314	20	56	14	0	56	0	58
15	1	00	75	5	00	135	9	00	195	13	00	255	17	00	315	21	00	15	1	01	1	02
16	1	04	76	5	04	136	9	04	196	13	04	256	17	04	316	21	04	16	1	05	1	06
17	1	08	77	5	08	137	9	08	197	13	08	257	17	08	317	21	08	17	1	09	1	10
18	1	12	78	5	12	138	9	12	198	13	12	258	17	12	318	21	12	18	1	12	1	14
19	1	16	79	5	16	139	9	16	199	13	16	259	17	16	319	21	16	19	1	16	1	18
20	1	20	80	5	20	140	9	20	200	13	20	260	17	20	320	21	20	20	1	20	1	22
21	1	24	81	5	24	141	9	24	201	13	24	261	17	24	321	21	24	21	1	24	1	26
22	1	28	82	5	28	142	9	28	202	13	28	262	17	28	322	21	28	22	1	28	1	30
23	1	32	83	5	32	143	9	32	203	13	32	263	17	32	323	21	32	23	1	32	1	34
24	1	36	84	5	36	144	9	36	204	13	36	264	17	36	324	21	36	24	1	36	1	38
25	1	40	85	5	40	145	9	40	205	13	40	265	17	40	325	21	40	25	1	40	1	42
26	1	44	86	5	44	146	9	44	206	13	44	266	17	44	326	21	44	26	1	44	1	46
27	1	48	87	5	48	147	9	48	207	13	48	267	17	48	327	21	48	27	1	48	1	50
28	1	52	88	5	52	148	9	52	208	13	52	268	17	52	328	21	52	28	1	52	1	54
29	1	56	89	5	56	149	9	56	209	13	56	269	17	56	329	21	56	29	1	56	1	58
30	2	00	90	6	00	150	10	00	210	14	00	270	18	00	330	22	00	30	2	00	2	02
31	2	04	91	6	04	151	10	04	211	14	04	271	18	04	331	22	04	31	2	04	2	06
32	2	08	92	6	08	152	10	08	212	14	08	272	18	08	332	22	08	32	2	08	2	10
33	2	12	93	6	12	153	10	12	213	14	12	273	18	12	333	22	12	33	2	12	2	14
34	2	16	94	6	16	154	10	16	214	14	16	274	18	16	334	22	16	34	2	16	2	18
35	2	20	95	6	20	155	10	20	215	14	20	275	18	20	335	22	20	35	2	20	2	22
36	2	24	96	6	24	156	10	24	216	14	24	276	18	24	336	22	24	36	2	24	2	26
37	2	28	97	6	28	157	10	28	217	14	28	277	18	28	337	22	28	37	2	28	2	30
38	2	32	98	6	32	158	10	32	218	14	32	278	18	32	338	22	32	38	2	32	2	34
39	2	36	99	6	36	159	10	36	219	14	36	279	18	36	339	22	36	39	2	36	2	38
40	2	40	100	6	40	160	10	40	220	14	40	280	18	40	340	22	40	40	2	40	2	42
41	2	44	101	6	44	161	10	44	221	14	44	281	18	44	341	22	44	41	2	44	2	46
42	2	48	102	6	48	162	10	48	222	14	48	282	18	48	342	22	48	42	2	48	2	50
43	2	52	103	6	52	163	10	52	223	14	52	283	18	52	343	22	52	43	2	52	2	54
44	2	56	104	6	56	164	10	56	224	14	56	284	18	56	344	22	56	44	2	56	2	58
45	3	00	105	7	00	165	11	00	225	15	00	285	19	00	345	23	00	45	3	00	3	02
46	3	04	106	7	04	166	11	04	226	15	04	286	19	04	346	23	04	46	3	04	3	06
47	3	08	107	7	08	167	11	08	227	15	08	287	19	08	347	23	08	47	3	08	3	10
48	3	12	108	7	12	168	11	12	228	15	12	288	19	12	348	23	12	48	3	12	3	14
49	3	16	109	7	16	169	11	16	229	15	16	289	19	16	349	23	16	49	3	16	3	18
50	3	20	110	7	20	170	11	20	230	15	20	290	19	20	350	23	20	50	3	20	3	22
51	3	24	111	7	24	171	11	24	231	15	24	291	19	24	351	23	24	51	3	24	3	26
52	3	28	112	7	28	172	11	28	232	15	28	292	19	28	352	23	28	52	3	28	3	30
53	3	32	113	7	32	173	11	32	233	15	32	293	19	32	353	23	32	53	3	32	3	34
54	3	36	114	7	36	174	11	36	234	15	36	294	19	36	354	23	36	54	3	36	3	38
55	3	40	115	7	40	175	11	40	235	15	40	295	19	40	355	23	40	55	3	40	3	42
56	3	44	116	7	44	176	11	44	236	15	44	296	19	44	356	23	44	56	3	44	3	46
57	3	48	117	7	48	177	11	48	237	15	48	297	19	48	357	23	48	57	3	48	3	50
58	3	52	118	7	52	178	11	52	238	15	52	298	19	52	358	23	52	58	3	52	3	54
59	3	56	119	7	56	179	11	56	239	15	56	299	19	56	359	23	56	59	3	56	3	58

The above table is for converting expressions in arc to their equivalent in time; its main use in this Almanac is for the conversion of longitude for application to L.M.T. (added if west, subtracted if east) to give G.M.T. or vice versa.

ANNEXURE 4 NAUTICAL ALMANAC

1994 NOV. 30, DEC. 1, 2 (WED., THURS., FRI.)

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UT (GMT)	SUN		MOON				Lat.	Twilight		Sunrise	Moonrise				
	G.H.A.	Dec.	G.H.A.	v	Dec.	d'		H.P.	Naut.		Civil	30	1	2	3
d° h°	$^{\circ}$ $'$	$^{\circ}$ $'$	$^{\circ}$ $'$	$'$	$^{\circ}$ $'$	$'$	$^{\circ}$	h^m m	h^m m	h^m m	h^m m	h^m m	h^m m	h^m m	
W E D N E S D A Y	30 00	182 53.3	S21 34.0		225 40.0	7.4	S11 28.2	10.4	60.4	N 72	07 50	09 49	06 07	08 41	
	01	197 53.1	34.4		240 06.4	7.3	11 38.6	10.4	60.4	N 70	07 34	09 10	05 42	07 50	
	02	212 52.8	34.9		254 32.7	7.2	11 49.0	10.3	60.5	68	07 21	08 43	10 35	05 23	
	03	227 52.6	35.3		268 58.9	7.2	11 59.3	10.3	60.5	66	07 10	08 22	09 46	05 09	
	04	242 52.4	35.7		283 25.1	7.0	12 09.6	10.2	60.5	64	07 01	08 06	09 15	04 57	
	05	257 52.2	36.1		297 51.1	7.0	12 19.8	10.1	60.5	62	06 53	07 52	08 53	04 46	
	06	272 51.9	S21 36.5		312 17.1	6.8	S12 29.9	10.0	60.6	60	06 45	07 40	08 34	04 38	
	07	287 51.7	36.9		326 42.9	6.8	12 39.9	10.0	60.6	N 58	06 39	07 30	08 19	04 30	
	08	302 51.5	37.3		341 08.7	6.8	12 49.9	9.9	60.6	56	06 33	07 21	08 06	04 23	
	09	317 51.3	37.7		355 34.5	6.6	12 59.8	9.8	60.6	54	06 28	07 13	07 55	04 18	
	10	332 51.0	38.1		10 00.1	6.5	13 09.6	9.7	60.7	52	06 23	07 06	07 45	04 12	
	11	347 50.8	38.5		24 25.6	6.5	13 19.3	9.7	60.7	50	06 18	06 59	07 36	04 07	
	12	2 50.6	S21 38.9		38 51.1	6.4	S13 29.0	9.6	60.7	45	06 08	06 45	07 18	03 57	
	13	17 50.4	39.4		53 16.5	6.3	13 38.6	9.5	60.8	N 40	05 59	06 32	07 02	03 48	
	14	32 50.1	39.8		67 41.8	6.2	13 48.1	9.4	60.8	35	05 50	06 22	06 49	03 41	
	15	47 49.9	40.2		82 07.0	6.1	13 57.5	9.3	60.8	30	05 42	06 12	06 38	03 35	
	16	62 49.7	40.6		96 32.1	6.1	14 06.8	9.2	60.8	20	05 28	05 55	06 18	03 24	
	17	77 49.4	41.0		110 57.2	5.9	14 16.0	9.2	60.8	N 10	05 13	05 39	06 01	03 14	
	18	92 49.2	S21 41.4		125 22.1	5.9	S14 25.2	9.0	60.9	0	04 57	05 23	05 45	03 05	
	19	107 49.0	41.8		139 47.0	5.8	14 34.2	9.0	60.9	S 10	04 40	05 06	05 29	02 56	
	20	122 48.8	42.2		154 11.8	5.7	14 43.2	8.8	60.9	20	04 19	04 47	05 12	02 47	
	21	137 48.5	42.6		168 36.5	5.7	14 52.0	8.8	60.9	30	03 52	04 24	04 51	02 36	
	22	152 48.3	43.0		183 01.2	5.6	15 00.8	8.7	61.0	35	03 35	04 10	04 39	02 30	
	23	167 48.1	43.4		197 25.8	5.4	15 09.5	8.5	61.0	40	03 14	03 54	04 26	02 23	
T H U R S D A Y	1 00	182 47.8	S21 43.8		211 50.2	5.4	S15 18.0	8.5	61.0	45	02 46	03 33	04 09	02 15	
	01	197 47.6	44.2		226 14.6	5.4	15 26.5	8.4	61.0	S 50	02 07	03 07	03 49	02 05	
	02	212 47.4	44.5		240 39.0	5.2	15 34.9	8.2	61.0	52	01 45	02 53	03 39	02 01	
	03	227 47.1	44.9		255 03.2	5.2	15 43.1	8.2	61.1	54	01 15	02 38	03 28	01 56	
	04	242 46.9	45.3		269 27.4	5.1	15 51.3	8.0	61.1	56	00 19	02 19	03 16	01 51	
	05	257 46.7	45.7		283 51.5	5.0	15 59.3	8.0	61.1	58	///	01 56	03 01	01 45	
	06	272 46.5	S21 46.1		298 15.5	5.0	S16 07.3	7.8	61.1	S 60	///	01 24	02 44	01 38	
	07	287 46.2	46.5		312 39.5	4.8	16 15.1	7.7	61.1						
	08	302 46.0	46.9		327 03.3	4.8	16 22.8	7.7	61.1	Lat.	Sunset	Twilight		Moonset	
	09	317 45.8	47.3		341 27.1	4.8	16 30.5	7.4	61.2			Civil	Naut.	30	1
	10	332 45.5	47.7		355 50.9	4.6	16 37.9	7.4	61.2					2	3
	11	347 45.3	48.1		10 14.5	4.6	16 45.3	7.3	61.2						
	12	2 45.1	S21 48.5		24 38.1	4.5	S16 52.6	7.1	61.2	N 72	13 48	15 47	12 11	11 39	
	13	17 44.8	48.9		39 01.6	4.5	16 59.7	7.1	61.2	N 70	13 03	14 27	16 03	12 37	
	14	32 44.6	49.2		53 25.1	4.3	17 06.8	6.9	61.2	68	13 03	14 54	16 16	12 57	
	15	47 44.3	49.6		67 48.4	4.4	17 13.7	6.7	61.2	66	13 51	15 15	16 27	13 04	
	16	62 44.1	50.0		82 11.8	4.2	17 20.4	6.7	61.3	64	14 22	15 32	16 37	13 13	
	17	77 43.9	50.4		96 35.0	4.2	17 27.1	6.5	61.3	62	14 45	15 45	16 45	13 26	
	18	92 43.6	S21 50.8		110 58.2	4.1	S17 33.6	6.4	61.3	60	15 03	15 57	16 52	13 37	
	19	107 43.4	51.2		125 21.3	4.1	17 40.0	6.3	61.3	N 58	15 18	16 08	16 59	13 55	
	20	122 43.2	51.5		139 44.4	4.0	17 46.3	6.1	61.3	56	15 31	16 17	17 04	14 02	
	21	137 42.9	51.9		154 07.4	4.0	17 52.4	6.1	61.3	54	15 42	16 25	17 10	14 09	
	22	152 42.7	52.3		168 30.4	3.8	17 58.5	5.8	61.3	52	15 52	16 32	17 15	14 15	
	23	167 42.5	52.7		182 53.2	3.9	18 04.3	5.8	61.3	50	16 01	16 39	17 19	14 20	
F R I D A Y	2 00	182 42.2	S21 53.1		197 16.1	3.8	S18 10.1	5.6	61.3	45	16 20	16 53	17 30	14 32	
	01	197 42.0	53.4		211 38.9	3.7	18 15.7	5.5	61.3	N 40	16 35	17 05	17 39	14 42	
	02	212 41.7	53.8		226 01.6	3.7	18 21.2	5.4	61.3	35	16 48	17 16	17 47	14 50	
	03	227 41.5	54.2		240 24.3	3.6	18 26.6	5.2	61.4	30	17 00	17 26	17 55	14 58	
	04	242 41.3	54.6		254 46.9	3.6	18 31.8	5.0	61.4	20	17 19	17 43	18 10	15 10	
	05	257 41.0	55.0		269 09.5	3.5	18 36.8	5.0	61.4	N 10	17 37	17 59	18 25	15 22	
	06	272 40.8	S21 55.3		283 32.0	3.5	S18 41.8	4.8	61.4	0	17 53	18 15	18 41	15 32	
	07	287 40.5	55.7		297 54.5	3.5	18 46.6	4.6	61.4	S 10	18 09	18 32	18 58	15 43	
	08	302 40.3	56.1		312 17.0	3.4	18 51.2	4.5	61.4	20	18 27	18 51	19 20	15 54	
	09	317 40.1	56.5		326 39.4	3.4	18 55.7	4.4	61.4	30	18 47	19 14	19 47	16 07	
	10	332 39.8	56.8		341 01.8	3.3	19 00.1	4.2	61.4	35	18 59	19 28	20 04	16 14	
	11	347 39.6	57.2		355 24.1	3.3	19 04.3	4.1	61.4	40	19 13	19 45	20 25	16 23	
	12	2 39.3	S21 57.6		9 46.4	3.3	S19 08.4	3.9	61.4	45	19 29	20 05	20 53	16 33	
	13	17 39.1	57.9		24 08.7	3.2	19 12.3	3.8	61.4	S 50	19 50	20 32	21 32	16 45	
	14	32 38.9	58.3		38 30.9	3.2	19 16.1	3.7	61.4	52	20 00	20 46	21 55	16 50	
	15	47 38.6	58.7		52 53.1	3.2	19 19.8	3.5	61.4	54	20 11	21 01	22 25	16 57	
	16	62 38.4	59.0		67 15.3	3.1	19 23.3	3.3	61.4	56	20 23	21 20	23 29	17 04	
	17	77 38.1	59.4		81 37.4	3.2	19 26.6	3.2	61.4	58	20 38	21 44	///	17 11	
	18	92 37.9	S21 59.8		95 59.6	3.1	S19 29.8	3.1	61.4	S 60	20 55	22 17	///	17 20	
	19	107 37.7	22 00.1		110 21.7	3.1	19 32.9	2.8	61.4						
	20	122 37.4	00.5		124 43.8	3.0	19 35.7	2.8	61.4	Day	SUN		MOON		
	21	137 37.2	00.9		139 05.8	3.1	19 38.5	2.6	61.4		Eqn. of Time	Mer. Pass.	Mer. Pass.	Upper	Lower
	22	152 36.9	01.2		153 27.9	3.0	19 41.1	2.4	61.3		00 h	12 h	Pass.	Age	Phase
	23	167 36.7	01.6		167 49.9	3.1	19 43.5	2.3	61.3		m s	m s	h m	h m	h m
		S.D. 16.2	d 0.4		S.D. 16.5	16.7	16.7			30	11 34	11 23	11 49	09 18	
										1	11 12	11 01	11 49	10 17	
										2	10 49	10 38	11 49	11 19	

ANNEXURE 5

32^m

INCREMENTS AND CORRECTIONS

33^m

^m 32	SUN PLANETS	ARIES	MOON	^r d or Corr ⁿ	^r d or Corr ⁿ	^r d or Corr ⁿ	^m 33	SUN PLANETS	ARIES	MOON	^r d or Corr ⁿ	^r d or Corr ⁿ	^r d or Corr ⁿ
^s 00	8 00-0	8 01-3	7 38-1	0-0	0-0	6-0 3-3	00	8 15-0	8 16-4	7 52-5	0-0	0-0	6-0 3-4
01	8 00-3	8 01-6	7 38-4	0-1	0-1	6-1 3-3	01	8 15-3	8 16-6	7 52-7	0-1	0-1	6-1 3-4
02	8 00-5	8 01-8	7 38-6	0-2	0-1	6-2 3-4	02	8 15-5	8 16-9	7 52-9	0-2	0-1	6-2 3-5
03	8 00-8	8 02-1	7 38-8	0-3	0-2	6-3 3-4	03	8 15-8	8 17-1	7 53-2	0-3	0-2	6-3 3-5
04	8 01-0	8 02-3	7 39-1	0-4	0-2	6-4 3-5	04	8 16-0	8 17-4	7 53-4	0-4	0-2	6-4 3-6
05	8 01-3	8 02-6	7 39-3	0-5	0-3	6-5 3-5	05	8 16-3	8 17-6	7 53-6	0-5	0-3	6-5 3-6
06	8 01-5	8 02-8	7 39-6	0-6	0-3	6-6 3-6	06	8 16-5	8 17-9	7 53-9	0-6	0-3	6-6 3-7
07	8 01-8	8 03-1	7 39-8	0-7	0-4	6-7 3-6	07	8 16-8	8 18-1	7 54-1	0-7	0-4	6-7 3-7
08	8 02-0	8 03-3	7 40-0	0-8	0-4	6-8 3-7	08	8 17-0	8 18-4	7 54-4	0-8	0-4	6-8 3-8
09	8 02-3	8 03-6	7 40-3	0-9	0-5	6-9 3-7	09	8 17-3	8 18-6	7 54-6	0-9	0-5	6-9 3-9
10	8 02-5	8 03-8	7 40-5	1-0	0-5	7-0 3-8	10	8 17-5	8 18-9	7 54-8	1-0	0-6	7-0 3-9
11	8 02-8	8 04-1	7 40-8	1-1	0-6	7-1 3-8	11	8 17-8	8 19-1	7 55-1	1-1	0-6	7-1 4-0
12	8 03-0	8 04-3	7 41-0	1-2	0-7	7-2 3-9	12	8 18-0	8 19-4	7 55-3	1-2	0-7	7-2 4-0
13	8 03-3	8 04-6	7 41-2	1-3	0-7	7-3 4-0	13	8 18-3	8 19-6	7 55-6	1-3	0-7	7-3 4-1
14	8 03-5	8 04-8	7 41-5	1-4	0-8	7-4 4-0	14	8 18-5	8 19-9	7 55-8	1-4	0-8	7-4 4-1
15	8 03-8	8 05-1	7 41-7	1-5	0-8	7-5 4-1	15	8 18-8	8 20-1	7 56-0	1-5	0-8	7-5 4-2
16	8 04-0	8 05-3	7 42-0	1-6	0-9	7-6 4-2	16	8 19-0	8 20-4	7 56-3	1-6	0-9	7-6 4-2
17	8 04-3	8 05-6	7 42-2	1-7	0-9	7-7 4-2	17	8 19-3	8 20-6	7 56-5	1-7	0-9	7-7 4-3
18	8 04-5	8 05-8	7 42-4	1-8	1-0	7-8 4-2	18	8 19-5	8 20-9	7 56-7	1-8	1-0	7-8 4-4
19	8 04-8	8 06-1	7 42-7	1-9	1-0	7-9 4-3	19	8 19-8	8 21-1	7 57-0	1-9	1-1	7-9 4-4
20	8 05-0	8 06-3	7 42-9	2-0	1-1	8-0 4-3	20	8 20-0	8 21-4	7 57-2	2-0	1-1	8-0 4-5
21	8 05-3	8 06-6	7 43-1	2-1	1-1	8-1 4-4	21	8 20-3	8 21-6	7 57-5	2-1	1-2	8-1 4-5
22	8 05-5	8 06-8	7 43-4	2-2	1-2	8-2 4-4	22	8 20-5	8 21-9	7 57-7	2-2	1-2	8-2 4-6
23	8 05-8	8 07-1	7 43-6	2-3	1-2	8-3 4-5	23	8 20-8	8 22-1	7 57-9	2-3	1-3	8-3 4-6
24	8 06-0	8 07-3	7 43-9	2-4	1-3	8-4 4-6	24	8 21-0	8 22-4	7 58-2	2-4	1-3	8-4 4-7
25	8 06-3	8 07-6	7 44-1	2-5	1-4	8-5 4-6	25	8 21-3	8 22-6	7 58-4	2-5	1-4	8-5 4-7
26	8 06-5	8 07-8	7 44-3	2-6	1-4	8-6 4-7	26	8 21-5	8 22-9	7 58-7	2-6	1-5	8-6 4-8
27	8 06-8	8 08-1	7 44-6	2-7	1-5	8-7 4-7	27	8 21-8	8 23-1	7 58-9	2-7	1-5	8-7 4-9
28	8 07-0	8 08-3	7 44-8	2-8	1-5	8-8 4-8	28	8 22-0	8 23-4	7 59-1	2-8	1-6	8-8 4-9
29	8 07-3	8 08-6	7 45-1	2-9	1-6	8-9 4-8	29	8 22-3	8 23-6	7 59-4	2-9	1-6	8-9 5-0
30	8 07-5	8 08-8	7 45-3	3-0	1-6	9-0 4-9	30	8 22-5	8 23-9	7 59-6	3-0	1-7	9-0 5-0
31	8 07-8	8 09-1	7 45-5	3-1	1-7	9-1 4-9	31	8 22-8	8 24-1	7 59-8	3-1	1-7	9-1 5-1
32	8 08-0	8 09-3	7 45-8	3-2	1-7	9-2 5-0	32	8 23-0	8 24-4	8 00-1	3-2	1-8	9-2 5-1
33	8 08-3	8 09-6	7 46-0	3-3	1-8	9-3 5-0	33	8 23-3	8 24-6	8 00-3	3-3	1-8	9-3 5-2
34	8 08-5	8 09-8	7 46-2	3-4	1-8	9-4 5-1	34	8 23-5	8 24-9	8 00-6	3-4	1-9	9-4 5-2
35	8 08-8	8 10-1	7 46-5	3-5	1-9	9-5 5-1	35	8 23-8	8 25-1	8 00-8	3-5	2-0	9-5 5-3
36	8 09-0	8 10-3	7 46-7	3-6	2-0	9-6 5-2	36	8 24-0	8 25-4	8 01-0	3-6	2-0	9-6 5-4
37	8 09-3	8 10-6	7 47-0	3-7	2-0	9-7 5-3	37	8 24-3	8 25-6	8 01-3	3-7	2-1	9-7 5-4
38	8 09-5	8 10-8	7 47-2	3-8	2-1	9-8 5-3	38	8 24-5	8 25-9	8 01-5	3-8	2-1	9-8 5-5
39	8 09-8	8 11-1	7 47-4	3-9	2-1	9-9 5-4	39	8 24-8	8 26-1	8 01-8	3-9	2-2	9-9 5-5
40	8 10-0	8 11-3	7 47-7	4-0	2-2	10-0 5-4	40	8 25-0	8 26-4	8 02-0	4-0	2-2	10-0 5-6
41	8 10-3	8 11-6	7 47-9	4-1	2-2	10-1 5-5	41	8 25-3	8 26-6	8 02-2	4-1	2-3	10-1 5-6
42	8 10-5	8 11-8	7 48-2	4-2	2-3	10-2 5-5	42	8 25-5	8 26-9	8 02-5	4-2	2-3	10-2 5-7
43	8 10-8	8 12-1	7 48-4	4-3	2-3	10-3 5-6	43	8 25-8	8 27-1	8 02-7	4-3	2-4	10-3 5-8
44	8 11-0	8 12-3	7 48-6	4-4	2-4	10-4 5-6	44	8 26-0	8 27-4	8 02-9	4-4	2-5	10-4 5-8
45	8 11-3	8 12-6	7 48-9	4-5	2-4	10-5 5-7	45	8 26-3	8 27-6	8 03-2	4-5	2-5	10-5 5-9
46	8 11-5	8 12-8	7 49-1	4-6	2-5	10-6 5-7	46	8 26-5	8 27-9	8 03-4	4-6	2-6	10-6 5-9
47	8 11-8	8 13-1	7 49-3	4-7	2-5	10-7 5-8	47	8 26-8	8 28-1	8 03-7	4-7	2-6	10-7 6-0
48	8 12-0	8 13-3	7 49-6	4-8	2-6	10-8 5-9	48	8 27-0	8 28-4	8 03-9	4-8	2-7	10-8 6-0
49	8 12-3	8 13-6	7 49-8	4-9	2-7	10-9 5-9	49	8 27-3	8 28-6	8 04-1	4-9	2-7	10-9 6-1
50	8 12-5	8 13-8	7 50-1	5-0	2-7	11-0 6-0	50	8 27-5	8 28-9	8 04-4	5-0	2-8	11-0 6-1
51	8 12-8	8 14-1	7 50-3	5-1	2-8	11-1 6-0	51	8 27-8	8 29-1	8 04-6	5-1	2-8	11-1 6-2
52	8 13-0	8 14-3	7 50-5	5-2	2-8	11-2 6-1	52	8 28-0	8 29-4	8 04-9	5-2	2-9	11-2 6-3
53	8 13-3	8 14-6	7 50-8	5-3	2-9	11-3 6-1	53	8 28-3	8 29-6	8 05-1	5-3	3-0	11-3 6-3
54	8 13-5	8 14-9	7 51-0	5-4	2-9	11-4 6-2	54	8 28-5	8 29-9	8 05-3	5-4	3-0	11-4 6-4
55	8 13-8	8 15-1	7 51-3	5-5	3-0	11-5 6-2	55	8 28-8	8 30-1	8 05-6	5-5	3-1	11-5 6-4
56	8 14-0	8 15-4	7 51-5	5-6	3-0	11-6 6-3	56	8 29-0	8 30-4	8 05-8	5-6	3-1	11-6 6-5
57	8 14-3	8 15-6	7 51-7	5-7	3-1	11-7 6-3	57	8 29-3	8 30-6	8 06-1	5-7	3-2	11-7 6-5
58	8 14-5	8 15-9	7 52-0	5-8	3-1	11-8 6-4	58	8 29-5	8 30-9	8 06-3	5-8	3-2	11-8 6-6
59	8 14-8	8 16-1	7 52-2	5-9	3-2	11-9 6-4	59	8 29-8	8 31-1	8 06-5	5-9	3-3	11-9 6-6
60	8 15-0	8 16-4	7 52-5	6-0	3-3	12-0 6-5	60	8 30-0	8 31-4	8 06-8	6-0	3-4	12-0 6-7

ANNEXURE 6

PREDICTED HOURLY HEIGHTS in METRES																													
WALVIS BAY															NOVEMBER 2001														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
Thur 1	0.86	1.19	1.47	1.61	1.57	1.39	1.11	0.78	0.50	0.37	0.41	0.59	0.86	1.17	1.46	1.62	1.60	1.43	1.14	0.78	0.44	0.25	0.26	0.42					
Fri 2	0.69	1.02	1.34	1.56	1.61	1.50	1.27	0.96	0.63	0.41	0.36	0.48	0.70	0.99	1.30	1.54	1.62	1.53	1.30	0.98	0.62	0.34	0.24	0.32					
Sat 3	0.54	0.83	1.16	1.44	1.59	1.57	1.41	1.14	0.81	0.52	0.37	0.41	0.57	0.81	1.11	1.38	1.55	1.58	1.42	1.17	0.84	0.51	0.30	0.29					
Sun 4	0.43	0.67	0.96	1.26	1.49	1.56	1.49	1.30	1.02	0.70	0.47	0.40	0.49	0.67	0.91	1.18	1.40	1.50	1.47	1.31	1.06	0.74	0.47	0.35					
Mon 5	0.40	0.56	0.78	1.05	1.31	1.46	1.49	1.40	1.20	0.92	0.64	0.48	0.48	0.58	0.75	0.96	1.19	1.36	1.42	1.37	1.23	0.99	0.70	0.5					
Tues 6	0.44	0.51	0.66	0.86	1.09	1.28	1.40	1.41	1.32	1.14	0.88	0.66	0.55	0.57	0.85	0.78	0.97	1.15	1.28	1.33	1.31	1.18	0.97	0.73					
Wed 7	0.59	0.56	0.61	0.71	0.88	1.08	1.24	1.33	1.35	1.29	1.12	0.90	0.72	0.64	0.84	0.67	0.77	0.92	1.08	1.20	1.27	1.28	1.19	1.01					
Thur 8	0.81	0.70	0.65	0.65	0.71	0.85	1.02	1.17	1.26	1.33	1.30	1.16	0.96	0.81	0.71	0.65	0.64	0.70	0.84	0.99	1.14	1.28	1.32	1.25					
Fri 9	1.09	0.92	0.78	0.69	0.63	0.67	0.80	0.96	1.12	1.27	1.37	1.36	1.23	1.05	0.88	0.72	0.60	0.55	0.61	0.75	0.93	1.12	1.30	1.39					
Sat 10	1.34	1.19	1.00	0.82	0.66	0.57	0.60	0.74	0.92	1.12	1.32	1.46	1.46	1.32	1.12	0.89	0.67	0.49	0.43	0.52	0.68	0.91	1.16	1.4					
Sun 11	1.50	1.44	1.27	1.04	0.79	0.58	0.48	0.54	0.70	0.92	1.17	1.42	1.58	1.56	1.39	1.14	0.84	0.55	0.36	0.33	0.44	0.65	0.94	1.26					
Mon 12	1.51	1.61	1.52	1.30	1.02	0.71	0.47	0.40	0.50	0.69	0.96	1.27	1.55	1.68	1.62	1.41	1.10	0.73	0.41	0.23	0.25	0.41	0.66	1.02					
Tues 13	1.38	1.63	1.66	1.55	1.29	0.94	0.60	0.37	0.35	0.48	0.72	1.04	1.39	1.66	1.75	1.64	1.37	1.00	0.60	0.28	0.16	0.23	0.44	0.75					
Wed 14	1.14	1.50	1.71	1.71	1.53	1.21	0.82	0.48	0.30	0.33	0.51	0.79	1.14	1.49	1.73	1.78	1.59	1.28	0.87	0.46	0.19	0.14	0.26	0.52					
Thur 15	0.87	1.27	1.59	1.74	1.68	1.46	1.10	0.70	0.38	0.28	0.36	0.57	0.88	1.24	1.58	1.73	1.70	1.50	1.16	0.74	0.37	0.17	0.19	0.35					
Fri 16	0.64	1.00	1.38	1.64	1.72	1.61	1.35	0.97	0.59	0.34	0.30	0.42	0.66	0.97	1.31	1.58	1.67	1.60	1.37	1.02	0.62	0.33	0.22	0.29					
Sat 17	0.49	0.78	1.13	1.44	1.63	1.65	1.50	1.22	0.84	0.51	0.34	0.36	0.51	0.75	1.06	1.35	1.53	1.57	1.47	1.23	0.89	0.56	0.35	0.32					
Sun 18	0.43	0.63	0.91	1.22	1.46	1.57	1.54	1.38	1.08	0.74	0.49	0.40	0.46	0.61	0.84	1.11	1.33	1.45	1.45	1.33	1.10	0.80	0.55	0.43					
Mon 19	0.45	0.57	0.77	1.02	1.26	1.43	1.49	1.43	1.25	0.98	0.70	0.52	0.49	0.56	0.71	0.91	1.12	1.28	1.35	1.33	1.22	1.01	0.76	0.59					
Tues 20	0.54	0.58	0.70	0.87	1.08	1.26	1.37	1.40	1.33	1.16	0.91	0.70	0.59	0.59	0.65	0.78	0.94	1.10	1.21	1.26	1.24	1.13	0.96	0.78					
Wed 21	0.67	0.65	0.69	0.78	0.93	1.08	1.23	1.30	1.32	1.26	1.10	0.90	0.75	0.68	0.67	0.71	0.81	0.94	1.06	1.15	1.19	1.18	1.10	0.96					
Thur 22	0.83	0.75	0.73	0.75	0.82	0.94	1.07	1.18	1.25	1.28	1.22	1.09	0.93	0.81	0.74	0.70	0.72	0.80	0.91	1.02	1.11	1.17	1.18	1.11					
Fri 23	1.00	0.90	0.82	0.77	0.76	0.81	0.92	1.04	1.15	1.24	1.28	1.23	1.12	0.98	0.86	0.75	0.69	0.69	0.77	0.88	1.00	1.11	1.20	1.21					
Sat 24	1.16	1.06	0.95	0.84	0.75	0.73	0.78	0.89	1.02	1.15	1.26	1.31	1.27	1.15	1.01	0.86	0.71	0.63	0.64	0.73	0.86	1.01	1.16	1.26					
Sun 25	1.28	1.21	1.10	0.96	0.81	0.70	0.68	0.76	0.88	1.03	1.20	1.33	1.37	1.31	1.17	0.99	0.79	0.62	0.55	0.59	0.71	0.88	1.07	1.25					
Mon 26	1.35	1.35	1.25	1.10	0.92	0.74	0.63	0.63	0.73	0.89	1.09	1.28	1.41	1.43	1.33	1.15	0.91	0.68	0.51	0.47	0.55	0.72	0.94	1.17					
Tues 27	1.36	1.44	1.39	1.28	1.06	0.83	0.64	0.56	0.61	0.75	0.95	1.19	1.39	1.48	1.46	1.30	1.06	0.78	0.54	0.40	0.42	0.58	0.78	1.05					
Wed 28	1.30	1.47	1.50	1.40	1.21	0.96	0.70	0.53	0.51	0.61	0.79	1.04	1.31	1.50	1.55	1.45	1.23	0.94	0.63	0.40	0.33	0.41	0.61	0.88					
Thur 29	1.19	1.44	1.56	1.53	1.37	1.12	0.82	0.57	0.45	0.48	0.64	0.88	1.16	1.43	1.58	1.56	1.40	1.12	0.78	0.48	0.30	0.30	0.45	0.7					
Fri 30	1.02	1.33	1.55	1.61	1.51	1.29	0.99	0.67	0.46	0.40	0.50	0.70	0.98	1.29	1.52	1.61	1.53	1.31	0.99	0.63	0.36	0.25	0.32	0.52					