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Interpolation Tables

Revision V0.4 Oct-2016

Warning and Terms of Usage:

The following pages have been generated by a computer program. Complex computer programs usually have bugs and may produce wrong data. The data in these Tables is believed to be accurate but no warranty is given for its correctness.
Use these Tables only for training and exercising!

Compiled by Erik De Man (mail2erik@siranah.de) on Fri Jan 31 12:48:41 2020

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Purpose and Scope

The Interpolation and Conversion Tables presented on the following pages, are designed to be used for the interpolation of the Nautical Almanac data (GHA and Declination) as well as for the interpolation of the data from the Sight Reduction Tables (calculated Altitude).

In order to obtain the highest possible accuracy an interpolation scheme based on logarithmic arithmetic is used. The use of this scheme will be shown in some examples.

The calculation of a linear interpolation with the presented tables requirs only one addition and three table lookups. The interpolated values have an accuracy better than ±0.05 minutes of arc compared to the same results calculated with full precision.

Arrangement

The Interpolation Tables have an entry for each Second through the Hour. Each entry corresponds to a specific Minute:Second combination (from 00:00 through 59:59) representing a fraction of the Hour.

For each entry four data values are given arranged in two subtables.The following excerpt gives the first entries of the "16 Min" data:

16 Min

Sec	fMin	d_{HA}	p	s
	'	° '		
00	16.0	04 00.0	29823	65386
01		04 00.2	29827	65390
02		04 00.5	29832	65395
03		04 00.8	29836	65399
04		04 01.0	29841	65404
05		04 01.2	29845	65408
06	16.1	04 01.5	29850	65413
07		04 01.8	29854	65417
08		04 02.0	29859	65422
09		04 02.2	29863	65426
10		04 02.5	29868	65431
11		04 02.8	29872	65435
12	16.2	04 03.0	29877	65440
13		04 03.2	29881	65444
14		04 03.5	29886	65449
	...			

The table is entered with a Min:Sec combination. For each of these combinations, the following data values are compiled:

fMin is the decimal (fractional) representation in minutes of the Min:Sec combination. These values are recorded only for each 6th Second entry. For the other seconds, the nearest value of fMin should be chosen.

dHA is the value of the increase of the Hour Angle, interpolated according to the Min:Sec combination. This is calculated as follows: dHA = 15° * 3600 / (60*Min + Sec). The result is expressed in degrees (°) and fractional minutes (').

p is the logarithm of the hour fraction expressed in seconds: $10000*\log_{10}(60*Min + Sec)$. The multiplication factor of 10000 as well as the scaling on seconds, is used to obtain positive integral numbers for the logarithmic representations. This simplifies the calculations.

s is the logarithm of the hour fraction expressed in seconds and additionally multiplied with 3600: $10000*\log_{10}(3600*(60*Min + Sec))$. This value is used for the backward transformation to obtain the result of the interpolation process (taken from the nearest value in the "fMin" column).

Use and Application of the Interpolation Tables

The tables presented here are designed for solving the following two problems:

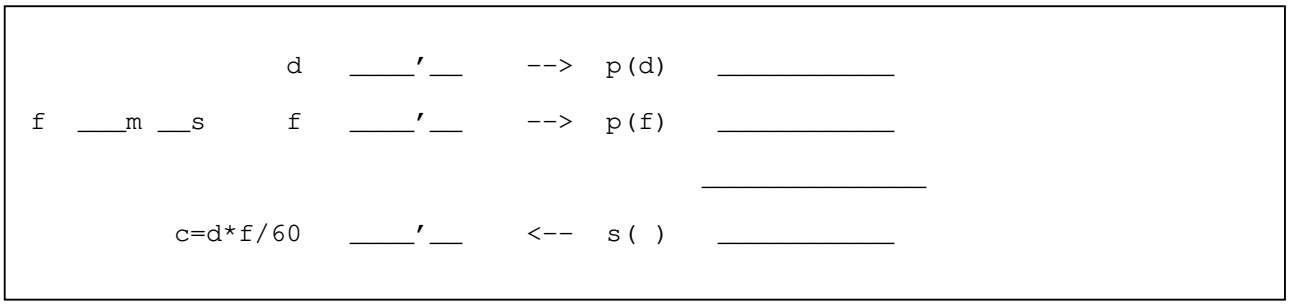
1. Find the principe interpolation correction for the GHA of a celestial object for a given time of observation.

2. Given a fraction of the hour (or degree) and given an increment of a value over an integral hour (or degree) interval, find the fraction of the increment corresponding to the given fraction of the hour (or the given fraction of a degree).

The first problem, finding the interpolated Hour Angle of a celestial body according to a fraction of the hour (obtained from the time of observation), is directly implemented in the Interpolation Tables. The result for any fraction of the hour can be read directly from the data column "dHA".

The second problem is the typical (linear) interpolation problem of determining a new data pair from two known pairs of values.

For this problem the logaritmic tables are used with the following calculation scheme:



Where p() and s() stand for the p and s values as recorded in the Tables.

In the first line the increment/decrement for one hour interval (Nautical Almanac) or one degree of declination (Sight Reduction Tables) is recorded ("d"). In both, the Nautical Almanac and the Sight Reduction Tables this increment/decrement is given in decimal minutes.

In the second line the fraction of the hour or degree is entered as Minutes / Seconds combination in the first column ("m","s") or in decimal minutes (less accurate) in the second column ("f").

Both "d" and "f" are converted to "log(d)" and "log(f)" using the "p" column of the Interpolation Tables. Then both logarithmic values are added. Finally, the resulting logarithmic value is converted back to the fraction "c=d*f/60" expressed in minutes or minutes of arc, using the "s" data column of the Interpolation Tables.

NOTICE:
The increment/decrement value "d" has an algebraic sign. This sign is disregarded in the logarithmic part of the calculation. At the end of the calculation scheme, the sign of "d" is assigned to the result "c".
The fraction value "f" is always positive.

Example 1

From the Nautical Almanac, the increase of Declination for the next hour interval is given as d=+44.3' and the fraction of the hour is f=(34m 56s). So requested is the increment of Declination for f=(34m 56s, given the increment for the (60m 00s) interval.

With an electronic calculator the increment of Declination for the hour fraction of 34m 56s would yield:

```
c= (44.3) * (34 + 56/60) / 60 = 25.8
```

Using the Interpolation Tables the calculation scheme would be as follows:

```
                d    +44'3     -->  p(d)   34246    from the 44Min page: 18Sec line
f   34m 56s     f    ____'__   -->  p(f)   33214    from the 34Min page: 56Sec line
                                          ________
         c=d*f/60   +25'8      <--  s(c)   67460    from the 25Min page: 48Sec line
```

Since the increment "d" for the hour interval is positive, also the resulting fractional increase "c" for the Declination is positive.

Example 2

From the Sight-Reduction Tables, the increase of Altitude (Hc) for the next Declination interval of one degree is obtained as d=-16.2' and the required fraction of the Declination is f=(24.8'). So requested is the decrement of Altitude for f=(24.8'), given the decrement for the (60.0') interval.

With an electronic calculator the increment of Altitude for the Declination fraction of 24.8' would yield:

```
c= (-16.2) * (24.8) / 60 =      -06.7
```

Using the Interpolation Tables the calculation scheme would be as follows:

```
                d    -16'2     -->  p(d)   29876    from the 16Min page: 12Sec line
f   __m __s     f     24'8     -->  p(f)   31726    from the 24Min page: 48Sec line
                                          ________
         c=d*f/60   -06'7      <--  s(c)   61602    from the 06Min page: 42Sec line
```

Since the increment "d" for the Declination interval is negative, also the resulting fractional increase "c" of the Altitude is negative.

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00 Min					01 Min					02 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	00.0	00 00.0			00	01.0	00 15.0	17782	53345	00	02.0	00 30.0	20792	56355
01		00 00.2	00000	35563	01		00 15.2	17853	53416	01		00 30.2	20828	56391
02		00 00.5	03010	38573	02		00 15.5	17924	53487	02		00 30.5	20864	56427
03		00 00.8	04771	40334	03		00 15.8	17993	53556	03		00 30.7	20899	56462
04		00 01.0	06021	41584	04		00 16.0	18062	53625	04		00 31.0	20934	56497
05		00 01.2	06990	42553	05		00 16.2	18129	53692	05		00 31.3	20969	56532
06	00.1	00 01.5	07782	43345	06	01.1	00 16.5	18195	53758	06	02.1	00 31.5	21004	56567
07		00 01.8	08451	44014	07		00 16.8	18261	53824	07		00 31.8	21038	56601
08		00 02.0	09031	44594	08		00 17.0	18325	53888	08		00 32.0	21072	56635
09		00 02.2	09542	45105	09		00 17.2	18388	53952	09		00 32.2	21106	56669
10		00 02.5	10000	45563	10		00 17.5	18451	54014	10		00 32.5	21139	56702
11		00 02.8	10414	45977	11		00 17.8	18513	54076	11		00 32.8	21173	56736
12	00.2	00 03.0	10792	46355	12	01.2	00 18.0	18573	54136	12	02.2	00 33.0	21206	56769
13		00 03.2	11139	46702	13		00 18.2	18633	54196	13		00 33.2	21239	56802
14		00 03.5	11461	47024	14		00 18.5	18692	54255	14		00 33.5	21271	56834
15		00 03.8	11761	47324	15		00 18.8	18751	54314	15		00 33.8	21303	56866
16		00 04.0	12041	47604	16		00 19.0	18808	54371	16		00 34.0	21335	56898
17		00 04.2	12304	47868	17		00 19.2	18865	54428	17		00 34.2	21367	56930
18	00.3	00 04.5	12553	48116	18	01.3	00 19.5	18921	54484	18	02.3	00 34.5	21399	56962
19		00 04.8	12788	48351	19		00 19.8	18976	54539	19		00 34.8	21430	56993
20		00 05.0	13010	48573	20		00 20.0	19031	54594	20		00 35.0	21461	57024
21		00 05.2	13222	48785	21		00 20.2	19085	54648	21		00 35.2	21492	57055
22		00 05.5	13424	48987	22		00 20.5	19138	54701	22		00 35.5	21523	57086
23		00 05.8	13617	49180	23		00 20.8	19191	54754	23		00 35.8	21553	57116
24	00.4	00 06.0	13802	49365	24	01.4	00 21.0	19243	54806	24	02.4	00 36.0	21584	57147
25		00 06.2	13979	49542	25		00 21.2	19294	54857	25		00 36.2	21614	57177
26		00 06.5	14150	49713	26		00 21.5	19345	54908	26		00 36.5	21644	57207
27		00 06.8	14314	49877	27		00 21.8	19395	54958	27		00 36.8	21673	57236
28		00 07.0	14472	50035	28		00 22.0	19445	55008	28		00 37.0	21703	57266
29		00 07.2	14624	50187	29		00 22.2	19494	55057	29		00 37.2	21732	57295
30	00.5	00 07.5	14771	50334	30	01.5	00 22.5	19542	55105	30	02.5	00 37.5	21761	57324
31		00 07.8	14914	50477	31		00 22.8	19590	55153	31		00 37.8	21790	57353
32		00 08.0	15051	50615	32		00 23.0	19638	55201	32		00 38.0	21818	57381
33		00 08.2	15185	50748	33		00 23.2	19685	55248	33		00 38.2	21847	57410
34		00 08.5	15315	50878	34		00 23.5	19731	55294	34		00 38.5	21875	57438
35		00 08.8	15441	51004	35		00 23.8	19777	55340	35		00 38.8	21903	57466
36	00.6	00 09.0	15563	51126	36	01.6	00 24.0	19823	55386	36	02.6	00 39.0	21931	57494
37		00 09.2	15682	51245	37		00 24.2	19868	55431	37		00 39.2	21959	57522
38		00 09.5	15798	51361	38		00 24.5	19912	55475	38		00 39.5	21987	57550
39		00 09.8	15911	51474	39		00 24.8	19956	55519	39		00 39.8	22014	57577
40		00 10.0	16021	51584	40		00 25.0	20000	55563	40		00 40.0	22041	57604
41		00 10.2	16128	51691	41		00 25.2	20043	55606	41		00 40.2	22068	57631
42	00.7	00 10.5	16232	51796	42	01.7	00 25.5	20086	55649	42	02.7	00 40.5	22095	57658
43		00 10.8	16335	51898	43		00 25.8	20128	55691	43		00 40.8	22122	57685
44		00 11.0	16435	51998	44		00 26.0	20170	55733	44		00 41.0	22148	57711
45		00 11.2	16532	52095	45		00 26.2	20212	55775	45		00 41.2	22175	57738
46		00 11.5	16628	52191	46		00 26.5	20253	55816	46		00 41.5	22201	57764
47		00 11.8	16721	52284	47		00 26.8	20294	55857	47		00 41.8	22227	57790
48	00.8	00 12.0	16812	52375	48	01.8	00 27.0	20334	55897	48	02.8	00 42.0	22253	57816
49		00 12.2	16902	52465	49		00 27.2	20374	55937	49		00 42.2	22279	57842
50		00 12.5	16990	52553	50		00 27.5	20414	55977	50		00 42.5	22304	57868
51		00 12.8	17076	52639	51		00 27.8	20453	56016	51		00 42.8	22330	57893
52		00 13.0	17160	52723	52		00 28.0	20492	56055	52		00 43.0	22355	57918
53		00 13.2	17243	52806	53		00 28.2	20531	56094	53		00 43.2	22380	57943
54	00.9	00 13.5	17324	52887	54	01.9	00 28.5	20569	56132	54	02.9	00 43.5	22405	57969
55		00 13.8	17404	52967	55		00 28.7	20607	56170	55		00 43.8	22430	57993
56		00 14.0	17482	53045	56		00 29.0	20645	56208	56		00 44.0	22455	58018
57		00 14.2	17559	53122	57		00 29.2	20682	56245	57		00 44.2	22480	58043
58		00 14.5	17634	53197	58		00 29.5	20719	56282	58		00 44.5	22504	58067
59		00 14.8	17709	53272	59		00 29.8	20755	56318	59		00 44.8	22529	58092

03 Min					04 Min					05 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	03.0	00 45.0	22553	58116	**00**	04.0	01 00.0	23802	59365	**00**	05.0	01 15.0	24771	60334
01		00 45.2	22577	58140	**01**		01 00.2	23820	59383	**01**		01 15.2	24786	60349
02		00 45.5	22601	58164	**02**		01 00.5	23838	59401	**02**		01 15.5	24800	60363
03		00 45.8	22625	58188	**03**		01 00.7	23856	59419	**03**		01 15.7	24814	60377
04		00 46.0	22648	58211	**04**		01 01.0	23874	59437	**04**		01 16.0	24829	60392
05		00 46.2	22672	58235	**05**		01 01.2	23892	59455	**05**		01 16.2	24843	60406
06	03.1	00 46.5	22695	58258	**06**	04.1	01 01.5	23909	59472	**06**	05.1	01 16.5	24857	60420
07		00 46.8	22718	58281	**07**		01 01.7	23927	59490	**07**		01 16.7	24871	60434
08		00 47.0	22742	58305	**08**		01 02.0	23945	59508	**08**		01 17.0	24886	60449
09		00 47.2	22765	58328	**09**		01 02.3	23962	59525	**09**		01 17.3	24900	60463
10		00 47.5	22788	58351	**10**		01 02.5	23979	59542	**10**		01 17.5	24914	60477
11		00 47.8	22810	58373	**11**		01 02.8	23997	59560	**11**		01 17.8	24928	60491
12	03.2	00 48.0	22833	58396	**12**	04.2	01 03.0	24014	59577	**12**	05.2	01 18.0	24942	60505
13		00 48.2	22856	58419	**13**		01 03.3	24031	59594	**13**		01 18.2	24955	60518
14		00 48.5	22878	58441	**14**		01 03.5	24048	59611	**14**		01 18.5	24969	60532
15		00 48.8	22900	58463	**15**		01 03.8	24065	59628	**15**		01 18.8	24983	60546
16		00 49.0	22923	58486	**16**		01 04.0	24082	59645	**16**		01 19.0	24997	60560
17		00 49.2	22945	58508	**17**		01 04.2	24099	59662	**17**		01 19.2	25011	60574
18	03.3	00 49.5	22967	58530	**18**	04.3	01 04.5	24116	59679	**18**	05.3	01 19.5	25024	60587
19		00 49.8	22989	58552	**19**		01 04.7	24133	59696	**19**		01 19.7	25038	60601
20		00 50.0	23010	58573	**20**		01 05.0	24150	59713	**20**		01 20.0	25051	60615
21		00 50.2	23032	58595	**21**		01 05.2	24166	59729	**21**		01 20.2	25065	60628
22		00 50.5	23054	58617	**22**		01 05.5	24183	59746	**22**		01 20.5	25079	60642
23		00 50.8	23075	58638	**23**		01 05.8	24200	59763	**23**		01 20.8	25092	60655
24	03.4	00 51.0	23096	58659	**24**	04.4	01 06.0	24216	59779	**24**	05.4	01 21.0	25105	60668
25		00 51.2	23118	58681	**25**		01 06.3	24232	59795	**25**		01 21.3	25119	60682
26		00 51.5	23139	58702	**26**		01 06.5	24249	59812	**26**		01 21.5	25132	60695
27		00 51.8	23160	58723	**27**		01 06.8	24265	59828	**27**		01 21.8	25145	60709
28		00 52.0	23181	58744	**28**		01 07.0	24281	59844	**28**		01 22.0	25159	60722
29		00 52.2	23201	58764	**29**		01 07.3	24298	59861	**29**		01 22.2	25172	60735
30	03.5	00 52.5	23222	58785	**30**	04.5	01 07.5	24314	59877	**30**	05.5	01 22.5	25185	60748
31		00 52.8	23243	58806	**31**		01 07.7	24330	59893	**31**		01 22.8	25198	60761
32		00 53.0	23263	58826	**32**		01 08.0	24346	59909	**32**		01 23.0	25211	60774
33		00 53.2	23284	58847	**33**		01 08.2	24362	59925	**33**		01 23.2	25224	60787
34		00 53.5	23304	58867	**34**		01 08.5	24378	59941	**34**		01 23.5	25237	60800
35		00 53.8	23324	58887	**35**		01 08.7	24393	59956	**35**		01 23.7	25250	60813
36	03.6	00 54.0	23345	58908	**36**	04.6	01 09.0	24409	59972	**36**	05.6	01 24.0	25263	60826
37		00 54.2	23365	58928	**37**		01 09.3	24425	59988	**37**		01 24.3	25276	60839
38		00 54.5	23385	58948	**38**		01 09.5	24440	60003	**38**		01 24.5	25289	60852
39		00 54.8	23404	58967	**39**		01 09.8	24456	60019	**39**		01 24.8	25302	60865
40		00 55.0	23424	58987	**40**		01 10.0	24472	60035	**40**		01 25.0	25315	60878
41		00 55.2	23444	59007	**41**		01 10.3	24487	60050	**41**		01 25.3	25328	60891
42	03.7	00 55.5	23464	59027	**42**	04.7	01 10.5	24502	60066	**42**	05.7	01 25.5	25340	60903
43		00 55.8	23483	59046	**43**		01 10.8	24518	60081	**43**		01 25.8	25353	60916
44		00 56.0	23502	59066	**44**		01 11.0	24533	60096	**44**		01 26.0	25366	60929
45		00 56.2	23522	59085	**45**		01 11.2	24548	60111	**45**		01 26.2	25378	60941
46		00 56.5	23541	59104	**46**		01 11.5	24564	60127	**46**		01 26.5	25391	60954
47		00 56.8	23560	59123	**47**		01 11.7	24579	60142	**47**		01 26.8	25403	60966
48	03.8	00 57.0	23579	59142	**48**	04.8	01 12.0	24594	60157	**48**	05.8	01 27.0	25416	60979
49		00 57.2	23598	59161	**49**		01 12.2	24609	60172	**49**		01 27.2	25428	60991
50		00 57.5	23617	59180	**50**		01 12.5	24624	60187	**50**		01 27.5	25441	61004
51		00 57.8	23636	59199	**51**		01 12.7	24639	60202	**51**		01 27.7	25453	61016
52		00 58.0	23655	59218	**52**		01 13.0	24654	60217	**52**		01 28.0	25465	61028
53		00 58.2	23674	59237	**53**		01 13.2	24669	60232	**53**		01 28.2	25478	61041
54	03.9	00 58.5	23692	59255	**54**	04.9	01 13.5	24683	60246	**54**	05.9	01 28.5	25490	61053
55		00 58.8	23711	59274	**55**		01 13.8	24698	60261	**55**		01 28.8	25502	61065
56		00 59.0	23729	59292	**56**		01 14.0	24713	60276	**56**		01 29.0	25514	61078
57		00 59.2	23747	59311	**57**		01 14.3	24728	60291	**57**		01 29.3	25527	61090
58		00 59.5	23766	59329	**58**		01 14.5	24742	60305	**58**		01 29.5	25539	61102
59		00 59.8	23784	59347	**59**		01 14.8	24757	60320	**59**		01 29.8	25551	61114

06 Min					07 Min					08 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	06.0	01 30.0	25563	61126	**00**	07.0	01 45.0	26232	61796	**00**	08.0	02 00.0	26812	62375
01		01 30.2	25575	61138	**01**		01 45.2	26243	61806	**01**		02 00.3	26821	62384
02		01 30.5	25587	61150	**02**		01 45.5	26253	61816	**02**		02 00.5	26830	62393
03		01 30.7	25599	61162	**03**		01 45.8	26263	61826	**03**		02 00.8	26839	62402
04		01 31.0	25611	61174	**04**		01 46.0	26274	61837	**04**		02 01.0	26848	62411
05		01 31.2	25623	61186	**05**		01 46.2	26284	61847	**05**		02 01.3	26857	62420
06	06.1	01 31.5	25635	61198	**06**	07.1	01 46.5	26294	61857	**06**	08.1	02 01.5	26866	62429
07		01 31.7	25647	61210	**07**		01 46.7	26304	61867	**07**		02 01.8	26875	62438
08		01 32.0	25658	61222	**08**		01 47.0	26314	61877	**08**		02 02.0	26884	62447
09		01 32.3	25670	61233	**09**		01 47.3	26325	61888	**09**		02 02.3	26893	62456
10		01 32.5	25682	61245	**10**		01 47.5	26335	61898	**10**		02 02.5	26902	62465
11		01 32.8	25694	61257	**11**		01 47.8	26345	61908	**11**		02 02.8	26911	62474
12	06.2	01 33.0	25705	61268	**12**	07.2	01 48.0	26355	61918	**12**	08.2	02 03.0	26920	62483
13		01 33.2	25717	61280	**13**		01 48.2	26365	61928	**13**		02 03.3	26928	62491
14		01 33.5	25729	61292	**14**		01 48.5	26375	61938	**14**		02 03.5	26937	62500
15		01 33.8	25740	61303	**15**		01 48.8	26385	61948	**15**		02 03.8	26946	62509
16		01 34.0	25752	61315	**16**		01 49.0	26395	61958	**16**		02 04.0	26955	62518
17		01 34.2	25763	61326	**17**		01 49.2	26405	61968	**17**		02 04.2	26964	62527
18	06.3	01 34.5	25775	61338	**18**	07.3	01 49.5	26415	61978	**18**	08.3	02 04.5	26972	62535
19		01 34.8	25786	61349	**19**		01 49.8	26425	61988	**19**		02 04.7	26981	62544
20		01 35.0	25798	61361	**20**		01 50.0	26435	61998	**20**		02 05.0	26990	62553
21		01 35.2	25809	61372	**21**		01 50.2	26444	62007	**21**		02 05.2	26998	62561
22		01 35.5	25821	61384	**22**		01 50.5	26454	62017	**22**		02 05.5	27007	62570
23		01 35.8	25832	61395	**23**		01 50.8	26464	62027	**23**		02 05.7	27016	62579
24	06.4	01 36.0	25843	61406	**24**	07.4	01 51.0	26474	62037	**24**	08.4	02 06.0	27024	62587
25		01 36.3	25855	61418	**25**		01 51.3	26484	62047	**25**		02 06.2	27033	62596
26		01 36.5	25866	61429	**26**		01 51.5	26493	62056	**26**		02 06.5	27042	62605
27		01 36.8	25877	61440	**27**		01 51.8	26503	62066	**27**		02 06.7	27050	62613
28		01 37.0	25888	61451	**28**		01 52.0	26513	62076	**28**		02 07.0	27059	62622
29		01 37.2	25899	61463	**29**		01 52.2	26522	62085	**29**		02 07.2	27067	62630
30	06.5	01 37.5	25911	61474	**30**	07.5	01 52.5	26532	62095	**30**	08.5	02 07.5	27076	62639
31		01 37.8	25922	61485	**31**		01 52.8	26542	62105	**31**		02 07.8	27084	62647
32		01 38.0	25933	61496	**32**		01 53.0	26551	62114	**32**		02 08.0	27093	62656
33		01 38.2	25944	61507	**33**		01 53.2	26561	62124	**33**		02 08.3	27101	62664
34		01 38.5	25955	61518	**34**		01 53.5	26571	62134	**34**		02 08.5	27110	62673
35		01 38.7	25966	61529	**35**		01 53.7	26580	62143	**35**		02 08.8	27118	62681
36	06.6	01 39.0	25977	61540	**36**	07.6	01 54.0	26590	62153	**36**	08.6	02 09.0	27126	62690
37		01 39.3	25988	61551	**37**		01 54.3	26599	62162	**37**		02 09.3	27135	62698
38		01 39.5	25999	61562	**38**		01 54.5	26609	62172	**38**		02 09.5	27143	62706
39		01 39.8	26010	61573	**39**		01 54.8	26618	62181	**39**		02 09.8	27152	62715
40		01 40.0	26021	61584	**40**		01 55.0	26628	62191	**40**		02 10.0	27160	62723
41		01 40.2	26031	61594	**41**		01 55.2	26637	62200	**41**		02 10.3	27168	62731
42	06.7	01 40.5	26042	61605	**42**	07.7	01 55.5	26646	62209	**42**	08.7	02 10.5	27177	62740
43		01 40.8	26053	61616	**43**		01 55.8	26656	62219	**43**		02 10.8	27185	62748
44		01 41.0	26064	61627	**44**		01 56.0	26665	62228	**44**		02 11.0	27193	62756
45		01 41.2	26075	61638	**45**		01 56.2	26675	62238	**45**		02 11.2	27202	62765
46		01 41.5	26085	61648	**46**		01 56.5	26684	62247	**46**		02 11.5	27210	62773
47		01 41.8	26096	61659	**47**		01 56.8	26693	62256	**47**		02 11.7	27218	62781
48	06.8	01 42.0	26107	61670	**48**	07.8	01 57.0	26702	62265	**48**	08.8	02 12.0	27226	62789
49		01 42.2	26117	61680	**49**		01 57.2	26712	62275	**49**		02 12.2	27235	62798
50		01 42.5	26128	61691	**50**		01 57.5	26721	62284	**50**		02 12.5	27243	62806
51		01 42.7	26138	61701	**51**		01 57.7	26730	62293	**51**		02 12.7	27251	62814
52		01 43.0	26149	61712	**52**		01 58.0	26739	62302	**52**		02 13.0	27259	62822
53		01 43.2	26160	61723	**53**		01 58.2	26749	62312	**53**		02 13.2	27267	62830
54	06.9	01 43.5	26170	61733	**54**	07.9	01 58.5	26758	62321	**54**	08.9	02 13.5	27275	62838
55		01 43.8	26180	61744	**55**		01 58.8	26767	62330	**55**		02 13.7	27284	62847
56		01 44.0	26191	61754	**56**		01 59.0	26776	62339	**56**		02 14.0	27292	62855
57		01 44.2	26201	61764	**57**		01 59.2	26785	62348	**57**		02 14.2	27300	62863
58		01 44.5	26212	61775	**58**		01 59.5	26794	62357	**58**		02 14.5	27308	62871
59		01 44.8	26222	61785	**59**		01 59.8	26803	62366	**59**		02 14.7	27316	62879

09 Min					10 Min					11 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
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00	09.0	02 15.0	27324	62887	00	10.0	02 30.0	27782	63345	00	11.0	02 45.0	28195	63758
01		02 15.3	27332	62895	01		02 30.3	27789	63352	01		02 45.3	28202	63765
02		02 15.5	27340	62903	02		02 30.5	27796	63359	02		02 45.5	28209	63772
03		02 15.8	27348	62911	03		02 30.8	27803	63366	03		02 45.8	28215	63778
04		02 16.0	27356	62919	04		02 31.0	27810	63373	04		02 46.0	28222	63785
05		02 16.3	27364	62927	05		02 31.3	27818	63381	05		02 46.3	28228	63791
06	09.1	02 16.5	27372	62935	06	10.1	02 31.5	27825	63388	06	11.1	02 46.5	28235	63798
07		02 16.8	27380	62943	07		02 31.8	27832	63395	07		02 46.8	28241	63804
08		02 17.0	27388	62951	08		02 32.0	27839	63402	08		02 47.0	28248	63811
09		02 17.3	27396	62959	09		02 32.3	27846	63409	09		02 47.3	28254	63817
10		02 17.5	27404	62967	10		02 32.5	27853	63416	10		02 47.5	28261	63824
11		02 17.8	27412	62975	11		02 32.8	27860	63423	11		02 47.8	28267	63830
12	09.2	02 18.0	27419	62982	12	10.2	02 33.0	27868	63431	12	11.2	02 48.0	28274	63837
13		02 18.2	27427	62990	13		02 33.2	27875	63438	13		02 48.2	28280	63843
14		02 18.5	27435	62998	14		02 33.5	27882	63445	14		02 48.5	28287	63850
15		02 18.8	27443	63006	15		02 33.8	27889	63452	15		02 48.8	28293	63856
16		02 19.0	27451	63014	16		02 34.0	27896	63459	16		02 49.0	28299	63862
17		02 19.2	27459	63022	17		02 34.2	27903	63466	17		02 49.2	28306	63869
18	09.3	02 19.5	27466	63029	18	10.3	02 34.5	27910	63473	18	11.3	02 49.5	28312	63875
19		02 19.7	27474	63037	19		02 34.8	27917	63480	19		02 49.8	28319	63882
20		02 20.0	27482	63045	20		02 35.0	27924	63487	20		02 50.0	28325	63888
21		02 20.2	27490	63053	21		02 35.2	27931	63494	21		02 50.2	28331	63894
22		02 20.5	27497	63060	22		02 35.5	27938	63501	22		02 50.5	28338	63901
23		02 20.7	27505	63068	23		02 35.7	27945	63508	23		02 50.7	28344	63907
24	09.4	02 21.0	27513	63076	24	10.4	02 36.0	27952	63515	24	11.4	02 51.0	28351	63914
25		02 21.2	27520	63084	25		02 36.2	27959	63522	25		02 51.2	28357	63920
26		02 21.5	27528	63091	26		02 36.5	27966	63529	26		02 51.5	28363	63926
27		02 21.7	27536	63099	27		02 36.7	27973	63536	27		02 51.7	28370	63933
28		02 22.0	27543	63107	28		02 37.0	27980	63543	28		02 52.0	28376	63939
29		02 22.2	27551	63114	29		02 37.2	27987	63550	29		02 52.2	28382	63945
30	09.5	02 22.5	27559	63122	30	10.5	02 37.5	27993	63556	30	11.5	02 52.5	28388	63952
31		02 22.8	27566	63129	31		02 37.8	28000	63563	31		02 52.8	28395	63958
32		02 23.0	27574	63137	32		02 38.0	28007	63570	32		02 53.0	28401	63964
33		02 23.3	27582	63145	33		02 38.3	28014	63577	33		02 53.3	28407	63970
34		02 23.5	27589	63152	34		02 38.5	28021	63584	34		02 53.5	28414	63977
35		02 23.8	27597	63160	35		02 38.8	28028	63591	35		02 53.8	28420	63983
36	09.6	02 24.0	27604	63167	36	10.6	02 39.0	28035	63598	36	11.6	02 54.0	28426	63989
37		02 24.3	27612	63175	37		02 39.3	28041	63604	37		02 54.3	28432	63995
38		02 24.5	27619	63182	38		02 39.5	28048	63611	38		02 54.5	28439	64002
39		02 24.8	27627	63190	39		02 39.8	28055	63618	39		02 54.8	28445	64008
40		02 25.0	27634	63197	40		02 40.0	28062	63625	40		02 55.0	28451	64014
41		02 25.3	27642	63205	41		02 40.2	28069	63632	41		02 55.2	28457	64020
42	09.7	02 25.5	27649	63212	42	10.7	02 40.5	28075	63638	42	11.7	02 55.5	28463	64026
43		02 25.8	27657	63220	43		02 40.8	28082	63645	43		02 55.8	28470	64033
44		02 26.0	27664	63227	44		02 41.0	28089	63652	44		02 56.0	28476	64039
45		02 26.2	27672	63235	45		02 41.2	28096	63659	45		02 56.2	28482	64045
46		02 26.5	27679	63242	46		02 41.5	28102	63665	46		02 56.5	28488	64051
47		02 26.8	27686	63249	47		02 41.8	28109	63672	47		02 56.8	28494	64057
48	09.8	02 27.0	27694	63257	48	10.8	02 42.0	28116	63679	48	11.8	02 57.0	28500	64063
49		02 27.2	27701	63264	49		02 42.2	28122	63685	49		02 57.2	28506	64069
50		02 27.5	27709	63272	50		02 42.5	28129	63692	50		02 57.5	28513	64076
51		02 27.7	27716	63279	51		02 42.7	28136	63699	51		02 57.7	28519	64082
52		02 28.0	27723	63286	52		02 43.0	28142	63706	52		02 58.0	28525	64088
53		02 28.2	27731	63294	53		02 43.2	28149	63712	53		02 58.2	28531	64094
54	09.9	02 28.5	27738	63301	54	10.9	02 43.5	28156	63719	54	11.9	02 58.5	28537	64100
55		02 28.7	27745	63308	55		02 43.7	28162	63725	55		02 58.7	28543	64106
56		02 29.0	27752	63315	56		02 44.0	28169	63732	56		02 59.0	28549	64112
57		02 29.2	27760	63323	57		02 44.2	28176	63739	57		02 59.2	28555	64118
58		02 29.5	27767	63330	58		02 44.5	28182	63745	58		02 59.5	28561	64124
59		02 29.7	27774	63337	59		02 44.7	28189	63752	59		02 59.7	28567	64130

12 Min					13 Min					14 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
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00	12.0	03 00.0	28573	64136	**00**	13.0	03 15.0	28921	64484	**00**	14.0	03 30.0	29243	64806
01		03 00.3	28579	64142	**01**		03 15.3	28927	64490	**01**		03 30.3	29248	64811
02		03 00.5	28585	64148	**02**		03 15.5	28932	64495	**02**		03 30.5	29253	64816
03		03 00.8	28591	64154	**03**		03 15.8	28938	64501	**03**		03 30.8	29258	64821
04		03 01.0	28597	64160	**04**		03 16.0	28943	64506	**04**		03 31.0	29263	64826
05		03 01.3	28603	64166	**05**		03 16.3	28949	64512	**05**		03 31.3	29269	64832
06	12.1	03 01.5	28609	64172	**06**	13.1	03 16.5	28954	64517	**06**	14.1	03 31.5	29274	64837
07		03 01.8	28615	64178	**07**		03 16.8	28960	64523	**07**		03 31.8	29279	64842
08		03 02.0	28621	64184	**08**		03 17.0	28965	64528	**08**		03 32.0	29284	64847
09		03 02.3	28627	64190	**09**		03 17.3	28971	64534	**09**		03 32.3	29289	64852
10		03 02.5	28633	64196	**10**		03 17.5	28976	64539	**10**		03 32.5	29294	64857
11		03 02.8	28639	64202	**11**		03 17.8	28982	64545	**11**		03 32.8	29299	64862
12	12.2	03 03.0	28645	64208	**12**	13.2	03 18.0	28987	64550	**12**	14.2	03 33.0	29304	64867
13		03 03.3	28651	64214	**13**		03 18.2	28993	64556	**13**		03 33.2	29309	64873
14		03 03.5	28657	64220	**14**		03 18.5	28998	64561	**14**		03 33.5	29315	64878
15		03 03.8	28663	64226	**15**		03 18.8	29004	64567	**15**		03 33.8	29320	64883
16		03 04.0	28669	64232	**16**		03 19.0	29009	64572	**16**		03 34.0	29325	64888
17		03 04.2	28675	64238	**17**		03 19.2	29015	64578	**17**		03 34.2	29330	64893
18	12.3	03 04.5	28681	64244	**18**	13.3	03 19.5	29020	64583	**18**	14.3	03 34.5	29335	64898
19		03 04.7	28686	64249	**19**		03 19.7	29025	64588	**19**		03 34.8	29340	64903
20		03 05.0	28692	64255	**20**		03 20.0	29031	64594	**20**		03 35.0	29345	64908
21		03 05.2	28698	64261	**21**		03 20.2	29036	64599	**21**		03 35.2	29350	64913
22		03 05.5	28704	64267	**22**		03 20.5	29042	64605	**22**		03 35.5	29355	64918
23		03 05.7	28710	64273	**23**		03 20.7	29047	64610	**23**		03 35.7	29360	64923
24	12.4	03 06.0	28716	64279	**24**	13.4	03 21.0	29053	64616	**24**	14.4	03 36.0	29365	64928
25		03 06.2	28722	64285	**25**		03 21.2	29058	64621	**25**		03 36.2	29370	64933
26		03 06.5	28727	64290	**26**		03 21.5	29063	64626	**26**		03 36.5	29375	64938
27		03 06.7	28733	64296	**27**		03 21.7	29069	64632	**27**		03 36.7	29380	64943
28		03 07.0	28739	64302	**28**		03 22.0	29074	64637	**28**		03 37.0	29385	64948
29		03 07.2	28745	64308	**29**		03 22.2	29079	64643	**29**		03 37.2	29390	64953
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31		03 07.8	28756	64319	**31**		03 22.8	29090	64653	**31**		03 37.8	29400	64963
32		03 08.0	28762	64325	**32**		03 23.0	29096	64659	**32**		03 38.0	29405	64968
33		03 08.3	28768	64331	**33**		03 23.3	29101	64664	**33**		03 38.3	29410	64973
34		03 08.5	28774	64337	**34**		03 23.5	29106	64669	**34**		03 38.5	29415	64978
35		03 08.8	28779	64342	**35**		03 23.8	29112	64675	**35**		03 38.8	29420	64983
36	12.6	03 09.0	28785	64348	**36**	13.6	03 24.0	29117	64680	**36**	14.6	03 39.0	29425	64988
37		03 09.3	28791	64354	**37**		03 24.3	29122	64685	**37**		03 39.3	29430	64993
38		03 09.5	28797	64360	**38**		03 24.5	29128	64691	**38**		03 39.5	29435	64998
39		03 09.8	28802	64365	**39**		03 24.8	29133	64696	**39**		03 39.8	29440	65003
40		03 10.0	28808	64371	**40**		03 25.0	29138	64701	**40**		03 40.0	29445	65008
41		03 10.3	28814	64377	**41**		03 25.3	29143	64706	**41**		03 40.2	29450	65013
42	12.7	03 10.5	28820	64383	**42**	13.7	03 25.5	29149	64712	**42**	14.7	03 40.5	29455	65018
43		03 10.8	28825	64388	**43**		03 25.8	29154	64717	**43**		03 40.8	29460	65023
44		03 11.0	28831	64394	**44**		03 26.0	29159	64722	**44**		03 41.0	29465	65028
45		03 11.2	28837	64400	**45**		03 26.2	29165	64728	**45**		03 41.2	29469	65032
46		03 11.5	28842	64405	**46**		03 26.5	29170	64733	**46**		03 41.5	29474	65037
47		03 11.7	28848	64411	**47**		03 26.8	29175	64738	**47**		03 41.8	29479	65042
48	12.8	03 12.0	28854	64417	**48**	13.8	03 27.0	29180	64743	**48**	14.8	03 42.0	29484	65047
49		03 12.2	28859	64422	**49**		03 27.2	29186	64749	**49**		03 42.2	29489	65052
50		03 12.5	28865	64428	**50**		03 27.5	29191	64754	**50**		03 42.5	29494	65057
51		03 12.7	28871	64434	**51**		03 27.7	29196	64759	**51**		03 42.7	29499	65062
52		03 13.0	28876	64439	**52**		03 28.0	29201	64764	**52**		03 43.0	29504	65067
53		03 13.2	28882	64445	**53**		03 28.2	29206	64769	**53**		03 43.2	29509	65072
54	12.9	03 13.5	28887	64450	**54**	13.9	03 28.5	29212	64775	**54**	14.9	03 43.5	29513	65076
55		03 13.7	28893	64456	**55**		03 28.7	29217	64780	**55**		03 43.7	29518	65081
56		03 14.0	28899	64462	**56**		03 29.0	29222	64785	**56**		03 44.0	29523	65086
57		03 14.2	28904	64467	**57**		03 29.2	29227	64790	**57**		03 44.2	29528	65091
58		03 14.5	28910	64473	**58**		03 29.5	29232	64795	**58**		03 44.5	29533	65096
59		03 14.7	28915	64478	**59**		03 29.7	29238	64801	**59**		03 44.7	29538	65101

15 Min					16 Min					17 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	15.0	03 45.0	29542	65105	00	16.0	04 00.0	29823	65386	00	17.0	04 15.0	30086	65649
01		03 45.3	29547	65110	01		04 00.2	29827	65390	01		04 15.2	30090	65653
02		03 45.5	29552	65115	02		04 00.5	29832	65395	02		04 15.5	30095	65658
03		03 45.8	29557	65120	03		04 00.8	29836	65399	03		04 15.8	30099	65662
04		03 46.0	29562	65125	04		04 01.0	29841	65404	04		04 16.0	30103	65666
05		03 46.3	29566	65130	05		04 01.2	29845	65408	05		04 16.2	30107	65670
06	15.1	03 46.5	29571	65134	06	16.1	04 01.5	29850	65413	06	17.1	04 16.5	30111	65674
07		03 46.8	29576	65139	07		04 01.8	29854	65417	07		04 16.8	30116	65679
08		03 47.0	29581	65144	08		04 02.0	29859	65422	08		04 17.0	30120	65683
09		03 47.3	29586	65149	09		04 02.2	29863	65426	09		04 17.2	30124	65687
10		03 47.5	29590	65153	10		04 02.5	29868	65431	10		04 17.5	30128	65691
11		03 47.8	29595	65158	11		04 02.8	29872	65435	11		04 17.8	30133	65696
12	15.2	03 48.0	29600	65163	12	16.2	04 03.0	29877	65440	12	17.2	04 18.0	30137	65700
13		03 48.2	29605	65168	13		04 03.2	29881	65444	13		04 18.2	30141	65704
14		03 48.5	29609	65172	14		04 03.5	29886	65449	14		04 18.5	30145	65708
15		03 48.8	29614	65177	15		04 03.8	29890	65453	15		04 18.8	30149	65712
16		03 49.0	29619	65182	16		04 04.0	29894	65458	16		04 19.0	30154	65717
17		03 49.2	29624	65187	17		04 04.3	29899	65462	17		04 19.3	30158	65721
18	15.3	03 49.5	29628	65191	18	16.3	04 04.5	29903	65466	18	17.3	04 19.5	30162	65725
19		03 49.8	29633	65196	19		04 04.7	29908	65471	19		04 19.7	30166	65729
20		03 50.0	29638	65201	20		04 05.0	29912	65475	20		04 20.0	30170	65733
21		03 50.2	29643	65206	21		04 05.3	29917	65480	21		04 20.3	30175	65738
22		03 50.5	29647	65210	22		04 05.5	29921	65484	22		04 20.5	30179	65742
23		03 50.7	29652	65215	23		04 05.7	29926	65489	23		04 20.7	30183	65746
24	15.4	03 51.0	29657	65220	24	16.4	04 06.0	29930	65493	24	17.4	04 21.0	30187	65750
25		03 51.2	29661	65224	25		04 06.3	29934	65497	25		04 21.3	30191	65754
26		03 51.5	29666	65229	26		04 06.5	29939	65502	26		04 21.5	30195	65758
27		03 51.7	29671	65234	27		04 06.7	29943	65506	27		04 21.7	30199	65762
28		03 52.0	29675	65239	28		04 07.0	29948	65511	28		04 22.0	30204	65767
29		03 52.2	29680	65243	29		04 07.3	29952	65515	29		04 22.3	30208	65771
30	15.5	03 52.5	29685	65248	30	16.5	04 07.5	29956	65519	30	17.5	04 22.5	30212	65775
31		03 52.8	29689	65253	31		04 07.7	29961	65524	31		04 22.7	30216	65779
32		03 53.0	29694	65257	32		04 08.0	29965	65528	32		04 23.0	30220	65783
33		03 53.3	29699	65262	33		04 08.3	29969	65533	33		04 23.3	30224	65787
34		03 53.5	29703	65266	34		04 08.5	29974	65537	34		04 23.5	30228	65791
35		03 53.8	29708	65271	35		04 08.7	29978	65541	35		04 23.7	30233	65796
36	15.6	03 54.0	29713	65276	36	16.6	04 09.0	29983	65546	36	17.6	04 24.0	30237	65800
37		03 54.3	29717	65280	37		04 09.3	29987	65550	37		04 24.3	30241	65804
38		03 54.5	29722	65285	38		04 09.5	29991	65554	38		04 24.5	30245	65808
39		03 54.8	29727	65290	39		04 09.7	29996	65559	39		04 24.7	30249	65812
40		03 55.0	29731	65294	40		04 10.0	30000	65563	40		04 25.0	30253	65816
41		03 55.2	29736	65299	41		04 10.3	30004	65567	41		04 25.3	30257	65820
42	15.7	03 55.5	29741	65304	42	16.7	04 10.5	30009	65572	42	17.7	04 25.5	30261	65824
43		03 55.8	29745	65308	43		04 10.7	30013	65576	43		04 25.7	30265	65828
44		03 56.0	29750	65313	44		04 11.0	30017	65580	44		04 26.0	30269	65832
45		03 56.2	29754	65317	45		04 11.2	30022	65585	45		04 26.2	30273	65837
46		03 56.5	29759	65322	46		04 11.5	30026	65589	46		04 26.5	30278	65841
47		03 56.8	29763	65327	47		04 11.8	30030	65593	47		04 26.8	30282	65845
48	15.8	03 57.0	29768	65331	48	16.8	04 12.0	30035	65598	48	17.8	04 27.0	30286	65849
49		03 57.2	29773	65336	49		04 12.2	30039	65602	49		04 27.2	30290	65853
50		03 57.5	29777	65340	50		04 12.5	30043	65606	50		04 27.5	30294	65857
51		03 57.7	29782	65345	51		04 12.8	30048	65611	51		04 27.8	30298	65861
52		03 58.0	29786	65349	52		04 13.0	30052	65615	52		04 28.0	30302	65865
53		03 58.2	29791	65354	53		04 13.2	30056	65619	53		04 28.2	30306	65869
54	15.9	03 58.5	29795	65359	54	16.9	04 13.5	30060	65623	54	17.9	04 28.5	30310	65873
55		03 58.7	29800	65363	55		04 13.8	30065	65628	55		04 28.8	30314	65877
56		03 59.0	29805	65368	56		04 14.0	30069	65632	56		04 29.0	30318	65881
57		03 59.2	29809	65372	57		04 14.2	30073	65636	57		04 29.2	30322	65885
58		03 59.5	29814	65377	58		04 14.5	30077	65641	58		04 29.5	30326	65889
59		03 59.7	29818	65381	59		04 14.8	30082	65645	59		04 29.8	30330	65893

18 Min					19 Min					20 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
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01		04 30.2	30338	65901	**01**		04 45.2	30573	66136	**01**		05 00.2	30795	66358
02		04 30.5	30342	65905	**02**		04 45.5	30577	66140	**02**		05 00.5	30799	66362
03		04 30.8	30346	65909	**03**		04 45.8	30580	66143	**03**		05 00.8	30803	66366
04		04 31.0	30350	65913	**04**		04 46.0	30584	66147	**04**		05 01.0	30806	66369
05		04 31.2	30354	65917	**05**		04 46.2	30588	66151	**05**		05 01.2	30810	66373
06	18.1	04 31.5	30358	65921	**06**	19.1	04 46.5	30592	66155	**06**	20.1	05 01.5	30813	66376
07		04 31.8	30362	65925	**07**		04 46.8	30596	66159	**07**		05 01.8	30817	66380
08		04 32.0	30366	65929	**08**		04 47.0	30599	66162	**08**		05 02.0	30821	66384
09		04 32.2	30370	65933	**09**		04 47.2	30603	66166	**09**		05 02.2	30824	66387
10		04 32.5	30374	65937	**10**		04 47.5	30607	66170	**10**		05 02.5	30828	66391
11		04 32.8	30378	65941	**11**		04 47.8	30611	66174	**11**		05 02.8	30831	66394
12	18.2	04 33.0	30382	65945	**12**	19.2	04 48.0	30615	66178	**12**	20.2	05 03.0	30835	66398
13		04 33.2	30386	65949	**13**		04 48.2	30618	66181	**13**		05 03.2	30839	66402
14		04 33.5	30390	65953	**14**		04 48.5	30622	66185	**14**		05 03.5	30842	66405
15		04 33.8	30394	65957	**15**		04 48.8	30626	66189	**15**		05 03.8	30846	66409
16		04 34.0	30398	65961	**16**		04 49.0	30630	66193	**16**		05 04.0	30849	66412
17		04 34.3	30402	65965	**17**		04 49.3	30633	66196	**17**		05 04.3	30853	66416
18	18.3	04 34.5	30406	65969	**18**	19.3	04 49.5	30637	66200	**18**	20.3	05 04.5	30856	66419
19		04 34.8	30410	65973	**19**		04 49.8	30641	66204	**19**		05 04.7	30860	66423
20		04 35.0	30414	65977	**20**		04 50.0	30645	66208	**20**		05 05.0	30864	66427
21		04 35.3	30418	65981	**21**		04 50.3	30648	66211	**21**		05 05.3	30867	66430
22		04 35.5	30422	65985	**22**		04 50.5	30652	66215	**22**		05 05.5	30871	66434
23		04 35.7	30426	65989	**23**		04 50.7	30656	66219	**23**		05 05.7	30874	66437
24	18.4	04 36.0	30430	65993	**24**	19.4	04 51.0	30660	66223	**24**	20.4	05 06.0	30878	66441
25		04 36.3	30434	65997	**25**		04 51.3	30663	66226	**25**		05 06.3	30881	66444
26		04 36.5	30438	66001	**26**		04 51.5	30667	66230	**26**		05 06.5	30885	66448
27		04 36.7	30441	66005	**27**		04 51.7	30671	66234	**27**		05 06.7	30888	66451
28		04 37.0	30445	66008	**28**		04 52.0	30674	66237	**28**		05 07.0	30892	66455
29		04 37.3	30449	66012	**29**		04 52.3	30678	66241	**29**		05 07.3	30896	66459
30	18.5	04 37.5	30453	66016	**30**	19.5	04 52.5	30682	66245	**30**	20.5	05 07.5	30899	66462
31		04 37.7	30457	66020	**31**		04 52.7	30686	66249	**31**		05 07.7	30903	66466
32		04 38.0	30461	66024	**32**		04 53.0	30689	66252	**32**		05 08.0	30906	66469
33		04 38.3	30465	66028	**33**		04 53.3	30693	66256	**33**		05 08.3	30910	66473
34		04 38.5	30469	66032	**34**		04 53.5	30697	66260	**34**		05 08.5	30913	66476
35		04 38.7	30473	66036	**35**		04 53.7	30700	66263	**35**		05 08.7	30917	66480
36	18.6	04 39.0	30477	66040	**36**	19.6	04 54.0	30704	66267	**36**	20.6	05 09.0	30920	66483
37		04 39.3	30481	66044	**37**		04 54.3	30708	66271	**37**		05 09.3	30924	66487
38		04 39.5	30484	66047	**38**		04 54.5	30711	66274	**38**		05 09.5	30927	66490
39		04 39.7	30488	66051	**39**		04 54.7	30715	66278	**39**		05 09.7	30931	66494
40		04 40.0	30492	66055	**40**		04 55.0	30719	66282	**40**		05 10.0	30934	66497
41		04 40.2	30496	66059	**41**		04 55.2	30722	66286	**41**		05 10.3	30938	66501
42	18.7	04 40.5	30500	66063	**42**	19.7	04 55.5	30726	66289	**42**	20.7	05 10.5	30941	66504
43		04 40.7	30504	66067	**43**		04 55.7	30730	66293	**43**		05 10.7	30945	66508
44		04 41.0	30508	66071	**44**		04 56.0	30734	66297	**44**		05 11.0	30948	66511
45		04 41.2	30512	66075	**45**		04 56.2	30737	66300	**45**		05 11.2	30952	66515
46		04 41.5	30515	66078	**46**		04 56.5	30741	66304	**46**		05 11.5	30955	66518
47		04 41.8	30519	66082	**47**		04 56.8	30745	66308	**47**		05 11.8	30959	66522
48	18.8	04 42.0	30523	66086	**48**	19.8	04 57.0	30748	66311	**48**	20.8	05 12.0	30962	66525
49		04 42.2	30527	66090	**49**		04 57.2	30752	66315	**49**		05 12.2	30966	66529
50		04 42.5	30531	66094	**50**		04 57.5	30755	66318	**50**		05 12.5	30969	66532
51		04 42.8	30535	66098	**51**		04 57.8	30759	66322	**51**		05 12.8	30973	66536
52		04 43.0	30538	66101	**52**		04 58.0	30763	66326	**52**		05 13.0	30976	66539
53		04 43.2	30542	66105	**53**		04 58.2	30766	66329	**53**		05 13.2	30980	66543
54	18.9	04 43.5	30546	66109	**54**	19.9	04 58.5	30770	66333	**54**	20.9	05 13.5	30983	66546
55		04 43.8	30550	66113	**55**		04 58.8	30774	66337	**55**		05 13.8	30986	66549
56		04 44.0	30554	66117	**56**		04 59.0	30777	66340	**56**		05 14.0	30990	66553
57		04 44.2	30558	66121	**57**		04 59.2	30781	66344	**57**		05 14.2	30993	66556
58		04 44.5	30561	66124	**58**		04 59.5	30785	66348	**58**		05 14.5	30997	66560
59		04 44.8	30565	66128	**59**		04 59.8	30788	66351	**59**		05 14.8	31000	66563

21 Min					22 Min					23 Min				
Sec	fMin	dHA ° ′	p	s	Sec	fMin	dHA ° ′	p	s	Sec	fMin	dHA ° ′	p	s
00	21.0	05 15.0	31004	66567	**00**	22.0	05 30.0	31206	66769	**00**	23.0	05 45.0	31399	66962
01		05 15.2	31007	66570	**01**		05 30.2	31209	66772	**01**		05 45.2	31402	66965
02		05 15.5	31011	66574	**02**		05 30.5	31212	66775	**02**		05 45.5	31405	66968
03		05 15.8	31014	66577	**03**		05 30.8	31216	66779	**03**		05 45.8	31408	66971
04		05 16.0	31017	66580	**04**		05 31.0	31219	66782	**04**		05 46.0	31411	66974
05		05 16.2	31021	66584	**05**		05 31.2	31222	66785	**05**		05 46.2	31414	66978
06	21.1	05 16.5	31024	66587	**06**	22.1	05 31.5	31225	66788	**06**	23.1	05 46.5	31418	66981
07		05 16.8	31028	66591	**07**		05 31.8	31229	66792	**07**		05 46.8	31421	66984
08		05 17.0	31031	66594	**08**		05 32.0	31232	66795	**08**		05 47.0	31424	66987
09		05 17.2	31035	66598	**09**		05 32.2	31235	66798	**09**		05 47.2	31427	66990
10		05 17.5	31038	66601	**10**		05 32.5	31239	66802	**10**		05 47.5	31430	66993
11		05 17.8	31041	66604	**11**		05 32.8	31242	66805	**11**		05 47.8	31433	66996
12	21.2	05 18.0	31045	66608	**12**	22.2	05 33.0	31245	66808	**12**	23.2	05 48.0	31436	66999
13		05 18.2	31048	66611	**13**		05 33.2	31248	66811	**13**		05 48.2	31440	67003
14		05 18.5	31052	66615	**14**		05 33.5	31252	66815	**14**		05 48.5	31443	67006
15		05 18.8	31055	66618	**15**		05 33.8	31255	66818	**15**		05 48.8	31446	67009
16		05 19.0	31059	66622	**16**		05 34.0	31258	66821	**16**		05 49.0	31449	67012
17		05 19.3	31062	66625	**17**		05 34.3	31261	66824	**17**		05 49.3	31452	67015
18	21.3	05 19.5	31065	66628	**18**	22.3	05 34.5	31265	66828	**18**	23.3	05 49.5	31455	67018
19		05 19.7	31069	66632	**19**		05 34.8	31268	66831	**19**		05 49.8	31458	67021
20		05 20.0	31072	66635	**20**		05 35.0	31271	66834	**20**		05 50.0	31461	67024
21		05 20.3	31075	66639	**21**		05 35.3	31274	66837	**21**		05 50.3	31464	67027
22		05 20.5	31079	66642	**22**		05 35.5	31278	66841	**22**		05 50.5	31467	67031
23		05 20.7	31082	66645	**23**		05 35.7	31281	66844	**23**		05 50.7	31471	67034
24	21.4	05 21.0	31086	66649	**24**	22.4	05 36.0	31284	66847	**24**	23.4	05 51.0	31474	67037
25		05 21.3	31089	66652	**25**		05 36.3	31287	66850	**25**		05 51.3	31477	67040
26		05 21.5	31092	66655	**26**		05 36.5	31290	66853	**26**		05 51.5	31480	67043
27		05 21.7	31096	66659	**27**		05 36.7	31294	66857	**27**		05 51.7	31483	67046
28		05 22.0	31099	66662	**28**		05 37.0	31297	66860	**28**		05 52.0	31486	67049
29		05 22.3	31103	66666	**29**		05 37.3	31300	66863	**29**		05 52.3	31489	67052
30	21.5	05 22.5	31106	66669	**30**	22.5	05 37.5	31303	66866	**30**	23.5	05 52.5	31492	67055
31		05 22.7	31109	66672	**31**		05 37.7	31307	66870	**31**		05 52.7	31495	67058
32		05 23.0	31113	66676	**32**		05 38.0	31310	66873	**32**		05 53.0	31498	67061
33		05 23.3	31116	66679	**33**		05 38.3	31313	66876	**33**		05 53.3	31501	67064
34		05 23.5	31119	66682	**34**		05 38.5	31316	66879	**34**		05 53.5	31504	67068
35		05 23.7	31123	66686	**35**		05 38.7	31319	66882	**35**		05 53.7	31508	67071
36	21.6	05 24.0	31126	66689	**36**	22.6	05 39.0	31323	66886	**36**	23.6	05 54.0	31511	67074
37		05 24.3	31129	66692	**37**		05 39.3	31326	66889	**37**		05 54.3	31514	67077
38		05 24.5	31133	66696	**38**		05 39.5	31329	66892	**38**		05 54.5	31517	67080
39		05 24.7	31136	66699	**39**		05 39.7	31332	66895	**39**		05 54.7	31520	67083
40		05 25.0	31139	66702	**40**		05 40.0	31335	66898	**40**		05 55.0	31523	67086
41		05 25.3	31143	66706	**41**		05 40.2	31339	66902	**41**		05 55.2	31526	67089
42	21.7	05 25.5	31146	66709	**42**	22.7	05 40.5	31342	66905	**42**	23.7	05 55.5	31529	67092
43		05 25.7	31149	66712	**43**		05 40.7	31345	66908	**43**		05 55.7	31532	67095
44		05 26.0	31153	66716	**44**		05 41.0	31348	66911	**44**		05 56.0	31535	67098
45		05 26.2	31156	66719	**45**		05 41.2	31351	66914	**45**		05 56.2	31538	67101
46		05 26.5	31159	66722	**46**		05 41.5	31355	66918	**46**		05 56.5	31541	67104
47		05 26.8	31163	66726	**47**		05 41.8	31358	66921	**47**		05 56.8	31544	67107
48	21.8	05 27.0	31166	66729	**48**	22.8	05 42.0	31361	66924	**48**	23.8	05 57.0	31547	67110
49		05 27.2	31169	66732	**49**		05 42.2	31364	66927	**49**		05 57.2	31550	67113
50		05 27.5	31173	66736	**50**		05 42.5	31367	66930	**50**		05 57.5	31553	67116
51		05 27.8	31176	66739	**51**		05 42.8	31370	66933	**51**		05 57.8	31556	67119
52		05 28.0	31179	66742	**52**		05 43.0	31374	66937	**52**		05 58.0	31559	67122
53		05 28.2	31183	66746	**53**		05 43.2	31377	66940	**53**		05 58.2	31562	67125
54	21.9	05 28.5	31186	66749	**54**	22.9	05 43.5	31380	66943	**54**	23.9	05 58.5	31565	67129
55		05 28.8	31189	66752	**55**		05 43.8	31383	66946	**55**		05 58.8	31569	67132
56		05 29.0	31193	66756	**56**		05 44.0	31386	66949	**56**		05 59.0	31572	67135
57		05 29.2	31196	66759	**57**		05 44.2	31389	66952	**57**		05 59.2	31575	67138
58		05 29.5	31199	66762	**58**		05 44.5	31392	66956	**58**		05 59.5	31578	67141
59		05 29.8	31202	66765	**59**		05 44.8	31396	66959	**59**		05 59.8	31581	67144

24 Min					25 Min					26 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	24.0	06 00.0	31584	67147	**00**	25.0	06 15.0	31761	67324	**00**	26.0	06 30.0	31931	67494
01		06 00.2	31587	67150	**01**		06 15.2	31764	67327	**01**		06 30.2	31934	67497
02		06 00.5	31590	67153	**02**		06 15.5	31767	67330	**02**		06 30.5	31937	67500
03		06 00.8	31593	67156	**03**		06 15.8	31770	67333	**03**		06 30.8	31940	67503
04		06 01.0	31596	67159	**04**		06 16.0	31772	67336	**04**		06 31.0	31942	67505
05		06 01.2	31599	67162	**05**		06 16.2	31775	67338	**05**		06 31.2	31945	67508
06	24.1	06 01.5	31602	67165	**06**	25.1	06 16.5	31778	67341	**06**	26.1	06 31.5	31948	67511
07		06 01.8	31605	67168	**07**		06 16.8	31781	67344	**07**		06 31.8	31951	67514
08		06 02.0	31608	67171	**08**		06 17.0	31784	67347	**08**		06 32.0	31953	67516
09		06 02.2	31611	67174	**09**		06 17.2	31787	67350	**09**		06 32.2	31956	67519
10		06 02.5	31614	67177	**10**		06 17.5	31790	67353	**10**		06 32.5	31959	67522
11		06 02.8	31617	67180	**11**		06 17.8	31793	67356	**11**		06 32.8	31962	67525
12	24.2	06 03.0	31620	67183	**12**	25.2	06 18.0	31796	67359	**12**	26.2	06 33.0	31965	67528
13		06 03.2	31623	67186	**13**		06 18.2	31798	67361	**13**		06 33.2	31967	67530
14		06 03.5	31626	67189	**14**		06 18.5	31801	67364	**14**		06 33.5	31970	67533
15		06 03.8	31629	67192	**15**		06 18.8	31804	67367	**15**		06 33.8	31973	67536
16		06 04.0	31632	67195	**16**		06 19.0	31807	67370	**16**		06 34.0	31976	67539
17		06 04.3	31635	67198	**17**		06 19.3	31810	67373	**17**		06 34.3	31978	67541
18	24.3	06 04.5	31638	67201	**18**	25.3	06 19.5	31813	67376	**18**	26.3	06 34.5	31981	67544
19		06 04.7	31641	67204	**19**		06 19.7	31816	67379	**19**		06 34.8	31984	67547
20		06 05.0	31644	67207	**20**		06 20.0	31818	67381	**20**		06 35.0	31987	67550
21		06 05.3	31647	67210	**21**		06 20.3	31821	67384	**21**		06 35.3	31989	67552
22		06 05.5	31649	67212	**22**		06 20.5	31824	67387	**22**		06 35.5	31992	67555
23		06 05.7	31652	67215	**23**		06 20.7	31827	67390	**23**		06 35.7	31995	67558
24	24.4	06 06.0	31655	67218	**24**	25.4	06 21.0	31830	67393	**24**	26.4	06 36.0	31998	67561
25		06 06.3	31658	67221	**25**		06 21.3	31833	67396	**25**		06 36.3	32000	67563
26		06 06.5	31661	67224	**26**		06 21.5	31836	67399	**26**		06 36.5	32003	67566
27		06 06.7	31664	67227	**27**		06 21.7	31838	67401	**27**		06 36.7	32006	67569
28		06 07.0	31667	67230	**28**		06 22.0	31841	67404	**28**		06 37.0	32009	67572
29		06 07.3	31670	67233	**29**		06 22.3	31844	67407	**29**		06 37.3	32011	67574
30	24.5	06 07.5	31673	67236	**30**	25.5	06 22.5	31847	67410	**30**	26.5	06 37.5	32014	67577
31		06 07.7	31676	67239	**31**		06 22.7	31850	67413	**31**		06 37.7	32017	67580
32		06 08.0	31679	67242	**32**		06 23.0	31853	67416	**32**		06 38.0	32019	67582
33		06 08.3	31682	67245	**33**		06 23.3	31855	67418	**33**		06 38.3	32022	67585
34		06 08.5	31685	67248	**34**		06 23.5	31858	67421	**34**		06 38.5	32025	67588
35		06 08.7	31688	67251	**35**		06 23.7	31861	67424	**35**		06 38.7	32028	67591
36	24.6	06 09.0	31691	67254	**36**	25.6	06 24.0	31864	67427	**36**	26.6	06 39.0	32030	67593
37		06 09.3	31694	67257	**37**		06 24.3	31867	67430	**37**		06 39.3	32033	67596
38		06 09.5	31697	67260	**38**		06 24.5	31870	67433	**38**		06 39.5	32036	67599
39		06 09.7	31700	67263	**39**		06 24.7	31872	67435	**39**		06 39.7	32038	67602
40		06 10.0	31703	67266	**40**		06 25.0	31875	67438	**40**		06 40.0	32041	67604
41		06 10.3	31706	67269	**41**		06 25.3	31878	67441	**41**		06 40.2	32044	67607
42	24.7	06 10.5	31708	67272	**42**	25.7	06 25.5	31881	67444	**42**	26.7	06 40.5	32047	67610
43		06 10.7	31711	67274	**43**		06 25.7	31884	67447	**43**		06 40.7	32049	67612
44		06 11.0	31714	67277	**44**		06 26.0	31886	67449	**44**		06 41.0	32052	67615
45		06 11.2	31717	67280	**45**		06 26.2	31889	67452	**45**		06 41.2	32055	67618
46		06 11.5	31720	67283	**46**		06 26.5	31892	67455	**46**		06 41.5	32057	67620
47		06 11.8	31723	67286	**47**		06 26.8	31895	67458	**47**		06 41.8	32060	67623
48	24.8	06 12.0	31726	67289	**48**	25.8	06 27.0	31898	67461	**48**	26.8	06 42.0	32063	67626
49		06 12.2	31729	67292	**49**		06 27.2	31901	67464	**49**		06 42.2	32066	67629
50		06 12.5	31732	67295	**50**		06 27.5	31903	67466	**50**		06 42.5	32068	67631
51		06 12.8	31735	67298	**51**		06 27.8	31906	67469	**51**		06 42.8	32071	67634
52		06 13.0	31738	67301	**52**		06 28.0	31909	67472	**52**		06 43.0	32074	67637
53		06 13.2	31741	67304	**53**		06 28.2	31912	67475	**53**		06 43.2	32076	67639
54	24.9	06 13.5	31744	67307	**54**	25.9	06 28.5	31915	67478	**54**	26.9	06 43.5	32079	67642
55		06 13.8	31746	67309	**55**		06 28.8	31917	67480	**55**		06 43.8	32082	67645
56		06 14.0	31749	67312	**56**		06 29.0	31920	67483	**56**		06 44.0	32084	67647
57		06 14.2	31752	67315	**57**		06 29.2	31923	67486	**57**		06 44.2	32087	67650
58		06 14.5	31755	67318	**58**		06 29.5	31926	67489	**58**		06 44.5	32090	67653
59		06 14.8	31758	67321	**59**		06 29.8	31928	67491	**59**		06 44.8	32092	67655

27 Min					28 Min					29 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	27.0	06 45.0	32095	67658	00	28.0	07 00.0	32253	67816	00	29.0	07 15.0	32405	67969
01		06 45.2	32098	67661	01		07 00.2	32256	67819	01		07 15.2	32408	67971
02		06 45.5	32101	67664	02		07 00.5	32258	67821	02		07 15.5	32410	67974
03		06 45.8	32103	67666	03		07 00.8	32261	67824	03		07 15.8	32413	67976
04		06 46.0	32106	67669	04		07 01.0	32263	67826	04		07 16.0	32415	67978
05		06 46.2	32109	67672	05		07 01.2	32266	67829	05		07 16.2	32418	67981
06	27.1	06 46.5	32111	67674	06	28.1	07 01.5	32269	67832	06	29.1	07 16.5	32420	67983
07		06 46.8	32114	67677	07		07 01.8	32271	67834	07		07 16.8	32423	67986
08		06 47.0	32117	67680	08		07 02.0	32274	67837	08		07 17.0	32425	67988
09		06 47.2	32119	67682	09		07 02.2	32276	67839	09		07 17.2	32428	67991
10		06 47.5	32122	67685	10		07 02.5	32279	67842	10		07 17.5	32430	67993
11		06 47.8	32125	67688	11		07 02.8	32281	67844	11		07 17.8	32433	67996
12	27.2	06 48.0	32127	67690	12	28.2	07 03.0	32284	67847	12	29.2	07 18.0	32435	67998
13		06 48.2	32130	67693	13		07 03.2	32287	67850	13		07 18.2	32438	68001
14		06 48.5	32133	67696	14		07 03.5	32289	67852	14		07 18.5	32440	68003
15		06 48.8	32135	67698	15		07 03.8	32292	67855	15		07 18.8	32443	68006
16		06 49.0	32138	67701	16		07 04.0	32294	67857	16		07 19.0	32445	68008
17		06 49.3	32140	67704	17		07 04.3	32297	67860	17		07 19.3	32448	68011
18	27.3	06 49.5	32143	67706	18	28.3	07 04.5	32299	67862	18	29.3	07 19.5	32450	68013
19		06 49.8	32146	67709	19		07 04.7	32302	67865	19		07 19.7	32453	68016
20		06 50.0	32148	67711	20		07 05.0	32304	67868	20		07 20.0	32455	68018
21		06 50.3	32151	67714	21		07 05.3	32307	67870	21		07 20.3	32458	68021
22		06 50.5	32154	67717	22		07 05.5	32310	67873	22		07 20.5	32460	68023
23		06 50.7	32156	67719	23		07 05.7	32312	67875	23		07 20.7	32463	68026
24	27.4	06 51.0	32159	67722	24	28.4	07 06.0	32315	67878	24	29.4	07 21.0	32465	68028
25		06 51.3	32162	67725	25		07 06.3	32317	67880	25		07 21.3	32467	68030
26		06 51.5	32164	67727	26		07 06.5	32320	67883	26		07 21.5	32470	68033
27		06 51.7	32167	67730	27		07 06.7	32322	67885	27		07 21.7	32472	68035
28		06 52.0	32170	67733	28		07 07.0	32325	67888	28		07 22.0	32475	68038
29		06 52.3	32172	67735	29		07 07.3	32327	67890	29		07 22.3	32477	68040
30	27.5	06 52.5	32175	67738	30	28.5	07 07.5	32330	67893	30	29.5	07 22.5	32480	68043
31		06 52.7	32177	67740	31		07 07.7	32333	67896	31		07 22.7	32482	68045
32		06 53.0	32180	67743	32		07 08.0	32335	67898	32		07 23.0	32485	68048
33		06 53.3	32183	67746	33		07 08.3	32338	67901	33		07 23.3	32487	68050
34		06 53.5	32185	67748	34		07 08.5	32340	67903	34		07 23.5	32490	68053
35		06 53.7	32188	67751	35		07 08.7	32343	67906	35		07 23.7	32492	68055
36	27.6	06 54.0	32191	67754	36	28.6	07 09.0	32345	67908	36	29.6	07 24.0	32494	68057
37		06 54.3	32193	67756	37		07 09.3	32348	67911	37		07 24.3	32497	68060
38		06 54.5	32196	67759	38		07 09.5	32350	67913	38		07 24.5	32499	68062
39		06 54.7	32198	67761	39		07 09.7	32353	67916	39		07 24.7	32502	68065
40		06 55.0	32201	67764	40		07 10.0	32355	67918	40		07 25.0	32504	68067
41		06 55.2	32204	67767	41		07 10.3	32358	67921	41		07 25.3	32507	68070
42	27.7	06 55.5	32206	67769	42	28.7	07 10.5	32360	67923	42	29.7	07 25.5	32509	68072
43		06 55.7	32209	67772	43		07 10.7	32363	67926	43		07 25.7	32512	68075
44		06 56.0	32212	67775	44		07 11.0	32365	67928	44		07 26.0	32514	68077
45		06 56.2	32214	67777	45		07 11.2	32368	67931	45		07 26.2	32516	68079
46		06 56.5	32217	67780	46		07 11.5	32370	67933	46		07 26.5	32519	68082
47		06 56.8	32219	67782	47		07 11.8	32373	67936	47		07 26.8	32521	68084
48	27.8	06 57.0	32222	67785	48	28.8	07 12.0	32375	67938	48	29.8	07 27.0	32524	68087
49		06 57.2	32225	67788	49		07 12.2	32378	67941	49		07 27.2	32526	68089
50		06 57.5	32227	67790	50		07 12.5	32380	67943	50		07 27.5	32529	68092
51		06 57.8	32230	67793	51		07 12.8	32383	67946	51		07 27.8	32531	68094
52		06 58.0	32232	67795	52		07 13.0	32385	67949	52		07 28.0	32533	68096
53		06 58.2	32235	67798	53		07 13.2	32388	67951	53		07 28.2	32536	68099
54	27.9	06 58.5	32238	67801	54	28.9	07 13.5	32390	67954	54	29.9	07 28.5	32538	68101
55		06 58.8	32240	67803	55		07 13.8	32393	67956	55		07 28.8	32541	68104
56		06 59.0	32243	67806	56		07 14.0	32395	67959	56		07 29.0	32543	68106
57		06 59.2	32245	67808	57		07 14.2	32398	67961	57		07 29.2	32545	68109
58		06 59.5	32248	67811	58		07 14.5	32400	67964	58		07 29.5	32548	68111
59		06 59.8	32251	67814	59		07 14.8	32403	67966	59		07 29.8	32550	68113

30 Min					31 Min					32 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
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01		07 30.2	32555	68118	01		07 45.2	32697	68260	01		08 00.2	32835	68398
02		07 30.5	32558	68121	02		07 45.5	32700	68263	02		08 00.5	32838	68401
03		07 30.8	32560	68123	03		07 45.8	32702	68265	03		08 00.7	32840	68403
04		07 31.0	32562	68125	04		07 46.0	32704	68267	04		08 01.0	32842	68405
05		07 31.2	32565	68128	05		07 46.2	32707	68270	05		08 01.3	32844	68407
06	30.1	07 31.5	32567	68130	06	31.1	07 46.5	32709	68272	06	32.1	08 01.5	32847	68410
07		07 31.8	32570	68133	07		07 46.8	32711	68274	07		08 01.8	32849	68412
08		07 32.0	32572	68135	08		07 47.0	32714	68277	08		08 02.0	32851	68414
09		07 32.2	32574	68137	09		07 47.2	32716	68279	09		08 02.2	32853	68416
10		07 32.5	32577	68140	10		07 47.5	32718	68281	10		08 02.5	32856	68419
11		07 32.8	32579	68142	11		07 47.8	32721	68284	11		08 02.7	32858	68421
12	30.2	07 33.0	32582	68145	12	31.2	07 48.0	32723	68286	12	32.2	08 03.0	32860	68423
13		07 33.2	32584	68147	13		07 48.2	32725	68288	13		08 03.3	32862	68425
14		07 33.5	32586	68149	14		07 48.5	32728	68291	14		08 03.5	32865	68428
15		07 33.8	32589	68152	15		07 48.8	32730	68293	15		08 03.8	32867	68430
16		07 34.0	32591	68154	16		07 49.0	32732	68295	16		08 04.0	32869	68432
17		07 34.3	32594	68157	17		07 49.3	32735	68298	17		08 04.2	32871	68434
18	30.3	07 34.5	32596	68159	18	31.3	07 49.5	32737	68300	18	32.3	08 04.5	32874	68437
19		07 34.8	32598	68161	19		07 49.8	32739	68302	19		08 04.8	32876	68439
20		07 35.0	32601	68164	20		07 50.0	32742	68305	20		08 05.0	32878	68441
21		07 35.3	32603	68166	21		07 50.3	32744	68307	21		08 05.3	32880	68443
22		07 35.5	32605	68169	22		07 50.5	32746	68309	22		08 05.5	32882	68446
23		07 35.7	32608	68171	23		07 50.7	32749	68312	23		08 05.7	32885	68448
24	30.4	07 36.0	32610	68173	24	31.4	07 51.0	32751	68314	24	32.4	08 06.0	32887	68450
25		07 36.3	32613	68176	25		07 51.3	32753	68316	25		08 06.2	32889	68452
26		07 36.5	32615	68178	26		07 51.5	32755	68318	26		08 06.5	32891	68454
27		07 36.7	32617	68180	27		07 51.7	32758	68321	27		08 06.8	32894	68457
28		07 37.0	32620	68183	28		07 52.0	32760	68323	28		08 07.0	32896	68459
29		07 37.3	32622	68185	29		07 52.3	32762	68325	29		08 07.3	32898	68461
30	30.5	07 37.5	32625	68188	30	31.5	07 52.5	32765	68328	30	32.5	08 07.5	32900	68463
31		07 37.7	32627	68190	31		07 52.7	32767	68330	31		08 07.7	32903	68466
32		07 38.0	32629	68192	32		07 53.0	32769	68332	32		08 08.0	32905	68468
33		07 38.3	32632	68195	33		07 53.3	32772	68335	33		08 08.2	32907	68470
34		07 38.5	32634	68197	34		07 53.5	32774	68337	34		08 08.5	32909	68472
35		07 38.7	32636	68199	35		07 53.7	32776	68339	35		08 08.8	32911	68474
36	30.6	07 39.0	32639	68202	36	31.6	07 54.0	32778	68341	36	32.6	08 09.0	32914	68477
37		07 39.3	32641	68204	37		07 54.3	32781	68344	37		08 09.3	32916	68479
38		07 39.5	32643	68206	38		07 54.5	32783	68346	38		08 09.5	32918	68481
39		07 39.7	32646	68209	39		07 54.7	32785	68348	39		08 09.7	32920	68483
40		07 40.0	32648	68211	40		07 55.0	32788	68351	40		08 10.0	32923	68486
41		07 40.2	32651	68214	41		07 55.2	32790	68353	41		08 10.2	32925	68488
42	30.7	07 40.5	32653	68216	42	31.7	07 55.5	32792	68355	42	32.7	08 10.5	32927	68490
43		07 40.7	32655	68218	43		07 55.7	32794	68357	43		08 10.8	32929	68492
44		07 41.0	32658	68221	44		07 56.0	32797	68360	44		08 11.0	32931	68494
45		07 41.2	32660	68223	45		07 56.2	32799	68362	45		08 11.2	32934	68497
46		07 41.5	32662	68225	46		07 56.5	32801	68364	46		08 11.5	32936	68499
47		07 41.8	32665	68228	47		07 56.8	32804	68367	47		08 11.7	32938	68501
48	30.8	07 42.0	32667	68230	48	31.8	07 57.0	32806	68369	48	32.8	08 12.0	32940	68503
49		07 42.2	32669	68232	49		07 57.2	32808	68371	49		08 12.3	32942	68505
50		07 42.5	32672	68235	50		07 57.5	32810	68373	50		08 12.5	32945	68508
51		07 42.8	32674	68237	51		07 57.8	32813	68376	51		08 12.8	32947	68510
52		07 43.0	32676	68239	52		07 58.0	32815	68378	52		08 13.0	32949	68512
53		07 43.2	32679	68242	53		07 58.2	32817	68380	53		08 13.2	32951	68514
54	30.9	07 43.5	32681	68244	54	31.9	07 58.5	32819	68382	54	32.9	08 13.5	32953	68516
55		07 43.8	32683	68246	55		07 58.8	32822	68385	55		08 13.7	32956	68519
56		07 44.0	32686	68249	56		07 59.0	32824	68387	56		08 14.0	32958	68521
57		07 44.2	32688	68251	57		07 59.2	32826	68389	57		08 14.3	32960	68523
58		07 44.5	32690	68253	58		07 59.5	32828	68392	58		08 14.5	32962	68525
59		07 44.8	32693	68256	59		07 59.8	32831	68394	59		08 14.8	32964	68527

33 Min					34 Min					35 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	33.0	08 15.0	32967	68530	**00**	34.0	08 30.0	33096	68659	**00**	35.0	08 45.0	33222	68785
01		08 15.2	32969	68532	**01**		08 30.2	33098	68661	**01**		08 45.2	33224	68787
02		08 15.5	32971	68534	**02**		08 30.5	33101	68664	**02**		08 45.5	33226	68789
03		08 15.7	32973	68536	**03**		08 30.7	33103	68666	**03**		08 45.7	33228	68791
04		08 16.0	32975	68538	**04**		08 31.0	33105	68668	**04**		08 46.0	33230	68793
05		08 16.3	32978	68541	**05**		08 31.3	33107	68670	**05**		08 46.3	33233	68796
06	33.1	08 16.5	32980	68543	**06**	34.1	08 31.5	33109	68672	**06**	35.1	08 46.5	33235	68798
07		08 16.8	32982	68545	**07**		08 31.8	33111	68674	**07**		08 46.8	33237	68800
08		08 17.0	32984	68547	**08**		08 32.0	33113	68676	**08**		08 47.0	33239	68802
09		08 17.2	32986	68549	**09**		08 32.2	33115	68678	**09**		08 47.2	33241	68804
10		08 17.5	32989	68552	**10**		08 32.5	33118	68681	**10**		08 47.5	33243	68806
11		08 17.7	32991	68554	**11**		08 32.7	33120	68683	**11**		08 47.7	33245	68808
12	33.2	08 18.0	32993	68556	**12**	34.2	08 33.0	33122	68685	**12**	35.2	08 48.0	33247	68810
13		08 18.3	32995	68558	**13**		08 33.3	33124	68687	**13**		08 48.3	33249	68812
14		08 18.5	32997	68560	**14**		08 33.5	33126	68689	**14**		08 48.5	33251	68814
15		08 18.8	32999	68562	**15**		08 33.8	33128	68691	**15**		08 48.8	33253	68816
16		08 19.0	33002	68565	**16**		08 34.0	33130	68693	**16**		08 49.0	33255	68818
17		08 19.2	33004	68567	**17**		08 34.2	33132	68695	**17**		08 49.2	33257	68820
18	33.3	08 19.5	33006	68569	**18**	34.3	08 34.5	33134	68697	**18**	35.3	08 49.5	33259	68822
19		08 19.8	33008	68571	**19**		08 34.8	33137	68700	**19**		08 49.8	33261	68824
20		08 20.0	33010	68573	**20**		08 35.0	33139	68702	**20**		08 50.0	33263	68826
21		08 20.3	33012	68575	**21**		08 35.3	33141	68704	**21**		08 50.3	33265	68828
22		08 20.5	33015	68578	**22**		08 35.5	33143	68706	**22**		08 50.5	33267	68830
23		08 20.7	33017	68580	**23**		08 35.7	33145	68708	**23**		08 50.7	33269	68833
24	33.4	08 21.0	33019	68582	**24**	34.4	08 36.0	33147	68710	**24**	35.4	08 51.0	33272	68835
25		08 21.2	33021	68584	**25**		08 36.2	33149	68712	**25**		08 51.2	33274	68837
26		08 21.5	33023	68586	**26**		08 36.5	33151	68714	**26**		08 51.5	33276	68839
27		08 21.8	33025	68588	**27**		08 36.8	33153	68716	**27**		08 51.8	33278	68841
28		08 22.0	33028	68591	**28**		08 37.0	33156	68719	**28**		08 52.0	33280	68843
29		08 22.3	33030	68593	**29**		08 37.3	33158	68721	**29**		08 52.3	33282	68845
30	33.5	08 22.5	33032	68595	**30**	34.5	08 37.5	33160	68723	**30**	35.5	08 52.5	33284	68847
31		08 22.7	33034	68597	**31**		08 37.7	33162	68725	**31**		08 52.7	33286	68849
32		08 23.0	33036	68599	**32**		08 38.0	33164	68727	**32**		08 53.0	33288	68851
33		08 23.2	33038	68601	**33**		08 38.2	33166	68729	**33**		08 53.2	33290	68853
34		08 23.5	33041	68604	**34**		08 38.5	33168	68731	**34**		08 53.5	33292	68855
35		08 23.8	33043	68606	**35**		08 38.8	33170	68733	**35**		08 53.8	33294	68857
36	33.6	08 24.0	33045	68608	**36**	34.6	08 39.0	33172	68735	**36**	35.6	08 54.0	33296	68859
37		08 24.3	33047	68610	**37**		08 39.3	33174	68737	**37**		08 54.3	33298	68861
38		08 24.5	33049	68612	**38**		08 39.5	33176	68739	**38**		08 54.5	33300	68863
39		08 24.7	33051	68614	**39**		08 39.7	33179	68742	**39**		08 54.7	33302	68865
40		08 25.0	33054	68617	**40**		08 40.0	33181	68744	**40**		08 55.0	33304	68867
41		08 25.2	33056	68619	**41**		08 40.2	33183	68746	**41**		08 55.2	33306	68869
42	33.7	08 25.5	33058	68621	**42**	34.7	08 40.5	33185	68748	**42**	35.7	08 55.5	33308	68871
43		08 25.8	33060	68623	**43**		08 40.8	33187	68750	**43**		08 55.8	33310	68873
44		08 26.0	33062	68625	**44**		08 41.0	33189	68752	**44**		08 56.0	33312	68875
45		08 26.2	33064	68627	**45**		08 41.2	33191	68754	**45**		08 56.2	33314	68877
46		08 26.5	33066	68629	**46**		08 41.5	33193	68756	**46**		08 56.5	33316	68879
47		08 26.7	33069	68632	**47**		08 41.7	33195	68758	**47**		08 56.7	33318	68881
48	33.8	08 27.0	33071	68634	**48**	34.8	08 42.0	33197	68760	**48**	35.8	08 57.0	33320	68883
49		08 27.3	33073	68636	**49**		08 42.3	33199	68762	**49**		08 57.3	33322	68885
50		08 27.5	33075	68638	**50**		08 42.5	33201	68764	**50**		08 57.5	33324	68887
51		08 27.8	33077	68640	**51**		08 42.8	33204	68767	**51**		08 57.8	33326	68889
52		08 28.0	33079	68642	**52**		08 43.0	33206	68769	**52**		08 58.0	33328	68891
53		08 28.2	33081	68644	**53**		08 43.2	33208	68771	**53**		08 58.2	33330	68893
54	33.9	08 28.5	33084	68647	**54**	34.9	08 43.5	33210	68773	**54**	35.9	08 58.5	33332	68895
55		08 28.7	33086	68649	**55**		08 43.7	33212	68775	**55**		08 58.7	33334	68897
56		08 29.0	33088	68651	**56**		08 44.0	33214	68777	**56**		08 59.0	33336	68900
57		08 29.3	33090	68653	**57**		08 44.3	33216	68779	**57**		08 59.3	33339	68902
58		08 29.5	33092	68655	**58**		08 44.5	33218	68781	**58**		08 59.5	33341	68904
59		08 29.8	33094	68657	**59**		08 44.8	33220	68783	**59**		08 59.8	33343	68906

36 Min					37 Min					38 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	36.0	09 00.0	33345	68908	00	37.0	09 15.0	33464	69027	00	38.0	09 30.0	33579	69142
01		09 00.2	33347	68910	01		09 15.2	33465	69029	01		09 30.2	33581	69144
02		09 00.5	33349	68912	02		09 15.5	33467	69030	02		09 30.5	33583	69146
03		09 00.7	33351	68914	03		09 15.7	33469	69032	03		09 30.7	33585	69148
04		09 01.0	33353	68916	04		09 16.0	33471	69034	04		09 31.0	33587	69150
05		09 01.3	33355	68918	05		09 16.3	33473	69036	05		09 31.3	33589	69152
06	36.1	09 01.5	33357	68920	06	37.1	09 16.5	33475	69038	06	38.1	09 31.5	33591	69154
07		09 01.8	33359	68922	07		09 16.8	33477	69040	07		09 31.8	33593	69156
08		09 02.0	33361	68924	08		09 17.0	33479	69042	08		09 32.0	33595	69158
09		09 02.2	33363	68926	09		09 17.2	33481	69044	09		09 32.2	33596	69159
10		09 02.5	33365	68928	10		09 17.5	33483	69046	10		09 32.5	33598	69161
11		09 02.7	33367	68930	11		09 17.7	33485	69048	11		09 32.7	33600	69163
12	36.2	09 03.0	33369	68932	12	37.2	09 18.0	33487	69050	12	38.2	09 33.0	33602	69165
13		09 03.3	33371	68934	13		09 18.3	33489	69052	13		09 33.3	33604	69167
14		09 03.5	33373	68936	14		09 18.5	33491	69054	14		09 33.5	33606	69169
15		09 03.8	33375	68938	15		09 18.8	33493	69056	15		09 33.8	33608	69171
16		09 04.0	33377	68940	16		09 19.0	33495	69058	16		09 34.0	33610	69173
17		09 04.2	33379	68942	17		09 19.2	33497	69060	17		09 34.2	33612	69175
18	36.3	09 04.5	33381	68944	18	37.3	09 19.5	33499	69062	18	38.3	09 34.5	33614	69177
19		09 04.8	33383	68946	19		09 19.8	33501	69064	19		09 34.8	33615	69178
20		09 05.0	33385	68948	20		09 20.0	33502	69066	20		09 35.0	33617	69180
21		09 05.3	33387	68950	21		09 20.3	33504	69067	21		09 35.3	33619	69182
22		09 05.5	33389	68952	22		09 20.5	33506	69069	22		09 35.5	33621	69184
23		09 05.7	33391	68954	23		09 20.7	33508	69071	23		09 35.7	33623	69186
24	36.4	09 06.0	33393	68956	24	37.4	09 21.0	33510	69073	24	38.4	09 36.0	33625	69188
25		09 06.2	33395	68958	25		09 21.2	33512	69075	25		09 36.2	33627	69190
26		09 06.5	33397	68960	26		09 21.5	33514	69077	26		09 36.5	33629	69192
27		09 06.8	33398	68962	27		09 21.8	33516	69079	27		09 36.8	33630	69194
28		09 07.0	33400	68963	28		09 22.0	33518	69081	28		09 37.0	33632	69195
29		09 07.3	33402	68965	29		09 22.3	33520	69083	29		09 37.3	33634	69197
30	36.5	09 07.5	33404	68967	30	37.5	09 22.5	33522	69085	30	38.5	09 37.5	33636	69199
31		09 07.7	33406	68969	31		09 22.7	33524	69087	31		09 37.7	33638	69201
32		09 08.0	33408	68971	32		09 23.0	33526	69089	32		09 38.0	33640	69203
33		09 08.2	33410	68973	33		09 23.2	33528	69091	33		09 38.2	33642	69205
34		09 08.5	33412	68975	34		09 23.5	33530	69093	34		09 38.5	33644	69207
35		09 08.8	33414	68977	35		09 23.8	33531	69094	35		09 38.8	33646	69209
36	36.6	09 09.0	33416	68979	36	37.6	09 24.0	33533	69096	36	38.6	09 39.0	33647	69210
37		09 09.3	33418	68981	37		09 24.3	33535	69098	37		09 39.3	33649	69212
38		09 09.5	33420	68983	38		09 24.5	33537	69100	38		09 39.5	33651	69214
39		09 09.7	33422	68985	39		09 24.7	33539	69102	39		09 39.7	33653	69216
40		09 10.0	33424	68987	40		09 25.0	33541	69104	40		09 40.0	33655	69218
41		09 10.2	33426	68989	41		09 25.2	33543	69106	41		09 40.2	33657	69220
42	36.7	09 10.5	33428	68991	42	37.7	09 25.5	33545	69108	42	38.7	09 40.5	33659	69222
43		09 10.8	33430	68993	43		09 25.8	33547	69110	43		09 40.8	33660	69224
44		09 11.0	33432	68995	44		09 26.0	33549	69112	44		09 41.0	33662	69225
45		09 11.2	33434	68997	45		09 26.2	33551	69114	45		09 41.2	33664	69227
46		09 11.5	33436	68999	46		09 26.5	33553	69116	46		09 41.5	33666	69229
47		09 11.7	33438	69001	47		09 26.7	33555	69118	47		09 41.7	33668	69231
48	36.8	09 12.0	33440	69003	48	37.8	09 27.0	33556	69119	48	38.8	09 42.0	33670	69233
49		09 12.3	33442	69005	49		09 27.3	33558	69121	49		09 42.3	33672	69235
50		09 12.5	33444	69007	50		09 27.5	33560	69123	50		09 42.5	33674	69237
51		09 12.8	33446	69009	51		09 27.8	33562	69125	51		09 42.8	33675	69238
52		09 13.0	33448	69011	52		09 28.0	33564	69127	52		09 43.0	33677	69240
53		09 13.2	33450	69013	53		09 28.2	33566	69129	53		09 43.2	33679	69242
54	36.9	09 13.5	33452	69015	54	37.9	09 28.5	33568	69131	54	38.9	09 43.5	33681	69244
55		09 13.7	33454	69017	55		09 28.7	33570	69133	55		09 43.7	33683	69246
56		09 14.0	33456	69019	56		09 29.0	33572	69135	56		09 44.0	33685	69248
57		09 14.3	33458	69021	57		09 29.3	33574	69137	57		09 44.3	33687	69250
58		09 14.5	33460	69023	58		09 29.5	33576	69139	58		09 44.5	33688	69251
59		09 14.8	33462	69025	59		09 29.8	33577	69140	59		09 44.8	33690	69253

39 Min					40 Min					41 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	39.0	09 45.0	33692	69255	00	40.0	10 00.0	33802	69365	00	41.0	10 15.0	33909	69472
01		09 45.2	33694	69257	01		10 00.2	33804	69367	01		10 15.2	33911	69474
02		09 45.5	33696	69259	02		10 00.5	33806	69369	02		10 15.5	33913	69476
03		09 45.7	33698	69261	03		10 00.7	33808	69371	03		10 15.7	33915	69478
04		09 46.0	33700	69263	04		10 01.0	33809	69372	04		10 16.0	33916	69479
05		09 46.3	33701	69264	05		10 01.3	33811	69374	05		10 16.3	33918	69481
06	39.1	09 46.5	33703	69266	06	40.1	10 01.5	33813	69376	06	41.1	10 16.5	33920	69483
07		09 46.8	33705	69268	07		10 01.8	33815	69378	07		10 16.8	33922	69485
08		09 47.0	33707	69270	08		10 02.0	33817	69380	08		10 17.0	33923	69486
09		09 47.2	33709	69272	09		10 02.2	33818	69381	09		10 17.2	33925	69488
10		09 47.5	33711	69274	10		10 02.5	33820	69383	10		10 17.5	33927	69490
11		09 47.7	33713	69276	11		10 02.7	33822	69385	11		10 17.7	33929	69492
12	39.2	09 48.0	33714	69277	12	40.2	10 03.0	33824	69387	12	41.2	10 18.0	33930	69494
13		09 48.3	33716	69279	13		10 03.3	33826	69389	13		10 18.3	33932	69495
14		09 48.5	33718	69281	14		10 03.5	33827	69390	14		10 18.5	33934	69497
15		09 48.8	33720	69283	15		10 03.8	33829	69392	15		10 18.8	33936	69499
16		09 49.0	33722	69285	16		10 04.0	33831	69394	16		10 19.0	33938	69501
17		09 49.2	33724	69287	17		10 04.2	33833	69396	17		10 19.2	33939	69502
18	39.3	09 49.5	33725	69288	18	40.3	10 04.5	33835	69398	18	41.3	10 19.5	33941	69504
19		09 49.8	33727	69290	19		10 04.8	33836	69399	19		10 19.8	33943	69506
20		09 50.0	33729	69292	20		10 05.0	33838	69401	20		10 20.0	33945	69508
21		09 50.3	33731	69294	21		10 05.3	33840	69403	21		10 20.3	33946	69509
22		09 50.5	33733	69296	22		10 05.5	33842	69405	22		10 20.5	33948	69511
23		09 50.7	33735	69298	23		10 05.7	33844	69407	23		10 20.7	33950	69513
24	39.4	09 51.0	33736	69299	24	40.4	10 06.0	33845	69408	24	41.4	10 21.0	33952	69515
25		09 51.2	33738	69301	25		10 06.2	33847	69410	25		10 21.2	33953	69516
26		09 51.5	33740	69303	26		10 06.5	33849	69412	26		10 21.5	33955	69518
27		09 51.8	33742	69305	27		10 06.8	33851	69414	27		10 21.8	33957	69520
28		09 52.0	33744	69307	28		10 07.0	33852	69416	28		10 22.0	33959	69522
29		09 52.3	33746	69309	29		10 07.3	33854	69417	29		10 22.3	33960	69523
30	39.5	09 52.5	33747	69311	30	40.5	10 07.5	33856	69419	30	41.5	10 22.5	33962	69525
31		09 52.7	33749	69312	31		10 07.7	33858	69421	31		10 22.7	33964	69527
32		09 53.0	33751	69314	32		10 08.0	33860	69423	32		10 23.0	33965	69529
33		09 53.2	33753	69316	33		10 08.2	33861	69424	33		10 23.2	33967	69530
34		09 53.5	33755	69318	34		10 08.5	33863	69426	34		10 23.5	33969	69532
35		09 53.8	33757	69320	35		10 08.8	33865	69428	35		10 23.8	33971	69534
36	39.6	09 54.0	33758	69321	36	40.6	10 09.0	33867	69430	36	41.6	10 24.0	33972	69535
37		09 54.3	33760	69323	37		10 09.3	33869	69432	37		10 24.3	33974	69537
38		09 54.5	33762	69325	38		10 09.5	33870	69433	38		10 24.5	33976	69539
39		09 54.7	33764	69327	39		10 09.7	33872	69435	39		10 24.7	33978	69541
40		09 55.0	33766	69329	40		10 10.0	33874	69437	40		10 25.0	33979	69542
41		09 55.2	33768	69331	41		10 10.2	33876	69439	41		10 25.2	33981	69544
42	39.7	09 55.5	33769	69332	42	40.7	10 10.5	33877	69440	42	41.7	10 25.5	33983	69546
43		09 55.8	33771	69334	43		10 10.8	33879	69442	43		10 25.8	33985	69548
44		09 56.0	33773	69336	44		10 11.0	33881	69444	44		10 26.0	33986	69549
45		09 56.2	33775	69338	45		10 11.2	33883	69446	45		10 26.2	33988	69551
46		09 56.5	33777	69340	46		10 11.5	33885	69448	46		10 26.5	33990	69553
47		09 56.7	33779	69342	47		10 11.7	33886	69449	47		10 26.7	33992	69555
48	39.8	09 57.0	33780	69343	48	40.8	10 12.0	33888	69451	48	41.8	10 27.0	33993	69556
49		09 57.3	33782	69345	49		10 12.3	33890	69453	49		10 27.3	33995	69558
50		09 57.5	33784	69347	50		10 12.5	33892	69455	50		10 27.5	33997	69560
51		09 57.8	33786	69349	51		10 12.8	33893	69456	51		10 27.8	33998	69561
52		09 58.0	33788	69351	52		10 13.0	33895	69458	52		10 28.0	34000	69563
53		09 58.2	33789	69352	53		10 13.2	33897	69460	53		10 28.2	34002	69565
54	39.9	09 58.5	33791	69354	54	40.9	10 13.5	33899	69462	54	41.9	10 28.5	34004	69567
55		09 58.7	33793	69356	55		10 13.7	33901	69464	55		10 28.7	34005	69568
56		09 59.0	33795	69358	56		10 14.0	33902	69465	56		10 29.0	34007	69570
57		09 59.3	33797	69360	57		10 14.3	33904	69467	57		10 29.3	34009	69572
58		09 59.5	33798	69362	58		10 14.5	33906	69469	58		10 29.5	34011	69574
59		09 59.8	33800	69363	59		10 14.8	33908	69471	59		10 29.8	34012	69575

42 Min					43 Min					44 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	42.0	10 30.0	34014	69577	00	43.0	10 45.0	34116	69679	00	44.0	11 00.0	34216	69779
01		10 30.2	34016	69579	01		10 45.2	34118	69681	01		11 00.2	34218	69781
02		10 30.5	34017	69580	02		10 45.5	34120	69683	02		11 00.5	34219	69782
03		10 30.7	34019	69582	03		10 45.7	34121	69684	03		11 00.7	34221	69784
04		10 31.0	34021	69584	04		10 46.0	34123	69686	04		11 01.0	34223	69786
05		10 31.3	34023	69586	05		10 46.3	34125	69688	05		11 01.3	34224	69787
06	42.1	10 31.5	34024	69587	06	43.1	10 46.5	34126	69689	06	44.1	11 01.5	34226	69789
07		10 31.8	34026	69589	07		10 46.8	34128	69691	07		11 01.8	34228	69791
08		10 32.0	34028	69591	08		10 47.0	34130	69693	08		11 02.0	34229	69792
09		10 32.2	34029	69593	09		10 47.2	34131	69694	09		11 02.2	34231	69794
10		10 32.5	34031	69594	10		10 47.5	34133	69696	10		11 02.5	34232	69795
11		10 32.7	34033	69596	11		10 47.7	34135	69698	11		11 02.7	34234	69797
12	42.2	10 33.0	34035	69598	12	43.2	10 48.0	34136	69699	12	44.2	11 03.0	34236	69799
13		10 33.3	34036	69599	13		10 48.3	34138	69701	13		11 03.3	34237	69800
14		10 33.5	34038	69601	14		10 48.5	34140	69703	14		11 03.5	34239	69802
15		10 33.8	34040	69603	15		10 48.8	34141	69704	15		11 03.8	34241	69804
16		10 34.0	34041	69605	16		10 49.0	34143	69706	16		11 04.0	34242	69805
17		10 34.2	34043	69606	17		10 49.2	34145	69708	17		11 04.2	34244	69807
18	42.3	10 34.5	34045	69608	18	43.3	10 49.5	34146	69709	18	44.3	11 04.5	34246	69809
19		10 34.8	34047	69610	19		10 49.8	34148	69711	19		11 04.8	34247	69810
20		10 35.0	34048	69611	20		10 50.0	34150	69713	20		11 05.0	34249	69812
21		10 35.3	34050	69613	21		10 50.3	34151	69714	21		11 05.3	34250	69813
22		10 35.5	34052	69615	22		10 50.5	34153	69716	22		11 05.5	34252	69815
23		10 35.7	34053	69616	23		10 50.7	34155	69718	23		11 05.7	34254	69817
24	42.4	10 36.0	34055	69618	24	43.4	10 51.0	34156	69719	24	44.4	11 06.0	34255	69818
25		10 36.2	34057	69620	25		10 51.2	34158	69721	25		11 06.2	34257	69820
26		10 36.5	34059	69622	26		10 51.5	34160	69723	26		11 06.5	34259	69822
27		10 36.8	34060	69623	27		10 51.8	34161	69724	27		11 06.8	34260	69823
28		10 37.0	34062	69625	28		10 52.0	34163	69726	28		11 07.0	34262	69825
29		10 37.3	34064	69627	29		10 52.3	34165	69728	29		11 07.3	34263	69827
30	42.5	10 37.5	34065	69628	30	43.5	10 52.5	34166	69729	30	44.5	11 07.5	34265	69828
31		10 37.7	34067	69630	31		10 52.7	34168	69731	31		11 07.7	34267	69830
32		10 38.0	34069	69632	32		10 53.0	34170	69733	32		11 08.0	34268	69831
33		10 38.2	34071	69634	33		10 53.2	34171	69734	33		11 08.2	34270	69833
34		10 38.5	34072	69635	34		10 53.5	34173	69736	34		11 08.5	34272	69835
35		10 38.8	34074	69637	35		10 53.8	34175	69738	35		11 08.8	34273	69836
36	42.6	10 39.0	34076	69639	36	43.6	10 54.0	34176	69739	36	44.6	11 09.0	34275	69838
37		10 39.3	34077	69640	37		10 54.3	34178	69741	37		11 09.3	34276	69840
38		10 39.5	34079	69642	38		10 54.5	34180	69743	38		11 09.5	34278	69841
39		10 39.7	34081	69644	39		10 54.7	34181	69744	39		11 09.7	34280	69843
40		10 40.0	34082	69645	40		10 55.0	34183	69746	40		11 10.0	34281	69844
41		10 40.2	34084	69647	41		10 55.2	34185	69748	41		11 10.2	34283	69846
42	42.7	10 40.5	34086	69649	42	43.7	10 55.5	34186	69749	42	44.7	11 10.5	34285	69848
43		10 40.8	34087	69651	43		10 55.8	34188	69751	43		11 10.8	34286	69849
44		10 41.0	34089	69652	44		10 56.0	34190	69753	44		11 11.0	34288	69851
45		10 41.2	34091	69654	45		10 56.2	34191	69754	45		11 11.2	34289	69852
46		10 41.5	34093	69656	46		10 56.5	34193	69756	46		11 11.5	34291	69854
47		10 41.7	34094	69657	47		10 56.7	34195	69758	47		11 11.7	34293	69856
48	42.8	10 42.0	34096	69659	48	43.8	10 57.0	34196	69759	48	44.8	11 12.0	34294	69857
49		10 42.3	34098	69661	49		10 57.3	34198	69761	49		11 12.3	34296	69859
50		10 42.5	34099	69662	50		10 57.5	34200	69763	50		11 12.5	34298	69861
51		10 42.8	34101	69664	51		10 57.8	34201	69764	51		11 12.8	34299	69862
52		10 43.0	34103	69666	52		10 58.0	34203	69766	52		11 13.0	34301	69864
53		10 43.2	34104	69667	53		10 58.2	34205	69768	53		11 13.2	34302	69865
54	42.9	10 43.5	34106	69669	54	43.9	10 58.5	34206	69769	54	44.9	11 13.5	34304	69867
55		10 43.7	34108	69671	55		10 58.7	34208	69771	55		11 13.7	34306	69869
56		10 44.0	34109	69672	56		10 59.0	34209	69772	56		11 14.0	34307	69870
57		10 44.3	34111	69674	57		10 59.3	34211	69774	57		11 14.3	34309	69872
58		10 44.5	34113	69676	58		10 59.5	34213	69776	58		11 14.5	34310	69873
59		10 44.8	34115	69678	59		10 59.8	34214	69777	59		11 14.8	34312	69875

45 Min					46 Min					47 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	45.0	11 15.0	34314	69877	00	46.0	11 30.0	34409	69972	00	47.0	11 45.0	34502	70066
01		11 15.2	34315	69878	01		11 30.2	34411	69974	01		11 45.2	34504	70067
02		11 15.5	34317	69880	02		11 30.5	34412	69975	02		11 45.5	34506	70069
03		11 15.7	34318	69881	03		11 30.7	34414	69977	03		11 45.7	34507	70070
04		11 16.0	34320	69883	04		11 31.0	34415	69978	04		11 46.0	34509	70072
05		11 16.3	34322	69885	05		11 31.3	34417	69980	05		11 46.3	34510	70073
06	45.1	11 16.5	34323	69886	06	46.1	11 31.5	34419	69982	06	47.1	11 46.5	34512	70075
07		11 16.8	34325	69888	07		11 31.8	34420	69983	07		11 46.8	34513	70076
08		11 17.0	34326	69890	08		11 32.0	34422	69985	08		11 47.0	34515	70078
09		11 17.2	34328	69891	09		11 32.2	34423	69986	09		11 47.2	34516	70079
10		11 17.5	34330	69893	10		11 32.5	34425	69988	10		11 47.5	34518	70081
11		11 17.7	34331	69894	11		11 32.7	34426	69989	11		11 47.7	34519	70082
12	45.2	11 18.0	34333	69896	12	46.2	11 33.0	34428	69991	12	47.2	11 48.0	34521	70084
13		11 18.3	34334	69898	13		11 33.3	34429	69993	13		11 48.3	34522	70085
14		11 18.5	34336	69899	14		11 33.5	34431	69994	14		11 48.5	34524	70087
15		11 18.8	34338	69901	15		11 33.8	34433	69996	15		11 48.8	34526	70089
16		11 19.0	34339	69902	16		11 34.0	34434	69997	16		11 49.0	34527	70090
17		11 19.2	34341	69904	17		11 34.2	34436	69999	17		11 49.2	34529	70092
18	45.3	11 19.5	34342	69906	18	46.3	11 34.5	34437	70000	18	47.3	11 49.5	34530	70093
19		11 19.8	34344	69907	19		11 34.8	34439	70002	19		11 49.8	34532	70095
20		11 20.0	34346	69909	20		11 35.0	34440	70003	20		11 50.0	34533	70096
21		11 20.3	34347	69910	21		11 35.3	34442	70005	21		11 50.3	34535	70098
22		11 20.5	34349	69912	22		11 35.5	34444	70007	22		11 50.5	34536	70099
23		11 20.7	34350	69914	23		11 35.7	34445	70008	23		11 50.7	34538	70101
24	45.4	11 21.0	34352	69915	24	46.4	11 36.0	34447	70010	24	47.4	11 51.0	34539	70102
25		11 21.2	34354	69917	25		11 36.2	34448	70011	25		11 51.2	34541	70104
26		11 21.5	34355	69918	26		11 36.5	34450	70013	26		11 51.5	34542	70105
27		11 21.8	34357	69920	27		11 36.8	34451	70014	27		11 51.8	34544	70107
28		11 22.0	34358	69921	28		11 37.0	34453	70016	28		11 52.0	34545	70108
29		11 22.3	34360	69923	29		11 37.3	34454	70018	29		11 52.3	34547	70110
30	45.5	11 22.5	34362	69925	30	46.5	11 37.5	34456	70019	30	47.5	11 52.5	34548	70111
31		11 22.7	34363	69926	31		11 37.7	34458	70021	31		11 52.7	34550	70113
32		11 23.0	34365	69928	32		11 38.0	34459	70022	32		11 53.0	34551	70115
33		11 23.2	34366	69929	33		11 38.2	34461	70024	33		11 53.2	34553	70116
34		11 23.5	34368	69931	34		11 38.5	34462	70025	34		11 53.5	34555	70118
35		11 23.8	34370	69933	35		11 38.8	34464	70027	35		11 53.8	34556	70119
36	45.6	11 24.0	34371	69934	36	46.6	11 39.0	34465	70028	36	47.6	11 54.0	34558	70121
37		11 24.3	34373	69936	37		11 39.3	34467	70030	37		11 54.3	34559	70122
38		11 24.5	34374	69937	38		11 39.5	34468	70032	38		11 54.5	34561	70124
39		11 24.7	34376	69939	39		11 39.7	34470	70033	39		11 54.7	34562	70125
40		11 25.0	34378	69941	40		11 40.0	34472	70035	40		11 55.0	34564	70127
41		11 25.2	34379	69942	41		11 40.2	34473	70036	41		11 55.2	34565	70128
42	45.7	11 25.5	34381	69944	42	46.7	11 40.5	34475	70038	42	47.7	11 55.5	34567	70130
43		11 25.8	34382	69945	43		11 40.8	34476	70039	43		11 55.8	34568	70131
44		11 26.0	34384	69947	44		11 41.0	34478	70041	44		11 56.0	34570	70133
45		11 26.2	34385	69948	45		11 41.2	34479	70042	45		11 56.2	34571	70134
46		11 26.5	34387	69950	46		11 41.5	34481	70044	46		11 56.5	34573	70136
47		11 26.7	34389	69952	47		11 41.7	34482	70045	47		11 56.7	34574	70137
48	45.8	11 27.0	34390	69953	48	46.8	11 42.0	34484	70047	48	47.8	11 57.0	34576	70139
49		11 27.3	34392	69955	49		11 42.3	34486	70049	49		11 57.3	34577	70140
50		11 27.5	34393	69956	50		11 42.5	34487	70050	50		11 57.5	34579	70142
51		11 27.8	34395	69958	51		11 42.8	34489	70052	51		11 57.8	34580	70143
52		11 28.0	34396	69960	52		11 43.0	34490	70053	52		11 58.0	34582	70145
53		11 28.2	34398	69961	53		11 43.2	34492	70055	53		11 58.2	34583	70146
54	45.9	11 28.5	34400	69963	54	46.9	11 43.5	34493	70056	54	47.9	11 58.5	34585	70148
55		11 28.7	34401	69964	55		11 43.7	34495	70058	55		11 58.7	34586	70149
56		11 29.0	34403	69966	56		11 44.0	34496	70059	56		11 59.0	34588	70151
57		11 29.3	34404	69967	57		11 44.3	34498	70061	57		11 59.3	34589	70152
58		11 29.5	34406	69969	58		11 44.5	34499	70062	58		11 59.5	34591	70154
59		11 29.8	34408	69971	59		11 44.8	34501	70064	59		11 59.8	34592	70155

48 Min					49 Min					50 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
00	48.0	12 00.0	34594	70157	00	49.0	12 15.0	34683	70246	00	50.0	12 30.0	34771	70334
01		12 00.2	34595	70158	01		12 15.2	34685	70248	01		12 30.2	34773	70336
02		12 00.5	34597	70160	02		12 15.5	34686	70249	02		12 30.5	34774	70337
03		12 00.7	34598	70161	03		12 15.7	34688	70251	03		12 30.7	34776	70339
04		12 01.0	34600	70163	04		12 16.0	34689	70252	04		12 31.0	34777	70340
05		12 01.3	34601	70164	05		12 16.3	34691	70254	05		12 31.3	34778	70341
06	48.1	12 01.5	34603	70166	06	49.1	12 16.5	34692	70255	06	50.1	12 31.5	34780	70343
07		12 01.8	34604	70167	07		12 16.8	34694	70257	07		12 31.8	34781	70344
08		12 02.0	34606	70169	08		12 17.0	34695	70258	08		12 32.0	34783	70346
09		12 02.2	34607	70171	09		12 17.2	34697	70260	09		12 32.2	34784	70347
10		12 02.5	34609	70172	10		12 17.5	34698	70261	10		12 32.5	34786	70349
11		12 02.7	34610	70174	11		12 17.7	34700	70263	11		12 32.7	34787	70350
12	48.2	12 03.0	34612	70175	12	49.2	12 18.0	34701	70264	12	50.2	12 33.0	34789	70352
13		12 03.3	34613	70177	13		12 18.3	34703	70266	13		12 33.3	34790	70353
14		12 03.5	34615	70178	14		12 18.5	34704	70267	14		12 33.5	34791	70354
15		12 03.8	34616	70180	15		12 18.8	34706	70269	15		12 33.8	34793	70356
16		12 04.0	34618	70181	16		12 19.0	34707	70270	16		12 34.0	34794	70357
17		12 04.2	34619	70183	17		12 19.2	34709	70272	17		12 34.2	34796	70359
18	48.3	12 04.5	34621	70184	18	49.3	12 19.5	34710	70273	18	50.3	12 34.5	34797	70360
19		12 04.8	34622	70186	19		12 19.8	34711	70274	19		12 34.8	34799	70362
20		12 05.0	34624	70187	20		12 20.0	34713	70276	20		12 35.0	34800	70363
21		12 05.3	34625	70189	21		12 20.3	34714	70277	21		12 35.3	34802	70365
22		12 05.5	34627	70190	22		12 20.5	34716	70279	22		12 35.5	34803	70366
23		12 05.7	34628	70191	23		12 20.7	34717	70280	23		12 35.7	34804	70367
24	48.4	12 06.0	34630	70193	24	49.4	12 21.0	34719	70282	24	50.4	12 36.0	34806	70369
25		12 06.2	34631	70194	25		12 21.2	34720	70283	25		12 36.2	34807	70370
26		12 06.5	34633	70196	26		12 21.5	34722	70285	26		12 36.5	34809	70372
27		12 06.8	34634	70197	27		12 21.8	34723	70286	27		12 36.8	34810	70373
28		12 07.0	34636	70199	28		12 22.0	34725	70288	28		12 37.0	34812	70375
29		12 07.3	34637	70200	29		12 22.3	34726	70289	29		12 37.3	34813	70376
30	48.5	12 07.5	34639	70202	30	49.5	12 22.5	34728	70291	30	50.5	12 37.5	34814	70377
31		12 07.7	34640	70203	31		12 22.7	34729	70292	31		12 37.7	34816	70379
32		12 08.0	34642	70205	32		12 23.0	34730	70294	32		12 38.0	34817	70380
33		12 08.2	34643	70206	33		12 23.2	34732	70295	33		12 38.2	34819	70382
34		12 08.5	34645	70208	34		12 23.5	34733	70296	34		12 38.5	34820	70383
35		12 08.8	34646	70209	35		12 23.8	34735	70298	35		12 38.8	34822	70385
36	48.6	12 09.0	34648	70211	36	49.6	12 24.0	34736	70299	36	50.6	12 39.0	34823	70386
37		12 09.3	34649	70212	37		12 24.3	34738	70301	37		12 39.3	34824	70387
38		12 09.5	34651	70214	38		12 24.5	34739	70302	38		12 39.5	34826	70389
39		12 09.7	34652	70215	39		12 24.7	34741	70304	39		12 39.7	34827	70390
40		12 10.0	34654	70217	40		12 25.0	34742	70305	40		12 40.0	34829	70392
41		12 10.2	34655	70218	41		12 25.2	34744	70307	41		12 40.2	34830	70393
42	48.7	12 10.5	34657	70220	42	49.7	12 25.5	34745	70308	42	50.7	12 40.5	34832	70395
43		12 10.8	34658	70221	43		12 25.8	34747	70310	43		12 40.8	34833	70396
44		12 11.0	34660	70223	44		12 26.0	34748	70311	44		12 41.0	34834	70397
45		12 11.2	34661	70224	45		12 26.2	34749	70312	45		12 41.2	34836	70399
46		12 11.5	34663	70226	46		12 26.5	34751	70314	46		12 41.5	34837	70400
47		12 11.7	34664	70227	47		12 26.7	34752	70315	47		12 41.7	34839	70402
48	48.8	12 12.0	34666	70229	48	49.8	12 27.0	34754	70317	48	50.8	12 42.0	34840	70403
49		12 12.3	34667	70230	49		12 27.3	34755	70318	49		12 42.3	34842	70405
50		12 12.5	34669	70232	50		12 27.5	34757	70320	50		12 42.5	34843	70406
51		12 12.8	34670	70233	51		12 27.8	34758	70321	51		12 42.8	34844	70407
52		12 13.0	34672	70235	52		12 28.0	34760	70323	52		12 43.0	34846	70409
53		12 13.2	34673	70236	53		12 28.2	34761	70324	53		12 43.2	34847	70410
54	48.9	12 13.5	34675	70238	54	49.9	12 28.5	34763	70326	54	50.9	12 43.5	34849	70412
55		12 13.7	34676	70239	55		12 28.7	34764	70327	55		12 43.7	34850	70413
56		12 14.0	34678	70241	56		12 29.0	34765	70328	56		12 44.0	34852	70415
57		12 14.3	34679	70242	57		12 29.3	34767	70330	57		12 44.3	34853	70416
58		12 14.5	34681	70244	58		12 29.5	34768	70331	58		12 44.5	34854	70417
59		12 14.8	34682	70245	59		12 29.8	34770	70333	59		12 44.8	34856	70419

51 Min					52 Min					53 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
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01		12 45.2	34859	70422	01		13 00.2	34943	70506	01		13 15.2	35026	70589
02		12 45.5	34860	70423	02		13 00.5	34944	70507	02		13 15.5	35027	70590
03		12 45.7	34861	70424	03		13 00.7	34946	70509	03		13 15.7	35028	70591
04		12 46.0	34863	70426	04		13 01.0	34947	70510	04		13 16.0	35030	70593
05		12 46.3	34864	70427	05		13 01.3	34949	70512	05		13 16.3	35031	70594
06	51.1	12 46.5	34866	70429	06	52.1	13 01.5	34950	70513	06	53.1	13 16.5	35032	70595
07		12 46.8	34867	70430	07		13 01.8	34951	70514	07		13 16.8	35034	70597
08		12 47.0	34869	70432	08		13 02.0	34953	70516	08		13 17.0	35035	70598
09		12 47.2	34870	70433	09		13 02.2	34954	70517	09		13 17.2	35037	70600
10		12 47.5	34871	70434	10		13 02.5	34955	70518	10		13 17.5	35038	70601
11		12 47.7	34873	70436	11		13 02.7	34957	70520	11		13 17.7	35039	70602
12	51.2	12 48.0	34874	70437	12	52.2	13 03.0	34958	70521	12	53.2	13 18.0	35041	70604
13		12 48.3	34876	70439	13		13 03.3	34960	70523	13		13 18.3	35042	70605
14		12 48.5	34877	70440	14		13 03.5	34961	70524	14		13 18.5	35043	70606
15		12 48.8	34878	70441	15		13 03.8	34962	70525	15		13 18.8	35045	70608
16		12 49.0	34880	70443	16		13 04.0	34964	70527	16		13 19.0	35046	70609
17		12 49.2	34881	70444	17		13 04.2	34965	70528	17		13 19.2	35047	70610
18	51.3	12 49.5	34883	70446	18	52.3	13 04.5	34967	70530	18	53.3	13 19.5	35049	70612
19		12 49.8	34884	70447	19		13 04.8	34968	70531	19		13 19.8	35050	70613
20		12 50.0	34886	70449	20		13 05.0	34969	70532	20		13 20.0	35051	70615
21		12 50.3	34887	70450	21		13 05.3	34971	70534	21		13 20.3	35053	70616
22		12 50.5	34888	70451	22		13 05.5	34972	70535	22		13 20.5	35054	70617
23		12 50.7	34890	70453	23		13 05.7	34973	70536	23		13 20.7	35056	70619
24	51.4	12 51.0	34891	70454	24	52.4	13 06.0	34975	70538	24	53.4	13 21.0	35057	70620
25		12 51.2	34893	70456	25		13 06.2	34976	70539	25		13 21.2	35058	70621
26		12 51.5	34894	70457	26		13 06.5	34978	70541	26		13 21.5	35060	70623
27		12 51.8	34895	70458	27		13 06.8	34979	70542	27		13 21.8	35061	70624
28		12 52.0	34897	70460	28		13 07.0	34980	70543	28		13 22.0	35062	70625
29		12 52.3	34898	70461	29		13 07.3	34982	70545	29		13 22.3	35064	70627
30	51.5	12 52.5	34900	70463	30	52.5	13 07.5	34983	70546	30	53.5	13 22.5	35065	70628
31		12 52.7	34901	70464	31		13 07.7	34984	70548	31		13 22.7	35066	70629
32		12 53.0	34902	70465	32		13 08.0	34986	70549	32		13 23.0	35068	70631
33		12 53.2	34904	70467	33		13 08.2	34987	70550	33		13 23.2	35069	70632
34		12 53.5	34905	70468	34		13 08.5	34989	70552	34		13 23.5	35070	70633
35		12 53.8	34907	70470	35		13 08.8	34990	70553	35		13 23.8	35072	70635
36	51.6	12 54.0	34908	70471	36	52.6	13 09.0	34991	70554	36	53.6	13 24.0	35073	70636
37		12 54.3	34909	70472	37		13 09.3	34993	70556	37		13 24.3	35075	70638
38		12 54.5	34911	70474	38		13 09.5	34994	70557	38		13 24.5	35076	70639
39		12 54.7	34912	70475	39		13 09.7	34995	70559	39		13 24.7	35077	70640
40		12 55.0	34914	70477	40		13 10.0	34997	70560	40		13 25.0	35079	70642
41		12 55.2	34915	70478	41		13 10.2	34998	70561	41		13 25.2	35080	70643
42	51.7	12 55.5	34916	70479	42	52.7	13 10.5	35000	70563	42	53.7	13 25.5	35081	70644
43		12 55.8	34918	70481	43		13 10.8	35001	70564	43		13 25.8	35083	70646
44		12 56.0	34919	70482	44		13 11.0	35002	70565	44		13 26.0	35084	70647
45		12 56.2	34921	70484	45		13 11.2	35004	70567	45		13 26.2	35085	70648
46		12 56.5	34922	70485	46		13 11.5	35005	70568	46		13 26.5	35087	70650
47		12 56.7	34923	70486	47		13 11.7	35006	70570	47		13 26.7	35088	70651
48	51.8	12 57.0	34925	70488	48	52.8	13 12.0	35008	70571	48	53.8	13 27.0	35089	70652
49		12 57.3	34926	70489	49		13 12.3	35009	70572	49		13 27.3	35091	70654
50		12 57.5	34928	70491	50		13 12.5	35011	70574	50		13 27.5	35092	70655
51		12 57.8	34929	70492	51		13 12.8	35012	70575	51		13 27.8	35093	70656
52		12 58.0	34930	70493	52		13 13.0	35013	70576	52		13 28.0	35095	70658
53		12 58.2	34932	70495	53		13 13.2	35015	70578	53		13 28.2	35096	70659
54	51.9	12 58.5	34933	70496	54	52.9	13 13.5	35016	70579	54	53.9	13 28.5	35097	70660
55		12 58.7	34935	70498	55		13 13.7	35017	70580	55		13 28.7	35099	70662
56		12 59.0	34936	70499	56		13 14.0	35019	70582	56		13 29.0	35100	70663
57		12 59.3	34937	70500	57		13 14.3	35020	70583	57		13 29.3	35101	70664
58		12 59.5	34939	70502	58		13 14.5	35022	70585	58		13 29.5	35103	70666
59		12 59.8	34940	70503	59		13 14.8	35023	70586	59		13 29.8	35104	70667

54 Min					55 Min					56 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
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01		13 30.2	35107	70670	01		13 45.2	35186	70749	01		14 00.2	35265	70828
02		13 30.5	35108	70671	02		13 45.5	35188	70751	02		14 00.5	35266	70829
03		13 30.7	35109	70672	03		13 45.7	35189	70752	03		14 00.7	35267	70830
04		13 31.0	35111	70674	04		13 46.0	35190	70753	04		14 01.0	35269	70832
05		13 31.3	35112	70675	05		13 46.3	35192	70755	05		14 01.3	35270	70833
06	54.1	13 31.5	35113	70677	06	55.1	13 46.5	35193	70756	06	56.1	14 01.5	35271	70834
07		13 31.8	35115	70678	07		13 46.8	35194	70757	07		14 01.8	35272	70835
08		13 32.0	35116	70679	08		13 47.0	35196	70759	08		14 02.0	35274	70837
09		13 32.2	35117	70681	09		13 47.2	35197	70760	09		14 02.2	35275	70838
10		13 32.5	35119	70682	10		13 47.5	35198	70761	10		14 02.5	35276	70839
11		13 32.7	35120	70683	11		13 47.7	35200	70763	11		14 02.7	35278	70841
12	54.2	13 33.0	35122	70685	12	55.2	13 48.0	35201	70764	12	56.2	14 03.0	35279	70842
13		13 33.3	35123	70686	13		13 48.3	35202	70765	13		14 03.3	35280	70843
14		13 33.5	35124	70687	14		13 48.5	35204	70767	14		14 03.5	35281	70844
15		13 33.8	35126	70689	15		13 48.8	35205	70768	15		14 03.8	35283	70846
16		13 34.0	35127	70690	16		13 49.0	35206	70769	16		14 04.0	35284	70847
17		13 34.2	35128	70691	17		13 49.2	35207	70770	17		14 04.2	35285	70848
18	54.3	13 34.5	35130	70693	18	55.3	13 49.5	35209	70772	18	56.3	14 04.5	35287	70850
19		13 34.8	35131	70694	19		13 49.8	35210	70773	19		14 04.8	35288	70851
20		13 35.0	35132	70695	20		13 50.0	35211	70774	20		14 05.0	35289	70852
21		13 35.3	35134	70697	21		13 50.3	35213	70776	21		14 05.3	35290	70853
22		13 35.5	35135	70698	22		13 50.5	35214	70777	22		14 05.5	35292	70855
23		13 35.7	35136	70699	23		13 50.7	35215	70778	23		14 05.7	35293	70856
24	54.4	13 36.0	35138	70701	24	55.4	13 51.0	35217	70780	24	56.4	14 06.0	35294	70857
25		13 36.2	35139	70702	25		13 51.2	35218	70781	25		14 06.2	35296	70859
26		13 36.5	35140	70703	26		13 51.5	35219	70782	26		14 06.5	35297	70860
27		13 36.8	35141	70705	27		13 51.8	35221	70784	27		14 06.8	35298	70861
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29		13 37.3	35144	70707	29		13 52.3	35223	70786	29		14 07.3	35301	70864
30	54.5	13 37.5	35145	70709	30	55.5	13 52.5	35224	70787	30	56.5	14 07.5	35302	70865
31		13 37.7	35147	70710	31		13 52.7	35226	70789	31		14 07.7	35303	70866
32		13 38.0	35148	70711	32		13 53.0	35227	70790	32		14 08.0	35305	70868
33		13 38.2	35149	70712	33		13 53.2	35228	70791	33		14 08.2	35306	70869
34		13 38.5	35151	70714	34		13 53.5	35230	70793	34		14 08.5	35307	70870
35		13 38.8	35152	70715	35		13 53.8	35231	70794	35		14 08.8	35308	70871
36	54.6	13 39.0	35153	70716	36	55.6	13 54.0	35232	70795	36	56.6	14 09.0	35310	70873
37		13 39.3	35155	70718	37		13 54.3	35234	70797	37		14 09.3	35311	70874
38		13 39.5	35156	70719	38		13 54.5	35235	70798	38		14 09.5	35312	70875
39		13 39.7	35157	70720	39		13 54.7	35236	70799	39		14 09.7	35314	70877
40		13 40.0	35159	70722	40		13 55.0	35237	70800	40		14 10.0	35315	70878
41		13 40.2	35160	70723	41		13 55.2	35239	70802	41		14 10.2	35316	70879
42	54.7	13 40.5	35161	70724	42	55.7	13 55.5	35240	70803	42	56.7	14 10.5	35317	70880
43		13 40.8	35163	70726	43		13 55.8	35241	70804	43		14 10.8	35319	70882
44		13 41.0	35164	70727	44		13 56.0	35243	70806	44		14 11.0	35320	70883
45		13 41.2	35165	70728	45		13 56.2	35244	70807	45		14 11.2	35321	70884
46		13 41.5	35167	70730	46		13 56.5	35245	70808	46		14 11.5	35322	70885
47		13 41.7	35168	70731	47		13 56.7	35247	70810	47		14 11.7	35324	70887
48	54.8	13 42.0	35169	70732	48	55.8	13 57.0	35248	70811	48	56.8	14 12.0	35325	70888
49		13 42.3	35171	70734	49		13 57.3	35249	70812	49		14 12.3	35326	70889
50		13 42.5	35172	70735	50		13 57.5	35250	70813	50		14 12.5	35328	70891
51		13 42.8	35173	70736	51		13 57.8	35252	70815	51		14 12.8	35329	70892
52		13 43.0	35175	70738	52		13 58.0	35253	70816	52		14 13.0	35330	70893
53		13 43.2	35176	70739	53		13 58.2	35254	70817	53		14 13.2	35331	70894
54	54.9	13 43.5	35177	70740	54	55.9	13 58.5	35256	70819	54	56.9	14 13.5	35333	70896
55		13 43.7	35179	70742	55		13 58.7	35257	70820	55		14 13.7	35334	70897
56		13 44.0	35180	70743	56		13 59.0	35258	70821	56		14 14.0	35335	70898
57		13 44.3	35181	70744	57		13 59.3	35260	70823	57		14 14.3	35336	70899
58		13 44.5	35183	70746	58		13 59.5	35261	70824	58		14 14.5	35338	70901
59		13 44.8	35184	70747	59		13 59.8	35262	70825	59		14 14.8	35339	70902

57 Min					58 Min					59 Min				
Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s	Sec	fMin	dHA	p	s
	′	° ′				′	° ′				′	° ′		
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01		14 15.2	35342	70905	01		14 30.2	35417	70980	01		14 45.2	35491	71054
02		14 15.5	35343	70906	02		14 30.5	35418	70981	02		14 45.5	35492	71056
03		14 15.7	35344	70907	03		14 30.7	35420	70983	03		14 45.7	35494	71057
04		14 16.0	35345	70908	04		14 31.0	35421	70984	04		14 46.0	35495	71058
05		14 16.3	35347	70910	05		14 31.3	35422	70985	05		14 46.3	35496	71059
06	57.1	14 16.5	35348	70911	06	58.1	14 31.5	35423	70986	06	59.1	14 46.5	35497	71060
07		14 16.8	35349	70912	07		14 31.8	35425	70988	07		14 46.8	35499	71062
08		14 17.0	35350	70913	08		14 32.0	35426	70989	08		14 47.0	35500	71063
09		14 17.2	35352	70915	09		14 32.2	35427	70990	09		14 47.2	35501	71064
10		14 17.5	35353	70916	10		14 32.5	35428	70991	10		14 47.5	35502	71065
11		14 17.7	35354	70917	11		14 32.7	35429	70993	11		14 47.7	35504	71067
12	57.2	14 18.0	35355	70918	12	58.2	14 33.0	35431	70994	12	59.2	14 48.0	35505	71068
13		14 18.3	35357	70920	13		14 33.3	35432	70995	13		14 48.3	35506	71069
14		14 18.5	35358	70921	14		14 33.5	35433	70996	14		14 48.5	35507	71070
15		14 18.8	35359	70922	15		14 33.8	35434	70997	15		14 48.8	35508	71071
16		14 19.0	35361	70924	16		14 34.0	35436	70999	16		14 49.0	35510	71073
17		14 19.2	35362	70925	17		14 34.2	35437	71000	17		14 49.2	35511	71074
18	57.3	14 19.5	35363	70926	18	58.3	14 34.5	35438	71001	18	59.3	14 49.5	35512	71075
19		14 19.8	35364	70927	19		14 34.8	35439	71002	19		14 49.8	35513	71076
20		14 20.0	35366	70929	20		14 35.0	35441	71004	20		14 50.0	35514	71078
21		14 20.3	35367	70930	21		14 35.3	35442	71005	21		14 50.3	35516	71079
22		14 20.5	35368	70931	22		14 35.5	35443	71006	22		14 50.5	35517	71080
23		14 20.7	35369	70932	23		14 35.7	35444	71007	23		14 50.7	35518	71081
24	57.4	14 21.0	35371	70934	24	58.4	14 36.0	35446	71009	24	59.4	14 51.0	35519	71082
25		14 21.2	35372	70935	25		14 36.2	35447	71010	25		14 51.2	35521	71084
26		14 21.5	35373	70936	26		14 36.5	35448	71011	26		14 51.5	35522	71085
27		14 21.8	35374	70937	27		14 36.8	35449	71012	27		14 51.8	35523	71086
28		14 22.0	35376	70939	28		14 37.0	35451	71014	28		14 52.0	35524	71087
29		14 22.3	35377	70940	29		14 37.3	35452	71015	29		14 52.3	35525	71088
30	57.5	14 22.5	35378	70941	30	58.5	14 37.5	35453	71016	30	59.5	14 52.5	35527	71090
31		14 22.7	35379	70942	31		14 37.7	35454	71017	31		14 52.7	35528	71091
32		14 23.0	35381	70944	32		14 38.0	35456	71019	32		14 53.0	35529	71092
33		14 23.2	35382	70945	33		14 38.2	35457	71020	33		14 53.2	35530	71093
34		14 23.5	35383	70946	34		14 38.5	35458	71021	34		14 53.5	35532	71095
35		14 23.8	35384	70948	35		14 38.8	35459	71022	35		14 53.8	35533	71096
36	57.6	14 24.0	35386	70949	36	58.6	14 39.0	35460	71024	36	59.6	14 54.0	35534	71097
37		14 24.3	35387	70950	37		14 39.3	35462	71025	37		14 54.3	35535	71098
38		14 24.5	35388	70951	38		14 39.5	35463	71026	38		14 54.5	35536	71099
39		14 24.7	35390	70953	39		14 39.7	35464	71027	39		14 54.7	35538	71101
40		14 25.0	35391	70954	40		14 40.0	35465	71028	40		14 55.0	35539	71102
41		14 25.2	35392	70955	41		14 40.2	35467	71030	41		14 55.2	35540	71103
42	57.7	14 25.5	35393	70956	42	58.7	14 40.5	35468	71031	42	59.7	14 55.5	35541	71104
43		14 25.8	35395	70958	43		14 40.8	35469	71032	43		14 55.8	35542	71105
44		14 26.0	35396	70959	44		14 41.0	35470	71033	44		14 56.0	35544	71107
45		14 26.2	35397	70960	45		14 41.2	35472	71035	45		14 56.2	35545	71108
46		14 26.5	35398	70961	46		14 41.5	35473	71036	46		14 56.5	35546	71109
47		14 26.7	35400	70963	47		14 41.7	35474	71037	47		14 56.7	35547	71110
48	57.8	14 27.0	35401	70964	48	58.8	14 42.0	35475	71038	48	59.8	14 57.0	35549	71112
49		14 27.3	35402	70965	49		14 42.3	35477	71040	49		14 57.3	35550	71113
50		14 27.5	35403	70966	50		14 42.5	35478	71041	50		14 57.5	35551	71114
51		14 27.8	35405	70968	51		14 42.8	35479	71042	51		14 57.8	35552	71115
52		14 28.0	35406	70969	52		14 43.0	35480	71043	52		14 58.0	35553	71116
53		14 28.2	35407	70970	53		14 43.2	35481	71044	53		14 58.2	35555	71118
54	57.9	14 28.5	35408	70971	54	58.9	14 43.5	35483	71046	54	59.9	14 58.5	35556	71119
55		14 28.7	35410	70973	55		14 43.7	35484	71047	55		14 58.7	35557	71120
56		14 29.0	35411	70974	56		14 44.0	35485	71048	56		14 59.0	35558	71121
57		14 29.3	35412	70975	57		14 44.3	35486	71049	57		14 59.3	35559	71122
58		14 29.5	35413	70976	58		14 44.5	35488	71051	58		14 59.5	35561	71124
59		14 29.8	35415	70978	59		14 44.8	35489	71052	59		14 59.8	35562	71125

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Time - Hour-Angle Conversion Table

Purpose and Arrangement

Longitude as part of our geographical coordinate system may be given both as

- the intersecting angle between the Local Meridian and the Prime Meridian of Greenwich expressed in Degrees and Minutes-of-Arc,
- or as a time difference between the Local Time and the Time at the Prime Meridian of Greenwich expressed in Hours, Minutes and Seconds.

Time is related to the rotation of the Earth. Over the time span of 24 hours, the Greenwich Hour Angle of the Sun increases by 360°. This implies an increase of 15° per hour. Since local time is based on mean solar time, locations with a Longitude difference of 15°, will have a difference in (local) time of exactly one hour.

This relation between Time and Longitude allows to translate differences in local time into differences of Longitude and vice versa. The "Time - Hour-Angle Conversion Table" gives this relation for integral values of the Hour-Angle. Accordingly Time is given in 4-minute intervals. The information for the fractional values of Time and Hour-Angle can be obtained from the first part of the **Interpolation Tables** (pages "0Min"-"3Min"). The column "dHA" of these pages gives the increment of the Hour-Angle of the Sun, corresponding to the Time entry.

Time - Hour-Angle Conversion

00:00	0°	**04:00**	60°	**08:00**	120°	**12:00**	180°	**16:00**	240°	**20:00**	300°
00:04	1°	**04:04**	61°	**08:04**	121°	**12:04**	181°	**16:04**	241°	**20:04**	301°
00:08	2°	**04:08**	62°	**08:08**	122°	**12:08**	182°	**16:08**	242°	**20:08**	302°
00:12	3°	**04:12**	63°	**08:12**	123°	**12:12**	183°	**16:12**	243°	**20:12**	303°
00:16	4°	**04:16**	64°	**08:16**	124°	**12:16**	184°	**16:16**	244°	**20:16**	304°
00:20	5°	**04:20**	65°	**08:20**	125°	**12:20**	185°	**16:20**	245°	**20:20**	305°
00:24	6°	**04:24**	66°	**08:24**	126°	**12:24**	186°	**16:24**	246°	**20:24**	306°
00:28	7°	**04:28**	67°	**08:28**	127°	**12:28**	187°	**16:28**	247°	**20:28**	307°
00:32	8°	**04:32**	68°	**08:32**	128°	**12:32**	188°	**16:32**	248°	**20:32**	308°
00:36	9°	**04:36**	69°	**08:36**	129°	**12:36**	189°	**16:36**	249°	**20:36**	309°
00:40	10°	**04:40**	70°	**08:40**	130°	**12:40**	190°	**16:40**	250°	**20:40**	310°
00:44	11°	**04:44**	71°	**08:44**	131°	**12:44**	191°	**16:44**	251°	**20:44**	311°
00:48	12°	**04:48**	72°	**08:48**	132°	**12:48**	192°	**16:48**	252°	**20:48**	312°
00:52	13°	**04:52**	73°	**08:52**	133°	**12:52**	193°	**16:52**	253°	**20:52**	313°
00:56	14°	**04:56**	74°	**08:56**	134°	**12:56**	194°	**16:56**	254°	**20:56**	314°
01:00	15°	**05:00**	75°	**09:00**	135°	**13:00**	195°	**17:00**	255°	**21:00**	315°
01:04	16°	**05:04**	76°	**09:04**	136°	**13:04**	196°	**17:04**	256°	**21:04**	316°
01:08	17°	**05:08**	77°	**09:08**	137°	**13:08**	197°	**17:08**	257°	**21:08**	317°
01:12	18°	**05:12**	78°	**09:12**	138°	**13:12**	198°	**17:12**	258°	**21:12**	318°
01:16	19°	**05:16**	79°	**09:16**	139°	**13:16**	199°	**17:16**	259°	**21:16**	319°
01:20	20°	**05:20**	80°	**09:20**	140°	**13:20**	200°	**17:20**	260°	**21:20**	320°
01:24	21°	**05:24**	81°	**09:24**	141°	**13:24**	201°	**17:24**	261°	**21:24**	321°
01:28	22°	**05:28**	82°	**09:28**	142°	**13:28**	202°	**17:28**	262°	**21:28**	322°
01:32	23°	**05:32**	83°	**09:32**	143°	**13:32**	203°	**17:32**	263°	**21:32**	323°
01:36	24°	**05:36**	84°	**09:36**	144°	**13:36**	204°	**17:36**	264°	**21:36**	324°
01:40	25°	**05:40**	85°	**09:40**	145°	**13:40**	205°	**17:40**	265°	**21:40**	325°
01:44	26°	**05:44**	86°	**09:44**	146°	**13:44**	206°	**17:44**	266°	**21:44**	326°
01:48	27°	**05:48**	87°	**09:48**	147°	**13:48**	207°	**17:48**	267°	**21:48**	327°
01:52	28°	**05:52**	88°	**09:52**	148°	**13:52**	208°	**17:52**	268°	**21:52**	328°
01:56	29°	**05:56**	89°	**09:56**	149°	**13:56**	209°	**17:56**	269°	**21:56**	329°
02:00	30°	**06:00**	90°	**10:00**	150°	**14:00**	210°	**18:00**	270°	**22:00**	330°
02:04	31°	**06:04**	91°	**10:04**	151°	**14:04**	211°	**18:04**	271°	**22:04**	331°
02:08	32°	**06:08**	92°	**10:08**	152°	**14:08**	212°	**18:08**	272°	**22:08**	332°
02:12	33°	**06:12**	93°	**10:12**	153°	**14:12**	213°	**18:12**	273°	**22:12**	333°
02:16	34°	**06:16**	94°	**10:16**	154°	**14:16**	214°	**18:16**	274°	**22:16**	334°
02:20	35°	**06:20**	95°	**10:20**	155°	**14:20**	215°	**18:20**	275°	**22:20**	335°
02:24	36°	**06:24**	96°	**10:24**	156°	**14:24**	216°	**18:24**	276°	**22:24**	336°
02:28	37°	**06:28**	97°	**10:28**	157°	**14:28**	217°	**18:28**	277°	**22:28**	337°
02:32	38°	**06:32**	98°	**10:32**	158°	**14:32**	218°	**18:32**	278°	**22:32**	338°
02:36	39°	**06:36**	99°	**10:36**	159°	**14:36**	219°	**18:36**	279°	**22:36**	339°
02:40	40°	**06:40**	100°	**10:40**	160°	**14:40**	220°	**18:40**	280°	**22:40**	340°
02:44	41°	**06:44**	101°	**10:44**	161°	**14:44**	221°	**18:44**	281°	**22:44**	341°
02:48	42°	**06:48**	102°	**10:48**	162°	**14:48**	222°	**18:48**	282°	**22:48**	342°
02:52	43°	**06:52**	103°	**10:52**	163°	**14:52**	223°	**18:52**	283°	**22:52**	343°
02:56	44°	**06:56**	104°	**10:56**	164°	**14:56**	224°	**18:56**	284°	**22:56**	344°
03:00	45°	**07:00**	105°	**11:00**	165°	**15:00**	225°	**19:00**	285°	**23:00**	345°
03:04	46°	**07:04**	106°	**11:04**	166°	**15:04**	226°	**19:04**	286°	**23:04**	346°
03:08	47°	**07:08**	107°	**11:08**	167°	**15:08**	227°	**19:08**	287°	**23:08**	347°
03:12	48°	**07:12**	108°	**11:12**	168°	**15:12**	228°	**19:12**	288°	**23:12**	348°
03:16	49°	**07:16**	109°	**11:16**	169°	**15:16**	229°	**19:16**	289°	**23:16**	349°
03:20	50°	**07:20**	110°	**11:20**	170°	**15:20**	230°	**19:20**	290°	**23:20**	350°
03:24	51°	**07:24**	111°	**11:24**	171°	**15:24**	231°	**19:24**	291°	**23:24**	351°
03:28	52°	**07:28**	112°	**11:28**	172°	**15:28**	232°	**19:28**	292°	**23:28**	352°
03:32	53°	**07:32**	113°	**11:32**	173°	**15:32**	233°	**19:32**	293°	**23:32**	353°
03:36	54°	**07:36**	114°	**11:36**	174°	**15:36**	234°	**19:36**	294°	**23:36**	354°
03:40	55°	**07:40**	115°	**11:40**	175°	**15:40**	235°	**19:40**	295°	**23:40**	355°
03:44	56°	**07:44**	116°	**11:44**	176°	**15:44**	236°	**19:44**	296°	**23:44**	356°
03:48	57°	**07:48**	117°	**11:48**	177°	**15:48**	237°	**19:48**	297°	**23:48**	357°
03:52	58°	**07:52**	118°	**11:52**	178°	**15:52**	238°	**19:52**	298°	**23:52**	358°
03:56	59°	**07:56**	119°	**11:56**	179°	**15:56**	239°	**19:56**	299°	**23:56**	359°

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