

SWISS EPHEMERIS for the year 1648  
heliocentric

JANUARY 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♊	♋	♌	♍	♎	♏	♐	♑	♒
W 1	6 40 52	10 <sup>5</sup> 19'53	10 <sup>11</sup> 11	14 <sup>II</sup> 32	28 <sup>II</sup> 11	21 <sup>III</sup> 45	0 <sup>III</sup> 28	29 <sup>III</sup> 59	5 <sup>III</sup> 18	10 <sup>III</sup> 29	8 <sup>III</sup> 13	28 <sup>III</sup> 17
T 2	6 44 48	11 <sup>0</sup> 21'04	11 <sup>0</sup> 12	20 <sup>0</sup> 50	29 <sup>0</sup> 48	22 <sup>0</sup> 22	0 <sup>0</sup> 33	0 <sup>II</sup> 1	5 <sup>0</sup> 18	10 <sup>0</sup> 30	8 <sup>0</sup> 13	28 <sup>0</sup> 19
F 3	6 48 45	12 <sup>0</sup> 22'14	12 <sup>0</sup> 13	27 <sup>0</sup> 8	1 <sup>0</sup> 26	22 <sup>0</sup> 59	0 <sup>0</sup> 37	0 <sup>0</sup> 4	5 <sup>0</sup> 19	10 <sup>0</sup> 30	8 <sup>0</sup> 14	28 <sup>0</sup> 21
S 4	6 52 41	13 <sup>0</sup> 23'23	13 <sup>0</sup> 14	3 <sup>0</sup> 22	3 <sup>0</sup> 3	23 <sup>0</sup> 36	0 <sup>0</sup> 42	0 <sup>0</sup> 6	5 <sup>0</sup> 20	10 <sup>0</sup> 30	8 <sup>0</sup> 14	28 <sup>0</sup> 23
S 5	6 56 38	14 <sup>0</sup> 24'32	14 <sup>0</sup> 16	9 <sup>0</sup> 31	4 <sup>0</sup> 41	24 <sup>0</sup> 12	0 <sup>0</sup> 47	0 <sup>0</sup> 8	5 <sup>0</sup> 21	10 <sup>0</sup> 31	8 <sup>0</sup> 14	28 <sup>0</sup> 26
M 6	7 0 34	15 <sup>0</sup> 25'41	15 <sup>0</sup> 18	15 <sup>0</sup> 35	6 <sup>0</sup> 18	24 <sup>0</sup> 49	0 <sup>0</sup> 51	0 <sup>0</sup> 10	5 <sup>0</sup> 21	10 <sup>0</sup> 31	8 <sup>0</sup> 14	28 <sup>0</sup> 28
T 7	7 4 31	16 <sup>0</sup> 26'49	16 <sup>0</sup> 20	21 <sup>0</sup> 32	7 <sup>0</sup> 56	25 <sup>0</sup> 26	0 <sup>0</sup> 56	0 <sup>0</sup> 13	5 <sup>0</sup> 22	10 <sup>0</sup> 32	8 <sup>0</sup> 14	28 <sup>0</sup> 30
W 8	7 8 28	17 <sup>0</sup> 27'56	17 <sup>0</sup> 23	27 <sup>0</sup> 21	9 <sup>0</sup> 33	26 <sup>0</sup> 3	1 <sup>0</sup> 0	0 <sup>0</sup> 15	5 <sup>0</sup> 23	10 <sup>0</sup> 32	8 <sup>0</sup> 14	28 <sup>0</sup> 32
T 9	7 12 24	18 <sup>0</sup> 29'03	18 <sup>0</sup> 26	3 <sup>0</sup> Ω 2	11 <sup>0</sup> 11	26 <sup>0</sup> 40	1 <sup>0</sup> 5	0 <sup>0</sup> 17	5 <sup>0</sup> 23	10 <sup>0</sup> 32	8 <sup>0</sup> 14	28 <sup>0</sup> 34
F 10	7 16 21	19 <sup>0</sup> 30'10	19 <sup>0</sup> 29	8 <sup>0</sup> 34	12 <sup>0</sup> 49	27 <sup>0</sup> 17	1 <sup>0</sup> 10	0 <sup>0</sup> 19	5 <sup>0</sup> 24	10 <sup>0</sup> 33	8 <sup>0</sup> 15	28 <sup>0</sup> 36
S 11	7 20 17	20 <sup>0</sup> 31'16	20 <sup>0</sup> 32	13 <sup>0</sup> 56	14 <sup>0</sup> 26	27 <sup>0</sup> 54	1 <sup>0</sup> 14	0 <sup>0</sup> 21	5 <sup>0</sup> 25	10 <sup>0</sup> 33	8 <sup>0</sup> 15	28 <sup>0</sup> 38
S 12	7 24 14	21 <sup>0</sup> 32'21	21 <sup>0</sup> 35	19 <sup>0</sup> 8	16 <sup>0</sup> 4	28 <sup>0</sup> 32	1 <sup>0</sup> 19	0 <sup>0</sup> 24	5 <sup>0</sup> 26	10 <sup>0</sup> 33	8 <sup>0</sup> 15	28 <sup>0</sup> 40
M13	7 28 10	22 <sup>0</sup> 33'26	22 <sup>0</sup> 38	24 <sup>0</sup> 11	17 <sup>0</sup> 41	29 <sup>0</sup> 9	1 <sup>0</sup> 24	0 <sup>0</sup> 26	5 <sup>0</sup> 26	10 <sup>0</sup> 34	8 <sup>0</sup> 15	28 <sup>0</sup> 42
T 14	7 32 7	23 <sup>0</sup> 34'30	23 <sup>0</sup> 41	29 <sup>0</sup> 5	19 <sup>0</sup> 19	29 <sup>0</sup> 46	1 <sup>0</sup> 28	0 <sup>0</sup> 28	5 <sup>0</sup> 27	10 <sup>0</sup> 34	8 <sup>0</sup> 15	28 <sup>0</sup> 44
W15	7 36 3	24 <sup>0</sup> 35'34	24 <sup>0</sup> 43	3 <sup>0</sup> η 49	20 <sup>0</sup> 56	0 <sup>0</sup> ≈23	1 <sup>0</sup> 33	0 <sup>0</sup> 30	5 <sup>0</sup> 28	10 <sup>0</sup> 34	8 <sup>0</sup> 15	28 <sup>0</sup> 46
T 16	7 40 0	25 <sup>0</sup> 36'38	25 <sup>0</sup> 45	8 <sup>0</sup> 24	22 <sup>0</sup> 34	1 <sup>0</sup> 1	1 <sup>0</sup> 37	0 <sup>0</sup> 33	5 <sup>0</sup> 28	10 <sup>0</sup> 35	8 <sup>0</sup> 16	28 <sup>0</sup> 49
F 17	7 43 57	26 <sup>0</sup> 37'41	26 <sup>0</sup> 46	12 <sup>0</sup> 50	24 <sup>0</sup> 11	1 <sup>0</sup> 38	1 <sup>0</sup> 42	0 <sup>0</sup> 35	5 <sup>0</sup> 29	10 <sup>0</sup> 35	8 <sup>0</sup> 16	28 <sup>0</sup> 51
S 18	7 47 53	27 <sup>0</sup> 38'44	27 <sup>0</sup> 47	17 <sup>0</sup> 7	25 <sup>0</sup> 49	2 <sup>0</sup> 15	1 <sup>0</sup> 47	0 <sup>0</sup> 37	5 <sup>0</sup> 30	10 <sup>0</sup> 35	8 <sup>0</sup> 16	28 <sup>0</sup> 53
S 19	7 51 50	28 <sup>0</sup> 39'47	28 <sup>0</sup> 48	21 <sup>0</sup> 17	27 <sup>0</sup> 26	2 <sup>0</sup> 53	1 <sup>0</sup> 51	0 <sup>0</sup> 39	5 <sup>0</sup> 31	10 <sup>0</sup> 36	8 <sup>0</sup> 16	28 <sup>0</sup> 55
M20	7 55 46	29 <sup>0</sup> 40'49	29 <sup>0</sup> 48	25 <sup>0</sup> 19	29 <sup>0</sup> 4	3 <sup>0</sup> 30	1 <sup>0</sup> 56	0 <sup>0</sup> 42	5 <sup>0</sup> 31	10 <sup>0</sup> 36	8 <sup>0</sup> 16	28 <sup>0</sup> 57
T 21	7 59 43	0 <sup>0</sup> Ω 41'50	0 <sup>0</sup> Ω 48	29 <sup>0</sup> 14	0 <sup>0</sup> η 41	4 <sup>0</sup> 8	2 <sup>0</sup> 1	0 <sup>0</sup> 44	5 <sup>0</sup> 32	10 <sup>0</sup> 37	8 <sup>0</sup> 16	28 <sup>0</sup> 59
W22	8 3 39	1 <sup>0</sup> 42'51	1 <sup>0</sup> 48	3 <sup>0</sup> Ω 2	2 <sup>0</sup> 19	4 <sup>0</sup> 45	2 <sup>0</sup> 5	0 <sup>0</sup> 46	5 <sup>0</sup> 33	10 <sup>0</sup> 37	8 <sup>0</sup> 17	29 <sup>0</sup> 1
T 23	8 7 36	2 <sup>0</sup> 43'51	2 <sup>0</sup> 47	6 <sup>0</sup> 43	3 <sup>0</sup> 56	5 <sup>0</sup> 22	2 <sup>0</sup> 10	0 <sup>0</sup> 48	5 <sup>0</sup> 34	10 <sup>0</sup> 37	8 <sup>0</sup> 17	29 <sup>0</sup> 3
F 24	8 11 32	3 <sup>0</sup> 44'50	3 <sup>0</sup> 46	10 <sup>0</sup> 19	5 <sup>0</sup> 34	6 <sup>0</sup> 0	2 <sup>0</sup> 14	0 <sup>0</sup> 50	5 <sup>0</sup> 34	10 <sup>0</sup> 38	8 <sup>0</sup> 17	29 <sup>0</sup> 5
S 25	8 15 29	4 <sup>0</sup> 45'48	4 <sup>0</sup> 45	13 <sup>0</sup> 50	7 <sup>0</sup> 11	6 <sup>0</sup> 38	2 <sup>0</sup> 19	0 <sup>0</sup> 53	5 <sup>0</sup> 35	10 <sup>0</sup> 38	8 <sup>0</sup> 17	29 <sup>0</sup> 7
S 26	8 19 26	5 <sup>0</sup> 46'46	5 <sup>0</sup> 45	17 <sup>0</sup> 15	8 <sup>0</sup> 49	7 <sup>0</sup> 15	2 <sup>0</sup> 24	0 <sup>0</sup> 55	5 <sup>0</sup> 36	10 <sup>0</sup> 38	8 <sup>0</sup> 17	29 <sup>0</sup> 10
M27	8 23 22	6 <sup>0</sup> 47'42	6 <sup>0</sup> 44	20 <sup>0</sup> 35	10 <sup>0</sup> 26	7 <sup>0</sup> 53	2 <sup>0</sup> 28	0 <sup>0</sup> 57	5 <sup>0</sup> 36	10 <sup>0</sup> 39	8 <sup>0</sup> 17	29 <sup>0</sup> 12
T 28	8 27 19	7 <sup>0</sup> 48'36	7 <sup>0</sup> 43	23 <sup>0</sup> 51	12 <sup>0</sup> 4	8 <sup>0</sup> 30	2 <sup>0</sup> 33	0 <sup>0</sup> 59	5 <sup>0</sup> 37	10 <sup>0</sup> 39	8 <sup>0</sup> 18	29 <sup>0</sup> 14
W29	8 31 15	8 <sup>0</sup> 49'30	8 <sup>0</sup> 43	27 <sup>0</sup> 4	13 <sup>0</sup> 41	9 <sup>0</sup> 8	2 <sup>0</sup> 38	1 <sup>0</sup> 2	5 <sup>0</sup> 38	10 <sup>0</sup> 39	8 <sup>0</sup> 18	29 <sup>0</sup> 16
T 30	8 35 12	9 <sup>0</sup> 50'22	9 <sup>0</sup> 42	0 <sup>0</sup> η 12	15 <sup>0</sup> 18	9 <sup>0</sup> 46	2 <sup>0</sup> 42	1 <sup>0</sup> 4	5 <sup>0</sup> 39	10 <sup>0</sup> 40	8 <sup>0</sup> 18	29 <sup>0</sup> 18
F 31	8 39 8	10 <sup>0</sup> Ω 51'13	10 <sup>0</sup> Ω 43	3 <sup>0</sup> η 17	16 <sup>0</sup> η 56	10 <sup>0</sup> ≈24	2 <sup>0</sup> η 47	1 <sup>0</sup> η 6	5 <sup>0</sup> ≈39	10 <sup>0</sup> ≈40	8 <sup>0</sup> η 18	29 <sup>0</sup> ≈20

Delta T = 48.28 sec. Greg. Calendar

FEBRUARY 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♊	♋	♌	♍	♎	♏	♐	♑	♒
S 1	8 43 5	11 <sup>0</sup> Ω 52'02	11 <sup>0</sup> Ω 43	6 <sup>0</sup> η 19	18 <sup>0</sup> η 33	11 <sup>0</sup> ≈ 1	2 <sup>0</sup> η 51	1 <sup>0</sup> η 8	5 <sup>0</sup> ≈40	10 <sup>0</sup> ≈40	8 <sup>0</sup> η 18	29 <sup>0</sup> ≈22
S 2	8 47 1	12 <sup>0</sup> 52'50	12 <sup>0</sup> 44	9 <sup>0</sup> 18	20 <sup>0</sup> 10	11 <sup>0</sup> 39	2 <sup>0</sup> 56	1 <sup>0</sup> 11	5 <sup>0</sup> 41	10 <sup>0</sup> 41	8 <sup>0</sup> 18	29 <sup>0</sup> 24
M 3	8 50 58	13 <sup>0</sup> 53'37	13 <sup>0</sup> 45	12 <sup>0</sup> 15	21 <sup>0</sup> 48	12 <sup>0</sup> 17	3 <sup>0</sup> 1	1 <sup>0</sup> 13	5 <sup>0</sup> 41	10 <sup>0</sup> 41	8 <sup>0</sup> 19	29 <sup>0</sup> 26
T 4	8 54 55	14 <sup>0</sup> 54'22	14 <sup>0</sup> 46	15 <sup>0</sup> 9	23 <sup>0</sup> 25	12 <sup>0</sup> 55	3 <sup>0</sup> 5	1 <sup>0</sup> 15	5 <sup>0</sup> 42	10 <sup>0</sup> 41	8 <sup>0</sup> 19	29 <sup>0</sup> 29
W 5	8 58 51	15 <sup>0</sup> 55'05	15 <sup>0</sup> 48	18 <sup>0</sup> 2	25 <sup>0</sup> 2	13 <sup>0</sup> 32	3 <sup>0</sup> 10	1 <sup>0</sup> 17	5 <sup>0</sup> 43	10 <sup>0</sup> 42	8 <sup>0</sup> 19	29 <sup>0</sup> 31
T 6	9 2 48	16 <sup>0</sup> 55'47	16 <sup>0</sup> 50	20 <sup>0</sup> 52	26 <sup>0</sup> 39	14 <sup>0</sup> 10	3 <sup>0</sup> 14	1 <sup>0</sup> 19	5 <sup>0</sup> 44	10 <sup>0</sup> 42	8 <sup>0</sup> 19	29 <sup>0</sup> 33
F 7	9 6 44	17 <sup>0</sup> 56'27	17 <sup>0</sup> 52	23 <sup>0</sup> 41	28 <sup>0</sup> 16	14 <sup>0</sup> 48	3 <sup>0</sup> 19	1 <sup>0</sup> 22	5 <sup>0</sup> 44	10 <sup>0</sup> 43	8 <sup>0</sup> 19	29 <sup>0</sup> 35
S 8	9 10 41	18 <sup>0</sup> 57'06	18 <sup>0</sup> 55	26 <sup>0</sup> 29	29 <sup>0</sup> 53	15 <sup>0</sup> 26	3 <sup>0</sup> 24	1 <sup>0</sup> 24	5 <sup>0</sup> 45	10 <sup>0</sup> 43	8 <sup>0</sup> 19	29 <sup>0</sup> 37
S 9	9 14 37	19 <sup>0</sup> 57'43	19 <sup>0</sup> 58	29 <sup>0</sup> 16	1 <sup>0</sup> Ω 30	16 <sup>0</sup> 4	3 <sup>0</sup> 28	1 <sup>0</sup> 26	5 <sup>0</sup> 46	10 <sup>0</sup> 43	8 <sup>0</sup> 19	29 <sup>0</sup> 39
M10	9 18 34	20 <sup>0</sup> 58'18	21 <sup>0</sup> 0	2 <sup>0</sup> ≈ 2	3 <sup>0</sup> 7	16 <sup>0</sup> 42	3 <sup>0</sup> 33	1 <sup>0</sup> 28	5 <sup>0</sup> 46	10 <sup>0</sup> 44	8 <sup>0</sup> 20	29 <sup>0</sup> 41
T 11	9 22 30	21 <sup>0</sup> 58'53	22 <sup>0</sup> 3	4 <sup>0</sup> 47	4 <sup>0</sup> 44	17 <sup>0</sup> 20	3 <sup>0</sup> 38	1 <sup>0</sup> 31	5 <sup>0</sup> 47	10 <sup>0</sup> 44	8 <sup>0</sup> 20	29 <sup>0</sup> 43
W12	9 26 27	22 <sup>0</sup> 59'25	23 <sup>0</sup> 5	7 <sup>0</sup> 32	6 <sup>0</sup> 21	17 <sup>0</sup> 58	3 <sup>0</sup> 42	1 <sup>0</sup> 33	5 <sup>0</sup> 48	10 <sup>0</sup> 44	8 <sup>0</sup> 20	29 <sup>0</sup> 45
T 13	9 30 24	23 <sup>0</sup> 59'57	24 <sup>0</sup> 7	10 <sup>0</sup> 17	7 <sup>0</sup> 58	18 <sup>0</sup> 36	3 <sup>0</sup> 47	1 <sup>0</sup> 35	5 <sup>0</sup> 49	10 <sup>0</sup> 45	8 <sup>0</sup> 20	29 <sup>0</sup> 48
F 14	9 34 20	25 <sup>0</sup> 0'27	25 <sup>0</sup> 8	13 <sup>0</sup> 2	9 <sup>0</sup> 35	19 <sup>0</sup> 14	3 <sup>0</sup> 51	1 <sup>0</sup> 37	5 <sup>0</sup> 49	10 <sup>0</sup> 45	8 <sup>0</sup> 20	29 <sup>0</sup> 50
S 15	9 38 17	26 <sup>0</sup> 0'56	26 <sup>0</sup> 10	15 <sup>0</sup> 46	11 <sup>0</sup> 12	19 <sup>0</sup> 52	3 <sup>0</sup> 56	1 <sup>0</sup> 40	5 <sup>0</sup> 50	10 <sup>0</sup> 45	8 <sup>0</sup> 20	29 <sup>0</sup> 52
S 16	9 42 13	27 <sup>0</sup> 1'23	27 <sup>0</sup> 10	18 <sup>0</sup> 32	12 <sup>0</sup> 49	20 <sup>0</sup> 30	4 <sup>0</sup> 1	1 <sup>0</sup> 42	5 <sup>0</sup> 51	10 <sup>0</sup> 46	8 <sup>0</sup> 21	29 <sup>0</sup> 54
M17	9 46 10	28 <sup>0</sup> 1'50	28 <sup>0</sup> 10	21 <sup>0</sup> 17	14 <sup>0</sup> 26	21 <sup>0</sup> 8	4 <sup>0</sup> 5	1 <sup>0</sup> 44	5 <sup>0</sup> 51	10 <sup>0</sup> 46	8 <sup>0</sup> 21	29 <sup>0</sup> 56
T 18	9 50 6	29 <sup>0</sup> 2'15	29 <sup>0</sup> 10	24 <sup>0</sup> 4	16 <sup>0</sup> 2	21 <sup>0</sup> 46	4 <sup>0</sup> 10	1 <sup>0</sup> 46	5 <sup>0</sup> 52	10 <sup>0</sup> 46	8 <sup>0</sup> 21	29 <sup>0</sup> 58
W19	9 54 3	0 <sup>0</sup> η 2'38	0 <sup>0</sup> η 10	26 <sup>0</sup> 52	17 <sup>0</sup> 39	22 <sup>0</sup> 24	4 <sup>0</sup> 14	1 <sup>0</sup> 48	5 <sup>0</sup> 53	10 <sup>0</sup> 47	8 <sup>0</sup> 21	0 <sup>0</sup> Ω 0
T 20	9 57 59	1 <sup>0</sup> 3'01	1 <sup>0</sup> 9	29 <sup>0</sup> 41	19 <sup>0</sup> 15	23 <sup>0</sup> 2	4 <sup>0</sup> 19	1 <sup>0</sup> 51	5 <sup>0</sup> 54	10 <sup>0</sup> 47	8 <sup>0</sup> 21	0 <sup>0</sup> 2
F 21	10 1 56	2 <sup>0</sup> 3'21	2 <sup>0</sup> 8	2 <sup>0</sup> ≈ 31	20 <sup>0</sup> 52	23 <sup>0</sup> 40	4 <sup>0</sup> 24	1 <sup>0</sup> 53	5 <sup>0</sup> 54	10 <sup>0</sup> 48	8 <sup>0</sup> 21	0 <sup>0</sup> 5
S 22	10 5 53	3 <sup>0</sup> 3'40	3 <sup>0</sup> 6	5 <sup>0</sup> 23	22 <sup>0</sup> 29	24 <sup>0</sup> 18	4 <sup>0</sup> 28	1 <sup>0</sup> 55	5 <sup>0</sup> 55	10 <sup>0</sup> 48	8 <sup>0</sup> 22	0 <sup>0</sup> 7
S 23	10 9 49	4 <sup>0</sup> 3'57	4 <sup>0</sup> 5	8 <sup>0</sup> 17	24 <sup>0</sup> 5	24 <sup>0</sup> 56	4 <sup>0</sup> 33	1 <sup>0</sup> 57	5 <sup>0</sup> 56	10 <sup>0</sup> 48	8 <sup>0</sup> 22	0 <sup>0</sup> 9
M24	10 13 46	5 <sup>0</sup> 4'12	5 <sup>0</sup> 3	11 <sup>0</sup> 13	25 <sup>0</sup> 41	25 <sup>0</sup> 34	4 <sup>0</sup> 37	2 <sup>0</sup> 0	5 <sup>0</sup> 57	10 <sup>0</sup> 49	8 <sup>0</sup> 22	0 <sup>0</sup> 11
T 25	10 17 42	6 <sup>0</sup> 4'26	6 <sup>0</sup> 2	14 <sup>0</sup> 11	27 <sup>0</sup> 18	26 <sup>0</sup> 12	4 <sup>0</sup> 42	2 <sup>0</sup> 2	5 <sup>0</sup> 57	10 <sup>0</sup> 49	8 <sup>0</sup> 22	0 <sup>0</sup> 13
W26	10 21 39	7 <sup>0</sup> 4'38	7 <sup>0</sup> 0	17 <sup>0</sup> 12	28 <sup>0</sup> 54	26 <sup>0</sup> 50	4 <sup>0</sup> 47	2 <sup>0</sup> 4	5 <sup>0</sup> 58	10 <sup>0</sup> 49	8 <sup>0</sup> 22	0 <sup>0</sup> 15
T 27	10 25 35	8 <sup>0</sup> 4'47	7 <sup>0</sup> 59	20 <sup>0</sup> 16	0 <sup>0</sup> η 30	27 <sup>0</sup> 28	4 <sup>0</sup> 51	2 <sup>0</sup> 6	5 <sup>0</sup> 59	10 <sup>0</sup> 50	8 <sup>0</sup> 22	0 <sup>0</sup> 17
F 28	10 29 32	9 <sup>0</sup> 4'55	8 <sup>0</sup> 58	23 <sup>0</sup> 23	2 <sup>0</sup> 7	28 <sup>0</sup> 6	4 <sup>0</sup> 56	2 <sup>0</sup> 9	5 <sup>0</sup> 59	10 <sup>0</sup> 50	8 <sup>0</sup> 23	0 <sup>0</sup> 19
S 29	10 33 28	10 <sup>0</sup> η 5'01	9 <sup>0</sup> η 57									

SWISS EPHEMERIS for the year 1648  
heliocentric

MARCH 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♃	♄	♅	♆	♁	♂	♆	♁	♂
S 1	10 37 25	11 <sup>h</sup> 5'04	10 <sup>m</sup> 56	29 <sup>s</sup> 47	5 <sup>m</sup> 19	29 <sup>s</sup> 23	5 <sup>m</sup> 5	2 <sup>h</sup> 13	6 <sup>s</sup> 1	10 <sup>s</sup> 51	8 <sup>m</sup> 23	0 <sup>d</sup> 24
M 2	10 41 21	12° 5'06	11° 56	3 <sup>m</sup> 5	6° 55	0 <sup>h</sup> 1	5° 10	2° 15	6° 2	10° 51	8° 23	0° 26
T 3	10 45 18	13° 5'05	12° 56	6° 28	8° 31	0° 39	5° 14	2° 17	6° 2	10° 51	8° 23	0° 28
W 4	10 49 15	14° 5'02	13° 57	9° 55	10° 7	1° 17	5° 19	2° 20	6° 3	10° 52	8° 23	0° 30
T 5	10 53 11	15° 4'57	14° 57	13° 27	11° 43	1° 55	5° 24	2° 22	6° 4	10° 52	8° 23	0° 32
F 6	10 57 8	16° 4'50	15° 59	17° 4	13° 19	2° 33	5° 28	2° 24	6° 4	10° 53	8° 24	0° 34
S 7	11 1 4	17° 4'40	17° 0	20° 47	14° 55	3° 11	5° 33	2° 26	6° 5	10° 53	8° 24	0° 36
S 8	11 5 1	18° 4'28	18° 2	24° 36	16° 31	3° 49	5° 37	2° 29	6° 6	10° 53	8° 24	0° 39
M 9	11 8 57	19° 4'14	19° 3	28° 32	18° 7	4° 27	5° 42	2° 31	6° 7	10° 54	8° 24	0° 41
T 10	11 12 54	20° 3'58	20° 5	2 <sup>h</sup> 34	19° 42	5° 5	5° 47	2° 33	6° 7	10° 54	8° 24	0° 43
W 11	11 16 50	21° 3'41	21° 7	6° 44	21° 18	5° 43	5° 51	2° 35	6° 8	10° 54	8° 24	0° 45
T 12	11 20 47	22° 3'21	22° 8	11° 1	22° 54	6° 21	5° 56	2° 38	6° 9	10° 55	8° 25	0° 47
F 13	11 24 44	23° 2'59	23° 9	15° 26	24° 29	7° 0	6° 0	2° 40	6° 9	10° 55	8° 25	0° 49
S 14	11 28 40	24° 2'36	24° 10	19° 59	26° 5	7° 38	6° 5	2° 42	6° 10	10° 55	8° 25	0° 51
S 15	11 32 37	25° 2'11	25° 11	24° 41	27° 40	8° 16	6° 10	2° 44	6° 11	10° 56	8° 25	0° 53
M 16	11 36 33	26° 1'44	26° 11	29° 32	29° 16	8° 54	6° 14	2° 46	6° 12	10° 56	8° 25	0° 56
T 17	11 40 30	27° 1'16	27° 10	4 <sup>h</sup> 31	0 <sup>s</sup> 51	9° 32	6° 19	2° 49	6° 12	10° 56	8° 25	0° 58
W 18	11 44 26	28° 0'45	28° 9	9° 40	2° 27	10° 10	6° 23	2° 51	6° 13	10° 57	8° 26	1° 0
T 19	11 48 23	29° 0'13	29° 8	14° 58	4° 2	10° 48	6° 28	2° 53	6° 14	10° 57	8° 26	1° 2
F 20	11 52 19	29° 59'39	0 <sup>h</sup> 6	20° 24	5° 37	11° 25	6° 33	2° 55	6° 14	10° 57	8° 26	1° 4
S 21	11 56 16	0 <sup>h</sup> 59'03	1° 5	26° 0	7° 13	12° 3	6° 37	2° 58	6° 15	10° 58	8° 26	1° 6
S 22	12 0 13	1° 58'26	2° 2	1 <sup>h</sup> 44	8° 48	12° 41	6° 42	3° 0	6° 16	10° 58	8° 26	1° 8
M 23	12 4 9	2° 57'46	3° 0	7° 36	10° 23	13° 19	6° 46	3° 2	6° 17	10° 59	8° 26	1° 11
T 24	12 8 6	3° 57'04	3° 58	13° 35	11° 59	13° 57	6° 51	3° 4	6° 17	10° 59	8° 27	1° 13
W 25	12 12 2	4° 56'20	4° 55	19° 41	13° 34	14° 35	6° 56	3° 7	6° 18	10° 59	8° 27	1° 15
T 26	12 15 59	5° 55'34	5° 53	25° 52	15° 9	15° 13	7° 0	3° 9	6° 19	11° 0	8° 27	1° 17
F 27	12 19 55	6° 54'46	6° 50	2 <sup>h</sup> 7	16° 44	15° 51	7° 5	3° 11	6° 19	11° 0	8° 27	1° 19
S 28	12 23 52	7° 53'56	7° 48	8° 24	18° 19	16° 29	7° 9	3° 13	6° 20	11° 0	8° 27	1° 21
S 29	12 27 48	8° 53'04	8° 46	14° 44	19° 54	17° 6	7° 14	3° 16	6° 21	11° 1	8° 27	1° 23
M 30	12 31 45	9° 52'09	9° 44	21° 2	21° 29	17° 44	7° 19	3° 18	6° 22	11° 1	8° 27	1° 26
T 31	12 35 42	10° 51'12	10° 43	27 <sup>h</sup> 20	23 <sup>s</sup> 4	18 <sup>h</sup> 22	7 <sup>m</sup> 23	3 <sup>h</sup> 20	6 <sup>s</sup> 22	11 <sup>s</sup> 1	8 <sup>m</sup> 28	1 <sup>d</sup> 28

Delta T = 48.13 sec.

Greg. Calendar

APRIL 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♃	♄	♅	♆	♁	♂	♆	♁	♂
W 1	12 39 38	11 <sup>h</sup> 5'13	11 <sup>m</sup> 41	3 <sup>s</sup> 34	24 <sup>m</sup> 39	19 <sup>s</sup> 0	7 <sup>m</sup> 28	3 <sup>h</sup> 22	6 <sup>s</sup> 23	11 <sup>s</sup> 2	8 <sup>m</sup> 28	1 <sup>d</sup> 30
T 2	12 43 35	12° 49'11	12° 41	9° 43	26° 14	19° 37	7° 32	3° 24	6° 24	11° 2	8° 28	1° 32
F 3	12 47 31	13° 48'08	13° 40	15° 47	27° 49	20° 15	7° 37	3° 27	6° 24	11° 2	8° 28	1° 34
S 4	12 51 28	14° 47'01	14° 40	21° 43	29° 24	20° 53	7° 42	3° 29	6° 25	11° 3	8° 28	1° 36
S 5	12 55 24	15° 45'53	15° 41	27° 32	0 <sup>h</sup> 59	21° 30	7° 46	3° 31	6° 26	11° 3	8° 28	1° 39
M 6	12 59 21	16° 44'42	16° 41	3 <sup>h</sup> 13	2° 34	22° 8	7° 51	3° 33	6° 27	11° 4	8° 29	1° 41
T 7	13 3 17	17° 43'29	17° 42	8° 44	4° 9	22° 45	7° 55	3° 36	6° 27	11° 4	8° 29	1° 43
W 8	13 7 14	18° 42'13	18° 43	14° 6	5° 44	23° 23	8° 0	3° 38	6° 28	11° 4	8° 29	1° 45
T 9	13 11 11	19° 40'56	19° 43	19° 18	7° 19	24° 0	8° 5	3° 40	6° 29	11° 5	8° 29	1° 47
F 10	13 15 7	20° 39'37	20° 44	24° 21	8° 53	24° 38	8° 9	3° 42	6° 30	11° 5	8° 29	1° 49
S 11	13 19 4	21° 38'17	21° 44	29° 14	10° 28	25° 15	8° 14	3° 45	6° 30	11° 5	8° 29	1° 51
S 12	13 23 0	22° 36'54	22° 44	3 <sup>h</sup> 58	12° 3	25° 53	8° 18	3° 47	6° 31	11° 6	8° 30	1° 54
M 13	13 26 57	23° 35'30	23° 44	8° 32	13° 38	26° 30	8° 23	3° 49	6° 32	11° 6	8° 30	1° 56
T 14	13 30 53	24° 34'05	24° 43	12° 58	15° 13	27° 8	8° 28	3° 51	6° 32	11° 6	8° 30	1° 58
W 15	13 34 50	25° 32'37	25° 42	17° 15	16° 48	27° 45	8° 32	3° 54	6° 33	11° 7	8° 30	2° 0
T 16	13 38 46	26° 31'08	26° 40	21° 25	18° 22	28° 22	8° 37	3° 56	6° 34	11° 7	8° 30	2° 2
F 17	13 42 43	27° 29'37	27° 38	25° 26	19° 57	28° 59	8° 41	3° 58	6° 35	11° 7	8° 30	2° 4
S 18	13 46 40	28° 28'05	28° 36	29° 21	21° 32	29° 37	8° 46	4° 0	6° 35	11° 8	8° 31	2° 7
S 19	13 50 36	29° 26'30	29° 33	3 <sup>h</sup> 9	23° 7	0 <sup>h</sup> 14	8° 50	4° 2	6° 36	11° 8	8° 31	2° 9
M 20	13 54 33	0 <sup>h</sup> 24'55	0 <sup>m</sup> 30	6° 50	24° 42	0° 51	8° 55	4° 5	6° 37	11° 9	8° 31	2° 11
T 21	13 58 29	1° 23'17	1° 27	10° 26	26° 17	1° 28	9° 0	4° 7	6° 37	11° 9	8° 31	2° 13
W 22	14 2 26	2° 21'38	2° 23	13° 56	27° 51	2° 5	9° 4	4° 9	6° 38	11° 9	8° 31	2° 15
T 23	14 6 22	3° 19'57	3° 20	17° 21	29° 26	2° 42	9° 9	4° 11	6° 39	11° 10	8° 31	2° 17
F 24	14 10 19	4° 18'14	4° 16	20° 42	1 <sup>m</sup> 1	3° 19	9° 13	4° 14	6° 40	11° 10	8° 31	2° 20
S 25	14 14 15	5° 16'29	5° 13	23° 58	2° 36	3° 56	9° 18	4° 16	6° 40	11° 10	8° 32	2° 22
S 26	14 18 12	6° 14'42	6° 10	27° 10	4° 11	4° 33	9° 23	4° 18	6° 41	11° 11	8° 32	2° 24
M 27	14 22 8	7° 12'54	7° 6	0 <sup>h</sup> 18	5° 46	5° 10	9° 27	4° 20	6° 42	11° 11	8° 32	2° 26
T 28	14 26 5	8° 11'04	8° 4	3° 23	7° 20	5° 47	9° 32	4° 23	6° 42	11° 11	8° 32	2° 28
W 29	14 30 2	9° 9'12	9° 1	6° 25	8° 55	6° 24	9° 36	4° 25	6° 43	11° 12	8° 32	2° 30
T 30	14 33 58	10 <sup>h</sup> 7'17	9 <sup>m</sup> 59	9 <sup>s</sup> 24	10 <sup>m</sup> 30	7 <sup>s</sup> 0	9 <sup>m</sup> 41	4 <sup>h</sup> 27	6 <sup>s</sup> 44	11 <sup>s</sup> 12	8 <sup>m</sup> 32	2 <sup>d</sup> 33

Delta T = 48.05 sec.

Greg. Calendar

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SWISS EPHEMERIS for the year 1648  
heliocentric

MAY 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♁	♂	♄	♃	♅	♁	♆	♄	♁	♁
F 1	14 37 55	11♈ 5'21	10♈57	12♈20	12♈ 5	7♈37	9♈46	4♈29	6♈45	11♈12	8♈33	2♈35	
S 2	14 41 51	12° 3'23	11°56	15°15	13°40	8°14	9°50	4°32	6°45	11°13	8°33	2°37	
S 3	14 45 48	13° 1'22	12°54	18° 7	15°15	8°51	9°55	4°34	6°46	11°13	8°33	2°39	
M 4	14 49 44	13°59'20	13°54	20°58	16°50	9°27	9°59	4°36	6°47	11°13	8°33	2°41	
T 5	14 53 41	14°57'16	14°53	23°47	18°25	10° 4	10° 4	4°38	6°47	11°14	8°33	2°43	
W 6	14 57 37	15°55'11	15°53	26°35	20° 0	10°40	10° 9	4°40	6°48	11°14	8°33	2°46	
T 7	15 1 34	16°53'03	16°53	29°21	21°35	11°17	10°13	4°43	6°49	11°15	8°34	2°48	
F 8	15 5 31	17°50'54	17°53	2♉ 7	23°10	11°53	10°18	4°45	6°50	11°15	8°34	2°50	
S 9	15 9 27	18°48'44	18°52	4°53	24°45	12°29	10°22	4°47	6°50	11°15	8°34	2°52	
S 10	15 13 24	19°46'33	19°52	7°37	26°20	13° 6	10°27	4°49	6°51	11°16	8°34	2°54	
M 11	15 17 20	20°44'20	20°51	10°22	27°55	13°42	10°31	4°52	6°52	11°16	8°34	2°57	
T 12	15 21 17	21°42'06	21°50	13° 7	29°30	14°18	10°36	4°54	6°52	11°16	8°34	2°59	
W 13	15 25 13	22°39'51	22°48	15°52	1♊ 5	14°54	10°41	4°56	6°53	11°17	8°35	3° 1	
T 14	15 29 10	23°37'34	23°47	18°37	2°40	15°31	10°45	4°58	6°54	11°17	8°35	3° 3	
F 15	15 33 7	24°35'17	24°44	21°23	4°15	16° 7	10°50	5° 1	6°55	11°17	8°35	3° 5	
S 16	15 37 3	25°32'58	25°42	24° 9	5°50	16°43	10°54	5° 3	6°55	11°18	8°35	3° 7	
S 17	15 41 0	26°30'39	26°39	26°57	7°25	17°19	10°59	5° 5	6°56	11°18	8°35	3°10	
M 18	15 44 56	27°28'18	27°35	29°46	9° 1	17°55	11° 4	5° 7	6°57	11°18	8°35	3°12	
T 19	15 48 53	28°25'56	28°32	2♋36	10°36	18°31	11° 8	5°10	6°57	11°19	8°35	3°14	
W 20	15 52 49	29°23'33	29°28	5°28	12°11	19° 6	11°13	5°12	6°58	11°19	8°36	3°16	
T 21	15 56 46	0♈21'09	0♈24	8°22	13°46	19°42	11°17	5°14	6°59	11°20	8°36	3°18	
F 22	16 0 42	1°18'44	1°20	11°18	15°21	20°18	11°22	5°16	7° 0	11°20	8°36	3°21	
S 23	16 4 39	2°16'18	2°15	14°17	16°57	20°54	11°26	5°18	7° 0	11°20	8°36	3°23	
S 24	16 8 35	3°13'51	3°11	17°18	18°32	21°29	11°31	5°21	7° 1	11°21	8°36	3°25	
M 25	16 12 32	4°11'23	4° 7	20°22	20° 7	22° 5	11°36	5°23	7° 2	11°21	8°36	3°27	
T 26	16 16 29	5° 8'54	5° 3	23°29	21°43	22°40	11°40	5°25	7° 3	11°21	8°37	3°29	
W 27	16 20 25	6° 6'23	5°59	26°39	23°18	23°16	11°45	5°27	7° 3	11°22	8°37	3°32	
T 28	16 24 22	7° 3'51	6°56	29°53	24°54	23°51	11°49	5°30	7° 4	11°22	8°37	3°34	
F 29	16 28 18	8° 1'18	7°53	3♈12	26°29	24°27	11°54	5°32	7° 5	11°22	8°37	3°36	
S 30	16 32 15	8°58'43	8°50	6°34	28° 4	25° 2	11°59	5°34	7° 5	11°23	8°37	3°38	
S 31	16 36 11	9♈56'07	9♈48	10♈ 1	29♈40	25♈37	12♈ 3	5♈36	7♈ 6	11♈23	8♈37	3♈40	

Delta T = 47.97 sec.

Greg. Calendar

JUNE 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♁	♂	♄	♃	♅	♁	♆	♄	♁	♁
M 1	16 40 8	10♈53'30	10♈46	13♈34	1♉15	26♈13	12♈ 8	5♈39	7♈ 7	11♈23	8♈38	3♈42	
T 2	16 44 5	11°50'52	11°45	17°11	2°51	26°48	12°12	5°41	7° 8	11°24	8°38	3°45	
W 3	16 48 1	12°48'13	12°44	20°54	4°26	27°23	12°17	5°43	7° 8	11°24	8°38	3°47	
T 4	16 51 58	13°45'32	13°43	24°44	6° 2	27°58	12°21	5°45	7° 9	11°25	8°38	3°49	
F 5	16 55 54	14°42'51	14°42	28°40	7°38	28°33	12°26	5°48	7°10	11°25	8°38	3°51	
S 6	16 59 51	15°40'10	15°41	2♉42	9°13	29° 8	12°31	5°50	7°10	11°25	8°38	3°53	
S 7	17 3 47	16°37'27	16°40	6°52	10°49	29°43	12°35	5°52	7°11	11°26	8°39	3°56	
M 8	17 7 44	17°34'44	17°39	11° 9	12°25	0♉18	12°40	5°54	7°12	11°26	8°39	3°58	
T 9	17 11 40	18°32'01	18°38	15°35	14° 0	0°52	12°44	5°57	7°13	11°26	8°39	4° 0	
W 10	17 15 37	19°29'17	19°37	20° 8	15°36	1°27	12°49	5°59	7°13	11°27	8°39	4° 2	
T 11	17 19 34	20°26'32	20°35	24°50	17°12	2° 2	12°53	6° 1	7°14	11°27	8°39	4° 4	
F 12	17 23 30	21°23'48	21°33	29°41	18°48	2°36	12°58	6° 3	7°15	11°27	8°39	4° 7	
S 13	17 27 27	22°21'03	22°30	4♉41	20°23	3°11	13° 3	6° 6	7°15	11°28	8°40	4° 9	
S 14	17 31 23	23°18'17	23°27	9°50	21°59	3°46	13° 7	6° 8	7°16	11°28	8°40	4°11	
M 15	17 35 20	24°15'32	24°24	15° 8	23°35	4°20	13°12	6°10	7°17	11°28	8°40	4°13	
T 16	17 39 16	25°12'46	25°21	20°35	25°11	4°54	13°16	6°12	7°18	11°29	8°40	4°15	
W 17	17 43 13	26°10'00	26°17	26°11	26°47	5°29	13°21	6°14	7°18	11°29	8°40	4°18	
T 18	17 47 9	27° 7'14	27°13	1♊55	28°23	6° 3	13°26	6°17	7°19	11°30	8°40	4°20	
F 19	17 51 6	28° 4'28	28° 8	7°47	29°59	6°37	13°30	6°19	7°20	11°30	8°40	4°22	
S 20	17 55 3	29° 1'42	29° 4	13°47	1♋35	7°11	13°35	6°21	7°20	11°30	8°41	4°24	
S 21	17 58 59	29°58'56	29°59	19°52	3°11	7°46	13°39	6°23	7°21	11°31	8°41	4°27	
M 22	18 2 56	0♋56'09	0♋54	26° 4	4°47	8°20	13°44	6°26	7°22	11°31	8°41	4°29	
T 23	18 6 52	1°53'23	1°50	2♈19	6°23	8°54	13°48	6°28	7°23	11°31	8°41	4°31	
W 24	18 10 49	2°50'35	2°45	8°36	7°59	9°28	13°53	6°30	7°23	11°32	8°41	4°33	
T 25	18 14 45	3°47'48	3°41	14°55	9°35	10° 1	13°58	6°32	7°24	11°32	8°41	4°35	
F 26	18 18 42	4°45'00	4°37	21°14	11°11	10°35	14° 2	6°35	7°25	11°32	8°42	4°38	
S 27	18 22 38	5°42'12	5°34	27°31	12°47	11° 9	14° 7	6°37	7°25	11°33	8°42	4°40	
S 28	18 26 35	6°39'23	6°31	3♈45	14°24	11°43	14°11	6°39	7°26	11°33	8°42	4°42	
M 29	18 30 32	7°36'34	7°28	9°55	16° 0	12°16	14°16	6°41	7°27	11°33	8°42	4°44	
T 30	18 34 28	8°33'44	8°26	15♈58	17♈36	12♈50	14♈20	6♈44	7♈28	11♈34	8♈42	4♈46	

Delta T = 47.88 sec.

Greg. Calendar

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SWISS EPHEMERIS for the year 1648  
heliocentric

JULY 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♃	♄	♅	♆	♁	♂	♆	♁	♃
W 1	18 38 25	9♁30'55	9♁25	21♁54	19♁13	13♁24	14♁25	6♁46	7♁28	11♁34	8♁42	4♁49
T 2	18 42 21	10°28'05	10°23	27°43	20°49	13°57	14°30	6°48	7°29	11°35	8°43	4°51
F 3	18 46 18	11°25'16	11°22	3♁23	22°25	14°31	14°34	6°50	7°30	11°35	8°43	4°53
S 4	18 50 14	12°22'26	12°21	8°54	24° 2	15° 4	14°39	6°53	7°30	11°35	8°43	4°55
S 5	18 54 11	13°19'37	13°20	14°16	25°38	15°37	14°43	6°55	7°31	11°36	8°43	4°58
M 6	18 58 7	14°16'48	14°19	19°28	27°14	16°10	14°48	6°57	7°32	11°36	8°43	5° 0
T 7	19 2 4	15°13'59	15°18	24°30	28°51	16°44	14°52	6°59	7°33	11°36	8°43	5° 2
W 8	19 6 1	16°11'10	16°16	29°23	0♁27	17°17	14°57	7° 2	7°33	11°37	8°44	5° 4
T 9	19 9 57	17° 8'22	17°15	4♁ 6	2° 4	17°50	15° 2	7° 4	7°34	11°37	8°44	5° 6
F 10	19 13 54	18° 5'35	18°13	8°41	3°41	18°23	15° 6	7° 6	7°35	11°37	8°44	5° 9
S 11	19 17 50	19° 2'48	19°11	13° 6	5°17	18°56	15°11	7° 8	7°36	11°38	8°44	5°11
S 12	19 21 47	20° 0'01	20° 9	17°23	6°54	19°29	15°15	7°10	7°36	11°38	8°44	5°13
M13	19 25 43	20°57'16	21° 6	21°32	8°31	20° 2	15°20	7°13	7°37	11°38	8°44	5°15
T 14	19 29 40	21°54'31	22° 3	25°34	10° 7	20°35	15°24	7°15	7°38	11°39	8°45	5°18
W15	19 33 36	22°51'47	23° 0	29°28	11°44	21° 7	15°29	7°17	7°38	11°39	8°45	5°20
T 16	19 37 33	23°49'03	23°56	3♁16	13°21	21°40	15°34	7°19	7°39	11°39	8°45	5°22
F 17	19 41 30	24°46'21	24°52	6°57	14°57	22°13	15°38	7°22	7°40	11°40	8°45	5°24
S 18	19 45 26	25°43'40	25°48	10°33	16°34	22°45	15°43	7°24	7°41	11°40	8°45	5°26
S 19	19 49 23	26°40'59	26°44	14° 3	18°11	23°18	15°47	7°26	7°41	11°41	8°45	5°29
M20	19 53 19	27°38'19	27°39	17°28	19°48	23°50	15°52	7°28	7°42	11°41	8°45	5°31
T 21	19 57 16	28°35'39	28°35	20°48	21°25	24°23	15°56	7°31	7°43	11°41	8°46	5°33
W22	20 1 12	29°33'01	29°30	24° 4	23° 2	24°55	16° 1	7°33	7°43	11°42	8°46	5°35
T 23	20 5 9	0♁30'23	0♁26	27°16	24°39	25°27	16° 6	7°35	7°44	11°42	8°46	5°38
F 24	20 9 6	1°27'45	1°22	0♁24	26°16	25°59	16°10	7°37	7°45	11°42	8°46	5°40
S 25	20 13 2	2°25'08	2°18	3°29	27°53	26°32	16°15	7°40	7°46	11°43	8°46	5°42
S 26	20 16 59	3°22'32	3°14	6°31	29°30	27° 4	16°19	7°42	7°46	11°43	8°46	5°44
M27	20 20 55	4°19'56	4°12	9°30	1♁ 7	27°36	16°24	7°44	7°47	11°43	8°47	5°47
T 28	20 24 52	5°17'21	5° 9	12°26	2°44	28° 8	16°28	7°46	7°48	11°44	8°47	5°49
W29	20 28 48	6°14'46	6° 7	15°20	4°21	28°40	16°33	7°49	7°48	11°44	8°47	5°51
T 30	20 32 45	7°12'13	7° 5	18°13	5°58	29°12	16°37	7°51	7°49	11°44	8°47	5°53
F 31	20 36 41	8° 9'40	8° 4	21♁ 3	7♁35	29♁44	16♁42	7♁53	7♁50	11♁45	8♁47	5♁55

Delta T = 47.80 sec. Greg. Calendar

AUGUST 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♃	♄	♅	♆	♁	♂	♆	♁	♃
S 1	20 40 38	9♁ 7'08	9♁ 3	23♁52	9♁13	0♁15	16♁47	7♁55	7♁51	11♁45	8♁47	5♁58
S 2	20 44 35	10° 4'36	10° 2	26°40	10°50	0°47	16°51	7°58	7°51	11°46	8°48	6° 0
M 3	20 48 31	11° 2'06	11° 1	29°27	12°27	1°19	16°56	8° 0	7°52	11°46	8°48	6° 2
T 4	20 52 28	11°59'37	12° 1	2♁13	14° 4	1°51	17° 0	8° 2	7°53	11°46	8°48	6° 4
W 5	20 56 24	12°57'09	13° 0	4°58	15°42	2°22	17° 5	8° 4	7°53	11°47	8°48	6° 7
T 6	21 0 21	13°54'42	13°59	7°43	17°19	2°54	17° 9	8° 7	7°54	11°47	8°48	6° 9
F 7	21 4 17	14°52'16	14°58	10°27	18°56	3°25	17°14	8° 9	7°55	11°47	8°48	6°11
S 8	21 8 14	15°49'52	15°57	13°12	20°34	3°57	17°19	8°11	7°56	11°48	8°49	6°13
S 9	21 12 10	16°47'29	16°56	15°57	22°11	4°28	17°23	8°13	7°56	11°48	8°49	6°16
M10	21 16 7	17°45'08	17°54	18°42	23°49	4°59	17°28	8°15	7°57	11°48	8°49	6°18
T 11	21 20 3	18°42'48	18°52	21°28	25°26	5°30	17°32	8°18	7°58	11°49	8°49	6°20
W12	21 24 0	19°40'30	19°49	24°15	27° 3	6° 2	17°37	8°20	7°58	11°49	8°49	6°22
T 13	21 27 57	20°38'14	20°47	27° 2	28°41	6°33	17°41	8°22	7°59	11°49	8°49	6°25
F 14	21 31 53	21°35'59	21°44	29°51	0♁18	7° 4	17°46	8°24	8° 0	11°50	8°49	6°27
S 15	21 35 50	22°33'46	22°40	2♁42	1°56	7°35	17°50	8°27	8° 1	11°50	8°50	6°29
S 16	21 39 46	23°31'35	23°37	5°34	3°33	8° 6	17°55	8°29	8° 1	11°51	8°50	6°31
M17	21 43 43	24°29'25	24°33	8°28	5°11	8°37	18° 0	8°31	8° 2	11°51	8°50	6°34
T 18	21 47 39	25°27'17	25°29	11°24	6°48	9° 8	18° 4	8°33	8° 3	11°51	8°50	6°36
W19	21 51 36	26°25'10	26°25	14°22	8°26	9°39	18° 9	8°36	8° 3	11°52	8°50	6°38
T 20	21 55 33	27°23'05	27°21	17°24	10° 3	10° 9	18°13	8°38	8° 4	11°52	8°50	6°40
F 21	21 59 29	28°21'01	28°17	20°28	11°41	10°40	18°18	8°40	8° 5	11°52	8°51	6°43
S 22	22 3 26	29°18'58	29°13	23°35	13°18	11°11	18°22	8°42	8° 6	11°53	8°51	6°45
S 23	22 7 22	0♁16'57	0♁10	26°45	14°56	11°42	18°27	8°45	8° 6	11°53	8°51	6°47
M24	22 11 19	1°14'58	1° 7	29°59	16°34	12°12	18°32	8°47	8° 7	11°53	8°51	6°49
T 25	22 15 15	2°12'59	2° 5	3♁18	18°11	12°43	18°36	8°49	8° 8	11°54	8°51	6°52
W26	22 19 12	3°11'02	3° 2	6°41	19°49	13°13	18°41	8°51	8° 8	11°54	8°51	6°54
T 27	22 23 8	4° 9'07	4° 1	10° 8	21°26	13°44	18°45	8°54	8° 9	11°54	8°52	6°56
F 28	22 27 5	5° 7'13	5° 0	13°40	23° 4	14°14	18°50	8°56	8°10	11°55	8°52	6°58
S 29	22 31 1	6° 5'20	5°59	17°18	24°41	14°44	18°54	8°58	8°11	11°55	8°52	7° 1
S 30	22 34 58	7° 3'29	6°58	21° 2	26°19	15°15	18°59	9° 0	8°11	11°56	8°52	7° 3
M31	22 38 55	8♁ 1'39	7♁58	24♁51	27♁56	15♁45	19♁ 3	9♁ 3	8♁12	11♁56	8♁52	7♁ 5

Delta T = 47.72 sec. Greg. Calendar created from Swiss Ephemeris, Copyright Astrodienst AG [13.11.2015]

SWISS EPHEMERIS for the year 1648  
heliocentric

SEPTEMBER 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♃	♄	♅	♆	♁	♂	♆	♁	♂
T 1	22 42 51	8 <sup>h</sup> 59 <sup>m</sup> 51 <sup>s</sup>	8 <sup>h</sup> 58 <sup>m</sup>	28 <sup>h</sup> 47 <sup>m</sup>	29 <sup>h</sup> 02 <sup>m</sup> 34 <sup>s</sup>	16 <sup>h</sup> 11 <sup>m</sup> 15 <sup>s</sup>	19 <sup>h</sup> 08 <sup>m</sup>	9 <sup>h</sup> 02 <sup>m</sup> 5 <sup>s</sup>	8 <sup>h</sup> 13 <sup>m</sup>	11 <sup>h</sup> 57 <sup>m</sup> 56 <sup>s</sup>	8 <sup>h</sup> 52 <sup>m</sup> 52 <sup>s</sup>	7 <sup>h</sup> 02 <sup>m</sup> 7 <sup>s</sup>
W 2	22 46 48	9°58'05"	9°58'	2 <sup>h</sup> 50 <sup>m</sup>	1 <sup>h</sup> 11 <sup>m</sup>	16°45'	19°13'	9°7'	8°13'	11°57'	8°53'	7°10'
T 3	22 50 44	10°56'20"	10°58'	7°0'	2°49'	17°15'	19°17'	9°9'	8°14'	11°57'	8°53'	7°12'
F 4	22 54 41	11°54'37"	11°58'	11°18'	4°26'	17°45'	19°22'	9°12'	8°15'	11°57'	8°53'	7°14'
S 5	22 58 37	12°52'56"	12°58'	15°43'	6°4'	18°15'	19°26'	9°14'	8°16'	11°58'	8°53'	7°17'
S 6	23 2 34	13°51'17"	13°58'	20°17'	7°41'	18°45'	19°31'	9°16'	8°16'	11°58'	8°53'	7°19'
M 7	23 6 30	14°49'41"	14°57'	24°59'	9°19'	19°15'	19°35'	9°18'	8°17'	11°58'	8°53'	7°21'
T 8	23 10 27	15°48'06"	15°56'	29°50'	10°56'	19°45'	19°40'	9°21'	8°18'	11°59'	8°54'	7°23'
W 9	23 14 24	16°46'33"	16°55'	4 <sup>h</sup> 50 <sup>m</sup>	12°34'	20°15'	19°44'	9°23'	8°18'	11°59'	8°54'	7°26'
T 10	23 18 20	17°45'03"	17°54'	10°0'	14°11'	20°45'	19°49'	9°25'	8°19'	11°59'	8°54'	7°28'
F 11	23 22 17	18°43'35"	18°52'	15°18'	15°48'	21°14'	19°54'	9°27'	8°20'	12°0'	8°54'	7°30'
S 12	23 26 13	19°42'09"	19°50'	20°45'	17°26'	21°44'	19°58'	9°29'	8°21'	12°0'	8°54'	7°32'
S 13	23 30 10	20°40'45"	20°48'	26°21'	19°3'	22°14'	20°3'	9°32'	8°21'	12°0'	8°54'	7°35'
M14	23 34 6	21°39'24"	21°45'	2 <sup>h</sup> 6 <sup>m</sup>	20°40'	22°43'	20°7'	9°34'	8°22'	12°1'	8°54'	7°37'
T 15	23 38 3	22°38'05"	22°42'	7°58'	22°17'	23°13'	20°12'	9°36'	8°23'	12°1'	8°55'	7°39'
W16	23 41 59	23°36'47"	23°39'	13°58'	23°55'	23°42'	20°16'	9°38'	8°23'	12°2'	8°55'	7°41'
T 17	23 45 56	24°35'32"	24°36'	20°4'	25°32'	24°12'	20°21'	9°41'	8°24'	12°2'	8°55'	7°44'
F 18	23 49 53	25°34'19"	25°33'	26°15'	27°9'	24°41'	20°25'	9°43'	8°25'	12°2'	8°55'	7°46'
S 19	23 53 49	26°33'08"	26°29'	2 <sup>h</sup> 30 <sup>m</sup>	28°46'	25°10'	20°30'	9°45'	8°26'	12°3'	8°55'	7°48'
S 20	23 57 46	27°31'58"	27°27'	8°48'	0 <sup>h</sup> 23 <sup>m</sup>	25°40'	20°35'	9°47'	8°26'	12°3'	8°55'	7°51'
M21	0 1 42	28°30'51"	28°24'	15°7'	2°0'	26°9'	20°39'	9°50'	8°27'	12°3'	8°56'	7°53'
T 22	0 5 39	29°29'45"	29°22'	21°26'	3°37'	26°38'	20°44'	9°52'	8°28'	12°4'	8°56'	7°55'
W23	0 9 35	0 <sup>h</sup> 28 <sup>m</sup> 41 <sup>s</sup>	0 <sup>h</sup> 20 <sup>m</sup>	27°43'	5°14'	27°8'	20°48'	9°54'	8°28'	12°4'	8°56'	7°57'
T 24	0 13 32	1°27'39"	1°19'	3 <sup>h</sup> 57 <sup>m</sup>	6°51'	27°37'	20°53'	9°56'	8°29'	12°4'	8°56'	8°0'
F 25	0 17 28	2°26'38"	2°18'	10°6'	8°28'	28°6'	20°57'	9°59'	8°30'	12°5'	8°56'	8°2'
S 26	0 21 25	3°25'39"	3°18'	16°9'	10°5'	28°35'	21°2'	10°1'	8°31'	12°5'	8°56'	8°4'
S 27	0 25 22	4°24'42"	4°17'	22°6'	11°42'	29°4'	21°6'	10°3'	8°31'	12°5'	8°57'	8°6'
M28	0 29 18	5°23'47"	5°18'	27°54'	13°18'	29°33'	21°11'	10°5'	8°32'	12°6'	8°57'	8°9'
T 29	0 33 15	6°22'54"	6°18'	3 <sup>h</sup> 03 <sup>m</sup> 34 <sup>s</sup>	14°55'	0 <sup>h</sup> 2 <sup>m</sup>	21°16'	10°8'	8°33'	12°6'	8°57'	8°11'
W30	0 37 11	7 <sup>h</sup> 22 <sup>m</sup> 02 <sup>s</sup>	7 <sup>h</sup> 19 <sup>m</sup>	9 <sup>h</sup> 05 <sup>m</sup>	16 <sup>h</sup> 32 <sup>m</sup>	0 <sup>h</sup> 53 <sup>m</sup>	21 <sup>h</sup> 20 <sup>m</sup>	10 <sup>h</sup> 10 <sup>m</sup>	8 <sup>h</sup> 34 <sup>m</sup>	12 <sup>h</sup> 7 <sup>m</sup>	8 <sup>h</sup> 57 <sup>m</sup>	8 <sup>h</sup> 02 <sup>m</sup> 13 <sup>s</sup>

Delta T = 47.63 sec.

Greg. Calendar

OCTOBER 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♃	♄	♅	♆	♁	♂	♆	♁	♂
T 1	0 41 8	8 <sup>h</sup> 21 <sup>m</sup> 13 <sup>s</sup>	8 <sup>h</sup> 20 <sup>m</sup>	14 <sup>h</sup> 02 <sup>m</sup> 26 <sup>s</sup>	18 <sup>h</sup> 08 <sup>m</sup>	1 <sup>h</sup> 00 <sup>m</sup>	21 <sup>h</sup> 25 <sup>m</sup>	10 <sup>h</sup> 12 <sup>m</sup>	8 <sup>h</sup> 34 <sup>m</sup>	12 <sup>h</sup> 7 <sup>m</sup>	8 <sup>h</sup> 57 <sup>m</sup>	8 <sup>h</sup> 02 <sup>m</sup> 16 <sup>s</sup>
F 2	0 45 4	9°20'25"	9°21'	19°37'	19°45'	1°28'	21°29'	10°14'	8°35'	12°7'	8°57'	8°18'
S 3	0 49 1	10°19'40"	10°22'	24°40'	21°22'	1°57'	21°34'	10°17'	8°36'	12°8'	8°58'	8°20'
S 4	0 52 57	11°18'56"	11°23'	29°32'	22°58'	2°26'	21°38'	10°19'	8°36'	12°8'	8°58'	8°22'
M 5	0 56 54	12°18'15"	12°24'	4 <sup>h</sup> 15 <sup>m</sup>	24°34'	2°55'	21°43'	10°21'	8°37'	12°8'	8°58'	8°25'
T 6	1 0 50	13°17'36"	13°24'	8°49'	26°11'	3°23'	21°47'	10°23'	8°38'	12°9'	8°58'	8°27'
W 7	1 4 47	14°17'00"	14°25'	13°14'	27°47'	3°52'	21°52'	10°26'	8°39'	12°9'	8°58'	8°29'
T 8	1 8 44	15°16'26"	15°25'	17°31'	29°24'	4°20'	21°57'	10°28'	8°39'	12°9'	8°58'	8°32'
F 9	1 12 40	16°15'54"	16°25'	21°40'	1 <sup>h</sup> 00 <sup>m</sup>	4°49'	22°1'	10°30'	8°40'	12°10'	8°58'	8°34'
S 10	1 16 37	17°15'24"	17°24'	25°41'	2°36'	5°17'	22°6'	10°32'	8°41'	12°10'	8°59'	8°36'
S 11	1 20 33	18°14'57"	18°23'	29°36'	4°12'	5°46'	22°10'	10°35'	8°41'	12°10'	8°59'	8°38'
M12	1 24 30	19°14'32"	19°22'	3 <sup>h</sup> 23 <sup>m</sup>	5°48'	6°14'	22°15'	10°37'	8°42'	12°11'	8°59'	8°41'
T 13	1 28 26	20°14'09"	20°21'	7°4'	7°24'	6°43'	22°19'	10°39'	8°43'	12°11'	8°59'	8°43'
W14	1 32 23	21°13'49"	21°19'	10°39'	9°1'	7°11'	22°24'	10°41'	8°44'	12°12'	8°59'	8°45'
T 15	1 36 19	22°13'31"	22°16'	14°9'	10°37'	7°39'	22°28'	10°44'	8°44'	12°12'	8°59'	8°48'
F 16	1 40 16	23°13'15"	23°14'	17°34'	12°12'	8°8'	22°33'	10°46'	8°45'	12°12'	9°0'	8°50'
S 17	1 44 13	24°13'00"	24°12'	20°54'	13°48'	8°36'	22°37'	10°48'	8°46'	12°13'	9°0'	8°52'
S 18	1 48 9	25°12'48"	25°10'	24°10'	15°24'	9°4'	22°42'	10°50'	8°46'	12°13'	9°0'	8°55'
M19	1 52 6	26°12'38"	26°8'	27°22'	17°0'	9°32'	22°47'	10°52'	8°47'	12°13'	9°0'	8°57'
T 20	1 56 2	27°12'30"	27°6'	0 <sup>h</sup> 30 <sup>m</sup>	18°36'	10°1'	22°51'	10°55'	8°48'	12°14'	9°0'	8°59'
W21	1 59 59	28°12'23"	28°5'	3°35'	20°12'	10°29'	22°56'	10°57'	8°49'	12°14'	9°0'	9°1'
T 22	2 3 55	29°12'18"	29°4'	6°36'	21°47'	10°57'	23°0'	10°59'	8°49'	12°14'	9°1'	9°4'
F 23	2 7 52	0 <sup>h</sup> 12 <sup>m</sup> 15 <sup>s</sup>	0 <sup>h</sup> 3 <sup>m</sup>	9°35'	23°23'	11°25'	23°5'	11°1'	8°50'	12°15'	9°1'	9°6'
S 24	2 11 48	1°12'14"	1°3'	12°32'	24°58'	11°53'	23°9'	11°4'	8°51'	12°15'	9°1'	9°8'
S 25	2 15 45	2°12'14"	2°4'	15°26'	26°34'	12°21'	23°14'	11°6'	8°51'	12°15'	9°1'	9°11'
M26	2 19 42	3°12'15"	3°4'	18°18'	28°10'	12°49'	23°18'	11°8'	8°52'	12°16'	9°1'	9°13'
T 27	2 23 38	4°12'18"	4°5'	21°9'	29°45'	13°17'	23°23'	11°10'	8°53'	12°16'	9°1'	9°15'
W28	2 27 35	5°12'23"	5°7'	23°58'	1 <sup>h</sup> 20 <sup>m</sup>	13°44'	23°28'	11°13'	8°54'	12°16'	9°2'	9°18'
T 29	2 31 31	6°12'30"	6°8'	26°45'	2°56'	14°12'	23°32'	11°15'	8°54'	12°17'	9°2'	9°20'
F 30	2 35 28	7°12'38"	7°10'	29°32'	4°31'	14°40'	23°37'	11°17'	8°55'	12°17'	9°2'	9°22'
S 31	2 39 24	8 <sup>h</sup> 12 <sup>m</sup> 48 <sup>s</sup>	8 <sup>h</sup> 12 <sup>m</sup>	2 <sup>h</sup> 18 <sup>m</sup>	6 <sup>h</sup> 7 <sup>m</sup>	15 <sup>h</sup> 08 <sup>m</sup>	23 <sup>h</sup> 41 <sup>m</sup>	11 <sup>h</sup> 19 <sup>m</sup>	8 <sup>h</sup> 56 <sup>m</sup>	12 <sup>h</sup> 18 <sup>m</sup>	9 <sup>h</sup> 2 <sup>m</sup>	9 <sup>h</sup> 02 <sup>m</sup> 24 <sup>s</sup>

Delta T = 47.55 sec.

Greg. Calendar

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SWISS EPHEMERIS for the year 1648  
heliocentric

NOVEMBER 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♁	♂	♄	♃	♅	♁	♆	♇	♈
S 1	2 43 21	9♁13'00	9♁14	5♁ 3	7♁42	15♁36	23♁46	11♁22	8♁56	12♁18	9♁ 2	9♁27
M 2	2 47 17	10°13'13	10°16	7°48	9°17	16° 3	23°50	11°24	8°57	12°18	9° 2	9°29
T 3	2 51 14	11°13'29	11°18	10°33	10°52	16°31	23°55	11°26	8°58	12°19	9° 2	9°31
W 4	2 55 11	12°13'46	12°20	13°17	12°28	16°59	23°59	11°28	8°59	12°19	9° 3	9°34
T 5	2 59 7	13°14'06	13°21	16° 2	14° 3	17°26	24° 4	11°31	8°59	12°19	9° 3	9°36
F 6	3 3 4	14°14'27	14°22	18°47	15°38	17°54	24° 8	11°33	9° 0	12°20	9° 3	9°38
S 7	3 7 0	15°14'50	15°23	21°33	17°13	18°22	24°13	11°35	9° 1	12°20	9° 3	9°41
S 8	3 10 57	16°15'15	16°24	24°20	18°48	18°49	24°18	11°37	9° 1	12°20	9° 3	9°43
M 9	3 14 53	17°15'42	17°24	27° 8	20°23	19°17	24°22	11°40	9° 2	12°21	9° 3	9°45
T 10	3 18 50	18°16'11	18°24	29°57	21°58	19°44	24°27	11°42	9° 3	12°21	9° 4	9°47
W11	3 22 46	19°16'42	19°24	2♁47	23°33	20°12	24°31	11°44	9° 4	12°21	9° 4	9°50
T 12	3 26 43	20°17'15	20°23	5°39	25° 8	20°39	24°36	11°46	9° 4	12°22	9° 4	9°52
F 13	3 30 40	21°17'49	21°22	8°33	26°43	21° 6	24°40	11°49	9° 5	12°22	9° 4	9°54
S 14	3 34 36	22°18'25	22°20	11°30	28°18	21°34	24°45	11°51	9° 6	12°23	9° 4	9°57
S 15	3 38 33	23°19'03	23°19	14°28	29°53	22° 1	24°49	11°53	9° 6	12°23	9° 4	9°59
M16	3 42 29	24°19'42	24°17	17°29	1♁28	22°28	24°54	11°55	9° 7	12°23	9° 5	10° 1
T 17	3 46 26	25°20'23	25°16	20°33	3° 3	22°56	24°58	11°58	9° 8	12°24	9° 5	10° 4
W18	3 50 22	26°21'05	26°15	23°41	4°38	23°23	25° 3	12° 0	9° 9	12°24	9° 5	10° 6
T 19	3 54 19	27°21'48	27°15	26°51	6°13	23°50	25° 8	12° 2	9° 9	12°24	9° 5	10° 8
F 20	3 58 15	28°22'32	28°14	0♁ 6	7°48	24°17	25°12	12° 4	9°10	12°25	9° 5	10°11
S 21	4 2 12	29°23'17	29°14	3°24	9°22	24°45	25°17	12° 7	9°11	12°25	9° 5	10°13
S 22	4 6 9	0♁24'04	0♁15	6°47	10°57	25°12	25°21	12° 9	9°11	12°25	9° 6	10°15
M23	4 10 5	1°24'51	1°16	10°15	12°32	25°39	25°26	12°11	9°12	12°26	9° 6	10°18
T 24	4 14 2	2°25'39	2°17	13°47	14° 7	26° 6	25°30	12°13	9°13	12°26	9° 6	10°20
W25	4 17 58	3°26'28	3°18	17°25	15°42	26°33	25°35	12°16	9°14	12°26	9° 6	10°22
T 26	4 21 55	4°27'18	4°20	21° 9	17°17	27° 0	25°39	12°18	9°14	12°27	9° 6	10°25
F 27	4 25 51	5°28'09	5°23	24°58	18°51	27°27	25°44	12°20	9°15	12°27	9° 6	10°27
S 28	4 29 48	6°29'01	6°25	28°55	20°26	27°54	25°48	12°22	9°16	12°28	9° 7	10°29
S 29	4 33 44	7°29'54	7°28	2♁58	22° 1	28°21	25°53	12°25	9°16	12°28	9° 7	10°32
M30	4 37 41	8♁30'48	8♁30	7♁ 8	23♁36	28♁48	25♁58	12♁27	9♁17	12♁28	9♁ 7	10♁34

Delta T = 47.47 sec.

Greg. Calendar

DECEMBER 1648 GC

00:00 UT

Day	Sid.t	Terra	☾	♁	♂	♄	♃	♅	♁	♆	♇	♈
T 1	4 41 38	9♁31'43	9♁33	11♁26	25♁11	29♁15	26♁ 2	12♁29	9♁18	12♁29	9♁ 7	10♁36
W 2	4 45 34	10°32'39	10°36	15°51	26°45	29°42	26° 7	12°31	9°19	12°29	9° 7	10°39
T 3	4 49 31	11°33'36	11°38	20°25	28°20	0♁ 9	26°11	12°34	9°19	12°29	9° 7	10°41
F 4	4 53 27	12°34'35	12°41	25° 8	29°55	0°36	26°16	12°36	9°20	12°30	9° 7	10°43
S 5	4 57 24	13°35'34	13°43	29°59	1♁30	1° 3	26°20	12°38	9°21	12°30	9° 8	10°46
S 6	5 1 20	14°36'34	14°45	5♁ 0	3° 5	1°30	26°25	12°40	9°21	12°30	9° 8	10°48
M 7	5 5 17	15°37'36	15°46	10° 9	4°40	1°57	26°29	12°43	9°22	12°31	9° 8	10°50
T 8	5 9 14	16°38'38	16°47	15°28	6°15	2°23	26°34	12°45	9°23	12°31	9° 8	10°53
W 9	5 13 10	17°39'42	17°48	20°55	7°49	2°50	26°38	12°47	9°24	12°31	9° 8	10°55
T 10	5 17 7	18°40'46	18°48	26°32	9°24	3°17	26°43	12°49	9°24	12°32	9° 8	10°57
F 11	5 21 3	19°41'52	19°48	2♁17	10°59	3°44	26°48	12°52	9°25	12°32	9° 9	11° 0
S 12	5 25 0	20°42'58	20°48	8° 9	12°34	4°11	26°52	12°54	9°26	12°33	9° 9	11° 2
S 13	5 28 56	21°44'06	21°47	14° 9	14° 9	4°37	26°57	12°56	9°26	12°33	9° 9	11° 4
M14	5 32 53	22°45'14	22°46	20°15	15°44	5° 4	27° 1	12°58	9°27	12°33	9° 9	11° 7
T 15	5 36 49	23°46'22	23°45	26°27	17°19	5°31	27° 6	13° 1	9°28	12°34	9° 9	11° 9
W16	5 40 46	24°47'31	24°44	2♁42	18°54	5°57	27°10	13° 3	9°29	12°34	9° 9	11°11
T 17	5 44 43	25°48'41	25°44	9° 0	20°29	6°24	27°15	13° 5	9°29	12°34	9°10	11°14
F 18	5 48 39	26°49'50	26°43	15°19	22° 4	6°51	27°19	13° 7	9°30	12°35	9°10	11°16
S 19	5 52 36	27°51'00	27°43	21°38	23°39	7°17	27°24	13°10	9°31	12°35	9°10	11°18
S 20	5 56 32	28°52'10	28°44	27°55	25°14	7°44	27°28	13°12	9°31	12°35	9°10	11°21
M21	6 0 29	29°53'20	29°44	4♁ 8	26°49	8°11	27°33	13°14	9°32	12°36	9°10	11°23
T 22	6 4 25	0♁54'29	0♁45	10°17	28°24	8°37	27°37	13°16	9°33	12°36	9°10	11°25
W23	6 8 22	1°55'39	1°46	16°20	29°59	9° 4	27°42	13°19	9°34	12°36	9°11	11°28
T 24	6 12 18	2°56'49	2°48	22°16	1♁34	9°30	27°47	13°21	9°34	12°37	9°11	11°30
F 25	6 16 15	3°57'58	3°50	28° 4	3° 9	9°57	27°51	13°23	9°35	12°37	9°11	11°32
S 26	6 20 12	4°59'08	4°52	3♁44	4°44	10°23	27°56	13°25	9°36	12°38	9°11	11°35
S 27	6 24 8	6° 0'17	5°55	9°15	6°19	10°50	28° 0	13°28	9°36	12°38	9°11	11°37
M28	6 28 5	7° 1'26	6°58	14°36	7°54	11°16	28° 5	13°30	9°37	12°38	9°11	11°39
T 29	6 32 1	8° 2'36	8° 1	19°47	9°30	11°43	28° 9	13°32	9°38	12°39	9°12	11°42
W30	6 35 58	9° 3'45	9° 4	24°49	11° 5	12° 9	28°14	13°34	9°39	12°39	9°12	11°44
T 31	6 39 54	10♁ 4'54	10♁ 7	29♁41	12♁40	12♁36	28♁18	13♁37	9♁39	12♁39	9♁12	11♁46

Delta T = 47.38 sec.

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