

**ALMANAK
UKUR
MALAYSIA**

2016

Diterbitkan Oleh:
Unit Almanak
Geomatic Innovation Research Group (GnG)
Fakulti Geoinformasi dan Harta Tanah
Universiti Teknologi Malaysia

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KANDUNGAN

<i>Prakata</i>	<i>iv</i>
<i>Keterangan</i>	<i>v</i>
Nilai Deklinasi Matahari	1-24
Pekali Deklinasi Matahari, 2016	25-26
Jadual Biasan dan Paralaks	27

PRAKATA

Almanak Ukur Malaysia 2016 adalah penerbitan siri ke-28 Almanak Ukur oleh Unit Almanak, *Geomatic Innovation Research Group (GnG)*, Fakulti Geoinformasi dan Harta Tanah, Universiti Teknologi Malaysia, Johor Bahru. Penerbitan siri ini dibuat khusus untuk kegunaan kerja-kerja ukur kadastral, cerapan astronomi, falak syarie dan lain-lain bidang yang berkaitan.

Data-data untuk Deklinasi Matahari telah dihitung menggunakan Jadual Matahari Newcomb (1895), Teori Egahan Woolard (1953), dan Sistem Tetap Astronomi IAU (1964). Ketepatan data dalam AUM adalah setanding dengan data yang diperoleh daripada Almanak lain keluaran luar negara.

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KETERANGAN

ALMANAK UKUR MALAYSIA

Almanak Ukur Malaysia (AUM) telah disediakan oleh Pejabat Almanak, Fakulti Geoinformasi dan Harta Tanah, Universiti Teknologi Malaysia. Perhitungannya adalah diasaskan kepada teori-teori asas pergerakan planet dan tidak ada data yang diambil secara langsung dari mana-mana almanak yang sedia ada. Ketepatan data-data dalam AUM adalah setanding dengan data USNO (*Geocentric Positions of Major Solar System Object and Bright Stars*).

Argumen masa yang digunakan dalam AUM ialah Waktu Universal (*UT*) bersamaan Waktu Piawai Malaysia (*WPM*) - 8 jam. Ini menyebabkan nilai-nilai yang dijadualkan oleh AUM adalah sama sepertimana yang terdapat dalam USNO.

Kandungan utama AUM 2016 adalah terhad kepada penjadualan data-data:

1. Deklinasi Matahari (*Dek*)
2. Perubahan Sejam (ν) bagi Deklinasi Matahari

Data deklinasi dalam AUM diberikan kepada nilai saat arka sahaja. Secara keseluruhannya, kejituan data-data terjadual adalah memenuhi kehendak kerja-kerja ukur tanah.

KETERANGAN KANDUNGAN

Deklinasi Matahari

Nilai-nilai perubahan untuk Deklinasi Matahari adalah diberi untuk setiap satu jam (ν = perubahan sejam).

Pekali Polinomial untuk Deklinasi Matahari

Jadual ini memberikan representasi polinomial bagi Deklinasi Matahari sahaja. Set-set pekali polinomial ini membolehkan nilai-nilai Deklinasi Matahari terus dihitung dalam komputer atau mesin hitungan elektronik. Keterangan dan contoh penggunaan juga diberikan.

Jadual Biasan dan Paralaks untuk Matahari

Jadual ini hanya bermaksud untuk digunakan bagi tujuan pembetulan biasan dalam cerapan Matahari sahaja.

Untuk cerapan astronomi bagi kerja-kerja penentuan kelas yang lebih tinggi, rumus pembetulan biasan berikut boleh digunakan:

$$r'' = 16.28 \{P/(273.16 + T)\} \tan z$$

dengan,

- r'' = Pembetulan biasan (dalam saat arka)
- P = Tekanan (dalam mb)
- T = Suhu (dalam °C)
- z = Jarak zenit

MATAHARI – JANUARI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	- 23 03 33		8	0	- 22 20 19		15	0	- 21 15 36	
Jum	6	- 23 02 23	12	Jum	6	- 22 18 22	19	Jum	6	- 21 12 55	27
	12	- 23 01 12	12		12	- 22 16 24	20		12	- 21 10 12	27
	18	- 23 00 59	12		18	- 22 14 23	20		18	- 21 07 27	28
2	0	- 22 58 44		9	0	- 22 12 21		16	0	- 21 04 41	
Sab	6	- 22 57 27	13	Sab	6	- 22 10 18	21	Sab	6	- 21 01 53	28
	12	- 22 56 09	13		12	- 22 08 13	21		12	- 20 59 04	28
	18	- 22 54 49	13		18	- 22 06 06	21		18	- 20 56 14	28
			14				21				29
3	0	- 22 53 28		10	0	- 22 03 58		17	0	- 20 53 22	
Aha	6	- 22 52 04	14	Aha	6	- 22 01 48	22	Aha	6	- 20 50 28	29
	12	- 22 50 39	14		12	- 22 00 36	22		12	- 20 47 33	29
	18	- 22 49 12	14		18	- 21 57 23	22		18	- 20 44 37	29
			15				22				30
4	0	- 22 47 44		11	0	- 21 55 08		18	0	- 20 41 39	
Isn	6	- 22 46 14	15	Isn	6	- 21 52 52	23	Isn	6	- 20 38 39	30
	12	- 22 44 42	15		12	- 21 50 34	23		12	- 20 35 38	30
	18	- 22 43 08	16		18	- 21 48 14	23		18	- 20 32 36	30
			16				24				31
5	0	- 22 41 33		12	0	- 21 45 53		19	0	- 20 29 32	
Sel	6	- 22 39 56	16	Sel	6	- 21 43 30	24	Sel	6	- 20 26 27	31
	12	- 22 38 17	16		12	- 21 41 06	24		12	- 20 23 20	31
	18	- 22 36 37	17		18	- 21 38 40	24		18	- 20 20 12	31
			17				25				32
6	0	- 22 34 55		13	0	- 21 36 12		20	0	- 20 17 02	
Rab	6	- 22 33 12	17	Rab	6	- 21 33 43	25	Rab	6	- 20 13 51	32
	12	- 22 31 26	18		12	- 21 31 12	25		12	- 20 10 39	32
	18	- 22 29 39	18		18	- 21 28 40	25		18	- 20 07 25	32
			18				26				33
7	0	- 22 27 50		14	0	- 21 26 06		21	0	- 20 04 10	
Kha	6	- 22 26 00	18	Kha	6	- 21 23 31	26	Kha	6	- 20 00 53	33
	12	- 22 24 08	19		12	- 21 20 54	26		12	- 19 57 35	33
	18	- 22 22 14	19		18	- 21 18 16	26		18	- 19 54 16	33
			19				27				33

MATAHARI – JANUARI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	- 19 50 55		26	0	- 18 54 16		30	0	- 17 52 05	
Jum	6	- 19 47 32	34	Sel	6	- 18 50 32	37	Sab	6	- 17 48 02	41
	12	- 19 44 09	34		12	- 18 46 47	37		12	- 17 43 57	41
	18	- 19 40 44	34		18	- 18 43 01	38		18	- 17 39 51	41
			34				38				41
23	0	- 19 37 17		27	0	- 18 39 13		31	0	- 17 35 44	
Sab	6	- 19 33 50	35	Rab	6	- 18 35 25	38	Aha	6	- 17 31 35	41
	12	- 19 30 21	35		12	- 18 31 35	38		12	- 17 27 26	42
	18	- 19 26 50	35		18	- 18 27 43	39		18	- 17 23 15	42
			35				39				42
24	0	- 19 23 18		28	0	- 18 23 51					
Aha	6	- 19 19 45	36	Kha	6	- 18 19 57	39				
	12	- 19 16 11	36		12	- 18 16 02	39				
	18	- 19 12 35	36		18	- 18 12 05	40				
			36				40				
25	0	- 19 08 58		29	0	- 18 08 08					
Isn	6	- 19 05 19	36	Jum	6	- 18 04 09	40				
	12	- 19 01 39	37		12	- 18 00 09	40				
	18	- 18 57 58	37		18	- 17 56 08	40				
			37				40				

MATAHARI – FEBRUARI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	- 17 19 03		8	0	- 15 14 06		15	0	- 12 56 30	
Isn	6	- 17 14 50	42	Isn	6	- 15 09 23	47	Isn	6	- 12 51 23	51
	12	- 17 10 36	42		12	- 15 04 40	47		12	- 12 46 15	51
	18	- 17 06 20	43		18	- 15 00 55	47		18	- 12 41 07	51
			43				48				52
2	0	- 17 02 04		9	0	- 14 55 10		16	0	- 12 35 57	
Sel	6	- 16 57 46	43	Sel	6	- 14 50 23	48	Sel	6	- 12 30 47	52
	12	- 16 53 28	43		12	- 14 45 36	48		12	- 12 25 36	52
	18	- 16 49 08	43		18	- 14 40 48	48		18	- 12 20 25	52
			43				48				52
3	0	- 16 44 47		10	0	- 14 35 58		17	0	- 12 15 12	
Rab	6	- 16 40 25	44	Rab	6	- 14 31 08	48	Rab	6	- 12 09 59	52
	12	- 16 36 02	44		12	- 14 26 17	49		12	- 12 04 45	52
	18	- 16 31 38	44		18	- 14 21 25	49		18	- 12 00 31	52
			44				49				53
4	0	- 16 27 12		11	0	- 14 16 32		18	0	- 11 54 16	
Kha	6	- 16 22 46	44	Kha	6	- 14 11 38	49	Kha	6	- 11 49 00	53
	12	- 16 18 19	45		12	- 14 06 44	49		12	- 11 43 43	53
	18	- 16 13 50	45		18	- 14 01 48	49		18	- 11 38 26	53
			45				49				53
5	0	- 16 09 21		12	0	- 13 56 52		19	0	- 11 33 08	
Jum	6	- 16 04 50	45	Jum	6	- 13 51 55	50	Jum	6	- 11 27 49	53
	12	- 16 00 18	45		12	- 13 46 57	50		12	- 11 22 30	53
	18	- 15 55 46	45		18	- 13 41 58	50		18	- 11 17 09	53
			46				50				53
6	0	- 15 51 12		13	0	- 13 36 58		20	0	- 11 11 49	
Sab	6	- 15 46 37	46	Sab	6	- 13 31 57	50	Sab	6	- 11 06 27	54
	12	- 15 42 01	46		12	- 13 26 56	50		12	- 11 01 05	54
	18	- 15 37 25	46		18	- 13 21 54	50		18	- 10 55 43	54
			46				51				54
7	0	- 15 32 47		14	0	- 13 16 50		21	0	- 10 50 20	
Aha	6	- 15 28 08	46	Aha	6	- 13 11 47	51	Aha	6	- 10 44 56	54
	12	- 15 23 28	47		12	- 13 06 42	51		12	- 10 39 31	54
	18	- 15 18 48	47		18	- 13 01 36	51		18	- 10 34 06	54
			47				51				54

MATAHARI – FEBRUARI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	- 10 28 40		25	0	- 09 22 46		28	0	- 08 15 35	
Isn	6	- 10 23 14	54	Kha	6	- 09 17 13	56	Aha	6	- 08 09 56	57
	12	- 10 17 47	54		12	- 09 11 39	56		12	- 08 04 16	57
	18	- 10 12 19	55		18	- 09 06 05	56		18	- 07 58 36	57
			55				56				57
23	0	- 10 06 51		26	0	- 09 00 30		29	0	- 07 52 56	
			55				56				57
Sel	6	- 10 01 23	55	Jum	6	- 08 54 55	56	Isn	6	- 07 47 15	57
	12	- 09 55 53	55		12	- 08 49 19	56		12	- 07 41 34	57
	18	- 09 50 23	55		18	- 08 43 43	56		18	- 07 35 52	57
			55				56				57
24	0	- 09 44 53		27	0	- 08 38 06					
			55				56				
Rab	6	- 09 39 22	55	Sab	6	- 08 32 29	56				
	12	- 09 33 50	55		12	- 08 26 51	56				
	18	- 09 28 18	55		18	- 08 21 13	56				
			55				56				

MATAHARI – MAC 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	- 07 30 10		8	0	- 04 48 08		15	0	- 02 03 02	
Sel	6	- 07 24 28	57	Sel	6	- 04 42 17	59	Sel	6	- 01 57 06	59
	12	- 07 18 45	57		12	- 04 36 25	59		12	- 01 51 11	59
	18	- 07 13 01	57		18	- 04 30 33	59		18	- 01 45 15	59
2	0	- 07 07 18		9	0	- 04 24 41		16	0	- 01 39 20	
Rab	6	- 07 01 34	57	Rab	6	- 04 18 49	59	Rab	6	- 01 33 24	59
	12	- 06 55 49	57		12	- 04 12 56	59		12	- 01 27 28	59
	18	- 06 50 04	58		18	- 04 07 04	59		18	- 01 21 32	59
3	0	- 06 44 19		10	0	- 04 01 11		17	0	- 01 15 37	
Kha	6	- 06 38 34	58	Kha	6	- 03 55 18	59	Kha	6	- 01 09 41	59
	12	- 06 32 48	58		12	- 03 49 24	59		12	- 01 03 45	59
	18	- 06 27 01	58		18	- 03 43 31	59		18	- 00 57 49	59
4	0	- 06 21 15		11	0	- 03 37 37		18	0	- 00 51 53	
Jum	6	- 06 15 28	58	Jum	6	- 03 31 43	59	Jum	6	- 00 45 57	59
	12	- 06 09 41	58		12	- 03 25 50	59		12	- 00 40 02	59
	18	- 06 03 53	58		18	- 03 19 55	59		18	- 00 34 06	59
5	0	- 05 58 05		12	0	- 03 14 01		19	0	- 00 28 10	
Sab	6	- 05 52 17	58	Sab	6	- 03 08 07	59	Sab	6	- 00 22 14	59
	12	- 05 46 29	58		12	- 03 02 12	59		12	- 00 16 19	59
	18	- 05 40 40	58		18	- 02 56 18	59		18	- 00 10 23	59
6	0	- 05 34 51		13	0	- 02 50 23		20	0	- 00 04 27	
Aha	6	- 05 29 01	58	Aha	6	- 02 44 28	59	Aha	6	00 01 28	59
	12	- 05 23 12	58		12	- 02 38 33	59		12	00 07 24	59
	18	- 05 17 22	58		18	- 02 32 38	59		18	00 13 19	59
7	0	- 05 11 31		14	0	- 02 26 43		21	0	00 19 14	
Isn	6	- 05 05 41	58	Isn	6	- 02 20 48	59	Isn	6	00 25 10	59
	12	- 05 00 50	58		12	- 02 14 53	59		12	00 31 05	59
	18	- 04 53 59	59		18	- 02 08 57	59		18	00 37 00	59

MATAHARI – MAC 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	00 42 55	59	26	0	02 17 20	59	30	0	03 50 59	58
Sel	6	00 48 50	59	Sab	6	02 23 13	59	Rab	6	03 56 49	58
	12	00 54 45	59		12	02 29 05	59		12	04 02 37	58
	18	01 00 40	59		18	02 34 58	59		18	04 08 26	58
23	0	01 06 35	59	27	0	02 40 50	59	31	0	04 14 15	58
Rab	6	01 12 29	59	Aha	6	02 46 42	59	Kha	6	04 20 03	58
	12	01 18 24	59		12	02 52 34	59		12	04 25 50	58
	18	01 24 18	59		18	02 58 25	59		18	04 31 38	58
24	0	01 30 12	59	28	0	03 04 17	59				
Kha	6	01 36 06	59	Isn	6	03 10 08	58				
	12	01 42 00	59		12	03 15 59	58				
	18	01 47 54	59		18	03 21 50	58				
25	0	01 53 47	59	29	0	03 27 40	58				
Jum	6	02 00 41	59	Sel	6	03 33 30	58				
	12	02 05 34	59		12	03 39 20	58				
	18	02 11 27	59		18	03 45 10	58				

MATAHARI – APRIL 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	04 37 25		8	0	07 17 02		15	0	09 50 36	
Jum	6	04 43 12	58	Jum	6	07 22 38	56	Jum	6	09 55 57	53
	12	04 48 59	58		12	07 28 14	56		12	10 01 17	53
	18	04 54 45	58		18	07 33 49	56		18	10 06 37	53
2	0	05 00 31		9	0	07 39 23		16	0	10 11 56	
Sab	6	05 06 16	58	Sab	6	07 44 57	56	Sab	6	10 17 14	53
	12	05 12 02	57		12	07 50 31	56		12	10 22 32	53
	18	05 17 47	57		18	07 56 04	55		18	10 27 49	53
3	0	05 23 31		10	0	08 01 37		17	0	10 33 05	
Aha	6	05 29 15	57	Aha	6	08 07 09	55	Aha	6	10 38 21	53
	12	05 34 59	57		12	08 12 41	55		12	10 43 36	52
	18	05 40 43	57		18	08 18 12	55		18	10 48 50	52
4	0	05 46 26		11	0	08 23 42		18	0	10 54 04	
Isn	6	05 52 09	57	Isn	6	08 29 12	55	Isn	6	10 59 17	52
	12	05 57 51	57		12	08 34 42	55		12	11 04 29	52
	18	06 03 33	57		18	08 40 11	55		18	11 09 41	52
5	0	06 09 15		12	0	08 45 39		19	0	11 14 52	
Sel	6	06 14 56	57	Sel	6	08 51 07	55	Sel	6	11 20 02	52
	12	06 20 37	57		12	08 56 35	54		12	11 25 12	51
	18	06 26 17	57		18	09 02 01	54		18	11 30 20	51
6	0	06 31 57		13	0	09 07 28		20	0	11 35 29	
Rab	6	06 37 37	57	Rab	6	09 12 53	54	Rab	6	11 40 36	51
	12	06 43 16	56		12	09 18 18	54		12	11 45 43	51
	18	06 48 55	56		18	09 23 43	54		18	11 50 49	51
7	0	06 54 33		14	0	09 29 07		21	0	11 55 54	
Kha	6	07 00 11	56	Kha	6	09 34 30	54	Kha	6	12 00 58	51
	12	07 05 48	56		12	09 39 53	54		12	12 06 02	51
	18	07 11 25	56		18	09 45 15	54		18	12 11 05	50

MATAHARI – APRIL 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	12 16 07		25	0	13 15 34		28	0	14 13 03	
			50				49				47
Jum	6	12 21 09		Isn	6	13 20 26		Kha	6	14 17 45	
			50				49				47
	12	12 26 10			12	13 25 17			12	14 22 26	
			50				48				47
	18	12 31 10			18	13 30 07			18	14 27 06	
			50				48				47
23	0	12 36 09		26	0	13 34 57		29	0	14 31 45	
			50				48				46
Sab	6	12 41 07		Scl	6	13 39 46		Jum	6	14 36 23	
			50				48				46
	12	12 46 05			12	13 44 34			12	14 41 01	
			49				48				46
	18	12 51 02			18	13 49 21			18	14 45 37	
			49				48				46
24	0	12 55 58		27	0	13 54 07		30	0	14 50 13	
			49				48				46
Aha	6	13 00 53		Rab	6	13 58 52		Sab	6	14 54 47	
			49				47				46
	12	13 05 47			12	14 03 37			12	14 59 21	
			49				47				45
	18	13 10 41			18	14 08 20			18	15 03 54	
			49				47				45

MATAHARI – MEI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB	UT	Dek	v	HB	UT	Dek	v	HB	UT	Dek	v
h	j	° ' "	"	h	j	° ' "	"	h	j	° ' "	"
1	0	15 08 26	45	8	0	17 08 41	40	15	0	18 54 56	35
Aha	6	15 12 57	45	Aha	6	17 12 44	40	Aha	6	18 58 27	35
	12	15 17 27	45		12	17 16 46	40		12	19 01 56	35
	18	15 21 56	45		18	17 20 47	40		18	19 05 24	35
2	0	15 26 24	44	9	0	17 24 46	40	16	0	19 08 52	34
Isn	6	15 30 51	44	Isn	6	17 28 44	40	Isn	6	19 12 18	34
	12	15 35 18	44		12	17 32 42	39		12	19 15 42	34
	18	15 39 43	44		18	17 36 38	39		18	19 19 06	34
3	0	15 44 07	44	10	0	17 40 33	39	17	0	19 22 28	33
Sel	6	15 48 30	44	Sel	6	17 44 27	39	Sel	6	19 25 49	33
	12	15 52 53	44		12	17 48 20	39		12	19 29 09	33
	18	15 57 14	43		18	17 52 12	38		18	19 32 27	33
4	0	16 01 34	43	11	0	17 56 03	38	18	0	19 35 44	33
Rab	6	16 05 54	43	Rab	6	18 00 52	38	Rab	6	19 39 00	32
	12	16 10 12	43		12	18 03 40	38		12	19 42 15	32
	18	16 14 29	43		18	18 07 28	38		18	19 45 29	32
5	0	16 18 46	43	12	0	18 11 14	37	19	0	19 48 41	32
Kha	6	16 23 01	42	Kha	6	18 14 59	37	Kha	6	19 51 52	32
	12	16 27 15	42		12	18 18 42	37		12	19 55 02	31
	18	16 31 29	42		18	18 22 25	37		18	19 58 10	31
6	0	16 35 41	42	13	0	18 26 07	37	20	0	20 01 17	31
Jum	6	16 39 52	42	Jum	6	18 29 47	37	Jum	6	20 04 23	31
	12	16 44 02	42		12	18 33 26	36		12	20 07 27	31
	18	16 48 12	41		18	18 37 04	36		18	20 10 31	30
7	0	16 52 20	41	14	0	18 40 41	36	21	0	20 13 33	30
Sab	6	16 56 27	41	Sab	6	18 44 16	36	Sab	6	20 16 33	30
	12	17 00 33	41		12	18 47 51	36		12	20 19 33	30
	18	17 04 38	41		18	18 51 24	35		18	20 22 31	29

MATAHARI – MEI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	20 25 28		26	0	21 09 35		30	0	21 47 52	
			29				26				22
Aha	6	20 28 23		Kha	6	21 12 09		Isn	6	21 50 03	
			29				25				22
	12	20 31 17			12	21 14 41			12	21 52 14	
			29				25				21
	18	- 22 43 08			18	21 17 13			18	21 54 22	
			29				25				21
23	0	20 37 01		27	0	21 19 42		31	0	21 56 30	
			28				25				21
Isn	6	20 39 52		Jum	6	21 22 11		Sel	6	21 58 36	
			28				25				21
	12	20 42 40			12	21 24 38			12	22 00 40	
			28				24				21
	18	20 45 28			18	21 27 04			18	22 02 43	
			28				24				20
24	0	20 48 14		28	0	21 29 28					
			27				24				
Sel	6	20 50 59		Sab	6	21 31 51					
			27				24				
	12	20 53 42			12	21 34 12					
			27				23				
	18	20 56 25			18	21 36 32					
			27				23				
25	0	20 59 05		29	0	21 38 51					
			27				23				
Rab	6	21 01 45		Aha	6	21 41 08					
			26				23				
	12	21 04 23			12	21 43 24					
			26				22				
	18	21 06 59			18	21 45 39					
			26				22				

MATAHARI – JUN 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	22 04 45		8	0	22 51 36		15	0	23 18 48	
Rab	6	22 06 45	20	Rab	6	22 52 55	13	Rab	6	23 19 24	6
	12	22 08 44	20		12	22 54 12	13		12	23 19 58	6
	18	22 10 41	20		18	22 55 28	13		18	23 20 31	5
			19				12				5
2	0	22 12 37		9	0	22 56 42		16	0	23 21 02	
Kha	6	22 14 31	19	Kha	6	22 57 55	12	Kha	6	23 21 32	5
	12	22 16 24	19		12	22 59 06	12		12	23 22 00	5
	18	22 18 16	19		18	23 00 16	12		18	23 22 27	4
			18				11				4
3	0	22 20 06		10	0	23 01 24		17	0	23 22 52	
Jum	6	22 21 54	18	Jum	6	23 02 31	11	Jum	6	23 23 16	4
	12	22 23 41	18		12	23 03 36	11		12	23 23 38	4
	18	22 25 27	18		18	23 04 40	11		18	23 23 59	3
			17				10				3
4	0	22 27 11		11	0	23 05 42		18	0	23 24 18	
Sab	6	22 28 54	17	Sab	6	23 06 43	10	Sab	6	23 24 35	3
	12	22 30 35	17		12	23 07 42	10		12	23 24 51	3
	18	22 32 15	17		18	23 08 39	10		18	23 25 05	2
			16				9				2
5	0	22 33 53		12	0	23 09 35		19	0	23 25 18	
Aha	6	22 35 30	16	Aha	6	23 10 30	9	Aha	6	23 25 29	2
	12	22 37 05	16		12	23 11 23	9		12	23 25 39	2
	18	22 38 39	16		18	23 12 14	9		18	23 25 47	1
			15				8				1
6	0	22 40 11		13	0	23 13 04		20	0	23 25 54	
Isn	6	22 41 42	15	Isn	6	23 13 52	8	Isn	6	23 25 59	1
	12	22 43 11	15		12	23 14 39	8		12	23 26 02	1
	18	22 44 39	15		18	23 15 24	8		18	23 26 04	0
			14				7				0
7	0	22 46 06		14	0	23 16 08		21	0	23 26 05	
Sel	6	22 47 30	14	Sel	6	23 16 50	7	Sel	6	23 26 03	0
	12	22 48 54	14		12	23 17 31	7		12	23 26 01	0
	18	22 50 16	14		18	23 18 10	7		18	23 25 57	-1
			13				6				-1

MATAHARI – JUN 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	23 25 51		25	0	23 22 40		28	0	23 15 48	
Rab	6	23 25 43	-1	Sab	6	23 22 15	-4	Sel	6	23 15 04	-7
	12	23 25 34	-1		12	23 21 47	-5		12	23 14 18	-8
	18	23 25 24	-2		18	23 21 18	-5		18	23 13 30	-8
			-2				-5				-8
23	0	23 25 12		26	0	23 20 48		29	0	23 12 41	
Kha	6	23 24 58	-2	Aha	6	23 20 16	-5	Rab	6	23 11 51	-8
	12	23 24 43	-3		12	23 19 42	-6		12	23 10 59	-9
	18	23 24 27	-3		18	23 19 07	-6		18	23 10 06	-9
			-3				-6				-9
24	0	23 24 09		27	0	23 18 30		30	0	23 09 10	
Jum	6	23 23 49	-3	Isn	6	23 17 52	-6	Kha	6	23 08 14	-9
	12	23 23 28	-4		12	23 17 12	-7		12	23 07 16	-10
	18	23 23 05	-4		18	23 16 31	-7		18	23 06 16	-10
			-4				-7				-10

MATAHARI – JULAI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	23 05 15		8	0	22 26 37		15	0	21 29 02	
			-10				-17				-24
Jum	6	23 04 13		Jum	6	22 24 53		Jum	6	21 26 38	
			-11				-18				-24
	12	23 03 08			12	22 23 07			12	21 24 13	
			-11				-18				-24
	18	23 02 03			18	22 21 20			18	21 21 47	
			-11				-18				-25
2	0	23 00 56		9	0	22 19 32		16	0	21 19 19	
			-11				-18				-25
Sab	6	23 00 47		Sab	6	22 17 42		Sab	6	21 16 50	
			-12				-19				-25
	12	22 58 37			12	22 15 51			12	21 14 19	
			-12				-19				-25
	18	22 57 25			18	22 13 58			18	21 11 47	
			-12				-19				-26
3	0	22 56 12		10	0	22 12 04		17	0	21 09 14	
			-12				-19				-26
Aha	6	22 54 57		Aha	6	22 10 08		Aha	6	21 06 40	
			-13				-20				-26
	12	22 53 41			12	22 08 11			12	21 04 04	
			-13				-20				-26
	18	22 52 24			18	22 06 12			18	21 01 27	
			-13				-20				-26
4	0	22 51 04		11	0	22 04 12		18	0	20 58 48	
			-13				-20				-27
Isn	6	22 49 44		Isn	6	22 02 11		Isn	6	20 56 08	
			-14				-20				-27
	12	22 48 22			12	22 00 08			12	20 53 27	
			-14				-21				-27
	18	22 46 58			18	21 58 04		18	18	20 50 45	
			-14				-21				-27
5	0	22 45 33		12	0	21 55 58		19	0	20 48 01	
			-14				-21				-28
Sel	6	22 44 06		Sel	6	21 53 51		Sel	6	20 45 16	
			-15				-21				-28
	12	22 42 38			12	21 51 43			12	20 42 29	
			-15				-22				-28
	18	22 41 09			18	21 49 33			18	20 39 42	
			-15				-22				-28
6	0	22 39 38		13	0	21 47 22		20	0	20 36 53	
			-15				-22				-28
Rab	6	22 38 05		Rab	6	21 45 09		Rab	6	20 34 02	
			-16				-22				-29
	12	22 36 32			12	21 42 55			12	20 31 11	
			-16				-23				-29
	18	22 34 56			18	21 40 40			18	20 28 18	
			-16				-23				-29
7	0	22 33 19		14	0	21 38 23		21	0	20 25 24	
			-16				-23				-29
Kha	6	22 31 41		Kha	6	21 36 05		Kha	6	20 22 28	
			-17				-23				-29
	12	22 30 01			12	21 33 45			12	20 19 31	
			-17				-23				-30
	18	22 28 20			18	21 31 24			18	20 16 33	
			-17				-24				-30

MATAHARI – JULAI 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	20 13 34		26	0	19 22 55		30	0	18 27 07	
Jum	6	20 10 33	-30	Sel	6	19 19 34	-33	Sab	6	18 23 28	-37
	12	20 07 31	-30		12	19 16 13	-34		12	18 19 47	-37
	18	20 04 28	-31		18	19 12 50	-34		18	18 16 06	-37
			-31				-34				-37
23	0	20 01 24		27	0	19 09 26		31	0	18 12 24	
Sab	6	19 58 18	-31	Rab	6	19 06 01	-34	Aha	6	18 08 40	-37
	12	19 55 11	-31		12	19 02 35	-34		12	18 04 55	-37
	18	19 52 03	-31		18	18 59 07	-35		18	18 01 10	-38
			-32				-35				-38
24	0	19 48 54		28	0	18 55 38					
Aha	6	19 45 43	-32	Kha	6	18 52 08	-35				
	12	19 42 32	-32		12	18 48 37	-35				
	18	19 39 18	-32		18	18 45 05	-35				
			-32				-36				

MATAHARI – OGOS 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	17 57 23		8	0	16 04 21		15	0	13 58 42	
Isn	6	17 53 35	-38	Isn	6	16 00 04	-43	Isn	6	13 54 01	-47
	12	17 49 46	-38		12	15 55 46	-43		12	13 49 18	-47
	18	17 45 55	-39		18	15 51 27	-43		18	13 44 34	-47
2	0	17 42 04		9	0	15 47 08		16	0	13 39 50	
Sel	6	17 38 12	-39	Sel	6	15 42 47	-44	Sel	6	13 35 05	-48
	12	17 34 18	-39		12	15 38 25	-44		12	13 30 19	-48
	18	17 30 24	-39		18	15 34 03	-44		18	13 25 32	-48
3	0	17 26 28		10	0	15 29 40		17	0	13 20 45	
Rab	6	17 22 32	-40	Rab	6	15 25 15	-44	Rab	6	13 15 56	-48
	12	17 18 34	-40		12	15 20 50	-44		12	13 11 07	-48
	18	17 14 35	-40		18	15 16 24	-45		18	13 06 17	-48
4	0	17 10 36		11	0	15 11 57		18	0	13 01 27	
Kha	6	17 06 35	-40	Kha	6	15 07 28	-45	Kha	6	12 56 35	-49
	12	17 02 33	-40		12	15 03 00	-45		12	12 51 43	-49
	18	16 58 30	-41		18	14 58 30	-45		18	12 46 50	-49
5	0	16 54 26		12	0	14 53 59		19	0	12 41 56	
Jum	6	16 50 21	-41	Jum	6	14 49 27	-45	Jum	6	12 37 02	-49
	12	16 46 15	-41		12	14 44 55	-46		12	12 32 07	-49
	18	16 42 08	-41		18	14 40 22	-46		18	12 27 11	-49
6	0	16 38 00		13	0	14 35 47		20	0	12 22 14	
Sab	6	16 33 51	-42	Sab	6	14 31 12	-46	Sab	6	12 17 16	-50
	12	16 29 41	-42		12	14 26 36	-46		12	12 12 18	-50
	18	16 25 30	-42		18	14 21 59	-46		18	12 07 19	-50
7	0	16 21 18		14	0	14 17 22		21	0	12 02 20	
Aha	6	16 17 05	-42	Aha	6	14 12 43	-47	Aha	6	11 57 19	-50
	12	16 12 52	-42		12	14 08 04	-47		12	11 52 18	-50
	18	16 08 37	-43		18	14 03 24	-47		18	11 47 16	-50

MATAHARI – OGOS 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	11 42 14		26	0	10 20 02		30	0	08 55 13	
Isn	6	11 37 11	-51	Jum	6	10 14 49	-52	Sel	6	08 49 50	-54
	12	11 32 07	-51		12	10 09 34	-52		12	08 44 26	-54
	18	11 27 02	-51		18	10 04 20	-53		18	08 39 02	-54
23	0	11 21 57		27	0	09 59 04		31	0	08 33 38	
Sel	6	11 16 51	-51	Sab	6	09 53 48	-53	Rab	6	08 28 13	-54
	12	11 11 45	-51		12	09 48 31	-53		12	08 22 47	-54
	18	11 06 37	-51		18	09 43 14	-53		18	08 17 21	-54
24	0	11 01 29		28	0	09 37 56					
Rab	6	10 56 21	-52	Aha	6	09 32 38	-53				
	12	10 51 11	-52		12	09 27 19	-53				
	18	10 46 02	-52		18	09 21 59	-53				
25	0	10 40 51		29	0	09 16 39					
Kha	6	10 35 40	-52	Isn	6	09 11 18	-54				
	12	10 30 28	-52		12	09 05 57	-54				
	18	10 25 16	-52		18	09 00 35	-54				

MATAHARI – SEPTEMBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	08 11 55		8	0	05 36 31		15	0	02 56 35	
Kha	6	08 06 28	-54	Kha	6	05 30 53	-56	Kha	6	02 50 49	-58
	12	08 01 00	-55		12	05 25 14	-57		12	02 45 02	-58
	18	07 55 32	-55		18	05 19 34	-57		18	02 39 15	-58
2	0	07 50 04		9	0	05 13 55		16	0	02 33 28	
Jum	6	07 44 35	-55	Jum	6	05 08 15	-57	Jum	6	02 27 41	-58
	12	07 39 06	-55		12	05 02 34	-57		12	02 21 54	-58
	18	07 33 36	-55		18	04 56 53	-57		18	02 16 07	-58
3	0	07 28 06		10	0	04 51 12		17	0	02 10 19	
Sab	6	07 22 35	-55	Sab	6	04 45 31	-57	Sab	6	02 04 31	-58
	12	07 17 04	-55		12	04 39 50	-57		12	01 58 43	-58
	18	07 11 32	-55		18	04 34 08	-57		18	01 52 55	-58
4	0	07 06 00		11	0	04 28 25		18	0	01 47 07	
Aha	6	07 00 27	-55	Aha	6	04 22 43	-57	Aha	6	01 41 18	-58
	12	06 54 54	-55		12	04 17 00	-57		12	01 35 30	-58
	18	06 49 21	-56		18	04 11 17	-57		18	01 29 41	-58
5	0	06 43 47		12	0	04 05 34		19	0	01 23 52	
Isn	6	06 38 13	-56	Isn	6	04 00 50	-57	Isn	6	01 18 03	-58
	12	06 32 39	-56		12	03 54 06	-57		12	01 12 14	-58
	18	06 27 04	-56		18	03 48 22	-57		18	01 06 25	-58
6	0	06 21 28		13	0	03 42 38		20	0	01 00 35	
Sel	6	06 15 52	-56	Sel	6	03 36 53	-57	Sel	6	00 54 46	-58
	12	06 10 16	-56		12	03 31 09	-58		12	00 48 56	-58
	18	06 04 40	-56		18	03 25 24	-58		18	00 43 07	-58
7	0	05 59 03		14	0	03 19 38		21	0	00 37 17	
Rab	6	05 53 25	-56	Rab	6	03 13 53	-58	Rab	6	00 31 27	-58
	12	05 47 48	-56		12	03 08 07	-58		12	00 25 37	-58
	18	05 42 10	-56		18	03 02 21	-58		18	00 19 47	-58

MATAHARI – SEPTEMBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB	UT	Dek	v	HB	UT	Dek	v	HB	UT	Dek	v
h	j	° ' "	"	h	j	° ' "	"	h	j	° ' "	"
22	0	00 13 57		25	0	- 00 56 07		28	0	- 02 06 12	
			-58				-58				-58
Kha	6	00 08 07		Aha	6	- 01 01 58		Rab	6	- 02 12 02	
			-58				-58				-58
	12	00 02 17			12	- 01 07 48			12	- 02 17 52	
			-58				-58				-58
	18	- 00 03 33			18	- 01 13 39			18	- 02 23 42	
			-58				-58				-58
23	0	- 00 09 24		26	0	- 01 19 29		29	0	- 02 29 32	
			-58				-58				-58
Jum	6	- 00 15 14		Isn	6	- 01 25 20		Kha	6	- 02 35 22	
			-58				-58				-58
	12	- 00 21 04			12	- 01 31 10			12	- 02 41 12	
			-58				-58				-58
	18	- 00 26 55			18	- 01 37 01			18	- 02 47 01	
			-58				-58				-58
24	0	- 00 32 45		27	0	- 01 42 51		30	0	- 02 52 51	
			-58				-58				-58
Sab	6	- 00 38 36		Sel	6	- 01 48 41		Jum	6	- 02 58 40	
			-58				-58				-58
	12	- 00 44 26			12	- 01 54 32			12	- 03 04 29	
			-58				-58				-58
	18	- 00 50 17			18	- 02 00 22			18	- 03 10 18	
			-58				-58				-58

MATAHARI – OKTOBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	- 03 16 07		8	0	- 05 57 45		15	0	- 08 35 32	
Sab	6	- 03 21 56	-58	Sab	6	- 06 03 28	-57	Sab	6	- 08 41 04	-55
	12	- 03 27 45	-58		12	- 06 09 11	-57		12	- 08 46 36	-55
	18	- 03 33 34	-58		18	- 06 14 53	-57		18	- 08 52 07	-55
2	0	- 03 39 22		9	0	- 06 20 35		16	0	- 08 57 38	
Aha	6	- 03 45 11	-58	Aha	6	- 06 26 17	-57	Aha	6	- 09 03 08	-55
	12	- 03 50 59	-58		12	- 06 31 58	-57		12	- 09 08 38	-55
	18	- 03 56 47	-58		18	- 06 37 39	-57		18	- 09 14 07	-55
3	0	- 04 02 34		10	0	- 06 43 19		17	0	- 09 19 36	
Isn	6	- 04 08 22	-58	Isn	6	- 06 49 00	-57	Isn	6	- 09 25 04	-55
	12	- 04 14 10	-58		12	- 06 54 40	-57		12	- 09 30 32	-55
	18	- 04 19 57	-58		18	- 07 00 19	-57		18	- 09 35 59	-54
4	0	- 04 25 44		11	0	- 07 05 58		18	0	- 09 41 26	
Sel	6	- 04 31 31	-58	Sel	6	- 07 11 37	-56	Sel	6	- 09 46 52	-54
	12	- 04 37 17	-58		12	- 07 17 16	-56		12	- 09 52 18	-54
	18	- 04 43 04	-58		18	- 07 22 54	-56		18	- 09 57 43	-54
5	0	- 04 48 50		12	0	- 07 28 31		19	0	- 10 03 08	
Rab	6	- 04 54 36	-58	Rab	6	- 07 34 09	-56	Rab	6	- 10 08 32	-54
	12	- 05 00 22	-58		12	- 07 39 46	-56		12	- 10 13 56	-54
	18	- 05 06 07	-58		18	- 07 45 22	-56		18	- 10 19 19	-54
6	0	- 05 11 53		13	0	- 07 50 58		20	0	- 10 24 41	
Kha	6	- 05 17 38	-57	Kha	6	- 07 56 34	-56	Kha	6	- 10 30 03	-54
	12	- 05 23 22	-57		12	- 08 02 09	-56		12	- 10 35 24	-53
	18	- 05 29 07	-57		18	- 08 07 44	-56		18	- 10 40 45	-53
7	0	- 05 34 51		14	0	- 08 13 18		21	0	- 10 46 05	
Jum	6	- 05 40 35	-57	Jum	6	- 08 18 52	-56	Jum	6	- 10 51 25	-53
	12	- 05 46 19	-57		12	- 08 24 26	-56		12	- 10 56 44	-53
	18	- 05 52 02	-57		18	- 08 29 59	-55		18	- 11 02 02	-53

MATAHARI – OKTOBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	- 11 07 20		26	0	- 12 30 35		30	0	- 13 50 45	
Sab	6	- 11 12 37	-53	Rab	6	- 12 35 41	-51	Aha	6	- 13 55 39	-49
	12	- 11 17 53	-53		12	- 12 40 47	-51		12	- 14 00 32	-49
	18	- 11 23 09	-53		18	- 12 45 51	-51		18	- 14 05 24	-49
			-53				-51				-49
23	0	- 11 28 24		27	0	- 12 50 56		31	0	- 14 10 16	
Aha	6	- 11 33 39	-52	Kha	6	- 12 55 59	-51	Isn	6	- 14 15 06	-48
	12	- 11 38 53	-52		12	- 13 01 02	-50		12	- 14 19 56	-48
	18	- 11 44 06	-52		18	- 13 06 03	-50		18	- 14 24 45	-48
			-52				-50				-48
24	0	- 11 49 19		28	0	- 13 11 05					
Isn	6	- 11 54 31	-52	Jum	6	- 13 16 05	-50				
	12	- 12 00 42	-52		12	- 13 21 04	-50				
	18	- 12 04 52	-52		18	- 13 26 03	-50				
			-52				-50				
25	0	- 12 10 02		29	0	- 13 31 01					
Sel	6	- 12 15 11	-51	Sab	6	- 13 35 58	-49				
	12	- 12 20 20	-51		12	- 13 40 55	-49				
	18	- 12 25 28	-51		18	- 13 45 50	-49				
			-51				-49				

MATAHARI – NOVEMBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
1	0	- 14 29 33		8	0	- 16 37 38		15	0	- 18 31 55	
Sel	6	- 14 34 20	-48	Sel	6	- 16 41 58	-43	Sel	6	- 18 35 42	-38
	12	- 14 39 06	-48		12	- 16 46 17	-43		12	- 18 39 29	-38
	18	- 14 43 52	-47		18	- 16 50 34	-43		18	- 18 43 15	-37
2	0	- 14 48 36	-47	9	0	- 16 54 51	-43	16	0	- 18 46 59	-37
Rab	6	- 14 53 20	-47	Rab	6	- 16 59 07	-42	Rab	6	- 18 50 42	-37
	12	- 14 58 02	-47		12	- 17 03 22	-42		12	- 18 54 23	-37
	18	- 15 02 44	-47		18	- 17 07 35	-42		18	- 18 58 04	-37
3	0	- 15 07 25	-47	10	0	- 17 11 47	-42	17	0	- 19 01 43	-36
Kha	6	- 15 12 05	-46	Kha	6	- 17 15 59	-42	Kha	6	- 19 05 21	-36
	12	- 15 16 44	-46		12	- 17 20 09	-42		12	- 19 08 57	-36
	18	- 15 21 22	-46		18	- 17 24 18	-41		18	- 19 12 33	-36
4	0	- 15 25 59	-46	11	0	- 17 28 26	-41	18	0	- 19 16 07	-35
Jum	6	- 15 30 35	-46	Jum	6	- 17 32 33	-41	Jum	6	- 19 19 39	-35
	12	- 15 35 10	-46		12	- 17 36 38	-41		12	- 19 23 11	-35
	18	- 15 39 44	-46		18	- 17 40 43	-41		18	- 19 26 41	-35
5	0	- 15 44 17	-45	12	0	- 17 44 46	-40	19	0	- 19 30 10	-35
Sab	6	- 15 48 50	-45	Sab	6	- 17 48 48	-40	Sab	6	- 19 33 37	-34
	12	- 15 53 21	-45		12	- 17 52 49	-40		12	- 19 37 04	-34
	18	- 15 57 51	-45		18	- 17 56 49	-40		18	- 19 40 28	-34
6	0	- 16 02 20	-45	13	0	- 18 00 48	-40	20	0	- 19 43 52	-34
Aha	6	- 16 06 49	-45	Aha	6	- 18 04 45	-39	Aha	6	- 19 47 14	-33
	12	- 16 11 16	-44		12	- 18 08 42	-39		12	- 19 50 35	-33
	18	- 16 15 42	-44		18	- 18 12 37	-39		18	- 19 53 54	-33
7	0	- 16 20 07	-44	14	0	- 18 16 31	-39	21	0	- 19 57 13	-33
Isn	6	- 16 24 32	-44	Isn	6	- 18 20 24	-39	Isn	6	- 20 00 29	-33
	12	- 16 28 55	-44		12	- 18 24 15	-38		12	- 20 03 45	-32
	18	- 16 33 17	-44		18	- 18 28 06	-38		18	- 20 06 59	-32

MATAHARI – NOVEMBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "	HB h	UT j	Dek ° ' "	v "
22	0	- 20 10 11		25	0	- 20 46 54		28	0	- 21 20 07	
			-32				-29				-26
Sel	6	- 20 13 23		Jum	6	- 20 49 48		Isn	6	- 21 22 43	
			-32				-29				-26
	12	- 20 16 33			12	- 20 52 41			12	- 21 25 18	
			-31				-29				-26
	18	- 20 19 41			18	- 20 55 32			18	- 21 27 52	
			-31				-28				-25
23	0	- 20 22 48		26	0	- 20 58 22		29	0	- 21 30 24	
			-31				-28				-25
Rab	6	- 20 25 54		Sab	6	- 21 01 10		Sel	6	- 21 32 54	
			-31				-28				-25
	12	- 20 28 58			12	- 21 03 57			12	- 21 35 23	
			-30				-28				-25
	18	- 20 32 01			18	- 21 06 42			18	- 21 37 50	
			-30				-27				-24
24	0	- 20 35 02		27	0	- 21 09 26		30	0	- 21 40 16	
			-30				-27				-24
Kha	6	- 20 38 02		Aha	6	- 21 12 09		Rab	6	- 21 42 40	
			-30				-27				-24
	12	- 20 41 01			12	- 21 14 50			12	- 21 45 02	
			-30				-27				-24
	18	- 20 43 58			18	- 21 17 29			18	- 21 47 23	
			-29				-26				-23

MATAHARI – DISEMBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ' ' "	v "	HB h	UT j	Dek ' ' "	v "	HB h	UT j	Dek ' ' "	v "
1	0	- 21 49 43		8	0	- 22 43 57		15	0	- 23 16 20	
			-23				-15				-7
Kha	6	- 21 52 01		Kha	6	- 22 45 29		Kha	6	- 23 17 04	
			-23				-15				-7
	12	- 21 54 17			12	- 22 47 00			12	- 23 17 47	
			-22				-15				-7
	18	- 21 56 32			18	- 22 48 29			18	- 23 18 28	
			-22				-15				-7
2	0	- 21 58 45		9	0	- 22 49 56		16	0	- 23 19 07	
			-22				-14				-6
Jum	6	- 22 00 57		Jum	6	- 22 51 22		Jum	6	- 23 19 44	
			-22				-14				-6
	12	- 22 03 07			12	- 22 52 46			12	- 23 20 20	
			-21				-14				-6
	18	- 22 05 15			18	- 22 54 08			18	- 23 20 54	
			-21				-13				-5
3	0	- 22 07 22		10	0	- 22 55 29		17	0	- 23 21 26	
			-21				-13				-5
Sab	6	- 22 09 27		Sab	6	- 22 56 48		Sab	6	- 23 21 56	
			-21				-13				-5
	12	- 22 11 31			12	- 22 58 05			12	- 23 22 25	
			-20				-13				-4
	18	- 22 13 33			18	- 22 59 20			18	- 23 22 52	
			-20				-12				-4
4	0	- 22 15 33		11	0	- 23 00 34		18	0	- 23 23 17	
			-20				-12				-4
Aha	6	- 22 17 32		Aha	6	- 23 01 46		Aha	6	- 23 23 41	
			-20				-12				-4
	12	- 22 19 29			12	- 23 02 56			12	- 23 24 02	
			-19				-11				-3
	18	- 22 21 25			18	- 23 04 05			18	- 23 24 22	
			-19				-11				-3
5	0	- 22 23 19		12	0	- 23 05 12		19	0	- 23 24 40	
			-19				-11				-3
Isn	6	- 22 25 11		Isn	6	- 23 06 17		Isn	6	- 23 24 57	
			-18				-11				-2
	12	- 22 27 02			12	- 23 07 20			12	- 23 25 11	
			-18				-10				-2
	18	- 22 28 51			18	- 23 08 22			18	- 23 25 24	
			-18				-10				-2
6	0	- 22 30 38		13	0	- 23 09 22		20	0	- 23 25 35	
			-18				-10				-2
Sel	6	- 22 32 24		Sel	6	- 23 10 20		Sel	6	- 23 25 44	
			-17				-9				-1
	12	- 22 34 08			12	- 23 11 17			12	- 23 25 52	
			-17				-9				-1
	18	- 22 35 50			18	- 23 12 12			18	- 23 25 58	
			-17				-9				-1
7	0	- 22 37 31		14	0	- 23 13 05		21	0	- 23 26 02	
			-17				-9				0
Rab	6	- 22 39 10		Rab	6	- 23 13 56		Rab	6	- 23 26 04	
			-16				-8				0
	12	- 22 40 47			12	- 23 14 46			12	- 23 26 04	
			-16				-8				0
	18	- 22 42 23			18	- 23 15 34			18	- 23 26 03	
			-16				-8				1

MATAHARI – DISEMBER 2016

UT : Waktu Universal

v : Perubahan Sejam

HB h	UT j	Dek ' ' "	v "	HB h	UT j	Dek ' ' "	v "	HB h	UT j	Dek ' ' "	v "
22	0	- 23 26 00		26	0	- 23 21 11		30	0	- 23 08 53	
Kha	6	- 23 25 55	1	Isn	6	- 23 20 38	6	Jum	6	- 23 07 52	10
	12	- 23 25 49	1		12	- 23 20 04	6		12	- 23 06 49	10
	18	- 23 25 40	1		18	- 23 19 27	6		18	- 23 05 45	11
			2				6				11
23	0	- 23 25 30		27	0	- 23 18 49		31	0	- 23 04 38	
Jum	6	- 23 25 18	2	Sel	6	- 23 18 09	7	Sab	6	- 23 03 31	11
	12	- 23 25 05	2		12	- 23 17 27	7		12	- 23 02 21	12
	18	- 23 24 49	3		18	- 23 16 43	7		18	- 23 01 10	12
			3				8				12
24	0	- 23 24 32		28	0	- 23 15 58					
Sab	6	- 23 24 13	3	Rab	6	- 23 15 11	8				
	12	- 23 23 53	3		12	- 23 14 22	8				
	18	- 23 23 30	4		18	- 23 13 32	8				
			4				9				
25	0	- 23 23 06		29	0	- 23 12 39					
Aha	6	- 23 22 40	4	Kha	6	- 23 11 45	9				
	12	- 23 22 12	5		12	- 23 10 50	9				
	18	- 23 21 43	5		18	- 23 09 52	10				
			5				10				

PEKALI POLINOMIAL UNTUK DEKLINASI MATAHARI, 2016

Selain daripada menggunakan nilai-nilai terjadual, pengguna boleh menggunakan set-set pekali polinomial bulanan untuk menghitung Deklinasi Matahari. Set-set pekali ini membolehkan nilai-nilai Deklinasi Matahari dihitung secara terus dalam komputer.

Faktor tentuan dalaman (*interpolation*) yang digunakan ialah $x = d / 32$, dengan d ialah jumlah daripada hari dalam bulan tersebut dicampur dengan perpuluhan hari itu dalam Waktu Universal (*UT*).

Deklinasi Matahari dihitung dengan menggunakan polinomial berikut:

$$a_0 + a_1x + a_2x^2 + a_3x^3 + a_4x^4$$

dengan nilai-nilai a_0, a_1, a_2, a_3 dan a_4 diambil daripada jadual set pekali polinomial.

Set-set polinomial bulanan ini hanya sah untuk $0 < x < 1$. Untuk mendapatkan ketepatan yang penuh, nilai x perlu dihitung sehingga ke tujuh angka perpuluhan.

Contoh hitungan; Tarikh: 2016, Sep. 1^h 00ⁱ 00^m 00^s *UT*

$$\begin{aligned}x &= 1.0000000 / 32 \\ &= 0.031250\end{aligned}$$

Hitungan untuk Deklinasi Matahari:

		<i>Dek</i>		
0	8.56076		=	8.5607566
1	-11.55009	x	=	-0.3609402
2	-1.14140	x^2	=	-0.0011146
3	0.45285	x^3	=	0.0000138
4	0.02176	x^4	=	2.07565E-08
			=	8.1987156
			=	8°11'55.3"

PEKALI POLINOMIAL UNTUK DEKLINASI MATAHARI, 2016

	<i>Dek</i> °		<i>Dek</i> °		<i>Dek</i> °
a ₀	Jan. -23.13384	Mei.	14.83620	Sep.	8.56076
a ₁	2.21301		9.78850		-11.55009
a ₂	3.92020		-2.08077		-1.14140
a ₃	-0.17930		-0.53353		0.45285
a ₄	<u>-0.13822</u>		<u>0.06876</u>		<u>0.02176</u>
	Jum. -17.31816	Jum.	22.07916	Jum.	-3.65612
a ₀	Feb. -17.59527	Jun.	21.94139	Okt.	-2.87978
a ₁	8.80603		4.50478		-12.43989
a ₂	2.69537		-3.25576		0.31949
a ₃	-0.65789		-0.29285		0.44382
a ₄	<u>0.01261</u>		<u>0.11792</u>		<u>0.06456</u>
	Jum. -6.73914	Jum.	23.01548	Jum.	-14.49180
a ₀	Mac. -7.88190	Jul.	23.15511	Nov.	-14.17066
a ₁	12.10082		-2.00072		-10.35136
a ₂	1.02445		-3.41796		1.94614
a ₃	-0.66280		0.12702		0.63310
a ₄	<u>0.04265</u>		<u>0.09304</u>		<u>-0.03637</u>
	Jum. 4.62322	Jum.	17.95649	Jum.	-21.97915
a ₀	Apr. 4.23725	Ogo.	18.20681	Dis.	-21.67078
a ₁	12.37973		-7.93167		-5.15581
a ₂	-0.62917		-2.53786		3.53086
a ₃	-0.59028		0.45872		0.46185
a ₄	<u>0.04275</u>		<u>0.00255</u>		<u>-0.16502</u>
	Jum. 15.44027	Jum.	8.19855	Jum.	-22.99890

JADUAL BIASAN DAN PARALAKS

Untuk suhu 26.7°C dan tekanan udara 1002.5mb.

Alt	Pemb	Alt	Pemb	Alt	Pemb	Alt	Pemb	Alt	Pemb	Alt	Pemb
5° 00'	9°05"	7° 50'	6°01"	11° 20'	4°11"	17° 00'	2°43"	22° 40'	1°59"	29° 00'	1°27"
05'	8°57"	55'	5°57"	30'	4°06"	10'	2°42"	50'	1°58"	20'	1°26"
10'	8°50"	8° 00'	5°53"	40'	4°03"	20'	2°40"	23° 00'	1°57"	40'	1°25"
15'	8°42"	05'	5°49"	50'	4°00"	30'	2°38"	10'	1°56"	30° 00'	1°23"
20'	8°36"	10'	5°47"	12° 00'	3°56"	40'	2°36"	20'	1°55"	20'	1°22"
25'	8°27"	15'	5°43"	10'	3°53"	50'	2°35"	30'	1°54"	40'	1°21"
30'	8°21"	20'	5°40"	20'	3°49"	18° 00'	2°34"	40'	1°53"	31° 00'	1°20"
35'	8°14"	25'	5°36"	30'	3°47"	10'	2°32"	50'	1°52"	20'	1°18"
40'	8°08"	30'	5°34"	40'	3°43"	20'	2°31"	24° 00'	1°52"	40'	1°17"
45'	8°01"	35'	5°31"	50'	3°40"	30'	2°30"	10'	1°51"	32° 00'	1°17"
50'	7°56"	40'	5°27"	13° 00'	3°37"	40'	2°28"	20'	1°50"	20'	1°16"
55'	7°49"	45'	5°24"	10'	3°34"	50'	2°27"	30'	1°49"	40'	1°15"
6° 00'	7°44"	50'	5°22"	20'	3°31"	19° 00'	2°25"	40'	1°48"	33° 00'	1°14"
05'	7°37"	55'	5°19"	30'	3°29"	10'	2°24"	50'	1°47"	20'	1°13"
10'	7°32"	9° 00'	5°15"	40'	3°26"	20'	2°22"	25° 00'	1°46"	40'	1°12"
15'	7°26"	05'	5°12"	50'	3°23"	30'	2°21"	10'	1°45"	34° 00'	1°11"
20'	7°20"	10'	5°09"	14° 00'	3°20"	40'	2°19"	20'	1°44"	20'	1°10"
25'	7°15"	15'	5°07"	10'	3°18"	50'	2°18"	30'	1°43"	40'	1°09"
30'	7°09"	20'	5°04"	20'	3°15"	20° 00'	2°16"	40'	1°42"	35° 00'	1°08"
35'	7°03"	25'	5°02"	30'	3°14"	10'	2°15"	50'	1°41"	20'	1°07"
40'	6°59"	30'	4°59"	40'	3°11"	20'	2°13"	26° 00'	1°40"	40'	1°06"
45'	6°54"	35'	4°56"	50'	3°09"	30'	2°12"	10'	1°39"	36° 00'	1°05"
50'	6°49"	40'	4°54"	15° 00'	3°06"	40'	2°10"	20'	1°39"	30'	1°04"
55'	6°45"	45'	4°52"	10'	3°04"	50'	2°09"	30'	1°38"	37° 00'	1°03"
7° 00'	6°40"	50'	4°49"	20'	3°02"	21° 00'	2°09"	40'	1°37"	30'	1°01"
05'	6°35"	55'	4°47"	30'	3°01"	10'	2°08"	50'	1°36"	38° 00'	1°00"
10'	6°32"	10° 00'	4°44"	40'	2°58"	20'	2°07"	27° 00'	1°35"	30'	0°59"
15'	6°27"	10'	4°39"	50'	2°56"	30'	2°07"	15'	1°34"	39° 00'	0°58"
20'	6°23"	20'	4°35"	16° 00'	2°54"	40'	2°06"	30'	1°33"	30'	0°57"
25'	6°19"	30'	4°30"	10'	2°53"	50'	2°04"	45'	1°32"	40° 00'	0°56"
30'	6°15"	40'	4°26"	20'	2°50"	22° 00'	2°03"	28° 00'	1°31"	30'	0°55"
35'	6°12"	50'	4°22"	30'	2°49"	10'	2°02"	15'	1°31"	41° 00'	0°54"
40'	6°08"	11° 00'	4°18"	40'	2°47"	20'	2°01"	30'	1°30"	30'	0°53"
45'	6°04"	10'	4°14"	50'	2°45"	30'	2°00"	45'	1°29"	42° 00'	0°52"

Pembetulan – daripada altitud atau + kepada jarak zenit