

The 2010 AAVSO RR Lyrae Ephemeris

The AAVSO RR Lyrae Ephemeris provides the predicted time of maximum for RR Lyrae and Delta Sct type stars in the AAVSO RR Lyrae observing program. These times appear in Universal Time in the body of the ephemeris table. The time is rounded to the nearest half hour, providing sufficient accuracy to plan observing sessions while, hopefully, leaving sufficient doubt about the exact time in order to eliminate anticipatory bias. This ephemeris is designed for use by observers at American longitudes.

The top rows of the ephemeris table list the name of the RR Lyrae type star. Directly below the star's name are its approximate maximum and minimum magnitudes. These magnitudes are taken from the 4th edition of the GCVS and may be visual, photographic, or V.

Gerard Samolyk, AAVSO Short Period Pulsator Section

REFERENCE

Kholopov, P. N., *et al.* 1985, *General Catalogue of Variable Stars*, Fourth Edition, Moscow.

Below that, in the row labeled "RISE". This is the approximate time required for the star to rise from minimum to maximum, in hours.

CCD observations of RR Lyrae type stars at all phases of their lightcurves are encouraged. This ephemeris can be used as a guide to determine what portion of the lightcurve is observable on a given night.

The numbers in the left-most column are the "double date" - the evening and the following morning - for the event times listed in the corresponding row. For example, 5-6 corresponds to the evening of the 5th and the morning of the 6th of the month. January 0-1 is the evening of December 31 and the morning of January 1.

AAVSO RR Lyrae Ephemeris for January 2010

all times in U.T.

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	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	4.0	5.0			7.5	9.0		9.5	5.5		9.5	12.5			4.0	2.0		5.5	2.0	5.0	5.5	0.0	10.5
1- 2	1.0		4.5		2.0	7.0	8.5		6.0		8.0		11.5	12.0	6.5	5.0	1.5	4.0		2.0	4.0	4.5	
2- 3					6.5	5.0	11.5	6.5	6.5		6.5		9.5		8.5	8.0	4.0	2.5		10.0	3.0	9.0	10.5
3- 4	6.0	2.5	1.0	1.5	1.0	2.5	5.5	12.5	7.5		5.0		7.5	11.0	11.0	11.0		0.5	0.5	7.0	2.0	4.5	
4- 5	3.5		6.5		5.5	0.5	9.0		8.0		11.0	6.0				0.5		10.0		4.5	1.0	9.0	10.5
5- 6	0.5	6.5			0.0	9.5	12.0	9.0	8.5	6.5	9.5	7.5		10.0	2.5	4.0		8.5	3.0	1.5	11.0	4.0	
6- 7		0.0	3.0		4.5	7.5	6.0		9.5	7.5	8.0	9.0	12.0		4.5	7.0	1.0	7.0		9.5	10.0	8.5	10.5
7- 8	5.5				8.5	5.0	9.5	6.0	10.0	9.0	6.5	11.0	10.0	9.0	7.0	10.0	3.5	5.5		7.0	9.0	3.5	
8- 9	3.0	4.0			3.5	3.0	12.5	12.0	10.5	10.0	5.0	12.5	8.0		9.0	13.0	6.0	4.0	1.5	4.0	8.0	8.5	10.5
9-10	0.0		5.0	1.0	7.5	1.0	6.5		11.5	11.0	11.0		6.0	7.5	11.5	2.5		2.0		1.5	6.5	3.5	
10-11		8.0			2.5	10.0	10.0	8.5	12.0	12.0	9.5				0.5	5.5		0.5	4.0	9.5	5.5	8.0	10.5
11-12	5.0	1.5	1.5		6.5	7.5	13.0		12.5		8.0		13.0	6.5	3.0	8.5	0.5	10.0		6.5	4.5	3.0	
12-13	2.5		7.0		1.5	5.5	7.0				6.5	5.5	11.0		5.0	11.5	3.0	8.5		4.0	3.0	7.5	10.5
13-14		5.5			5.5	3.5	10.0	11.5			5.0	7.5	8.5		7.5	1.0	5.5	7.0	2.5	1.0	2.0	2.5	
14-15			3.5		0.5	1.5					11.0	9.0	6.5	12.5	9.5	4.0		5.5		9.0	1.0	7.5	10.5
15-16	4.5			0.0	4.5	10.5	7.5	8.0			9.5	10.5			12.0	7.0		4.0		6.0	11.5	2.5	
16-17	2.0	3.0			9.0	8.0	10.5			6.0	8.0	12.0		11.5	1.0	10.0		2.0	1.0	3.5	10.0	7.0	10.5
17-18			5.5		3.5	6.0				7.5	6.5		11.5		3.5		2.5	0.5		0.5	9.0	2.0	
18-19		7.0			8.0	4.0	8.0	11.0		8.5	5.0		9.5	10.5	5.5	3.0	5.0	10.0	3.5	8.5	8.0	6.5	10.5
19-20	4.0	0.5	2.0		2.5	2.0	11.0		5.5	9.5	11.0		7.5		8.0	6.0		8.5		6.0	7.0	1.5	
20-21	1.5		7.5	1.5	7.0	10.5		7.5	6.0	10.5	9.5	5.5		9.0	10.0	9.0		7.0		3.0	5.5	6.5	10.0
21-22		4.5			1.5	8.5	8.5		7.0	11.5	8.0	7.0			12.5	12.0		5.5	2.0	0.5	4.5	1.5	
22-23	6.5		4.0		6.0	6.5	11.5		7.5	12.5	6.5	8.5	12.0	8.0	1.5	1.5	2.0	4.0		8.5	3.5	6.0	10.0
23-24	4.0	8.5			0.5	4.5		10.5	8.0		5.0	10.0	10.0		3.5	4.5	4.5	2.0		5.5	2.5	1.0	
24-25	1.0	1.5	0.5		5.0	2.0	9.0		8.5		11.0	11.5	8.0	7.0	6.0	7.5		0.5	0.5	3.0	1.0	5.5	10.0
25-26			6.0		9.0	0.0	12.0	7.0	9.5		9.5		6.0		8.5	10.5		10.0		0.0	0.0	0.5	
26-27	6.0	5.5		1.0	4.0	9.0	6.0		10.0		8.0				10.5			8.5	3.0	8.0	10.5	5.5	10.0
27-28	3.5		2.5		8.0	7.0	9.5		10.5		6.5		12.5		13.0	3.0	1.5	7.0		5.0	9.0	0.5	
28-29	0.5				3.0	5.0	12.5	10.0	11.5	7.0	5.0	5.0	10.5		2.0	6.0	4.0	5.5		2.5	8.0	5.0	0.5
29-30		3.0			7.0	2.5	6.5		12.0	8.0	11.0	6.5	8.5	12.0	4.0	9.5		4.0	1.5	10.5	7.0	0.0	
30-31	5.5		4.5		2.0	0.5	10.0	6.5	12.5	9.0	9.5	8.0	6.5		6.5	12.5		2.0		7.5	6.0	4.5	0.5

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1						2.5	5.0	9.0	11.5		6.0	5.5	8.5		2.0	9.5
1- 2	12.0	12.0			4.0	4.0		8.0	9.0	9.0		10.5	2.0			8.0
2- 3	9.5	10.5	12.5	11.5	5.5	5.0	11.0	7.5	6.5		6.5		4.0		0.5	6.5
3- 4		9.0		9.0	7.5	6.0	5.0	7.0	4.5	6.5		6.0	6.0			5.0
4- 5		7.5			9.0	7.5		6.5	2.0	12.5	7.0	10.5	8.0			3.0
5- 6		6.0	11.5		11.0	8.5	11.5	6.0	10.5				1.5		3.5	1.5
6- 7	12.0			12.0	12.5	9.5	5.5	5.5	8.5	9.5	7.5	6.0	3.5			0.0
7- 8	10.0			9.5		10.5		5.0	6.0			11.0	5.5		2.5	10.0
8- 9			10.5		3.5	12.0	12.0	4.5	4.0	6.5	8.0		7.5			8.5
9-10		0.5			5.0		6.0	4.0	1.5	12.5		6.5	0.5		1.5	7.0
10-11		10.0		12.5	7.0			3.5	10.0		8.5	11.5	3.0			5.5
11-12	12.0	8.5	9.5	9.5	8.5	3.0	12.5	3.0	8.0	9.5		2.0	5.0		0.0	3.5
12-13	10.0	7.5			10.5	4.0	6.5	2.5	5.5		9.0	7.0	7.0			2.0
13-14		6.0			12.5	5.0			3.5	7.0		12.0	0.0			0.5
14-15				12.5		6.0	12.5		12.0	13.0	9.5	2.0	2.0	10.0	3.0	10.5
15-16			13.0	10.0	3.0	7.5	7.0	12.5	9.5			7.0	4.5	10.5		9.0
16-17	12.5	13.0			5.0	8.5		12.0	7.5	10.0	9.5	12.0	6.5	11.0	2.0	7.5
17-18	10.5	0.0			6.5	9.5		11.5	5.0			2.5	8.5	11.5		6.0
18-19		10.0	12.0	13.0	8.5	11.0	7.0	11.0	2.5	7.0	10.0	7.5	1.5	12.0	1.0	4.0
19-20		8.5		10.5	10.0	12.0		10.5	11.5			12.5	3.5	0.0		2.5
20-21		7.0			12.0			10.0	9.0		10.5	3.0	6.0	1.0		1.0
21-22	12.5	5.5	11.0				7.5	9.5	7.0	10.5		8.0	8.0	1.5	4.0	11.0
22-23	10.5				2.5	3.0		9.0	4.5		11.0	13.0	1.0			9.5
23-24	8.5			10.5	4.5	4.0		8.5	2.0	7.5		3.5	3.0		2.5	8.0
24-25		12.5	10.0		6.0	5.0	8.0	8.0	11.0		11.5	8.0	5.0			6.5
25-26		11.0			8.0	6.0	2.0	7.5	8.5	4.5			7.5		1.5	5.0
26-27	13.0	9.5			10.0	7.5		7.0	6.0	10.5	12.0	3.5	0.5			3.0
27-28	10.5	8.0		11.0	11.5	8.5	8.5	6.0	4.0			8.5	2.5		0.5	1.5
28-29	8.5	7.0				9.5	2.5	5.5	1.5	7.5	12.5		4.5			0.0
29-30		5.5				11.0		5.0	10.0		4.5	4.0	6.5			10.0
30-31					4.0	12.0	9.0	4.5	8.0	4.5	13.0	9.0	0.0		3.5	8.5

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	3.0				6.0	9.5	4.0	12.5		10.0	8.0	9.5	4.5	11.0	8.5	2.0		0.5		5.0	4.5	9.5	
1- 2	0.0	0.5	1.0		1.0	7.5	7.0			11.0	6.5	11.0			11.0	5.0	0.5	10.0		2.0	3.5	4.5	10.0
2- 3					5.0	5.0	10.0	9.5		12.0	5.0	12.5	11.5	9.5	0.0	8.0	3.5	8.5		10.0	2.5	9.0	
3- 4		4.5	12.0		9.0	3.0	4.5		3.0		3.5		9.0		2.5	11.0		7.0	12.5	7.5	1.5	4.0	10.0
4- 5	2.5		3.0		4.0	1.0	7.5	6.0	3.5		9.5	3.0	7.0	8.5	4.5	0.5		5.5		4.5	0.0	8.5	
5- 6					8.0	10.0	10.5	12.0	4.0		8.0	4.5	5.0		7.0	3.5		3.5		2.0	10.5	3.5	10.0
6- 7		2.0		12.5	3.0	7.5	5.0		5.0	4.0	6.5	6.0		7.5	9.0	6.5	0.0	2.0	1.0	9.5	9.5	8.5	
7- 8	4.5		5.0		7.0	5.5	8.0	9.0	5.5	5.0	5.0	7.5	12.0		11.5	9.5	2.5	0.5		7.0	8.0	3.5	10.0
8- 9	2.0	6.0			2.0	3.5	11.0		6.0	6.5	3.5	9.0	10.0	6.5	0.5			10.0		4.0	7.0	8.0	
9-10			1.5		6.0	1.5	5.0	5.5	7.0	7.5	2.0	11.0	8.0		3.0	2.0		8.5		1.5	6.0	3.0	10.0
10-11					1.0		8.5	11.5	7.5	8.5	8.0	12.5	5.5	5.0	5.0	5.0		7.0		9.5	5.0	7.5	
11-12	4.0	3.5	12.5		5.0	8.0	11.5		8.0	9.5	6.5			12.5	7.5	8.5		5.5	1.5	6.5	3.5	2.5	9.5
12-13	1.5		3.5		0.0	6.0	5.5	8.5	8.5	10.5	5.0	2.5	12.5	4.0	9.5	11.5	2.0	3.5		4.0	2.5	7.5	
13-14					4.0	4.0	9.0		9.5	11.5	3.5	4.0	10.5	11.5	12.0	1.0		2.0		1.0	1.5	2.5	9.5
14-15		0.5			8.5	2.0	12.0	5.0	10.0	13.0	2.0	5.5	8.5		1.0	4.0		0.5	0.0	9.0	0.5	7.0	
15-16	3.5		5.5		3.0		6.0	11.0	10.5		8.0	7.5	6.5	10.0	3.5	7.0		10.0		6.5	10.5	2.0	9.5
16-17	1.0	5.0			7.5	8.5	9.5		11.5		6.5	9.0	4.5		5.5	10.0		8.5	12.5	3.5	9.5	6.5	
17-18			2.0	13.0	2.0	6.5	12.5	7.5	12.0		5.0	10.5		9.0	8.0		1.5	7.0		1.0	8.5	2.0	9.5
18-19					6.5	4.5	6.5		12.5	4.5	3.5	12.0	11.0		10.0	2.5	4.0	5.5		8.5	7.0	6.5	
19-20	3.0	2.0			1.0	2.0	9.5	4.5		6.0	2.0		9.0	8.0	12.5	5.5		3.5	1.0	6.0	6.0	1.5	9.5
20-21	0.5		4.0		5.5	0.0	4.0	10.5		7.0	8.0		7.0		1.5	8.5		2.0		3.0	5.0	6.0	
21-22		6.0			0.0	9.0	7.0			8.0	6.5	4.0	5.0	7.0	4.0	11.5		0.5		0.5	4.0	1.0	9.5
22-23			0.5		4.5	7.0	10.0	7.0	3.0	9.0	5.0	5.5			6.0	1.0	1.0	10.0		8.5	2.5	5.5	
23-24	3.0			12.0	8.5	4.5	4.5		3.5	10.0	3.5	7.0	11.5	5.5	8.5	4.5	3.5	8.5		5.5	1.5	1.0	9.5
24-25	0.0	3.5	11.5		3.5	2.5	7.5	4.0	4.0	11.0	2.0	8.5	9.5	13.0	10.5	7.5		7.0	12.0	3.0	0.5	5.5	
25-26			2.5		7.5	0.5	10.5	10.0	5.0	12.5	8.0	10.0	7.5	4.5	13.0	10.5		5.5		0.0	11.0	0.5	9.5
26-27					2.5	9.5	4.5		5.5		6.5	11.5	5.5	12.0	2.0			3.5		8.0	9.5	5.0	
27-28	2.5	1.0			6.5	7.0	8.0	6.5	6.0		5.0				4.0	3.0	0.5	2.0	0.5	5.5	8.5	0.0	9.5

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1			12.0	11.5	6.0	0.5	3.0	4.0	5.5	11.0	5.0		2.0			7.0
1- 2	11.0	12.5		8.5	7.5	1.5		3.5	3.5			4.5	4.0		11.5	5.5
2- 3	9.0	11.0			9.5	3.0	9.0	3.0	1.0	8.0	5.5	9.0	6.0	8.0		3.5
3- 4	6.5	9.5	11.0		11.0	4.0	3.5	2.5	9.5				8.0	8.5	1.0	2.0
4- 5		8.0		11.5		5.0		2.0	7.5	5.0	6.0	4.5	1.5	9.0		0.5
5- 6		6.5		9.0	2.0	6.0	9.5	1.5	5.0	11.0		9.5	3.5	9.5		10.5
6- 7	11.0	5.0	10.0		3.5	7.5	3.5	1.0	3.0		6.5	0.0	5.5	10.0		9.0
7- 8	9.0	3.5			5.5	8.5		0.5	0.5	8.0		5.0	7.5	10.5		7.5
8- 9	7.0			12.0	7.0	9.5	10.0		9.0		7.0	10.0	1.0	11.0	12.0	6.0
9-10		12.0	9.0	9.5	9.0	11.0	4.0	11.0	7.0	5.0		0.5	3.0	11.5		4.0
10-11		10.5		6.5	11.0	12.0		10.5	4.5	11.5	7.0	5.5	5.0	12.0	1.5	2.5
11-12	11.5	9.0				0.5	10.5	10.0	2.0	2.5		10.0	7.0	12.5		1.0
12-13	9.0	8.0	8.0	12.0	1.5	1.5	4.5	9.5	11.0	8.5	7.5	0.5	0.5		0.5	11.0
13-14	7.0	6.5	12.5	9.5	3.0	3.0		9.0	8.5			5.5	2.5			9.5
14-15		5.0		7.0	5.0	4.0	11.0	8.5	6.0	5.5	8.0	10.5	4.5			8.0
15-16		3.5			7.0	5.0	5.0	8.0	4.0	11.5		1.0	6.5		13.0	6.5
16-17	11.5		11.5	12.5	8.5	6.5		7.5	1.5	2.5	8.5	6.0	8.5			4.5
17-18	9.5	12.0		10.0	10.5	7.5	11.5	7.0	10.0	8.5		11.0	2.0		11.5	3.0
18-19	7.5	10.5		7.5		8.5	5.5	6.5	8.0		9.0	1.5	4.0			1.5
19-20		9.0	10.5		1.0	9.5		6.0	5.5	5.5		6.5	6.0		1.0	0.0
20-21		7.5		13.0	3.0	11.0		5.5	3.5	12.0	9.5	11.5	8.0			10.0
21-22	12.0	6.0		10.0	4.5	12.0	6.0	5.0	1.0	3.0		1.5	1.5			8.5
22-23	9.5	4.5	9.5	7.5	6.5	0.5		4.5	9.5	9.0	10.0	6.5	3.5			7.0
23-24	7.5	3.0			8.0	1.5		3.5	7.5			11.5	5.5			5.0
24-25					10.0	3.0	6.0	3.0	5.0	6.0	10.5	2.0	7.5		12.5	3.5
25-26		11.5	8.5	10.5		4.0	0.5	2.5	3.0	12.0	2.5	7.0	1.0	8.0		2.0
26-27	12.0	10.0	13.0	8.0	0.5	5.0		2.0	0.5	3.0	11.0	12.0	3.0	8.5	2.0	0.5
27-28	10.0	8.5			2.5	6.5	6.5	1.5	9.0	9.0	3.0	2.5	5.0	9.0		10.5

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1		11.5			1.5	5.0	2.0		7.0	3.0	3.5	2.0	12.5	10.5	6.5	6.0		0.5		2.5	7.5	4.5	
1- 2			10.0	11.5	5.5	3.0	5.0	3.5	7.5	4.0	2.0	3.5	10.5	2.5	9.0	9.0		10.0		10.5	6.0	9.5	9.5
2- 3			1.0		10.0	1.0	8.5	9.5	8.0	5.5	0.5	5.0	8.0	9.5	11.0			8.5	9.0	7.5	5.0	4.5	
3- 4	2.0				4.5		2.5		9.0	6.5	6.5	6.5	6.0			1.5		7.0		5.0	4.0	9.0	9.0
4- 5		2.5	12.0		9.0	7.5	5.5	6.0	9.5	7.5	5.0	8.0	4.0	8.5	2.5	4.5		5.5	11.5	2.5	3.0	4.0	
5- 6			3.0		3.5	5.5	9.0	12.0	10.0	8.5	3.5	9.5	2.0		4.5	7.5		3.5		10.0	1.5	8.5	9.0
6- 7					8.0	3.5	3.0	3.0	10.5	9.5	2.0	11.0	11.0	7.5	7.0			2.0		7.5	0.5	4.0	
7- 8	1.5			11.0	2.5	1.5	6.0	9.0	11.5	10.5	0.5		9.0		9.0			0.5	10.0	4.5	11.0	8.5	9.0
8- 9					7.0		9.5		12.0	12.0	6.5	1.5	7.0	6.0	11.5	3.5		10.0		2.0	10.0	3.5	
9-10		4.0	10.5		1.5	8.0	3.5	5.5			5.0	3.0	4.5		0.5	6.5		8.5	12.5	10.0	8.5	8.0	9.0
10-11			1.0		6.0	6.0	6.5	11.5			3.5	4.5	2.5	5.0	3.0	9.5	2.0	7.0	8.5	7.0	7.5	3.0	
11-12	1.0				0.5	4.0	9.5	2.5	1.5	2.5	2.0	6.0	11.5	12.5	5.0			5.0		4.5	6.5	7.5	9.0
12-13		1.0	12.5	12.0	5.0	1.5	4.0	8.5	2.5	3.5	0.5	7.5	9.5	4.0	7.5	2.0		3.5	11.0	1.5	5.5	3.0	
13-14		12.0	3.5		9.0		7.0		3.0	5.0	6.5	9.0	7.5	11.0	9.5	5.0		2.0		9.5	4.0	7.5	9.0
14-15					4.0		10.0	5.0	3.5	6.0	5.0	11.0	5.5	3.0		8.0		0.5		6.5	3.0	2.5	
15-16					8.0	6.5	4.5	11.0	4.5	7.0	3.5	12.5	3.5	10.0	1.0		1.5	10.0	9.5	4.0	2.0	7.0	9.0
16-17					3.0	4.0	7.5		5.0	8.0	2.0	1.0	12.0		3.5	0.5		8.5		1.5	1.0	2.0	
17-18		2.5	11.0		7.0	2.0	10.5	8.0	5.5	9.0	0.5	2.5	10.0	9.0	5.5	3.5		7.0	12.0	9.0	11.0	6.5	9.0
18-19	2.5		1.5	11.5	2.0		4.5		6.0	10.0	6.5	4.0	8.0		8.0	6.5		5.0		6.5	10.0	2.0	
19-20					6.0		8.0	4.5	7.0	11.5	5.0	6.0	6.0	8.0	10.0	9.5		3.5		3.5	9.0	6.5	9.0
20-21					1.0	6.5	2.0	10.5	7.5	12.5	3.5	7.5	4.0				1.0	2.0	10.5	1.0	7.5	1.5	
21-22					5.0	4.5	5.0		8.0		2.0	9.0		6.5	1.5	2.5		11.5		9.0	6.5	6.0	9.0
22-23	2.0	4.0			9.0	2.5	8.5	7.5	9.0	2.0	0.5	10.5	10.5		4.0	5.5		10.0		6.0	5.5	1.0	
23-24					4.0		2.5		9.5	3.0	6.5	12.0	8.5	5.5	6.0	8.5		8.5	9.0	3.5	4.5	6.0	8.5
24-25				10.5	8.0		5.5	4.0	10.0	4.5	5.0		6.5		8.5			7.0		0.5	3.0	1.0	
25-26		1.5	11.5		3.0	7.0	9.0	10.0	11.0	5.5	3.5	2.5	4.5	4.5	10.5	1.0		5.0	11.5	8.5	2.0	5.5	8.5
26-27	2.0	12.0	2.0		7.0	5.0	3.0		11.5	6.5	2.0	4.0	2.5	11.5		4.0		3.5		6.0	1.0	0.5	
27-28					2.0	3.0	6.0	7.0	12.0	7.5	0.5	5.5	11.5	3.5	2.0	7.0		2.0		3.0	11.0	5.0	8.5
28-29					6.0	1.0	9.0				8.5	6.5	7.0	9.5	10.5	4.5		11.5	10.0	11.0	10.0	9.5	
29-30				12.0	1.0		3.5	3.5	1.0	9.5	5.5	8.5	7.0		6.5			10.0		8.0	9.0	5.0	8.5
30-31	1.5	3.0	10.0		5.0	7.5	6.5	9.5	1.5	11.0	4.0	10.0	5.0	9.5	9.0	2.5		8.5	12.5	5.5	8.0	9.5	

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1	7.5	7.5	7.5		4.5	7.5	0.5	1.0	7.0		11.5	7.5	7.0	9.5	10.0	9.0
1- 2	5.5	6.0	12.0	11.0	6.0	8.5		0.5	4.5	6.0	3.5		0.5	10.0		7.5
2- 3		4.5		8.5	8.0	9.5	7.0		2.0	12.5	11.5	3.0	2.5	10.5		5.5
3- 4	12.0	3.0	6.5	5.5	9.5		1.0		11.0	3.5	4.0	7.5	4.5	11.0		4.0
4- 5	10.0	1.5	11.0						8.5	9.5			6.5	11.5		2.5
5- 6	8.0	11.5		11.0		0.5	7.5		6.0		4.5	3.0	8.5	12.0	12.0	1.0
6- 7	6.0	10.0	5.5	8.5	2.0	2.0	1.5		4.0	6.5		8.0	2.0			11.0
7- 8		8.5	10.0	6.0	4.0	3.0		9.0	1.5		4.5		4.0		10.5	9.5
8- 9	12.5	7.0			5.5	4.0	8.0	8.5	10.0	3.5		3.5	6.0			8.0
9-10	10.5	5.5		11.5	7.5	5.0	2.0	8.0	8.0	9.5	5.0	8.5	8.0			6.0
10-11	8.0	4.0	9.0	9.0	9.0	6.5		7.5	5.5	0.5			1.5			4.5
11-12	6.0	2.5		6.5		7.5	8.0	7.0	3.5	7.0	5.5	4.0	3.5			3.0
12-13		1.5				8.5	2.5	6.5	1.0			8.5	5.5		12.5	1.5
13-14		11.0	8.0	12.0	1.5	10.0		6.0	9.5	4.0	6.0		7.5			11.5
14-15	10.5	9.5	12.5	9.0	3.5		8.5	5.5	7.5	10.0		4.0	1.0		11.5	10.0
15-16	8.5	8.0		6.5	5.5		2.5	5.0	5.0	1.0	6.5	9.0	3.0			8.5
16-17	6.0	7.0	7.0		7.0	0.5		4.5	3.0	7.0			5.0	6.0	10.0	6.5
17-18		5.5	11.5	12.0	9.0	2.0	9.0	4.0	0.5		7.0	4.5	7.0	6.5		5.0
18-19		4.0		9.5		3.0	3.0	3.5	9.0	4.0		9.5	9.0	7.0		3.5
19-20	10.5	2.5	6.0	7.0		4.0		3.0	7.0	10.0	7.5		2.5	7.5		2.0
20-21	8.5	12.5	10.5		1.5	5.0	9.5	2.5	4.5	1.0		5.0	4.5	8.0		0.5
21-22	6.5	11.0		12.5	3.0	6.5	3.5	1.5	2.0	7.5	8.0	10.0	6.5	8.5	12.0	10.5
22-23		9.5		10.0	5.0	7.5		1.0	11.0				8.5	9.0		9.0
23-24		8.0	9.5	7.0	6.5	8.5		0.5	8.5	4.5	8.5	5.0	2.0	9.5	11.0	7.0
24-25	11.0	6.5			8.5	10.0	4.0		6.0	10.5	0.5	10.0	4.0	10.0		5.5
25-26	9.0	5.0							4.0	1.5	9.0	0.5	6.0	11.0	9.5	4.0
26-27	6.5	3.5	8.5	10.0					1.5	7.5	1.0	5.5	8.0	11.5		2.5
27-28	4.5	2.0		7.5	1.0	0.5	4.5		10.5		9.0	10.5	1.5	12.0		1.0
28-29		12.0		5.0	2.5	2.0			8.0	4.5	1.5	1.0	3.5	12.5		11.0
29-30	11.0	10.5	7.5		4.5	3.0		9.5	5.5	10.5	9.5	6.0	5.5			9.5
30-31	9.0	9.0	11.5	10.5	6.5	4.0	5.0	8.5	3.5	1.5	2.0		7.5		11.5	7.5

AAVSO RR Lyrae Ephemeris for April 2010

all times in U.T.

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	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	XZ	DM	RW	XZ	RR	TW	VX
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CYG	CYG	DRA	DRA	GEM	HER	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.1	11.2	11.0	9.6	10.7	10.5	9.9
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.5	12.7	12.0	10.3	11.9	11.8	10.4
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	3	2	2	3	2	2	2
0- 1						5.5	9.5		2.5		2.5	11.5	3.0	1.0		5.5	7.0	8.5	2.5	6.5	4.5	8.5	7.0
1- 2					4.0	3.5	4.0	6.5	3.0		8.5		1.0	8.5			5.0		10.5	5.5		3.5	4.5
2- 3					8.5	1.0	7.0		3.5	1.5	7.0	2.0	10.0		2.5		3.5	11.0	8.0	4.5	4.0	8.5	2.5
3- 4	11.5	11.0			3.0		1.0	3.0	4.5	2.5	5.5	3.5	8.0	7.0	4.5	1.5	2.0	7.0	5.0	3.5		3.5	11.5
4- 5			8.5	11.0	7.5		4.0	9.0	5.0	4.0	4.0	5.0	6.0		7.0	4.5	11.5		2.5	2.0	4.0	8.5	9.0
5- 6				9.5	2.0	6.0	7.5		5.5	5.0	2.5	6.5	3.5	6.0	9.5	7.5	10.0	9.5	10.5	1.0		3.5	7.0
6- 7					6.5	3.5	1.5	5.5	6.0	6.0	8.5	8.0	1.5				8.5		7.5	11.5	3.5	8.5	5.0
7- 8	11.0	1.5	10.5		1.0	1.5	4.5	11.5	7.0	7.0	7.0	9.5	10.5	5.0			6.5		5.0	10.0		3.5	3.0
8- 9			1.0		5.5		8.0	2.5	7.5	8.0	5.5	11.0	8.5		3.0	3.0	5.0	8.0	2.0	9.0	3.0	8.5	11.5
9-10							2.0	8.5	8.0	9.0	4.0		6.5	4.0	5.0	6.0	3.5		10.0	8.0	8.0	3.5	9.5
10-11				10.5	4.5		5.0		9.0	10.5	2.5	1.5	4.5	11.0	7.5		2.0	10.5	7.0	7.0	3.0	8.5	7.5
11-12	10.5	9.5		8.5	8.5	4.0	8.5	5.0	9.5	11.5	8.5	3.0	2.5	2.5	9.5		11.5	6.5	4.5	5.5	7.5	3.5	5.0
12-13			8.5		3.5	2.0	2.5	11.0	10.0		7.0	4.5	11.0	10.0		1.5	10.0		1.5	4.5	2.5	8.5	3.0
13-14					7.5		5.5	2.0	11.0	1.0	5.5	6.0	9.0	1.5	1.0	5.0	8.5	9.0	9.5	3.5	7.0	3.5	
14-15					2.5		9.0	8.0	11.5	2.0	4.0	7.5	7.0	8.5	3.5	8.0	6.5		7.0	2.5	2.0	8.0	9.5
15-16	10.0		11.0		6.5		3.0			3.5	2.5	9.5	5.0		5.5		5.0	11.5	4.0	1.0	7.0	3.5	7.5
16-17		11.0	1.5	10.0	1.5	4.5	6.0	4.5		4.5	8.5	11.0	3.0	7.5	8.0		3.5	7.5	1.5	11.5	2.0	8.0	5.5
17-18					5.5	2.5	9.0	10.5	1.0	5.5	7.0						3.5	2.0		9.5	10.5	6.5	3.5
18-19							3.5	1.5	1.5	6.5	5.5	1.0	10.0	6.5		6.5	11.5	10.0	6.5	9.0	1.5	8.0	
19-20	9.5				4.5		6.5	7.5	2.5	7.5	4.0	2.5	7.5		1.5		10.0		4.0	8.0	6.0	3.5	10.0
20-21		2.0	9.0		9.0		9.5		3.0	8.5	2.5	4.0	5.5	5.5	4.0		8.5		1.0	7.0	1.0	8.0	7.5
21-22				11.0	3.5	5.0	4.0	4.0	3.5	10.0	8.5	6.0	3.5		6.0	2.0	6.5	8.5	9.0	6.0	6.0	3.5	5.5
22-23				9.0	8.0	3.0	7.0	10.0	4.5	11.0	7.0	7.5	1.5	4.0	8.5	5.0	5.0		6.0	4.5		8.0	3.5
23-24			11.5		2.5		1.0	1.0	5.0		5.5	9.0	10.5	11.5			3.5	10.5	3.5	3.5	5.5	3.0	
24-25		10.0			7.0		4.0	7.0	5.5		4.0	10.5	8.5	3.0			2.0	7.0	11.5	2.5		8.0	10.0
25-26			7.5		1.5		7.5		6.5	1.5	2.5		6.0	10.5	2.0		11.5		8.5	1.5	5.0	3.0	8.0
26-27	11.5				6.0	5.5	1.5	3.5	7.0	3.0	8.5		4.0	2.0	4.5	4.0	10.0	9.0	6.0	11.5		8.0	6.0
27-28				10.5		3.5	4.5	9.5	7.5	4.0	7.0	2.5	2.0	9.0	6.5	7.0	8.5		3.0	10.5	5.0	3.0	3.5
28-29			9.5	8.5	5.0	1.0	8.0		8.0	5.0	5.5	4.0	11.0		9.0		6.5	11.5	11.0	9.5		8.0	
29-30		11.5					2.0	6.5	9.0	6.0	4.0	5.5	9.0	8.0			5.0	8.0	8.5	8.5	4.5	3.0	10.5

	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1	7.5		8.0		5.5			1.0	8.0		1.5	9.5			6.0
1- 2	6.5	6.5	5.5		6.5			9.5		2.0	6.0	3.0		10.5	4.5
2- 3	5.0	10.5			7.5	5.0	7.0	7.5	5.0			5.0			3.0
3- 4	3.5		11.0				6.5	5.0		2.5	1.5	7.0		9.0	1.5
4- 5	2.0	5.5	8.0	2.5			6.0	3.0	2.0		6.5	9.0	4.0		11.5
5- 6		9.5	5.5	4.0		5.5	5.5		8.0	3.0		2.0	4.5	8.0	10.0
6- 7	10.5		3.0	6.0			5.0	9.0			2.0	4.5	5.0		8.5
7- 8	9.0	4.5	11.0				4.5	7.0	5.0	3.5	7.0	6.5	5.5		6.5
8- 9	7.5	8.5	8.5		2.0	6.0	4.0	4.5				8.5	6.0	11.0	5.0
9-10	6.0		6.0		3.0		3.5	2.5	2.0	4.0	2.5	1.5	6.5		3.5
10-11	4.5		3.5		4.0		3.0		8.5		7.0	3.5	7.0	10.0	2.0
11-12	3.0	7.5	11.5	2.0	5.5	6.5	2.5	8.5		4.5		6.0	7.5		
12-13	1.5		9.0	3.5	6.5		2.0	6.5	5.5		2.5	8.0	8.0	8.5	10.5
13-14	11.5		6.0	5.5	7.5		1.5	4.0		5.0	7.5	1.0	8.5		9.0
14-15	10.0	6.5	3.5	7.5		7.0		1.5	2.5			3.0	9.5		7.0
15-16	8.5	11.0	11.5			1.0		10.5	8.5	5.5	3.0	5.0	10.0	11.5	5.5
16-17	7.0		9.0					8.0			8.0	7.5	10.5		4.0
17-18	6.0	5.5	6.5			7.0		5.5	5.5	6.0		9.5	11.0	10.5	2.5
18-19	4.5	10.0	4.0	1.5		1.5		3.5			3.5	2.5	11.5		1.0
19-20	3.0			3.5	2.0			1.0	2.5	6.5	8.0	4.5		9.5	11.0
20-21	1.5	4.5	9.5	5.0	3.0			9.5	9.0			6.5			9.5
21-22	11.5	9.0	7.0	7.0	4.0	1.5		7.5		6.5	3.5	9.0		8.0	7.5
22-23	10.0		4.0		5.5			5.0	6.0		8.5	2.0			6.0
23-24	8.5	3.5			6.5			3.0		7.0		4.0			4.5
24-25	7.0	8.0	9.5		7.5	2.0	7.5		3.0		4.0	6.0		11.0	3.0
25-26	5.5		7.0	1.0			6.5	9.0	9.0	7.5		8.0			1.5
26-27	4.0		4.5	3.0			6.0	7.0				1.5		10.0	11.5
27-28	2.5	7.0		4.5		2.5	5.5	4.5	6.0	8.0	4.5	3.5	4.0		10.0
28-29	1.0	11.5	10.0	6.5			5.0	2.5				5.5	4.5	8.5	8.0
29-30	11.0		7.5				4.5		3.5	8.5		7.5	5.0		6.5

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW		
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER		
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5		
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8		
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2		
0- 1	11.0		6.0		4.0		5.0		9.5	7.0	2.5	7.0	7.0			2.5		3.5		5.5	7.0		8.0		
1- 2	8.0						8.5	3.0	10.0	8.0	8.5	8.5	5.0	7.0	2.5	5.5		2.0	10.0	3.0	6.0	4.0	3.0		
2- 3		9.0			3.0	3.5	2.5	9.0	11.0	9.5	7.0	10.0	2.5		5.0				6.5	10.5	5.0		8.0		
3- 4			8.0	9.5		1.5	5.5			10.5	5.5			6.0	7.0					8.0	3.5	4.0	3.0		
4- 5	10.5			7.5	2.0		8.5	6.0			4.0		9.5						8.5	8.5	5.0	2.5		7.5	
5- 6	7.5				6.0		3.0				2.5	2.0	7.5	4.5		4.0			6.5	5.0	2.5	1.5	3.5	3.0	
6- 7			10.0				6.0	2.5			8.5	3.5	5.5						5.0	11.0	10.5			7.5	
7- 8		10.0			5.0	4.0	9.0	8.5	2.0	2.5	7.0	5.0	3.5	3.5	3.0				3.5	7.0	7.5	10.5	3.0	3.0	
8- 9	10.0		6.5	11.0		2.0	3.5		2.5	3.5	5.5	6.5		11.0	5.5				2.0		5.0	9.5		7.5	
9-10				9.0	4.0		6.5	5.5	3.0	4.5	4.0	8.0	10.0	2.5	7.5	3.0				9.5	2.0	8.5	3.0	3.0	
10-11		7.5		7.0			9.5	11.0	3.5	5.5	2.5	9.5	8.0	9.5		6.0				10.0	6.0	10.0	7.5	7.5	
11-12			8.5		3.0		3.5	2.0	4.5	6.5	8.5		6.0						8.0		7.5	6.0	2.5	3.0	
12-13	9.5						7.0	8.0	5.0	7.5	7.0		4.0	8.5					6.5	8.0	4.5	5.0		7.5	
13-14					2.0	2.5	10.0		5.5	9.0	5.5	1.5	2.0		3.5	1.5			5.0	4.5	2.0	4.0	2.5	2.5	
14-15			10.5	10.5	6.0		4.0	5.0	6.5	10.0	4.0	3.0	11.0	7.5	5.5	4.5			3.5	10.5	9.5	3.0		7.5	
15-16		9.0		8.5			7.5	10.5	7.0	11.0	2.5	4.5	9.0				10.5		2.0	6.5	7.0	1.5	2.0	2.5	
16-17	9.0		7.0	6.5	5.0		1.5	1.5	7.5		8.5	6.0	6.5	6.5							4.0			7.5	
17-18							4.5	7.5	8.5		7.0	7.5	4.5							10.0	9.0	1.5	11.0	1.5	2.5
18-19					4.0	3.0	8.0		9.0	2.0	5.5	9.5	2.5	5.0	1.5	3.0			8.0	5.0	9.5	9.5		7.5	
19-20			9.0				2.0	4.5	9.5	3.0	4.0	11.0			4.0				6.5		6.5	8.5		2.5	
20-21	8.5	10.5		9.5	3.0		5.0	10.0	10.0	4.0	2.5		9.5	4.0	6.0				5.0	7.5	4.0	7.5	6.0	7.5	
21-22			5.5	7.5			8.5		11.0	5.0	8.5		7.5						3.5			6.5		2.5	
22-23			11.0		2.0		2.5	7.0		6.0	7.0	2.5	5.5	3.0		2.0			2.0	10.0	9.0	5.0	5.5	7.5	
23-24	11.0	8.0			6.5	3.0	5.5			7.0	5.5	4.5	3.0	10.0		5.0				6.0	6.5	4.0		2.5	
24-25	8.0		7.5				8.5	3.5		8.5	4.0	6.0		2.0	2.0					10.0		3.5	3.0	5.0	7.5
25-26				11.0	5.5		3.0	9.5		9.5	2.5	7.5	10.0	9.0	4.5					8.0	8.5		2.0		2.5
26-27				9.0			6.0		2.0	10.5	8.5	9.0	8.0		6.5					6.5	4.5	8.5		5.0	7.0
27-28	10.5		9.5	7.0	4.5		9.0	6.5	2.5		7.0	10.5	6.0	8.0		3.5				5.0	11.0	6.0	11.0		2.5
28-29	7.5	9.0				3.5	3.5		3.0		5.5		4.0							3.5	7.0	3.0	10.0	4.5	7.0
29-30			6.0		3.5	1.5	6.5	3.0	4.0		4.0		2.0	7.0						2.0		11.0	8.5		2.5
30-31							9.5	9.0	4.5	2.5	2.5	2.5	10.5		2.5					9.5	8.5	7.5	4.5	7.0	

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1	8.0	9.5	6.0	5.0		2.0	3.0	4.0				4.5		5.5	7.5	5.0
1- 2	6.0	8.0	10.5	2.5		3.0		3.5	6.5				3.0	6.0		3.5
2- 3	4.0	7.0		10.5		4.0		3.0	4.0	6.5			5.0	6.5	6.5	2.0
3- 4	1.5	5.5	5.0	8.0	2.5	5.5	3.5	2.5	1.5			5.0	7.0	7.5	10.5	
4- 5	10.5	4.0	9.5	5.0	4.5	6.5		2.0		3.5	1.5			8.0		10.5
5- 6	8.5	2.5		2.5				1.5	8.0				2.5	8.5	9.5	8.5
6- 7	6.0		4.0	10.5			4.0		5.5		2.0	5.5	4.5	9.0		7.0
7- 8	4.0	11.0	8.5	8.0					3.5	6.5			6.5	9.5	8.0	5.5
8- 9	2.0	9.5		5.5							2.5			10.0		4.0
9-10	10.5	8.0	3.0	3.0			4.0			4.0		5.5	2.0	10.5	7.0	2.5
10-11	8.5	6.5	7.5	11.0	2.0				7.5		3.0		4.0	11.0		
11-12	6.5	5.0		8.5	4.0	2.0			5.0				6.0		6.0	11.0
12-13	4.5	3.5	2.0	6.0		3.0	4.5		3.0	7.0	3.5	6.0	8.0		10.0	9.0
13-14	2.0	2.0	6.5	3.0		4.0							1.5			7.5
14-15	11.0		11.0			5.5				4.0	4.0	1.5	3.5		9.0	6.0
15-16	9.0	10.5		8.5		6.5	5.0		7.0			6.5	5.5			4.5
16-17	6.5	9.0	5.5	6.0					4.5		4.0		7.5	2.0	7.5	3.0
17-18	4.5	7.5	10.0	3.5	2.0				2.5	7.0		2.0		2.5		1.5
18-19	2.5	6.5			3.5		5.5						4.5		3.0	3.0
19-20		5.0	4.5	9.0	5.5						4.5		5.0	3.5	10.5	9.5
20-21	9.0	3.5	9.0	6.5				5.5	6.5		5.0	2.0	7.0	4.0		8.0
21-22	7.0	2.0		4.0				4.5	4.0	1.5				4.5	9.5	6.5
22-23	5.0		3.5			2.0		4.0	1.5	7.5	5.5		2.5	5.0		5.0
23-24	2.5	10.5	8.0	9.5		3.0		3.5				2.5	4.5	6.0	8.5	3.5
24-25		9.0		6.5	1.5	4.5		3.0	8.0	4.5	6.0		6.5	6.5		2.0
25-26	9.5	7.5	2.5	4.0	3.0	5.5		2.5	5.5					7.0	7.0	
26-27	7.0	6.0	7.0	1.5	5.0	6.5		2.0	3.5	1.5	6.5	3.0	2.0	7.5		10.0
27-28	5.0	4.5		9.5				1.5		7.5			4.0	8.0	6.0	8.5
28-29	3.0	3.0		7.0								7.0		6.0	8.5	10.0
29-30		1.5	6.0	4.5					7.5	5.0		3.0	8.0	9.0		5.5
30-31	9.5		10.0	2.0					5.0		7.5		1.5	9.5	9.0	4.0

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	10.0	6.5		10.0	2.5		3.5		5.0	3.5	8.5	4.0	8.5	5.5	5.0	2.0		10.0	5.5	5.5	6.5		2.5
1- 2	7.0		8.0	8.0			7.0	6.0	5.5	4.5	7.0	5.5	6.5					8.0		3.0	5.5	4.0	7.0
2- 3		10.5		6.0			10.0		6.5	5.5	5.5	7.0	4.5	4.5				6.5	8.0	11.0	4.0		2.0
3- 4			4.5	4.5		2.0	4.0	2.5	7.0	6.5	4.0	8.5	2.5					5.0	4.0	8.0	3.0	3.5	7.0
4- 5	9.5		10.0			10.5	7.5	8.5	7.5	8.0	2.5	10.0		3.5			8.5	3.5	10.5	5.5	2.0		2.0
5- 6	6.5	8.0			4.5		10.5		8.5	9.0	8.5		9.0		3.0	4.0		2.0	6.5	2.5		3.5	7.0
6- 7			6.5	9.5			4.5	5.5	9.0	10.0	7.0		7.0	2.5	5.5				2.5	10.5			2.0
7- 8				7.5	3.5		8.0		9.5		5.5	2.0	5.0					9.5	9.0	7.5	10.0	3.0	7.0
8- 9	9.0			5.5			2.0	2.0	10.5		4.0	3.5	3.0					8.0	5.0	5.0	9.0		2.0
9-10	6.0		8.5		2.5		5.0	8.0	11.0		2.5	5.0		8.5		2.5		6.5		2.5	7.5	2.5	7.0
10-11		9.5					8.0			2.0	8.5	6.5	10.0				10.5	5.0	7.5	10.0	6.5		2.0
11-12			5.0	10.5			2.5	5.0		3.0	7.0	8.0	8.0	7.5	3.5			3.5	3.5	7.5	5.5	2.5	7.0
12-13	8.5		10.5	8.5			5.5	10.5		4.0	5.5	9.5	5.5		6.0				10.0	4.5	4.5		2.0
13-14	5.5	7.0		7.0			8.5			5.0	4.0		3.5	6.0					6.0	2.0	3.0	2.0	7.0
14-15			7.0	5.0			3.0	7.5	2.0	6.5	2.5							9.5		10.0	2.0		2.0
15-16	11.0	11.0					6.0		2.5	7.5	8.5		10.5	5.0		10.0		8.0	8.5	7.0			6.5
16-17	8.0				4.0		9.0	4.5	3.0	8.5	7.0	3.0	8.5					6.5	4.5	4.5			2.0
17-18			9.0	10.0			3.0	10.0	4.0	9.5	5.5	4.5	6.5	4.0	4.0			5.0	11.0		10.0		6.5
18-19		8.5		8.0	3.0		6.5		4.5	10.5	4.0	6.0	4.5			3.0		3.5	7.0	9.5	9.0		2.0
19-20	10.5		5.5	6.0			9.5	7.0	5.0		2.5	8.0	2.0	3.0					3.0	7.0	8.0		6.5
20-21	7.5			4.0	2.0		3.5		5.5		8.5	9.5					9.5		9.5	4.0	6.5		2.0
21-22		5.5					7.0	4.0	6.5		7.0	11.0	9.0					9.5	5.5		5.5		6.5
22-23			7.5				10.0	9.5	7.0	2.5	5.5		7.0	9.0	2.0			8.0		9.0	4.5		2.0
23-24	10.0	9.5		9.5			4.0		7.5	3.5	4.0		5.0		4.5			6.5	8.0	6.5	3.5		6.5
24-25	7.0		4.0	7.5			7.5	6.5	8.5	4.5	2.5	2.5	3.0	8.0				5.0	4.0	3.5	2.0		
25-26			9.5	5.5	4.0	10.5	10.5		9.0	6.0	8.5	4.5					9.0	3.5	10.0				6.5
26-27		7.0					4.5	3.5	9.5	7.0	7.0	6.0	9.5	6.5					6.5	9.0			
27-28	9.5		6.0		3.0		8.0	9.0	10.5	8.0	5.5	7.5	7.5			3.5			2.5	6.0	10.5		6.5
28-29	6.5			10.5			2.0		11.0	9.0	4.0	9.0	5.5	5.5	2.5			9.5	9.0	3.5	9.0		
29-30				8.5	2.0	2.0	5.0	6.0		10.0	2.5	10.5	3.5		5.0			8.0	5.0		8.0		6.5

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1	7.5	10.0		10.0					3.0	2.0			3.5	10.0	4.0	2.5
1- 2	5.0	8.5	5.0	7.5	3.0							3.5	5.5	10.5	8.0	
2- 3	3.0	7.0	9.0	5.0		2.0										10.5
3- 4		6.0		2.0		3.0				5.0					6.5	9.0
4- 5	9.5	4.5	4.0	10.5		4.5			4.5			4.0	3.0		11.0	7.5
5- 6	7.5	3.0	8.0	7.5					2.5	2.0			5.0		5.5	6.0
6- 7	5.5			5.0			2.0								9.5	4.5
7- 8	3.5		3.0	2.5								4.0			4.5	3.0
8- 9		10.0	7.0	10.5	2.5					5.5			2.5	2.0	8.5	
9-10	10.0	8.5		8.0			2.5		4.0				4.5	2.5		
10-11	8.0	7.0	2.0	5.5					2.0	2.5		4.5		3.0	7.5	9.5
11-12	5.5	5.5	6.0	3.0										4.0		8.0
12-13	3.5	4.0	10.5	11.0			3.0				2.0		2.0	4.5	6.0	6.5
13-14		2.5		8.5		2.0			6.0	5.5			4.0	5.0	10.5	5.0
14-15	10.0		5.0	5.5		3.0			3.5		2.5		6.0	5.5	5.0	3.5
15-16	8.0		9.5	3.0	2.0	4.5	3.0	3.5		2.5				6.0	9.0	2.0
16-17	6.0	9.5						3.0			3.0			6.5	4.0	
17-18	3.5	8.0	4.0	8.5				2.0					3.5	7.0	8.0	10.0
18-19		6.5	8.5	6.0					5.0	6.0	3.5		5.5	7.5		8.5
19-20	10.5	5.5		3.5					3.0					8.0	7.0	7.0
20-21	8.0	4.0	3.0							3.0	4.0			8.5		5.5
21-22	6.0	2.5	7.5	9.0									3.0	9.0	5.5	4.0
22-23	4.0			6.5							4.5		5.0	9.5	10.0	2.5
23-24	2.0	11.0	2.0	3.5	3.5				4.5	6.0				10.0	4.5	
24-25	10.5	9.5	6.5			2.0			2.5		5.0			11.0	8.5	10.5
25-26	8.5	8.0		9.0		3.0				3.0			2.5			9.0
26-27	6.5	6.5		6.5		4.5					5.5		4.5		7.5	7.5
27-28	4.0	5.0	5.5	4.0												6.0
28-29	2.0	3.5	10.0						4.0	6.5					6.5	4.5
29-30	11.0	2.0		9.5					2.0						10.5	3.0

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1			8.0	6.5		10.5	8.0				8.5			4.5			8.5	6.5	11.0	8.5	7.0		
1- 2	9.0	8.5		4.5	10.5	8.5	2.5	3.0			7.0		10.5			2.0	11.0	5.0	7.5	6.0	6.0		6.5
2- 3	6.0		4.5	2.5			5.5	8.5			5.5	2.5	8.0	3.5				3.5	3.5	3.0	4.5		11.0
3- 4			10.0		9.5		8.5		2.0	2.0	4.0	4.0	6.0						9.5	11.0	3.5		6.5
4- 5		6.0		10.0			3.0	5.5	2.5	3.0	2.5	5.5	4.0	2.0	3.0				6.0	8.0	2.5		11.0
5- 6	8.5		6.5	8.0		11.0	6.0		3.0	4.0	8.5	7.0	2.0				8.0	9.5	2.0	5.5			6.0
6- 7	5.5	10.0		6.0		9.0	9.0	2.5	4.0	5.5	7.0	8.5					10.5	8.0	8.0	2.5			11.0
7- 8			3.0	4.0			3.0	8.0	4.5	6.5	5.5	10.0	9.0					6.5	4.5	10.5	10.5		6.0
8- 9	10.5		8.5		2.5		6.5		5.0	7.5	4.0		7.0					5.0	10.5	8.0	9.5		11.0
9-10	8.0	7.5		11.0			9.5	5.0	6.0	8.5	2.5		4.5	7.0				3.0	6.5	5.0	8.0		6.0
10-11	5.0		5.0	9.0	10.5		3.5		6.5		8.5	2.0	2.5		3.5		7.0		3.0	2.5	7.0		11.0
11-12			10.5	7.0		9.5	7.0	1.5	7.0		7.0	3.5		6.0			10.0		9.0	10.5	6.0		6.0
12-13	10.5	4.5		5.0	9.5			7.5	7.5		5.5	5.0	9.5					9.5	5.5	7.5	5.0	2.0	11.0
13-14	7.5		7.0	3.5			4.0		8.5		4.0	6.5	7.5	5.0				8.0		5.0	3.5		6.0
14-15	4.5	8.5					7.5	4.5	9.0		2.5	8.0	5.5					6.5	7.5	2.0	2.5		11.0
15-16			3.5	10.5				10.5		2.5	8.5	9.5	3.5	3.5	1.5		6.5	5.0	4.0	10.0			6.0
16-17	10.0		9.0	8.5		10.0	4.5			3.5	7.5						9.0	3.0	10.0	7.0		11.0	11.0
17-18	7.0	6.0		6.5	2.5		7.5	7.0		5.0	6.0		10.0	2.5					6.0	4.5	10.5		6.0
18-19	4.5		5.5	4.5			2.0			6.0	4.5		8.0						2.5		9.5	10.5	10.5
19-20		10.0	11.0	2.5	11.0		5.0	4.0		7.0	3.0	3.0	6.0					9.5	8.5	9.5	8.5		6.0
20-21	9.5						8.0	10.0		8.0	9.0	4.5	4.0					8.0	4.5	7.0	7.0		10.5
21-22	6.5		7.5	9.5	10.0	10.0	2.5			9.0	7.5	6.0	2.0		2.0		8.5	6.5	11.0	4.0	6.0		6.0
22-23	4.0	7.5		7.5		8.0	5.5	6.5	2.0		6.0	8.0						5.0	7.0		5.0		10.5
23-24			3.5	6.0			8.5		2.5		4.5	9.5	8.5					3.0	3.5	9.5	4.0		6.0
24-25	9.0		9.5	4.0			3.0	3.5	3.0		3.0		6.5	6.5					9.5	6.5	2.5		10.5
25-26	6.0	5.0					6.0	9.5	4.0		9.0		4.5						5.5	4.0			6.0
26-27			6.0	11.0	2.5	10.5	9.0		4.5	2.0	7.5		2.5	5.5			8.0	9.5	2.0				10.5
27-28		9.0		9.0		8.5	3.0	6.0	5.0	3.0	6.0	2.5			2.5		10.5	8.0	8.0	9.0	10.5		5.5
28-29	8.5		2.0	7.0	11.0		6.5		6.0	4.5	4.5	4.5	9.5	4.0				6.5	4.0	6.0	9.5		10.5
29-30	5.5		8.0	5.0			9.5	3.0	6.5	5.5	3.0	6.0	7.5					5.0	10.5	3.5	8.5		5.5
30-31		6.5		3.0	10.0		3.5	8.5	7.0	6.5	9.0	7.5	5.0	3.0				3.0	6.5		7.5		10.5

	VX	AR	DL	DY	UU	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.7	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	12.3	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	2	2	3	1	2	2	3
0- 1	8.5		4.5	7.0			3.5		2.0	4.0	2.0	5.0	
1- 2	6.5	10.5	9.0	4.5							2.5	9.5	
2- 3	4.5	9.0		2.0							3.0	4.0	9.5
3- 4	2.0	7.5	3.5	10.0		3.5		2.5	10.0	3.5	8.0	8.0	
4- 5		6.0	8.0	7.5						3.0	4.0	3.0	6.5
5- 6	9.0	5.0		4.5	2.0		3.5				4.5	7.0	5.0
6- 7	6.5	3.5	2.5	2.0				2.5			5.0	11.0	3.5
7- 8	4.5	2.0	7.0								5.5	6.0	2.0
8- 9	2.5			7.5		3.0				2.5	6.0	10.0	
9-10		10.5		5.0							6.5	4.5	10.0
10-11	9.0	9.0	6.0	2.5			4.0				7.0	9.0	8.5
11-12	7.0	7.5	10.5								7.5	3.5	7.0
12-13	5.0	6.0		8.0						2.0	8.0	7.5	5.5
13-14	2.5	4.5	5.0	5.5		2.5				4.0	9.0	2.5	4.0
14-15		3.0	9.5	2.5							9.5	6.5	2.5
15-16	9.5						4.0				10.0	10.5	
16-17	7.0		4.0	8.0	2.0				10.5	10.5	5.5	10.5	
17-18	5.0	10.0	8.5	5.5		4.0		2.0		3.5	11.0	9.5	9.0
18-19	3.0	8.5		3.0		2.0						4.0	7.5
19-20		7.0	3.0					2.5				8.5	6.0
20-21	9.5	6.0	7.5	8.5					10.0			3.0	4.5
21-22	7.5	4.5		6.0				3.0		3.0		7.0	3.0
22-23	5.0	3.0	2.0	3.5		3.5						2.0	
23-24	3.0		6.5					3.0			2.0	6.0	
24-25			11.0	9.0							2.5	10.0	9.5
25-26	9.5	10.0		6.0				3.5		2.5	3.0	5.0	8.0
26-27	7.5	8.5	5.5	3.5							3.5	9.0	6.5
27-28	5.5	7.0	10.0		2.0	3.0	2.0				4.0	3.5	5.0
28-29	3.5	5.5		9.0							4.5	8.0	3.5
29-30		4.0	4.5	6.5						2.0	5.0	2.5	2.0
30-31	10.0	2.5	8.5	4.0						4.0	5.5	6.5	

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	10.5		4.0			11.0	7.0				7.5		3.0				7.5	1.5	2.5	8.5	6.0		5.5
1- 2	8.0	10.5	10.0	10.5	9.0	9.0		5.5			6.0			2.0			10.0	11.0	9.0	6.0	5.0	8.5	10.5
2- 3	5.0	3.5		8.5		7.0	4.0				4.5							9.5	5.0	3.0	4.0		5.5
3- 4	2.5		6.0	6.5	8.0		7.5	2.5			3.0		8.0					8.0	1.5	11.0	3.0		10.5
4- 5	10.0	8.0		4.5			1.5	8.0			1.5	2.5	6.0			11.0	4.5	6.5	7.5	8.5	1.5		5.5
5- 6	7.5		2.5	2.5		11.5	4.5				7.5	4.0	4.0				7.0	5.0	3.5	5.5			10.5
6- 7	4.5		8.5	11.5	11.5	9.5		5.0		1.5	6.0	5.5	1.5				9.5	3.0	10.0	3.0	11.0		5.5
7- 8	2.0	5.0		9.5		7.0	2.0			2.5	4.5	7.0						1.5	6.0	10.5	9.5		10.5
8- 9	9.5		4.5	7.5	10.5		5.0	2.0		4.0	3.0								1.5	6.0	10.5	9.5	10.5
9-10	7.0	9.0	10.5	5.5				7.5	1.5	5.0	1.5		6.5						9.5	8.5	5.0	7.5	10.0
10-11	4.0	2.5		3.5	9.5		2.5		2.0	6.0	7.5		4.5	4.5			6.5	8.0	4.5	2.5	6.5		5.5
11-12			6.5	2.0		9.5	5.5	4.5	2.5	7.0	6.0		2.5				9.0	6.5	11.0	10.5	5.0		10.0
12-13	9.5	6.5		11.0	8.5	7.5			3.0		4.5	2.0		3.5				4.5	7.0	7.5	4.0	11.5	5.5
13-14	6.5		3.0	9.0			2.5	1.5	4.0		3.0	3.5			2.0	11.0		3.0	3.0	5.0	3.0		10.0
14-15	3.5	10.5	8.5	7.0	7.5		6.0	7.0	4.5		1.5	5.0	7.0	2.5				1.5	9.5	2.0	2.0	11.0	5.5
15-16	11.5	4.0		5.0	11.5				5.0		7.5	6.5	5.0				6.0	11.0	5.5	10.0			10.0
16-17	9.0		5.0	3.0		10.0	3.0	4.0	6.0		6.0	8.0	3.0	1.5			8.5	9.5	1.5	7.5	11.0	10.5	5.0
17-18	6.0	8.0	11.0		10.5	8.0	6.5		6.5		4.5				11.0		11.0	8.0	8.0	4.5	10.0		10.0
18-19	3.5		1.5	10.0		6.0			7.0	2.0	3.0							6.5	4.0	2.0	9.0	10.5	5.0
19-20	11.0		7.0	8.0	9.5		3.5	6.5		3.5	1.5		7.5					4.5	10.5	9.5	7.5		10.0
20-21	8.5	5.5		6.0			7.0			4.5	7.5	1.5	5.5				5.5	3.0	6.5	7.0	6.5	10.0	5.0
21-22	5.5		3.5	4.5	8.5	10.5		3.5		5.5	6.0	3.0	3.5				8.0	1.5	2.5	4.0	5.5		10.0
22-23	3.0	9.5	9.0	2.5		8.5	4.0			6.5	4.5	4.5	1.5			11.5	10.5	11.0	9.0	1.5	4.0	9.5	5.0
23-24	10.5	3.0		11.5	7.5	6.5	7.0				3.0	6.0		5.0	11.5			9.5	5.0	9.5	3.0		10.0
24-25	8.0		5.5	9.5			1.5	6.0			1.5	8.0						8.0	11.0	6.5	2.0	9.5	5.0
25-26	5.0	7.0	11.5	7.5			4.5				7.5		6.5	4.0			5.0	6.5	7.5	4.0			10.0
26-27	2.5		2.0	5.5	10.5	11.0		3.0			6.0		4.0				7.5	4.5	3.5		11.0	9.0	5.0
27-28	10.0	11.0	7.5	3.5		9.0	2.0			4.5		2.0	3.0				10.0	3.0	9.5	9.0	10.0		10.0
28-29	7.5	4.0		1.5	9.5	6.5	5.0		1.5		3.0							1.5	6.0	6.5	9.0	8.5	5.0
29-30	4.5		4.0	10.5				5.5	2.0	1.5	1.5	3.0		2.0				11.0	2.0	3.5	8.0		9.5
30-31	2.0	8.0	9.5	8.5	8.5		2.5		2.5	3.0	7.5	4.5	7.0				4.5	9.5	8.5	11.5	6.5	8.5	5.0

	VX	AR	DL	DY	RR	SS	TV	SZ	RZ	AV	RV
	HER	HER	HER	HER	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.0	10.5	11.5	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.0	12.6	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	2	1	2	2	3
0- 1	8.0			1.5					6.0	1.5	10.0
1- 2	5.5		3.5			2.0		8.0	6.5	5.5	8.5
2- 3	3.5	9.5	7.5	7.0				1.5	7.5	9.5	7.0
3- 4	1.5	8.0		4.5					8.0	4.5	5.5
4- 5		6.5	2.5	1.5					8.5	8.5	4.0
5- 6	8.0	5.5	6.5						9.0	3.0	2.5
6- 7	6.0	4.0		7.0	2.0	2.5		9.5	9.5	7.5	
7- 8	3.5	2.5	1.5	4.5					10.0	2.0	10.5
8- 9	1.5		5.5	2.0					10.5	6.0	9.0
9-10									11.0	10.0	7.5
10-11	8.0	9.5		7.5				9.0		5.0	6.0
11-12	6.0	8.0	4.5	5.0				11.0		9.0	4.5
12-13	4.0	6.5		2.5						4.0	3.0
13-14	2.0	5.0								8.0	1.5
14-15		3.5	3.5	8.0				8.5	1.5	2.5	11.0
15-16		2.0	8.0	5.0				2.0	2.0	6.5	9.5
16-17	6.5			2.5					2.5	1.5	8.0
17-18	4.0	10.5	2.5						3.0	5.5	6.5
18-19	2.0	9.0	7.0					8.0	3.5	9.5	5.0
19-20		7.5		5.5				1.5	4.0	4.5	3.5
20-21		6.0	1.5	3.0					4.5	8.5	2.0
21-22	6.5	5.0	6.0				1.5		5.5	3.5	
22-23	4.5	3.5							6.0	7.5	10.0
23-24	2.0	2.0		6.0				9.5	6.5	2.0	8.5
24-25			5.0	3.0					7.0	6.0	7.0
25-26		10.5			2.0				7.5	10.5	5.5
26-27	6.5	9.0							8.0	5.0	4.0
27-28	4.5	7.5	4.0	6.0				9.0	8.5	9.0	2.5
28-29	2.5	6.0	8.5	3.5				11.0	9.0	4.0	
29-30		4.5							9.5	8.0	10.5
30-31		3.0	3.0		1.5				10.0	3.0	9.0

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	9.5	1.5		7.0		11.5	5.5	2.5	3.5	4.0	6.0	6.0	5.0	0.5		12.0	7.0	8.0	4.5	8.5	5.5		
1- 2	7.0		6.0	5.0	7.5	9.0			4.0	5.0	4.5		3.0				9.5	6.5	0.5	6.0	4.5	8.0	5.0
2- 3	4.0	5.5	11.5	3.0	12.0	7.0	2.5		4.5		3.0		0.5				12.0	4.5	7.0	3.5	3.5		
3- 4	1.5		2.5	1.0	6.5	5.0		5.0	5.0		1.5				10.0			3.0	3.0	0.5	2.0	7.5	5.0
4- 5	9.0	9.5	8.0	10.0	11.0											10.5	4.0	1.5	9.0	8.5	1.0		
5- 6	6.5	3.0		8.0	5.5	11.5	3.0	2.0			6.0	1.0	5.5				6.5	11.0	5.5	5.5	11.5	7.5	5.0
6- 7	3.5		4.5	6.0	10.0	9.5					4.5	2.5	3.5				9.0	9.5	1.5	3.0	10.0	12.0	
7- 8	1.0	7.0	10.0	4.0		7.5					3.0	4.0	1.5				11.5	8.0	7.5	11.0	9.0	7.0	4.5
8- 9	8.5		1.0	2.0	9.0	5.5	3.5	4.5			1.5	5.5					9.0	6.0	4.0	8.0	8.0	11.5	
9-10	6.0	11.0	6.5							1.0				3.5	10.5		3.0	4.5	10.0	5.5	7.0	7.0	4.5
10-11	3.0	4.5		9.5	8.0		1.0	1.5		2.5	6.0		6.0				6.0	3.0	6.5	2.5	5.5	11.5	
11-12	11.0		3.0	7.5		10.0	4.0			3.5	4.5		4.0	2.5			8.5	1.5	2.5	10.5	4.5	6.5	4.5
12-13	8.5	8.5	8.5	5.5	7.0	8.0				4.5	3.0		2.0				11.0	11.0	8.5	7.5	3.5	11.0	
13-14	5.5	2.0		3.5	11.0	6.0	1.5	4.0			1.5			1.0		11.0		9.5	5.0	5.0	2.5		4.5
14-15	2.5		5.0	1.5	6.0		4.5					2.0			8.5		2.5	8.0	1.0	2.5	1.0	10.5	
15-16	10.5	6.0	10.5		10.0			1.0	0.5		6.0	3.5			11.0		5.0	6.0	7.0	10.0	11.5		4.5
16-17	8.0		1.5	8.5		10.5	2.0		1.5		4.5	5.0	4.5				8.0	4.5	3.5	7.5	10.5	10.5	
17-18	5.0	10.0	7.0	6.5	9.0	8.5	5.0		2.0		3.0		2.5			9.5	10.5	3.0	9.5	4.5	9.0		4.5
18-19	2.5	3.0		4.5		6.0		3.5	2.5		1.5		0.5					1.5	5.5	2.0	8.0	10.0	
19-20	10.0		3.5	2.5	8.0	4.0	2.0		3.5									11.0	2.0	10.0	7.0		4.5
20-21	7.5	7.5	9.0	1.0			5.5		4.0	0.5					9.0		4.5	9.5	8.0	7.0	6.0	9.5	
21-22	4.5	0.5		10.0	7.0	11.0		6.0	4.5	2.0	4.5		5.5		11.5		7.0	8.0	4.5	4.5	4.5		4.5
22-23	2.0	11.5	5.5	8.0	11.5	9.0	2.5		5.5	3.0	3.0	1.5	3.0			11.5	10.0	6.0	10.5	1.5	3.5	9.5	
23-24	9.5	4.5	11.0	6.0	6.0	6.5		3.0		4.0	1.5	3.0	1.0					4.5	6.5	9.5	2.5		4.5
24-25	7.0		2.0	4.0	10.5	4.5				5.0		4.5		2.5				3.0	3.0	7.0	1.5	9.0	
25-26	4.0	8.5	7.5	2.0			3.0					6.5					4.0	1.5	9.0	4.0	11.5		4.5
26-27	1.5	2.0			9.5	11.5		5.5			4.5		6.0	1.5	9.5	10.0	6.5	11.0	5.0	1.5	10.5	9.0	
27-28	9.0		4.0	9.0		9.0					3.0		4.0		12.0		9.0	9.5	1.5	9.0	9.5		4.0
28-29	6.5	6.0	9.5	7.0	8.5	7.0	3.5	2.5			1.5		2.0				12.0	8.0	7.5	6.5	8.0	8.5	
29-30	3.5			5.0		5.0												6.0	3.5	3.5	7.0		4.0

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	3	1	2	2	3
0- 1		1.5			10.5				10.0		8.5		7.0	7.5
1- 2	5.0			4.0							10.5		1.5	6.0
2- 3	2.5		2.0	1.5									5.5	4.5
3- 4			6.5								6.0		10.0	3.0
4- 5		7.0						11.5			8.0	0.5	4.5	1.5
5- 6		5.5	1.0	4.0		10.0					10.0	1.0	8.5	11.0
6- 7	5.0	4.5	5.5	1.5		11.5					12.0	1.5	3.5	9.5
7- 8	3.0	3.0										2.0	7.5	8.0
8- 9	0.5	1.5									7.5	2.5	2.5	6.5
9-10			4.5	4.5					11.0		9.5	3.5	6.5	5.0
10-11				2.0						10.0	11.5	4.0	1.0	3.5
11-12	5.0	8.5										4.5	5.0	2.0
12-13	3.0	7.0	3.5								7.0	5.0	9.5	11.5
13-14	1.0	5.5		5.0						10.5	9.0	5.5	4.0	10.0
14-15		4.0		2.0				10.5			11.0	6.0	8.0	8.5
15-16		2.5	2.5		11.5							6.5	3.0	7.0
16-17	5.5	1.0	7.0			10.5				11.0	6.5	7.0	7.0	5.5
17-18	3.5			5.0		11.5					8.5	7.5	2.0	4.0
18-19	1.0		1.5	2.5				12.0			10.5	8.0	6.0	2.5
19-20		8.0	6.0					11.5	10.0	11.0		8.5	0.5	1.0
20-21		6.5					10.5	11.0			6.0	9.0	4.5	10.5
21-22	5.5	5.0		5.5				10.0			8.0		9.0	9.0
22-23	3.5	4.0	5.0	3.0	11.5					11.5	10.0		3.5	7.5
23-24	1.5	2.5					10.5		11.5		12.0		7.5	6.0
24-25		1.0											2.5	4.5
25-26			4.0	5.5						12.0	7.5		6.5	3.0
26-27	6.0			3.0			11.0				9.5		1.0	1.5
27-28	3.5	8.0		0.5		10.5					11.5	0.5	5.5	11.0
28-29	1.5	6.5	3.0			11.5			11.0			1.0	9.5	9.5
29-30		5.0			11.0		11.5				7.0	2.0	4.0	8.0

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW	
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER	
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5	
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8	
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2	
0- 1	1.0	10.0	6.0	3.5	7.5	3.0	1.0					1.0				8.5	3.5	4.5	10.0	1.0	6.0	8.0		
1- 2	8.5	3.5	11.5	1.5	11.5	11.5			11.0	0.0	12.0	3.0			8.0	11.5	6.0	3.0	6.0	9.0	5.0		4.0	
2- 3	6.0		2.5		6.5	9.5			12.0	1.5	3.0	4.5			10.0		8.5	1.5	2.0	6.0	3.5	8.0		
3- 4	3.0	7.5	8.0		10.5	7.5	1.5	2.0	0.0	2.5	1.5		2.5		12.5		11.0	11.0	8.5	3.5	2.5	12.5	4.0	
4- 5	0.5	1.0		6.5	5.5	5.5			1.0		0.0		0.5			7.5	0.5	9.5	4.5	0.5	1.5	7.5		
5- 6	8.0	11.5	4.5	4.5	9.5	3.0			1.5						10.5	3.0	8.0	1.0	8.5	0.5	12.0	4.0		
6- 7	5.5	5.0	10.0	2.5	4.5	12.0	2.0		2.0		12.0						5.5	6.0	7.0	6.0	10.5	7.0		
7- 8	2.5		1.0	0.5	8.5	10.0			2.5		3.0	12.0			8.0		8.0	4.5	3.0	3.0	9.5	11.5	4.0	
8- 9	10.5	9.0	6.5		3.5	8.0		1.5	3.5		1.5	1.0	3.0		10.5		10.5	3.0	9.5	0.5	8.5	7.0		
9-10	7.5	2.5	12.0	8.0	7.5	6.0	2.0				0.0	2.5	1.0			9.0		1.5	5.5	8.0	7.0	11.5	4.0	
10-11	5.0		3.0	6.0	11.5	3.5						4.0				12.0	2.5	11.0	1.5	5.5	6.0	6.5		
11-12	2.0	6.5	8.5	4.0	6.5			4.0			12.0			1.0			5.0	9.5	8.0	2.5	5.0	11.0	4.0	
12-13	10.0			2.0	10.5	10.5	2.5			12.0	3.0					6.5		7.5	7.5	4.0	10.5	4.0	6.0	
13-14	7.5	10.5	5.0		5.5	8.5		1.0		1.0	1.5		3.5		8.5	7.5	10.0	6.0	0.0	8.0	2.5	11.0	4.0	
14-15	4.5	3.5	10.5		9.5	6.0				2.0	0.0		1.5		11.0	10.5		4.5	6.5	5.0	1.5	6.0		
15-16	1.5		1.5	7.0	4.5	4.0	3.0			3.0		11.5					2.0	3.0	2.5	2.5	0.5	10.5	4.0	
16-17	9.5	7.5	7.0	5.0	8.5	2.0		3.5			12.0	0.5					4.5	1.5	9.0	10.5	11.0	5.5		
17-18	7.0	1.0		3.0	3.5	11.0	0.5				3.0	2.0					7.0	11.0	5.0	7.5	9.5	10.0	4.0	
18-19	4.0	12.0	3.5	1.0	7.5	8.5	3.5	0.5			1.5	3.5			7.0	9.5	9.5	9.5	1.0	5.0	8.5	5.0		
19-20	1.5	5.0	9.0		12.0	6.5					0.0		2.0	12.0	9.0	12.5	12.0	7.5	7.5	2.0	7.5	10.0	3.5	
20-21	9.0				6.5	4.5	1.0	12.0	11.0				0.0		11.5		1.5	6.0	3.5	10.0	6.5	5.0		
21-22	6.5	9.0	5.5	6.5	11.0	2.5		3.0	12.0		12.0						4.0	4.5	10.0	7.0	5.0	9.5	3.5	
22-23	3.5	2.5	11.0	4.5	5.5	11.0			0.0		3.0					8.0	6.5	3.0	6.0	4.5	4.0	4.5		
23-24	1.0		2.0	2.5	10.0	9.0	1.5		1.0		1.5	11.5				11.0	9.0	1.5	2.0	1.5	3.0	9.0	3.5	
24-25	8.5	6.5	7.5	0.5	4.5	7.0			1.5	0.5	0.0	0.0	3.0	1.5	7.5		11.5	11.0	8.5	9.5	1.5			
25-26	6.0				9.0	5.0			2.0	1.5		1.5	1.0		9.5		1.0	9.5	4.5	7.0	0.5	9.0	3.5	
26-27	3.0	10.5	4.0	7.5	3.5	3.0	1.5	2.5	2.5	12.0	3.0			0.5	12.0	6.5	3.5	7.5	0.5	4.0	11.0			
27-28	0.5	4.0	9.5	5.5	8.0	11.5			3.5		3.0					9.5	6.0	6.0	7.0	1.5	10.0	8.5	3.5	
28-29	8.0		0.5	3.5	12.0	9.5					1.5						8.5	4.5	3.0	9.5	8.5			
29-30	5.5	8.0	6.0	2.0	7.0	7.5	2.0				0.0		3.5				11.0	3.0	9.0	6.5	7.5	8.0	3.5	
30-31	2.5	1.5	11.5		11.0	5.5							1.5		8.0		0.5	1.5	5.5	4.0	6.5			

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1		3.5		3.5							10.5		9.0	2.5	8.5	6.5
1- 2		2.0	2.0	1.0						11.0			11.0	3.0	3.0	5.0
2- 3	4.0	0.5					12.0				11.0		4.0	3.5	7.0	3.5
3- 4	2.0							10.5				8.0	6.0	4.0	2.0	2.0
4- 5			1.0	4.0				8.0		11.5			8.5	4.5	6.0	0.5
5- 6				1.0	8.5		12.5						10.5	5.0	0.5	10.0
6- 7		6.0			10.5				11.5	12.0	8.5	12.5	5.5	5.5	5.0	8.5
7- 8	4.0	4.5			12.5	9.0		12.0					5.5	6.0	9.0	7.0
8- 9	2.0	3.5	4.0			10.5		10.0		12.5			7.5	6.5	3.5	5.5
9-10		2.0		1.5		11.5		7.5				8.5	10.0	7.0	8.0	4.0
10-11		0.5						12.0					12.0		2.5	2.5
11-12			3.0					11.5		11.5			5.0		6.5	1.0
12-13								11.0	11.5			9.0	7.0		1.5	10.5
13-14	2.0			2.0	10.0			10.5	9.5				9.0		5.5	9.0
14-15	0.0	6.0	2.0		12.0			10.0					11.5		0.0	7.5
15-16		4.5						9.5				9.5	4.5		4.5	6.0
16-17		3.0						9.0		12.0			6.5		8.5	4.5
17-18		1.5	1.0	2.0					11.0				8.5		3.0	3.0
18-19	2.5	0.0				9.0	8.0		9.0			9.5	10.5		7.5	1.5
19-20	0.5					10.5							4.0	0.5	2.0	11.0
20-21			0.0		10.0	11.5							6.0	1.0	6.0	9.5
21-22			4.5	2.5	11.5		8.5			12.0		10.0	8.0	1.5	1.0	8.0
22-23		5.5							10.5				10.0	2.0	5.0	6.5
23-24	2.5	4.5							8.0				12.0	2.5	9.0	5.0
24-25	0.5	3.0	3.5				9.0					10.5	5.5	3.0	4.0	3.5
25-26		1.5		2.5									7.5	3.5	8.0	2.0
26-27		11.0		0.0					12.0				9.5	4.0	2.5	0.5
27-28			2.5		9.5		9.5	10.0				10.5	11.5	4.5	7.0	10.0
28-29	3.0				11.0				7.5				5.0	5.0	1.5	8.5
29-30	0.5			3.0		9.5							7.0	5.5	5.5	7.0
30-31		5.5	1.5	0.5		10.5	9.5					11.0	9.0	6.0	0.5	5.5

	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	10.5	12.0	2.5		6.0	3.0		2.0			12.0	11.0	10.5		10.0	8.5	3.0	11.0	1.5	1.0	5.5	8.0	3.5
1- 2	7.5	5.5	8.0		10.0	1.0	11.5				10.5	12.5		12.5	12.5	11.5	5.5	9.5	8.0	9.0	4.0	3.0	
2- 3	5.0			5.0	5.0	10.0				10.0	1.5	1.0					8.0	7.5	4.0	6.0	3.0	7.5	3.5
3- 4	2.0	9.5	4.5	3.0	9.0	8.0				11.0	0.5			11.5				6.0	0.0	3.5	2.0	2.5	
4- 5	10.0	2.5	10.0	1.0	4.0	5.5	12.0	10.5		12.5			2.0		6.0	7.0		4.5	6.5	0.5	1.0	7.0	3.5
5- 6	7.0		0.5		8.0	3.5		1.5	9.0	1.0	12.5		0.0	10.5	8.5	10.0	2.5	3.0	2.5	8.5	11.0	12.0	
6- 7	4.5	7.0	6.5		3.0	1.5	0.5		10.0		11.0				10.5		5.0	1.0		6.0	10.0	7.0	3.5
7- 8	1.5	0.0			7.0	10.5	12.5		10.5		2.0	9.0			13.0		7.5	11.0	5.0	3.0	9.0	11.5	
8- 9	9.5	11.0	3.0	4.5	2.0	8.0			11.0		0.5	10.5				5.5	10.0	9.0	1.0	0.5	7.5	6.5	3.0
9-10	6.5	4.0	8.5	2.5	6.0	6.0	1.0	10.0	12.0			12.0				8.5		7.5	7.0	8.5	6.5	11.0	
10-11	4.0			0.5	10.5	4.0		1.0	0.0		12.5	1.0	0.5		6.5	12.0	2.0	6.0	3.5	5.5	5.5	6.0	3.0
11-12	1.0	8.0	5.0		5.0	2.0			1.0		11.0				8.5		4.5	4.5		3.0	4.5	11.0	
12-13	9.0	1.5	10.5		9.5	10.5	1.5	13.0	1.5		2.0				11.0		7.0	3.0	6.0	0.0	3.0	6.0	3.0
13-14	6.5	12.0	1.0	5.5	4.0	8.5					0.5					7.5	9.5	1.0	2.0	8.0	2.0	10.5	
14-15	3.5	5.5	7.0	3.5	8.5	6.5				10.5						10.5		11.0		5.0	1.0	5.5	3.0
15-16	0.5			1.5	3.0	4.5	11.0	0.5		12.0	12.5		1.5		4.5		1.0	9.0	4.5	2.5	11.0	10.0	
16-17	8.5	9.5	3.5		7.5	2.5				0.5	11.0	10.0	10.0	12.0	7.0		4.0	7.5	0.5	10.5	10.0	5.0	3.0
17-18	6.0	3.0	9.0		2.0	0.0		12.5			2.0	11.5			9.0	6.0	6.5	6.0	6.5	7.5	9.0	10.0	
18-19	3.0				6.5	9.0	11.0				0.5	0.5		11.0	11.5	9.0	9.0	4.5	3.0	5.0	8.0	5.0	3.0
19-20	0.5	7.0	5.5	5.0	1.0	7.0						2.0				12.0		3.0		2.0	6.5	9.5	
20-21	8.0	0.5	11.0	3.0	5.5	5.0					12.5		2.0				0.5	1.0	5.0	10.0	5.5	4.5	3.0
21-22	5.5	11.0	1.5	1.0	9.5	2.5	11.5				11.0		11.0		5.0	4.5	3.0	11.0	1.5	7.5	4.5	9.0	
22-23	2.5	4.5	7.5		4.5	0.5		11.5			2.0				7.5	8.0	6.0	9.0	7.5	4.5	3.5	4.5	3.0
23-24	10.5				8.5	9.5					0.5				9.5	11.0	8.5	7.5	4.0	2.0	2.0	9.0	
24-25	7.5	8.5	3.5		3.5	7.5	12.0		9.5			10.0			12.0			6.0		9.5	1.0	4.0	3.0
25-26	5.0	2.0	9.5	4.0	7.5	5.0			10.0	10.0	12.5	11.5					0.0	4.5	6.0	7.0	11.5	8.5	
26-27	2.0	12.5	0.0	2.0	2.5	3.0	0.5		10.5	11.5	11.0	0.0	0.5			6.5	2.5	3.0	2.5	4.0	10.0	3.5	3.0
27-28	10.0	6.0	6.0	0.0	6.5	1.0	12.5	11.0	11.0	12.5	2.0	1.5			5.5	9.5	5.0	1.0		1.5	9.0	8.0	
28-29	7.0		11.5		1.5	10.0		2.0	12.0	1.0	0.5				8.0	12.5	8.0	11.0	4.5	9.5	8.0	3.5	2.5
29-30	4.5	10.0	2.0		5.5	7.5	1.0		0.0					12.5	10.0		10.5	9.0	1.0	6.5	7.0	8.0	

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1		4.0					11.5	12.5	11.5	12.5	9.5		2.5		4.5	4.0
1- 2		2.5					12.5	12.0	9.5			6.5	4.5			2.5
2- 3		1.0	0.5		7.0		10.0	11.5	7.0	10.0	10.0	11.5	6.5		3.5	1.0
3- 4	1.0	11.0		1.0	9.0			11.0					8.5		7.5	10.5
4- 5		9.5			11.0			10.5			10.0	7.0	2.0		2.0	9.0
5- 6					12.5		10.5	10.0	11.0	13.0		12.0	4.0		6.5	7.5
6- 7								9.5	9.0		10.5		6.0		1.0	6.0
7- 8				1.0		7.0		9.0	6.5	10.0		7.0	8.0		5.0	4.5
8- 9	1.0	4.0				8.0	11.0	8.5			11.0	12.0	10.0			3.0
9-10		2.5			7.0	9.5		8.0	13.0				3.5		4.0	1.5
10-11		1.0			8.5	10.5		7.5	10.5		11.5	7.5	5.5			11.0
11-12		10.5		1.5	10.5	11.5	11.5	7.0	8.0			12.5	7.5	0.5	3.0	9.5
12-13		9.5	2.0		12.0	12.5		6.5	6.0	10.5	12.0		9.5	1.0	7.0	8.0
13-14	1.5											8.0	3.0	1.5	1.5	6.5
14-15							12.0		12.0		12.5	13.0	5.0	2.0	6.0	5.0
15-16			1.0	1.5					10.0				7.0	2.5	0.5	3.5
16-17		3.5							7.5		13.0	8.0	9.0	3.0	4.5	2.0
17-18		2.0			8.0		12.0			10.5			2.5	3.5		0.5
18-19	1.5	0.5			10.0	7.0	6.5						4.5	4.0	3.5	10.0
19-20		10.5		12.5	12.0	8.0			11.5			8.5	6.5	5.0	7.5	8.5
20-21		9.0				9.5	12.5		9.5				8.5	5.5	2.5	7.0
21-22						10.5	6.5		7.0				2.0		6.5	5.5
22-23						11.5		12.5		11.0		9.0	4.0		1.0	4.0
23-24	2.0					12.5	13.0	12.0					6.0		5.5	2.5
24-25		3.5			8.0		7.0	11.5	11.0				8.0			1.0
25-26		2.0	2.5		9.5			11.0	9.0			9.0	10.0		4.0	10.5
26-27		0.5			11.5			10.5	6.5				3.5			9.0
27-28		10.0					7.5	10.0		11.0			5.5		3.0	7.5
28-29	2.0		1.5	0.0				9.5	13.0			9.5	7.5		7.0	6.0
29-30						7.0		9.0	10.5				9.5		2.0	4.5

AAVSO RR Lyrae Ephemeris for December 2010

all times in U.T.

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	SW	XX	AT	SW	TZ	BH	RS	ST	SW	SZ	TV	TW	UU	UY	RW	TT	RR	XZ	DM	RW	XZ	RR	TW
	AND	AND	AND	AQR	AUR	AUR	BOO	BOO	BOO	BOO	BOO	BOO	BOO	BOO	CNC	CNC	CET	CYG	CYG	DRA	DRA	GEM	HER
MAX	9.3	10.3	10.8	10.5	11.2	11.1	9.8	10.6	11.3	12.0	10.8	10.8	11.2	10.6	10.7	11.0	9.3	9.1	11.2	11.0	9.6	10.7	10.5
MIN	10.8	11.6	11.5	12.1	12.8	12.6	11.3	11.8	12.7	13.4	11.5	12.1	12.7	12.0	12.6	12.3	10.3	10.5	12.7	12.0	10.3	11.9	11.8
RISE	2	3	3	1	2	2	2	3	2	2	3	2	1	2	2	3	2	3	2	2	3	2	2
0- 1	1.5	3.0	8.0		0.5	5.5					12.5				12.5	5.0		7.5		4.0	5.5	3.0	12.5
1- 2				3.5	4.5	3.5					11.0	8.0	12.0	11.5		8.0	2.0	6.0	3.0	1.0	4.5	7.5	
2- 3	6.5	7.5	4.0	1.5	8.5	1.5	10.5	10.5			9.5	9.5	10.0		4.0	11.0	4.5	4.5		9.0	3.5	2.5	12.0
3- 4	4.0	0.5			3.5	10.0					8.0	11.0	8.0	10.0	6.0		7.0	3.0	5.5	6.5	2.5	7.0	
4- 5	1.0		0.5		7.5	8.0					6.5	12.5			8.5	4.0		1.0	2.0	3.5	1.0	2.5	12.0
5- 6		4.5	6.0		2.5	6.0	10.5			8.5	12.5			9.0	10.5	7.0		11.0		1.0	0.0	7.0	
6- 7	6.0				6.5	4.0				9.5	11.0		12.5		13.0	10.0	1.5	9.0	4.0	8.5	10.5	2.0	12.0
7- 8	3.5	8.5	2.5	2.5	1.5	2.0	8.0	10.0		11.0	9.5		10.5			13.0	4.0	7.5	0.5	6.0	9.5	6.5	
8- 9	0.5	2.0	8.5	1.0	5.5	10.5	11.0			12.0	8.0		8.5		4.0		6.5	6.0		3.5	8.0	1.5	12.0
9-10	8.5				0.5	8.5					6.5	7.5			6.5	5.5		4.5	2.5	0.5	7.0	6.5	
10-11	5.5	6.0	4.5		4.5	6.5	8.5	13.0	7.5		12.5	9.0			9.0	8.5		2.5		8.5	6.0	1.5	2.5
11-12	3.0				9.0	4.5	11.5		8.0		11.0	10.5			11.0	11.5	1.0	1.0	5.0	5.5	4.5	6.0	
12-13	0.0	10.0	1.0	4.0	3.5	2.0		9.5	8.5		9.5	12.0	0.5	13.0			3.5	10.5	1.0	3.0	3.5	1.0	2.5
13-14	8.0	3.5	6.5	2.0	8.0	0.0	9.0	0.5	9.5		8.0		9.0		2.5	4.0	6.0	9.0		0.0	2.5	5.5	
14-15	5.5			0.0	2.5	9.0	12.0		10.0		6.5			12.0	4.5	7.0		7.5	3.5	8.0	1.5	0.5	2.5
15-16	2.5	7.5	3.0		7.0	7.0		12.5	10.5		12.5				7.0	10.0		6.0		5.5	0.0	5.5	
16-17		1.0	8.5		1.5	4.5	9.5		11.5	8.0	11.0			10.5	9.0		0.5	4.5	6.0	2.5	10.5	0.5	2.5
17-18	7.5				6.0	2.5	12.5	9.0	12.0	9.0	9.5	7.0	12.0		11.5	3.0	3.0	2.5	2.0	10.5	9.5	5.0	
18-19	5.0	5.0	5.0	3.5	1.0	0.5		0.0	12.5	10.5	8.0	8.5	10.0	9.5		6.0	5.5	1.0		8.0	8.5	9.5	2.5
19-20	2.0			1.5	5.0	9.5	10.0			11.5	6.5	10.0			3.0	9.0	8.0	10.5	4.5	5.0	7.0	4.5	
20-21		9.0	1.5		9.0	7.5	13.0	12.0		12.5	12.5	11.5		8.5	5.0	12.0		9.0	0.5	2.5	6.0	9.0	2.0
21-22	7.0	2.5	7.0		4.0	5.0					11.0				7.5			7.5		10.0	5.0	4.5	
22-23	4.5				8.0	3.0	10.5	8.5			9.5		12.5		9.5	4.5	2.5	6.0	3.0	7.5	4.0	9.0	2.0
23-24	1.5	6.5	3.5		3.0	1.0					8.0		10.5		12.0	7.5	5.0	4.5		4.5	2.5	4.0	
24-25			9.0	2.5	7.0	10.0					6.5		8.5			10.5	7.5	2.5	5.5	2.0	1.5	8.5	2.0
25-26	6.5	10.5	0.0	0.5	2.0	7.5	10.5	11.5			12.5	6.5			3.5			1.0	1.5	10.0	0.5	3.5	
26-27	4.0	3.5	5.5		6.0	5.5					11.0	8.0			5.5	3.0		10.5		7.0	10.5	8.5	2.0
27-28	1.0				1.0	3.5	8.0	8.0			9.5	10.0		12.0	8.0	6.0	2.0	9.0	4.0	4.5	9.5	3.5	
28-29		7.5	2.0		5.0	1.5	11.0			8.5	8.0	11.5	0.0		10.0	9.0	4.5	7.5	0.0	1.5	8.5	8.0	2.0
29-30	6.0	1.0	7.5	4.0	9.5	10.0			7.5	10.0	6.5	0.0	9.0	11.0	12.5	12.5	7.0	6.0		9.5	7.5	3.0	
30-31	3.5			2.0	4.0	8.0	8.5	11.0	8.0	11.0	12.5							4.5	2.5	7.0	6.0	7.5	2.0

	VX	AR	DL	DY	SZ	UU	DG	DH	RR	SS	TV	WW	SZ	RZ	AV	RV
	HER	HER	HER	HER	HYA	HYA	HYA	HYA	LEO	LEO	LEO	LEO	LYN	LYR	PEG	UMA
MAX	9.9	10.6	11.0	10.2	10.6	10.7	11.6	11.4	10.0	10.5	11.5	11.0	9.1	10.0	9.9	10.1
MIN	10.4	11.6	12.4	10.6	11.7	12.3	12.6	12.6	11.7	12.0	12.6	12.0	9.6	12.0	10.9	11.2
RISE	2	2	1	1	2	2	3	2	2	2	2	3	1	2	2	3
0- 1					5.5	8.0	8.0	8.5	8.0			5.0	3.0		6.0	3.0
1- 2			0.5		7.5	9.5		8.0	6.0		8.0	10.0	5.0		0.5	1.5
2- 3				11.0	9.0	10.5		7.5	3.5	11.5			7.0	12.0	4.5	11.0
3- 4		1.5			11.0	11.5	8.5	7.0	12.0		8.5	5.5	0.0	0.0		9.5
4- 5	0.0	0.0			13.0	13.0		6.5	10.0	8.5		10.5	2.5	0.5	3.5	8.0
5- 6		10.0						6.0	7.5		9.0		4.5	1.0		6.5
6- 7		8.5		11.5			8.5	5.5	5.5			5.5	6.5	1.5	2.5	5.0
7- 8		7.0	12.5		5.5			5.0		11.5	9.5	10.5	8.5	2.0		3.5
8- 9					7.0	5.0		4.5	11.5				1.5	2.5	1.5	2.0
9-10	0.5				9.0	6.0	9.0		9.5	8.5	10.0	6.0	4.0	3.5	5.5	0.5
10-11			11.5	11.5	10.5	7.0			7.0			11.0	6.0		0.0	10.0
11-12		1.5			12.5	8.0			5.0		10.5		8.0		4.0	8.5
12-13		11.0				9.5	9.5			12.0		6.5	1.0			7.0
13-14		9.5				10.5			11.0		11.0	11.5	3.0		3.0	5.5
14-15	11.5	8.5	0.5	12.0	5.0	11.5		13.0	9.0	9.0			5.5			4.0
15-16					6.5	13.0	10.0	12.5	6.5		11.5	6.5	7.5		2.0	2.5
16-17					8.5		4.0	12.0	4.5			11.5	0.5			1.0
17-18					10.0			11.5	13.0	12.0	11.5		2.5		1.0	10.5
18-19		2.5		12.5	12.0		10.5	10.5	10.5			7.0	4.5		5.0	9.0
19-20	11.5	1.0				5.0	4.5	10.0	8.5	9.0	12.0	12.0	7.0			7.5
20-21		11.0	13.0			6.0		9.5	6.0				0.0		3.5	6.0
21-22		9.5				7.0	10.5	9.0	3.5		12.5	7.5	2.0			4.5
22-23		8.0		12.5	6.5	8.5	5.0	8.5	12.5	12.5		12.5	4.0		2.5	3.0
23-24			12.0		8.0	9.5		8.0	10.0				6.0			1.5
24-25	12.0				10.0	10.5	11.0	7.5	7.5	9.5		7.5	8.5		1.5	11.0
25-26					11.5	11.5	5.5	7.0	5.5			12.5	1.5	12.0	5.5	9.5
26-27		2.5		13.0		13.0		6.5		6.5			3.5	0.0	0.5	8.0
27-28		1.0					11.5	6.0	11.5	12.5		8.0	5.5	0.5	4.5	6.5
28-29		10.5					5.5	5.5	9.5			13.0	7.5	1.5		5.0
29-30	12.0	9.5			6.0			5.0	7.0	9.5			1.0	2.0	3.0	3.5
30-31		8.0	0.0		7.5	5.0	12.0	4.5	5.0		6.5	8.5	3.0	2.5		2.0