

Table from Uruk (Astronomical Cuneiform Texts 620)

Turn the page for a commentary and a more readable version of this tablet.

Column I	Column II	Column III	Column IV	Column V		
2,7;	49t42	izi	27t36	37°37	24°31	zib-me
2,8;	47t54	du6	15t30	35°49	30°20	hhun
2,9; a	46t6	gan	1t36	34°1	4°21	mash-masf
2,10;	44t18	gan	15t54	32°13	6°34	kushu
2,11;	42t30	ab	28t24	30°25	6°59	a
2,12; kin-a	40t42	ziz	9t6	28°37	5°36	absin
2,13;	41t47,30	she	20t53,30	29°42	5°18	rin
2,15;	43t35,30	bar	4t29	31°30	6°48	gir-tab
2,16;	45t23,30	gu4	19t52,30	33°18	10°6	pa
2,17; a	47t11,30	shu	7t4	35°6	15°12	mas
2,18;	48t59,30	shu	26t3,30	36°54	22°6	gu
2,19;	49t27	kin	15t30,30	37°22	29°28	zib-me
2,20; a	47t39	apin	3t9,30	35°34	5°2	mul
2,21;	45t51	apin	19t0,30	33°46	8°48	mash-masf
2,22; a	44t3	ab	3t3,30	31°58	10°46	kushu
2,23;	42t15	ab	15t18,30	30°10	10°56	a
2,24;	40t27	ziz	25t45,30	28°22	9°18	absin
2,25; a	42t2,30	dir-se	7t48	29°57	9°15	rin
2,27;	43t50,30	bar	21t38,30	31°45	11°	gir-tab
2,28; a	45t38,30	sig	7t17	33°33	14°33	pa
2,29;	47t26,30	sig	24t43,30	35°21	19°54	mas
2,30;	49t14,30	izi	13t58	37°9	27°3	gu
2,31; kin-a	49t12	kin-2-kam	3t10	37°7	4°10	hhun
2,32;	47t24	du6	20t34	35°19	9°29	mul
2,33; a	45t36	gan	6t10	33°31	13°	mash-masf
2,34;	43t48	gan	19t58	31°43	14°43	kushu
2,35;	42t	ziz	1t58	29°55	14°38	a
2,36; a	40t29,30	se	12t27,30	28°24	13°2	absin
2,37;	42t17,30	she	24t45	30°12	13°14	rin
2,39; a	44t5,30	gu4	8t50,30	32°	15°14	gir-tab
2,40;	45t53,30	gu4	24t44	33°48	19°2	pa
2,41; a	47t41,30	shu	12t25,30	35°36	24°38	mas
2,42;	49t29,30	izi	1t55	37°24	2°2	zib-me
2,43;	48t57	kin	20t52	36°52	8°54	hhun
2,44; a	47t9	apin	8t1	35°4	13°58	mul
2,45;	45t21	apin	23t22	33°16	17°14	mash-masf
2,46;	43t33	ab	6t55	31°28	18°42	kushu

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System B for Jupiter

In the following text, we find five columns instead of the four for System A. Let's start again with column V. Here the numbers seem to increase irregularly. However, we can readily see that in line 2,

$$I \ 30^{\circ}20 = XII \ 24^{\circ}31 + 35^{\circ}49$$

We quickly see that this is the relation between Column IV and VI. So let us look at Column IV. Here the numbers go up and down, but except for the switches, in both directions the difference is  $1^{\circ}48$ . The function underlying this procedure is a linear function commonly called a zigzag function. Let's derive the maximum (M) and minimum (m), in each case between values whose difference is less than  $1^{\circ}48$ .

Since  $29^{\circ}42 - 28^{\circ}37 = 1^{\circ}5$ , we may suppose the minimum is in between.

$$(29^{\circ}42 - m) + (28^{\circ}37 - m) = 1^{\circ}48$$

$$2m = 29^{\circ}42 + 28^{\circ}37 - 1^{\circ}48$$

$$m = 56^{\circ}31 / 2 = 28^{\circ}15,30$$

Similarly for M,  $36^{\circ}54 - 37^{\circ}22 = 1^{\circ}32$ , with the maximum between these.

$$(M - 36^{\circ}54) + (M - 37^{\circ}22) = 1^{\circ}48$$

$$2M = 36^{\circ}54 + 37^{\circ}22 + 1^{\circ}48$$

$$M = 76^{\circ}4 / 2 = 38^{\circ}2$$

Note now that

$$M - m = 9^{\circ}46,30.$$

Moreover, the mean change will be  $(M + m) / 2$

$$(M + m) / 2 = 33^{\circ}8,45, \text{ M and m are } 33^{\circ}8,45 \pm 4^{\circ}53,15$$

Finally, note that the switches seem to occur always in Virgo (VI) or Pisces (XII). According to other texts (ACT 812, 813) it should be the middle of these signs,  $15^{\circ}$  Virgo, and  $15^{\circ}$  Pisces.

We also see that Columns II and III have the same relation, with the switches in Column II occurring on the same lines as for Column IV. Here, the difference is also  $1;48$ . It is easy to calculate, for  $m_d$  the minimum and  $M_d$  the maximum. As before  $41t47,30 - 40t42 = 1t5..$

$$(41t47,30 - m_d) + (40t42 - m_d) = 1t48$$

$$2m_d = 40t42 \quad 41t47,30 - 1t48 = 80t41,30$$

$$m_d = 40t20,45$$

M will be between  $48t59,30$  and  $49t27$

$$(M_d - 48t59,30) + (M_d - 49t27) = 1t48$$

$$2M_d = 100t14,30$$

$$M_d = 50t7,15$$

Again,

$$\text{The amplitude of variation is } M - m = 9t46,30.$$

$$\text{The mean period of variation is } (M + m)/2 = 45t14.$$

However, the period is seen from Column I, the year, to be actually 12 months more or 13 months  $15t14$

As in the case of ACT 604, we now see that Column III provides months and tithi, while Column I provides the year of the Seleucid dynasty.

The zodiacal motion is apparently about 12 years to a cycle, which suggests Jupiter. Here the phenomenon tracked is oppositions.

Table for ACT 604 made more readable.

	Column I	Column II	Column III	Column IV	Column V	
-184	127	49t42	V	27t36	37°37	24°31 XII
-183	128	47t54	VII	15t30	35°49	30°20 I
-182	129 a	46t6	IX	1t36	34°1	4°21 III
-181	130	44t18	IX	15t54	32°13	6°34 IV
-180	131	42t30	X	28t24	30°25	6°59 V
-179	132 kin-a	<b>40t42</b>	XI	9t6	<b>28°37</b>	5°36 VI
-178	133	<b>41t47,30</b>	XII	20t53,30	<b>29°42</b>	5°18 VII
-176	135	43t35,30	I	4t29	31°30	6°48 VIII
-175	136	45t23,30	II	19t52,30	33°18	10°6 IX
-174	137 a	47t11,30	IV	7t4	35°6	15°12 X
-173	138	<b>48t59,30</b>	IV	26t3,30	<b>36°54</b>	22°6 XI
-172	139	<b>49t27</b>	VI	15t30,30	<b>37°22</b>	29°28 XII
-171	140 a	47t39	VIII	3t9,30	35°34	5°2 II
-170	141	45t51	VIII	19t0,30	33°46	8°48 III
-169	142 a	44t3	X	3t3,30	31°58	10°46 IV
-168	143	42t15	X	15t18,30	30°10	10°56 V
-167	144	<b>40t27</b>	XI	25t45,30	<b>28°22</b>	9°18 VI
-166	145 a	<b>42t2,30</b>	XII2	7t48	<b>29°57</b>	9°15 VII
-164	147	43t50,30	I	21t38,30	31°45	11° VIII
-163	148 a	45t38,30	III	7t17	33°33	14°33 IX
-162	149	47t26,30	III	24t43,30	35°21	19°54 X
-161	150	<b>49t14,30</b>	V	13t58	<b>37°9</b>	27°3 XI
-160	151 kin-a	<b>49t12</b>	VI2	3t10	<b>37°7</b>	4°10 I
-159	152	47t24	VII	20t34	35°19	9°29 II
-158	153 a	45t36	IX	6t10	33°31	13° III
-157	154	43t48	IX	19t58	31°43	14°43 IV
-156	155	<b>42t</b>	XI	1t58	<b>29°55</b>	14°38 V
-155	156 a	<b>40t29,30</b>	XII	12t27,30	<b>28°24</b>	13°2 VI
-154	157	42t17,30	XII	24t45	30°12	13°14 VII
-152	159 a	44t5,30	II	8t50,30	32°	15°14 VIII
-151	160	45t53,30	II	24t44	33°48	19°2 IX
-150	161 a	47t41,30	IV	12t25,30	35°36	24°38 X
-149	162	<b>49t29,30</b>	V	1t55	<b>37°24</b>	2°2 XII
-148	163	<b>48t57</b>	VI	20t52	<b>36°52</b>	8°54 I
-147	164 a	47t9	VIII	8t1	35°4	13°58 II
-146	165	45t21	VIII	23t22	33°16	17°14 III
-145	166	43t33	X	6t55	31°28	18°42 IV