Occultation prediction for Nederland midden
E. Longitude 5 0 0.0, Latitude 52 0 0.0, Alt. 0m;

y	m	day d	Time h	m	s	P	Star No	Sp D	Mag v	Mag r V	% ill	Elon Sun Alt	Moon Alt	Moon Az	CA o	PA o	VA o	AA o	Libration L	Libration B	A m/o	B m/o	RV "/s	Cct o	durn sec	R.A. (J2000) h	m	s	Dec o	m	s	Mdist Mm	SV m/s
25	Nov	1	18	22	25.1	D	3412	M2	4.2	3.4s	81+	128	28	149	33S	124	142	145	-6.9	+0.8	+2.8	+0.0	.165	-69.1	.04	23	14	19.4	- 6	2	56	368.9	828.7
	R3412 = phi Aquarii																																
	3412 = NSV 26044, 4.3 to 4.33, Hp																																
25	Nov	1	18	47	7.8	R	3412	M2	4.2	3.4s	81+	128	30	156	-8S	165	179	186	-6.9	+0.8	-0.8	+2.8	.164	-110.9	.04	23	14	19.4	- 6	2	56	368.7	820.2
	R3412 = phi Aquarii																																
	3412 = NSV 26044, 4.3 to 4.33, Hp																																
25	Nov	1	21	20	2.8	d	146634	K0	8.9	8.3	81+	129	32	199	63S	93	82	115	-7.2	+0.5	+1.8	-0.8	.350	-41.0		23	18	50.8	- 5	5	59	367.8	827.3
25	Nov	1	21	58	45	M	3430	WF3	5.6	5.4	82+	129	29	210	14S	143	125	164	-7.3	+0.4	+9.9	+9.9	.000	-90.0		23	19	24.0	- 5	7	28	367.9	843.5
	R3430 = 96 Aquarii																																
	3430 is double: AB 5.6 10.4 11.1" 19.6																																
25	Nov	1	21	58	59	Gr	3430	WF3	5.6	5.4	82+	129	27	** GRAZE: CA 13.4S; Dist. 77km in az. 319deg. [Lat = 52.92+0.53(E.Long-5.00)]																			
25	Nov	1	22	59	24.6	D	3437	kA0	6.8	6.7	82+	130	24	225	53S	103	77	125	-7.4	+0.3	+1.5	-2.0	.323	-49.0		23	21	21.5	- 4	40	22	368.2	879.3
25	Nov	2	21	57	49.4	D	19	F8	7.5	7.3	90+	143	39	198	88S	69	58	91	-6.1	-1.3	+1.3	+0.1	.459	-16.3		0	10	40.7	2	3	20	361.3	837.9
25	Nov	2	22	17	57.2	d	109047	K2	8.2	7.6	90+	143	38	204	49N	27	12	49	-6.1	-1.3	+0.7	+1.1	.430	26.6		0	10	39.3	2	18	2	361.3	843.0
25	Nov	3	20	23	59.8	D	109605	kK0	7.5	6.7	96+	156	43	150	72S	90	108	111	-4.3	-2.6	+1.5	+0.8	.408	-35.7		1	1	23.1	8	27	2	356.7	868.3
25	Nov	3	21	10	41.1	D	143	F0	7.1	6.9	96+	156	46	166	77N	59	68	80	-4.3	-2.7	+1.1	+1.1	.491	-4.9		1	2	29.6	8	49	18	356.3	851.4
25	Nov	3	21	48	10.9	D	145	PF5	6.8	6.6	96+	156	47	179	27N	9	10	31	-4.4	-2.8	+0.3	+2.3	.346	44.9		1	2	42.6	9	7	59	356.1	843.8
	145 is triple: AB 6.9 13.0 2.9" 36.0, dT = +7sec : AC 6.9 13.0 31" 146.6, dT = -66sec																																
	145 is a close double. Observations are highly desired																																
	Distance of 145 to Terminator = 18.1"; to 3km sunlit peak = 6.9"																																
25	Nov	4	0	51	20.3	D	166	kM*	6.7	5.8S	96+	158	35	237	56N	40	8	61	-4.6	-3.1	+0.8	+0.4	.486	19.7		1	8	21.8	9	54	30	356.7	892.7
	166 = NSV 15246, 6.73, , Type VAR:																																
25	Nov	4	0	56	43.2	D	109700	kB9	7.3	7.3	96+	158	34	238	76S	87	55	108	-4.6	-3.1	+1.0	-1.2	.459	-27.6		1	8	55.9	9	43	50	356.8	896.2
25	Nov	4	2	26	6.7	D	173	G5	6.5	6.0	97+	158	22	258	63N	47	9	68	-4.6	-3.3	+0.5	-0.1	.537	16.3		1	11	29.0	10	17	31	357.7	969.6
25	Nov	5	19	48	33.1	r	75633	K0	7.0	6.3	100-	174	36	104	78N	224	264	240	+0.0	-5.0	+0.2	+1.9	.547	-161.0		2	54	49.8	20	22	23	353.1	990.1
	Distance of 75633 to Terminator = 4.2"; to 3km sunlit peak = 0.0"																																
25	Nov	5	21	11	29.8	R	435	wF5	5.8	5.6S	100-	174	48	123	79S	205	238	221	+0.0	-5.1	+0.2	+2.4	.422	-142.0		2	58	5.2	20	40	7	352.1	914.4
	R435 = 47 Arietis																																
	435 is double: AB 5.8 14.7 14.6" 113.0, dT = +1.2sec																																
	435 = NSV 15614, 5.8, , Type VAR:																																
	Distance of 435 to Terminator = 5.3"; to 3km sunlit peak = 0.0"																																
25	Nov	5	21	44	32	Gr	440	SA2	4.7		100-	174	54	** GRAZE: CA-25.7N; Dist.161km in az. 135deg. [Lat = 49.96+0.61(E.Long-5.00)]																			
25	Nov	5	21	47	18	m	440	SA2	4.7		100-	174	53	134	-26N	333	2	349	+0.0	-5.2	+9.9	+9.9	.000	90.0		2	59	12.7	21	20	25	351.8	888.1
	R440 = epsilon Arietis																																
	440 is triple: AB 5.17 5.57 1.28" 210.6 : AC 5.2 12.7 146" 192.0																																
	440 is a close double. Observations are highly desired																																

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      day  Time      P   Star  Sp  Mag  Mag     % Elon Sun  Moon   CA   PA  VA  AA Libration    A    B   RV     Cct durn  R.A. (J2000)  Dec    Mdist    SV
 y  m  d  h  m   s        No  D     v    r V  ill     Alt Alt Az   o    o   o   o   L     B    m/o m/o  "/s      o  sec  h  m   s    o  m  s   Mm     m/s

25 Nov  6  0  5 10.4 r    75705 K0  7.8  7.3  100- 17.     60 190  42N 269 262 285 -0.1 -5.4 +1.5-0.2 .449  156.8       3  3  2.1  21 33 55 351.4 832.5
   Distance of 75705 to Terminator = 3.5"; to 3km sunlit peak = 0.0"
25 Nov  6  0 33 34.5 r    75715cK0  7.3  6.7  100- 172     58 202  83N 229 214 244 -0.1 -5.4 +1.1+1.0 .463 -161.4       3  4 15.2  21 28 22 351.4 832.3
     75715 is double: ** 8.2 8.2 0.10" 222.0, dT = -0.21sec
     75715 has been reported as non-instantaneous (OCc 751). Observations are highly desired
   Distance of 75715 to Terminator = 8.1"; to 3km sunlit peak = 0.9"
25 Nov  6  3 29 31.7 R      461cK0  7.2  6.7   99- 171     39 256  70S 207 166 222 -0.3 -5.5 +1.0+1.1 .361 -132.3       3 10 39.9  21 53 34 352.9 919.7
   Distance of 461 to Terminator = 9.9"; to 3km sunlit peak = 1.9"
25 Nov  6  4  3 55.0 r    75777 B9  7.6  7.5   99- 171     34 264  59N 259 217 274 -0.3 -5.5 +0.6-1.1 .555  176.8       3 11 19.5  22 10 14 353.4 952.5
   Distance of 75777 to Terminator = 8.6"; to 3km sunlit peak = 1.2"
25 Nov  6 19  5 29.0 R      587 K0  6.2  5.5   97- 161     24  80  60S 216 258 227 +2.3 -5.6 -0.3+2.0 .523 -145.3       3 57 26.4  24 27 43 355.01095.0
25 Nov  6 20  6 18.7 r   76374kG0  8.3  8.0   97- 161     33  91  67S 223 266 234 +2.4 -5.7 +0.0+2.0 .532 -153.1       3 59 54.8  24 41 44 354.21025.3
25 Nov  6 21 34 37.2 r    76415 F8  8.7  8.4   97- 160     46 109  53S 210 250 221 +2.4 -5.8 +0.1+2.5 .417 -139.9       4  3 37.3  24 56 46 353.2 932.8
25 Nov  6 21 40  4.7 r    76413 A2  8.7  8.5   97- 160     47 110  38N 299 339 310 +2.4 -5.8 +1.4+0.3 .355  131.0       4  3 21.2  25 20 38 353.1 927.7
25 Nov  6 22  3 59.8 r    76422 M0  8.6  7.7v  97- 160     50 117  42N 295 333 305 +2.4 -5.8 +1.5+0.3 .377  135.4       4  4 12.0  25 23 57 352.9 906.1
     76422 = V1134 Tau, 8.69, range 0.1, V, Type LB:, Period 1.0599 days, Phase  32%
25 Nov  6 22 24 42.1 r    76433 G0  8.9  8.5   97- 160     53 122  47N 290 325 300 +2.4 -5.9 +1.4+0.3 .401  140.5       4  4 54.9  25 26 17 352.7 888.8
25 Nov  7  1 37 11.7 r X  5440DG0  8.8        96- 158     63 205  28N 311 294 321 +2.2 -6.0 +1.6-2.7 .283  126.2       4 11 49.0  25 59  2 352.4 818.7
   X  5440 is double: AB 8.97 10.62 1.08" 174.0, dT = +2.8sec
   X  5440 is a close double. Observations are highly desired
   Distance of X  5440 to Terminator = 15.8"; to 3km sunlit peak = 5.4"
25 Nov  7  5 19  4.2 r    76559 B9  7.8  7.7   96- 156     35 269  46S 206 163 216 +2.0 -6.0 +1.2+1.1 .290 -121.2       4 20 30.4  25 49 39 354.8 965.9
25 Nov  7 20  1 17.9 r   76965cG   7.6  7.2   92- 147     24  76  39S 207 249 212 +4.5 -5.8 -0.6+2.4 .391 -128.8       5  7  5.1  26 59 45 357.71082.3
     76965 is double: ** 9.1 9.1 0.050"
     76965 has been reported as non-instantaneous (OCc1253). Observations are highly desired
25 Nov  7 21  6  8.4 r    76984 K2  8.8  8.0   91- 146     34  88  84S 253 297 258 +4.6 -5.9 +0.2+1.7 .578 -174.9       5  9 19.0  27 17 56 356.91005.1
25 Nov  7 21 21  5.2 R      773wF8  7.0  6.7   91- 146     36  90  48N 301 345 306 +4.6 -5.9 +0.9+0.6 .416  136.8       5 10  3.9  27 33 23 356.7 988.2
     773 is double: AB 7.0 9.3 315" 353.1, dT = -465sec
25 Nov  7 22 26 10.5 r    77030 K0  8.6  7.9   91- 145     46 104  65N 285 327 289 +4.6 -6.0 +1.0+0.9 .478  154.1       5 12 34.1  27 36 15 356.1 918.4
25 Nov  8  2 13 29.0 R      797cB9  6.4  6.3e  90- 144     66 191  46N 305 297 308 +4.3 -6.1 +1.4-1.7 .366  142.0       5 20 59.3  27 57 26 355.4 801.3
     797 is double: ** 6.5 8.5
     797 = HR 1750, 6.21, range 0.03, H1, Type EA, Period 3.315 days, Phase  14%
25 Nov  8  4 56 41.9 R      812SF8  8.0        90- 143     49 252  56S 227 186 231 +4.2 -6.0 +1.4+0.4 .357 -134.4       5 27  1.3  27 36 37 356.9 881.9
     812 is triple: AB 8.71 8.61 0.59" 276.7, dT = -1.1sec : AB,C 7.9 13.2 27.0" 277.8, dT = -48sec
     812 is a close double. Observations are highly desired
25 Nov  8  6 51 35.5 r   77224cF8  7.4  7.1   89- 142    0 32 275  72N 280 235 282 +4.1 -5.9 +0.3-1.6 .574  175.6       5 31 22.8  27 46  9 358.61001.3
     77224 is double: ** 8.3 8.3 0.10"  90.0, dT = +0.17sec
     77224 has been reported as non-instantaneous (OCc 194). Observations are highly desired
25 Nov  8 22 16  1.2 r    78234 A0  8.2  8.2   83- 132     34  88  37S 216 260 214 +6.4 -5.7 -0.2+3.0 .344 -128.6       6 20  4.5  27 23  6 361.3 966.0
25 Nov  8 22 33 51.4 r    78239 A0  9.0  9.0   83- 131     37  92  87N 271 315 269 +6.4 -5.7 +0.5+1.4 .538  175.9       6 20 16.9  27 37 25 361.1 945.5
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      day  Time      P   Star  Sp  Mag  Mag    % Elon Sun  Moon   CA   PA  VA  AA Libration   A   B   RV    Cct durn  R.A. (J2000)  Dec   Mdist   SV
 y   m  d  h  m   s        No  D    v    r V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o  "/s     o  sec  h  m   s    o  m  s   Mm   m/s

25 Nov  8 22 37 34.2 r    78242 K0  8.8  8.4   83- 131     38  92  87N 272 31¢ 270 +6.4 -5.7 +0.6+1.3 .536  175.7      6 20 26.0  27 37 36 361.1 941.4
25 Nov  8 23 33 45.8 r    78295 A3  8.8  8.¢   83- 131     4¢ 104  46S 225 26? 223 +6.4 -5.7 +0.4+2.8 .365 -13¢.3      6 23  0.3  27 26 37 360.¢ 883.8
25 Nov  8 23 44 14.7 r    78299 A0  8.3  8.3   83- 131     48 10¢  70N 289 331 287 +6.4 -5.7 +1.1+0.¢ .469  159.8      6 23  5.8  27 43 53 360.5 873.9
25 Nov  9  1 28  9.8 r X  9053cK0  8.8  8.4   82- 130     61 138  78N 281 309 279 +¢.2 -5.7 +1.4+0.3 .454  171.3      ¢ 2¢ 47.4  27 41 23 360.0 802.8
   X  9053 is double: ** 9.¢ 9.¢ 0.15"  ¢2.0, dT = +0.26sec
   X  9053 has been reported as non-instantaneous (OCc1120). Observations are highly desired
25 Nov  9  2 19 51.1 R    78410 K1  7.7  7.1   82- 130     ¢5 1¢1  85N 275 288 272 +¢.2 -5.7 +1.4+0.1 .451  180.0      ¢ 28 32.2  27 38  4 360.0 787.7
25 Nov  9  2 55 11.8 r    78434 K0  8.¢  7.8   82- 130     ¢¢ 179  81N 279 279 27¢ +¢.1 -5.7 +1.4-0.3 .450  177.9      ¢ 29 44.3  27 37 32 360.1 785.8
25 Nov  9  4 28 55.1 r    78487 A2  8.9  8.9   81- 129     ¢0 223  43S 223 195 220 +¢.0 -5.¢ +2.0+1.9 .251 -122.7      ¢ 33 17.7  27 1¢ 33 360.7 813.7
25 Nov  9  ¢  8  ¢.1 R     1013cG0  7.0        81- 128  -7 48 253  82S 263 221 2¢0 +5.8 -5.5 +1.0-1.0 .475 -159.9      ¢ 3¢ 2¢.3  27 1¢ 42 3¢1.9 888.¢
      1013 is double: AB 7.14 8.97 0.69" 271.0, dT = -1.4sec
      1013 is a close double. Observations are highly desired
25 Nov  9 21 23 30.5 r    79319 K2  7.9  7.3   74- 119     17  ¢9  80N 287 327 279 +7.7 -4.9 +0.0+1.1 .584  1¢7.4      7 21 39.7  25 51 44 368.31¢9.2
25 Nov  9 23  0  7.3 r    79382 M*  8.4  7.¢v  73- 118     31  8¢  34N 333  1¢ 325 +7.7 -4.9 +1.1-0.9 .290  122.7      7 2¢ 18.3  25 57 1¢ 367.2 953.3
     79382 = V0341 Gem, 8.24 to 8.42, Hp, Type LB, Period 33.17 days, Phase  14%
25 Nov 10  1  4 57.1 r    79444dK2  8.5  7.8   73- 117     49 113  52S 239 278 231 +7.¢ -5.0 +0.9+2.5 .358 -140.0      7 30 24.3  25 2¢ 55 3¢¢.2 830.9
     79444 is double: AB 8.4 13.4 2.1" 133.9, dT = +1.5sec
     79444 is a close double. Observations are highly desired
25 Nov 10  1 30 15.4 r    79469 K0  8.7  8.2   72- 117     52 120  37N 330   7 322 +7.¢ -5.0 +1.4-1.7 .29¢  130.3      7 31 41.4  25 47 2¢ 3¢¢.0 813.1
25 Nov 10  2 51 15.0 r     1146 K7  8.9  8.1   72- 11¢     61 148  76S 264 285 255 +7.5 -4.9 +1.5+0.8 .412 -159.9      7 33 42.5  25 24  2 365.8 777.7
25 Nov 10  4  8  0   Gr  79544 F0  8.4  8.2   72- 11¢     63 ** GRAZE: CA  9.6S; Dist. 19km in az.  21deg. [Lat = 52.18-0.23(E.Long-5.00)]
25 Nov 10  4  8  8   M   79544 F0  8.4  8.2   72- 11¢     63 184  10S 197 195 189 +7.3 -4.8 +9.9+9.9 .000  -90.0      7 3¢ 5¢.0  25  1  1 3¢¢.0 77¢.4
25 Nov 10  ¢ 43  ¢.¢ R    79¢10 F8  7.2  7.0   71- 115  -2 50 244  81N 288 250 279 +7.1 -4.¢ +0.9-1.¢ .483 -17¢.7      7 41  3.1  24 57 54 367.5 863.0
25 Nov 10  7 54 14.3 D     1170dG8  3.¢  3.1   70- 114   7 39 2¢0   0S 189 147 179 +7.0 -4.5 -2.4-5.7 .115  -77.3 .02  7 44 2¢.8  24 23 53 368.¢ 929.5
   R1170 = kappa Geminorum
      1170 is double: AB 3.7 10.0 7.3" 241.1, dT = +39sec
      1170 is a close double. Observations are highly desired
25 Nov 10  8  2 3¢   Gr    1170dG8  3.¢  3.1   70- 114   9 37 ** GRAZE: CA 12.9S; Dist. ¢2km in az. 230deg. [Lat = 51.12-0.75(E.Long-5.00)]
25 Nov 10  8  7 4¢.3 R     1170dG8  3.¢  3.1   70- 114   9 37 263  25S 214 172 205 +7.0 -4.5 +3.2+1.9 .11¢ -102.7 .02  7 44 2¢.8  24 23 53 368.8 944.3
   R1170 = kappa Geminorum
      1170 is double: AB 3.7 10.0 7.3" 241.1, dT = -5¢sec
      1170 is a close double. Observations are highly desired
25 Nov 10 23  4 35.8 r    80172kG5  8.5  8.1   63- 105     20  79  74N 299 340 28¢ +8.5 -3.9 +0.3+0.8 .520  1¢3.1      8 25 19.4  22 21 12 374.2 987.2
25 Nov 11  1 18 35.4 r     1273KM0  8.7  7.9v  62- 104     40 10¢  88N 28¢ 325 272 +8.4 -3.9 +0.9+0.9 .4¢8 -179.4      8 29 5¢.7  22  1 47 372.9 845.5
      1273 = ASAS J082957+2201.8, 8.59, range 0.19, V, Type MISC, Period 45.8 days, Phase  ¢8%
25 Nov 11  2 21 50.7 r    80231kK0  8.8  8.3   ¢2- 103     48 122  50S 244 278 231 +8.3 -3.8 +1.2+2.¢ .313 -135.1      8 31 59.8  21 41 53 372.5 799.3
25 Nov 11  3 55 48.¢ R    80¢¢2kF8  8.1  7.8   ¢1- 103     58 154  58S 252 ¢9 239 +8.1 -3.8 +1.8+1.4 .321 -139.2      8 34 39.2  21 29 35 372.2 ¢5.7
25 Nov 11  4  3 58.0 r    80¢¢5 K0  9.0  8.4   ¢1- 103     58 157  ¢3S 258 272 244 +8.1 -3.7 +1.7+1.1 .343 -144.0      8 34 51.2  21 29 37 372.2 ¢4.9
25 Nov 11  4 44  ¢   Gr   80281 A0  8.8  8.8   ¢1- 103     59 ** GRAZE: CA 10.9S; Dist. 22km in az.  28deg. [Lat = 52.23-0.32(E.Long-5.00)]
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      day  Time      P   Star  Sp  Mag  Mag     % Elon Sun  Moon   CA   PA  VA  AA Libration    A   B   RV    Cct durn  R.A. (J2000)   Dec    Mdist   SV
 y   m  d  h  m   s        No  D    v    r V  ill     Alt Alt Az    o    o   o   o   L    B   m/o m/o  "/s     o  sec  h  m   s    o  m  s    Mm   m/s

25 Nov 11  4 44 18    m   80281 A0  8.8  8.8   61- 103      59 175  11S 205 208 192 +8.0 -3.7 +9.9+9.9 .000  -90.0       8 36 36.2  21 11 24 372.3 765.8
25 Nov 11 22 57 24.8 R    1383cF5  6.6  6.4   52-  93       8  72  84S 282 320 265 +8.8 -2.6 -0.1+1.2 .558 -174.7       9 18 58.9  17 42 19 381.4103.9
   R1383 = 83 Cancri
      1383 is double: AB 6.6      0.30" 328.2, dT = -0.37sec
      1383 is a close double. Observations are highly desired
25 Nov 12  3 31 19    r   98598 K0  8.4  7.9   50-  90      46 130   1N  18  47   1 +8.5 -2.5 +9.9+9.9 .066   98.9       9 29  2.6  17  6 59 378.8 781.1
   Distance of 98598 to Terminator = 9.2"; to 3km sunlit peak = 0.0"
25 Nov 12  3 37 48.2 r   98586 F8  8.9  8.6   50-  90      47 133  77N 302 330 285 +8.5 -2.5 +1.2-0.2 .422  175.3       9 27 56.5  16 59  1 378.8 777.9
25 Nov 12  3 37 50.1 r   98584 G0  8.9  8.7   50-  90      47 133  78S 277 305 260 +8.5 -2.5 +1.4+0.8 .397 -159.7       9 27 47.1  16 52 35 378.8 778.0
25 Nov 13  0 29 23.3 r   98990 K5  7.8  6.9   41-  80      10  84  64S 265 304 245 +8.6 -1.2 +0.0+1.8 .458 -151.9      10 11 35.3  12  2 11 387.1 974.6
25 Nov 13  1 41 29.2 r   99015 F8  8.7  8.4   41-  79      21  98  39S 240 279 220 +8.5 -1.2 +0.4+3.5 .272 -124.6      10 13 58.2  11 41 18 386.3 897.4
25 Nov 13  2 28  8.1 R    1501 G5  7.2  6.7   40-  79      28 107  72S 274 311 254 +8.5 -1.1 +0.8+1.5 .418 -156.5      10 15  9.7  11 40 27 385.7 852.9
25 Nov 13  4  8 21.3 R   99041KF5  8.5  8.2   40-  78      40 132  65S 266 294 246 +8.3 -1.0 +1.5+1.5 .341 -144.5      10 17 45.6  11 17  1 384.9 782.7
25 Nov 13  5 33 59.5 R   99069kG0  8.9  8.5   39-  78      48 159  75N 306 319 287 +8.1 -0.9 +1.2-0.7 .405  178.2      10 19 58.0  11  8  7 384.7 756.0
25 Nov 13  5 57 33.6 R   99071 K0  8.5  8.0   39-  78  -9  48 167  64S 265 273 245 +8.0 -0.8 +2.0+0.6 .309 -139.9      10 20 17.9  10 52  8 384.7 754.4
25 Nov 13  6 14 22.6 r   99078 G5  9.0  8.5   39-  77  -7  49 173  34N 347 351 327 +8.0 -0.8 +0.5-2.4 .303  138.5      10 21 29.4  11  4 41 384.7 754.7
25 Nov 14  2 10 41.8 R    1600wA5  5.0  4.9   31-  67      14  99  83N 299 337 278 +7.9 +0.3 +0.4+0.7 .480  179.0      11  0 44.8   6  6  5 392.0 911.9
   R1600 = 59 Leonis
      1600 is double: AB 5.0 12.6 40" 217.4, dT = -12sec
25 Nov 14  2 20 52.6 r  118616 K2  8.9  8.4   31-  67      16 101  75S 278 315 256 +7.9 +0.3 +0.4+1.4 .442 -158.8      11  0 54.5   5 58 18 391.9 901.7
25 Nov 14  4  2  3.6 R  118645 G5  8.3  7.9   30-  67      30 123  36N 346  18 325 +7.8 +0.4 +0.4-1.6 .313  136.7      11  4 18.9   5 47 44 390.8 814.3
25 Nov 14  4 20 27    M    1606 M*  7.8  7.0v  30-  66      31 127  11S 214 243 192 +7.7 +0.5 +9.9+9.9 .000  -90.0      11  4 19.1   5 13 30 390.7 802.4
      1606 = FG Leo, 7.84 to 8.01, Hp, Type SRB, Period 24.962161 days, Phase   9%
25 Nov 14  5 36 49.1 R  118664 F0  8.2  7.9   30-  66      39 148  25N 357  16 336 +7.5 +0.6 +0.2-2.6 .254  129.1      11  6 40.5   5 25 48 390.2 764.1
25 Nov 15  4 51 20.5 R    1708wF7  6.2  5.9   21-  55      25 128  60N 323 352 301 +6.8 +1.9 +0.6-0.4 .404  162.6      11 49  1.3 - 0 19  7 395.4 812.9
      1708 is double: AB 6.2 13.1 27.4" 128.3, dT = +66sec
25 Nov 16  3 43  7.6 R    1792PF2  7.4  7.1S  14-  44       6 108  64S 264 301 243 +5.9 +3.2 +0.5+2.0 .372 -142.2      12 30  1.9 - 6  1 24 400.6 914.4
      1792 is triple: AB 7.4 13.0 3.3" 278.9, dT = -9sec : AC 7.4 13.0 18.8" 292.0, dT = -45sec
      1792 is a close double. Observations are highly desired
      1792 = NSV 19406, 7.3, , Type VAR:
25 Nov 16  3 56 47.7 R  138821kK5  8.7  8.1   14-  44       8 111  75S 276 311 254 +5.9 +3.2 +0.5+1.5 .415 -153.4      12 30 23.5 - 6  1 48 400.4 900.9
25 Nov 16  6  5 46   Gr 138847 F8  8.1  7.8   14-  43  -8  25 ** GRAZE: CA 16.8S; Dist.120km in az. 218deg. [Lat = 50.63-0.48(E.Long-5.00)]
25 Nov 16  6 18 38.8 r  138847 F8  8.1  7.8   14-  43  -7  25 143  37S 237 260 216 +5.6 +3.4 +3.1+4.4 .141 -110.3      12 33 55.3 - 6 46 40 398.9 785.8
25 Nov 17  5 42  7.4 R  157830 F2  8.9  8.7    8-  33      12 127  53N 323 353 303 +4.5 +4.5 +0.3-0.1 .409  160.8      13 16 51.2 -11 46 14 402.6 846.5
25 Nov 25 16 33 33.3 D  189244 F6  7.7  7.5   25+  59  -8  14 191  66N  55  47  67 -6.5 +5.2 +1.2+0.1 .379    9.7      20 24 19.6 -23 28 33 394.4 736.0
25 Nov 25 17  6 43.6 D  189265 G0  8.7  8.4   25+  60      13 199  88S  81  68  93 -6.6 +5.2 +1.4-0.6 .376  -17.0      20 25 21.6 -23 29  8 394.4 753.1
25 Nov 25 17 37 56.3 d  189262 K2  8.7  7.9   25+  60      11 206  15N   4 347  17 -6.7 +5.1 -0.4+1.3 .207   59.1      20 25  9.5 -23 10 59 394.5 773.3
25 Nov 25 18 59 24.8 D  189316 M1  7.9  7.0   25+  60       5 223  62N  50  23  63 -6.9 +5.0 +0.5-0.5 .429   12.3      20 28  8.8 -23  0 52 395.0 841.5
25 Nov 26 18 54 47.0 d    3114 F6  8.8  8.5   34+  72      13 214  42N  25   4  41 -7.5 +3.8 +0.3+0.4 .360   33.1      21 18 11.4 -18 41 16 389.6 812.5
25 Nov 27 16 48  5    M  164844 K5  7.4  6.6   44+  83 -11  24 172  14S 146 151 165 -7.6 +2.7 +9.9+9.9 .000  -90.0      22  4 27.9 -14 26 49 383.8 758.3
25 Nov 27 16 48 25   Gr 164844 K5  7.4  6.6   44+  83 -11  22 ** GRAZE: CA 13.5S; Dist. 20km in az. 298deg. [Lat = 52.38+1.17(E.Long-5.00)]
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      day  Time      P   Star  Sp  Mag  Mag     % Elon Sun  Moon   CA   PA  VA  AA Libration    A    B    RV    Cct durn  R.A. (J2000)   Dec    Mdist   SV
 y   m  d  h  m    s       No  D    v    r V    ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o  "/s     o  sec  h  m    s    o  m  s    Mm    m/s

25 Nov 27 17 55 55.5 D    3237cB8  4.3  4.3    44+  83     24 190  88N  68  62  87 -7.7 +2.5 +1.4+0.1 .404  -13.2     22  6 26.2 -13 52 11 383.5 771.5
   R3237 = iota Aquarii
      3237 is double: ** 5.2 5.2 0.050"
      3237 has been reported as non-instantaneous (OCc1616). Observations are highly desired
25 Nov 27 18  2  2.8 d  164862 K0  8.8  8.2    44+  83     24 191  36S 124 117 143 -7.8 +2.5 +3.5-2.3 .149  -69.1     22  6 28.4 -14  5 15 383.5 773.5
25 Nov 27 18 14 21   Gr 164862 K0  8.8  8.2    44+  83     24 ** GRAZE: CA 15.6S; Dist.147km in az. 126deg. [Lat = 49.75+0.84(E.Long-5.00)]
25 Nov 27 18 59  0.7 d  164874 K0  8.8  8.2    44+  83     21 206  81N  61  45  80 -7.9 +2.4 +1.1-0.2 .428   -6.3     22  7 52.4 -13 35  5 383.5 800.1
25 Nov 27 19  7 36.6 R    3237cB8  4.3  4.3    44+  84     20 208 -62S 221 204 240 -7.9 +2.4 +0.7+0.2 .421 -166.6     22  6 26.2 -13 52 11 383.6 805.6
   R3237 = iota Aquarii
      3237 is double: ** 5.2 5.2 0.050"
      3237 has been reported as non-instantaneous (OCc1616). Observations are highly desired
25 Nov 27 19 47 54.8 D    3245KF5  6.9  6.7    45+  84     18 217  58N  38  15  57 -8.0 +2.3 +0.6+0.2 .426   17.6     22  8 47.4 -13 18  2 383.7 831.9
25 Nov 28 18 38 25.1 D  146393wG6  8.0  7.7    55+  96     30 189  80S  78  72  98 -7.8 +1.0 +1.5+0.0 .392  -25.0     22 55 50.0 - 7 49 21 377.0 789.8
    146393 is double: AB 8.0 17.0 41" 190.8, dT = -42sec
25 Nov 28 18 55 46.7 D  146387 K0  7.9  7.3    55+  96     30 195  20N 357 348  18 -7.9 +0.9 -0.2+2.1 .248   55.2     22 55  9.6 - 7 32 23 377.0 794.7
25 Nov 28 22 32  7   Gr   3379 K5  6.2  5.5    56+  97      8 ** GRAZE: CA  9.8S; Dist.160km in az. 341deg. [Lat = 53.53+0.22(E.Long-5.00)]
25 Nov 28 22 32 57   m    3379 K5  6.2  5.5    56+  97      9 246  10S 147 113 168 -8.2 +0.5 +9.9+9.9 .000  -90.0     23  1 23.6 - 7  3 40 378.2 942.6
   R3379 = 81 Aquarii
25 Nov 28 23  0 41.0 D    3383 M2  6.2  5.4s   56+  97      6 252  86N  63  27  84 -8.2 +0.5 +0.3-0.8 .526   -4.9     23  2 32.6 - 6 34 26 378.5 969.2
   R3383 = 82 Aquarii
      3383 = NSV 25999, 6.24 to 6.29, Hp
25 Nov 29 16 33 14.7 d  146838cK0  8.8  8.2    65+ 107  -9 30 141  16N 353  16  14 -7.2 -0.3 -0.3+2.5 .221   61.6     23 40 15.8 - 1 45 16 371.7 837.0
    146838 is double: ** 9.6 9.6 0.20"  76.0, dT = +0.1sec
    146838 has been reported as non-instantaneous (OCc 969). Observations are highly desired
25 Nov 29 17 34 15.6 d    3495 F2  8.3  8.0    65+ 108     35 157  49N  26  40  48 -7.3 -0.5 +0.7+1.7 .403   27.0     23 42 21.8 - 1 30  5 371.0 813.2
25 Nov 29 20 53 28.3 D  146911dK0  7.1  6.5    66+ 109     32 216  81S  76  54  98 -7.7 -0.9 +1.2-0.6 .431  -22.2     23 47 42.0 - 0 45 44 370.4 836.5
    146911 is double: AB 7.2 14.2 4.1"  47.4, dT = +8sec
    146911 is a close double. Observations are highly desired
25 Nov 29 21 12 59.1 d  146916 G5  8.5  8.2    66+ 109     30 221  59S  98  74 120 -7.7 -0.9 +1.5-1.6 .340  -43.8     23 48 12.7 - 0 46 30 370.5 847.1
25 Nov 30 16 24 17.8 D      64 F5  6.5  6.3    75+ 120  -8 29 123  31N   8  39  30 -6.3 -1.8 +0.1+2.2 .344   47.4      0 30  8.7   4 51 36 366.0 902.6
25 Nov 30 16 54 38.8 D  109254 F0  8.0  7.8v   75+ 121 -12 33 131  89N  66  94  88 -6.3 -1.9 +0.9+1.6 .487  -11.6      0 31 49.8   4 50 46 365.6 881.3
    109254 = FM Psc, 8.01 to 8.11, Hp, Type GDOR, Period 0.65070 days, Phase  57%
25 Nov 30 18  7  6.3 d  109276 F5  8.4  8.2    76+ 121     40 151  38S 119 137 141 -6.4 -2.0 +2.7-0.4 .194  -65.9      0 33 40.9   4 56 52 364.7 841.3
25 Nov 30 20 54 20.9 d  109324 K2  8.9  8.3    77+ 122     42 205  65S  93  77 114 -6.7 -2.4 +1.7-0.8 .367  -38.3      0 38  1.3   5 50 51 363.9 826.5
25 Nov 30 21 16 56.5 d  109339 G0  8.8  8.5    77+ 122     40 212  80S  78  58  99 -6.7 -2.4 +1.3-0.4 .435  -22.8      0 38 34.5   6  1 18 363.9 833.3
25 Nov 30 23 57 35.8 d  109401 K0  8.5  7.8    78+ 124     22 253  81N  60  23  81 -6.9 -2.7 +0.5-0.5 .530    1.0      0 42 58.6   6 48 42 365.1 937.8
25 Dec  1 16 17 31.8 D     203 K0  6.8  6.2    85+ 134  -7 27 106  54N  34  72  55 -5.0 -3.2 +0.2+2.0 .512   23.7      1 22 53.6  11 21 59 361.1 979.3
25 Dec  1 19 57 41.3 d     217 A0  8.3  8.3    86+ 135     50 169  61N  42  49  63 -5.1 -3.7 +0.9+1.5 .467   13.6      1 29 25.0  12 23 20 358.4 835.9
25 Dec  1 20  0 25.4 d   92456 K5  8.8  8.2    86+ 135     50 170  29N  10  16  30 -5.1 -3.7 +0.3+2.5 .335   45.8      1 28 55.4  12 28 10 358.4 835.1
25 Dec  2  2  9 27.9 d   92574 K0  7.6  7.0    87+ 138     15 273  89N  71  32  91 -5.4 -4.1 +0.2-1.0 .584   -3.1      1 41  4.5  13 46 24 360.51023.6
25 Dec  2 17 46 59.1 D   92911 A2  7.5  7.4    93+ 148     37 109  68S  99 137 117 -3.2 -4.6 +1.0+1.2 .439  -38.1      2 22 59.6  17 35 52 356.0 964.1
25 Dec  2 21 46 58.3 d   92977 K0  8.2  7.7    93+ 150     57 190  81S  87  80 104 -3.3 -5.0 +1.5-0.1 .441  -24.1      2 30 30.1  18 39 52 354.0 829.2
25 Dec  2 22 52 30.0 d   92994     8.8  8.2    94+ 151     53 216  84S  84  62 102 -3.4 -5.1 +1.4-0.5 .459  -19.3      2 32 30.0  18 54 45 354.1 835.0
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      day  Time      P   Star  Sp  Mag  Mag    % Elon Sun  Moon   CA   PA  VA  AA Libration    A    B    RV    Cct durn  R.A. (J2000)  Dec    Mdist   SV
 y   m  d  h  m   s       No  D    v    r V  ill     Alt Alt Az   o    o   o   o   L    B    m/o m/o  "/s     o  sec  h  m   s    o  m  s    Mm   m/s

25 Dec  4  2 50 52.3 d   76104KA7  8.3  8.1v  99+ 166     34 266  44N  49   7  62 -1.3 -5.8 +0.8-0.2 .480   31.0      3 43 43.2  24 22 28 353.5 959.4
     76104 = V0624 Tau, 8.23 to 8.25, V, Type DSCTC, Period 0.0205 days
   Distance of 76104 to Terminator = 12.8"; to 3km sunlit peak = 3.7"
25 Dec  4  3  7 42.2 d   76119pA5  8.1  8.0   99+ 167     32 270  45N  51   8  64 -1.3 -5.8 +0.7-0.3 .495   29.8      3 44 25.7  24 23 41 353.7 977.3
     76119 is double: ** 9.3 9.3 0.10" 139.0, dT = +0.01sec
     76119 has been reported as non-instantaneous (OCc 776). Observations are highly desired
   Distance of 76119 to Terminator = 13.1"; to 3km sunlit peak = 3.9"
25 Dec  4  3 10 56.4 D     536pB7  5.5  5.5   99+ 167     31 270  71N  76  34  89 -1.3 -5.8 +0.5-1.1 .570    4.6      3 44 48.2  24 17 22 353.7 980.7
   R536 = Celaeno = 16 Tauri
       536 is triple: AB 5.4 13.2 89" 264.5, dT = -154sec : AC 5.4 11.5 218" 196.1, dT = -189sec
25 Dec  4  3 14 22.8 D     537SB6  3.7  3.8s  99+ 167     31 271  72S 114  71 127 -1.3 -5.8 +0.2-2.1 .480  -33.2      3 44 52.5  24  6 48 353.8 984.7
   R537 = Electra = 17 Tauri
       537 is multiple: ** 3.9 7.5 0.20" 117.0, dT = +0.41sec : Aa,Ac 3.9 7.5 0.20"       : Aa,Ab 3.9 7.0 26.4"       : AB 3.7 13.0 98" 144.0, dT = +177sec
       537 has been reported as non-instantaneous (OCc1693). Observations are highly desired
       537 = NSV 15755, 3.70, range 0.00, 1Kp, Type SPB, Period 1.1073 days
25 Dec  4  3 30 22.7 D     539SB6  4.3  4.4s  99+ 167     29 274  34N  40 357  53 -1.3 -5.8 +0.7+0.0 .439   41.3      3 45 12.5  24 28  2 354.01002.6
   R539 = Taygeta = 19 Tauri
       539 is multiple: Aa,Ab 4.6 6.1           : AB          0.018" 246.1, dT = -0.04sec : AC 4.3 14.0 53"  53.4, dT = +117sec : AB 4.3 11.0 72" 328.8, dT = +53s
       539 is a close double. Observations are highly desired
       539 = NSV 1264, 4.30, range 0.00, 1Kp, Type SPB, Period 1.5664 days
   Distance of 539 to Terminator = 8.0"; to 3km sunlit peak = 0.8"
25 Dec  4  3 31  9.7 D   76152pB9  7.2  7.1S  99+ 167     29 274  67N  73  30  85 -1.3 -5.8 +0.4-1.0 .578    8.4      3 45 37.8  24 20  8 354.01003.3
     76152 is triple: Aa,Ab 7.4 9.0 0.006" 349.3, dT = 0.00sec : AB 7.2 9.9 177" 164.1, dT = -5sec
     76152 = NSV 15762, 7.17, , Type VAR:
25 Dec  4  3 36 42.6 D     541SB8  3.9  3.9s  99+ 167     28 275  62N  68  25  80 -1.3 -5.8 +0.4-0.9 .571   13.7      3 45 49.6  24 22  4 354.11009.6
   R541 = Maia = 20 Tauri
       541 is quadruple: Aa,Ab 4.4 5.4           : AB 3.8 13.7 113"  72.6, dT = +198sec : AB 3.8 13.7 113"  72.7, dT = +198sec
       541 = NSV 1279, 3.87, range 0.00, 4Kp, Type ACV, Period 10.288 days
   Distance of 541 to Terminator = 19.2"; to 3km sunlit peak = 8.1"
25 Dec  4  3 37 17.3 d   76145pA3  8.1  8.0   99+ 167     27 275  42S 144 102 156 -1.3 -5.8 -0.4-3.8 .272  -62.5      3 45 26.1  24  2  7 354.11010.8
     76145 is triple: AB 8.1 13.6 123" 356.9, dT = -380sec : AC 8.1 15.0 139" 136.9, dT = +507sec
   Distance of 76145 to Terminator = 11.3"; to 3km sunlit peak = 2.8"
25 Dec  4  3 45  6.3 d   76167SK2  7.6  7.0S  99+ 167     26 276  80S 106  64 118 -1.3 -5.8 +0.1-1.8 .541  -24.3      3 46 13.7  24 11 48 354.21019.3
     76167 is triple: CD 7.7 12.9 18.3"   4.5, dT = -7sec : C,AB 7.7 8.1 39" 128.4, dT = +67sec
     76167 = NSV 15768, 7.7,
25 Dec  4  3 46 11.5 d   76169pA3  8.1  7.9   99+ 167     26 277  79S 108  66 120 -1.3 -5.8 +0.1-1.9 .533  -26.1      3 46 16.0  24 11 24 354.21020.6
     76169 is triple: AB 8.1 9.4 1.1" 178.3, dT = +0.7sec : AB,C 8.1 7.7 39" 308.4, dT = -68sec
     76169 has been reported as non-instantaneous (S   437). Observations are highly desired
25 Dec  4  3 49 25.0 d     546pA0  7.3  7.3   99+ 167     26 277  89N  95  53 108 -1.3 -5.8 +0.2-1.5 .580  -13.4      3 46 27.3  24 15 18 354.31024.1
       546 is triple: Aa,Ab 7.3      0.20" 160.9, dT = +0.14sec : AB 7.3 14.8 119"  34.8, dT = +102sec
       546 is a close double. Observations are highly desired
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      day  Time     P   Star  Sp  Mag  Mag    % Elon Sun  Moon   CA   PA  VA  AA Libration   A   B   RV    Cct durn  R.A. (J2000)  Dec   Mdist   SV
 y   m  d  h  m   s       No  D    v    r V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o  "/s     o  sec  h  m   s    o  m  s   Mm   m/s

25 Dec  4  3 53 51.1 d     543pA0  6.4  6.4   99+ 167     25 278  24N  31 349  43 -1.2 -5.8 +0.8+0.4 .377   51.1      3 46  2.9  24 31 40 354.31029.7
   R543 = 22 Tauri
       543 is triple: BC 6.4 15.1 52" 267.9, dT = -75sec : BA 6.4 5.8 150" 310.1, dT = +64sec
   Distance of 543 to Terminator = 4.2"; to 3km sunlit peak = 0.0"
25 Dec  4  4  2 33.5 R     537SB6  3.7  3.8s  99+ 167     23 280 -42S 229 187 241 -1.2 -5.8 +0.5-0.4 .508 -146.9      3 44 52.5  24  6 48 354.51041.7
   R537 = Electra = 17 Tauri
       537 is multiple: ** 3.9 7.5 0.20" 117.0, dT = +0.14sec : Aa,Ac 3.9 7.5 0.20"       : Aa,Ab 3.9 7.0 26.4"       : AB 3.7 13.0 98" 144.0, dT = -18sec
       537 has been reported as non-instantaneous (OCc1693). Observations are highly desired
       537 = NSV 15755, 3.70, range 0.00, 1Kp, Type SPB, Period 1.1073 days
25 Dec  4  4 10 55.4 d     548pB9  6.8  6.8   99+ 167     23 281  35N  42   0  54 -1.2 -5.8 +0.5-0.2 .466   40.3      3 46 59.4  24 31 12 354.61049.7
       548 is quadruple: Aa,Ab 6.8 6.9 0.015" 244.9, dT = -0.03sec : AB 6.8 14.8 102" 299.3, dT = -48sec : AC 6.8 13.0 123" 190.1, dT = -224sec
       548 is a close double. Observations are highly desired
   Distance of 548 to Terminator = 8.0"; to 3km sunlit peak = 0.8"
25 Dec  4  4 12 31.3 r     539SB6  4.3  4.4s  99+ 167     22 282 -63N 303 262 316 -1.2 -5.8 -0.2-2.3 .460  138.7      3 45 12.5  24 28  2 354.61053.3
   R539 = Taygeta = 19 Tauri
       539 is multiple: Aa,Ab 4.6 6.1            : AB          0.018" 246.1, dT = -0.02sec : AC 4.3 14.0 53"  53.4, dT = +39sec : AB 4.3 11.0 72" 328.8, dT = -142s
       539 is a close double. Observations are highly desired
       539 = NSV 1264, 4.30, range 0.00, 1Kp, Type SPB, Period 1.5664 days
25 Dec  4  4 13  6.4 D     553pA0  6.8  6.8e  99+ 167     22 281  89N  95  54 108 -1.2 -5.8 +0.1-1.5 .596  -13.1      3 47 29.5  24 17 18 354.61052.0
       553 is double: AB 6.8 15.5 95"  16.7, dT = +31sec
       553 = V1229 Tau, 6.83 to 6.94, V, Type EA, Period 2.46113408 days, Phase  24%
25 Dec  4  4 18 34.0 D     549SA0  6.3  6.3   99+ 167     21 282  50S 137  96 149 -1.2 -5.8 -0.5-2.9 .354  -54.9      3 47 21.0  24  6 59 354.71059.1
   R549 = 24 Tauri
       549 is multiple: AB               109.9, dT = -25sec :  6.7 7.8            : BD 6.3 8.7 75" 305.1, dT = -208sec : BC 6.3 8.2 86" 345.0, dT = -215sec
   Distance of 549 to Terminator = 13.6"; to 3km sunlit peak = 4.3"
25 Dec  4  4 23 42.6 D     552SB7  2.9  2.9s  99+ 167     21 283  44S 143 102 155 -1.2 -5.8 -0.6-3.3 .303  -60.7      3 47 29.1  24  6 18 354.81065.3
   R552 = Alcyone = eta Tauri
       552 is multiple: Aa,Ab 3.0 4.6            : AB     1.6 0.031" 207.1, dT = +0.04sec : AE 2.8 15.0 78" 232.5, dT = +2.5sec : AB 2.8 6.3 118" 291.1, dT = -329s
       552 is a close double. Observations are highly desired
       552 = NSV 15775, 2.87, range 0.00, 1Kp, Type ROT+SPB, Period 2.2925 days
   Distance of 552 to Terminator = 11.2"; to 3km sunlit peak = 2.7"
25 Dec  4  4 30 37.5 r     541SB8  3.9  3.9s  99+ 167     20 285 -89S 276 235 288 -1.2 -5.8 +0.0-1.5 .607  166.3      3 45 49.6  24 22  4 354.91075.2
   R541 = Maia = 20 Tauri
       541 is quadruple: Aa,Ab 4.4 5.4            : AB 3.8 13.7 113"  72.6, dT = +171sec : AB 3.8 13.7 113"  72.7, dT = +172sec
       541 = NSV 1279, 3.87, range 0.00, 4Kp, Type ACV, Period 10.288 days
25 Dec  4  4 35 25.2 d     557pA1  7.0  6.9   99+ 167     19 285  83N  90  49 102 -1.2 -5.7 +0.0-1.4 .621   -7.5      3 48 30.1  24 20 44 354.91078.7
       557 is quadruple: Aa,Ab 7.2 8.5 0.20" 239.0, dT = -0.28sec : Aa,Ab 7.2 8.5 0.20" 239.0, dT = -0.28sec : AB 7.0 15.0 72" 217.0, dT = -69sec
       557 is a close double. Observations are highly desired
25 Dec  4  4 50  5.9 R     552SB7  2.9  2.9s  99+ 167     17 288 -15S 202 162 214 -1.2 -5.7 +0.8+0.7 .312 -119.3      3 47 29.1  24  6 18 355.21098.0
   R552 = Alcyone = eta Tauri
       552 is multiple: Aa,Ab 3.0 4.6            : AB     1.6 0.031" 207.1, dT = -0.1sec : AE 2.8 15.0 78" 232.5, dT = -216sec : AB 2.8 6.3 118" 291.1, dT = -5sec
       552 is a close double. Observations are highly desired
       552 = NSV 15775, 2.87, range 0.00, 1Kp, Type ROT+SPB, Period 2.2925 days
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      day  Time     P   Star  Sp  Mag  Mag    % Elon Sun  Moon   CA   PA  VA  AA Libration    A    B    RV    Cct durn  R.A. (J2000)  Dec   Mdist   SV
 y   m  d  h  m   s       No  D    v    r V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o  "/s     o  sec  h  m   s    o  m  s   Mm   m/s

25 Dec  4  4 52 31.3 d   76234pA0  7.5  7.5   99+ 168     17 288  77N  84  44  97 -1.2 -5.7 +0.0-1.2 .638   -1.8      3 49 16.8  24 23 46 355.21099.2
     76234 is multiple: BC 7.5 11.9 70"  12.8, dT = +34sec : BD 7.5 12.1 81" 242.2, dT = -117sec : BA 7.5 6.6 87" 129.1, dT = +98sec : BI 7.5 14.5 147'
25 Dec  4  4 54 11.9 D     562pB9  6.6  6.6   99+ 168     17 289  81N  88  48 100 -1.2 -5.7 -0.1-1.3 .636   -5.3      3 49 21.8  24 22 51 355.21101.2
       562 is multiple: Aa,Ab 7.3 7.4 5.2"       : AB 6.6 7.5 87" 309.1, dT = -104sec : AE 6.6 13.8 115"  82.8, dT = +180sec : AG 6.6 15.1 158" 212.2,
       562 is a close double. Observations are highly desired
25 Dec  4  5  4 46.2 D     561SB7  5.1  5.1V  99+ 168     15 290  35S 153 113 165 -1.2 -5.7 -1.2-4.0 .222  -69.9      3 49 11.2  24  8 12 355.41114.5
   R561 = Pleione = 28 BU Tauri
       561 is multiple: Aa,Ab 5.1      0.20"  55.0, dT = -0.12sec : AF 5.0 14.5 4.7" 221.0, dT = +8sec : AE 5.1 14.8 96"  76.8, dT = +105sec : AD 5.1 1
       561 is a close double. Observations are highly desired
       561 = BU Tau, 4.83 to 5.38, V, Type GCAS+LERI|S, Period 12630. days, Phase  51%
   Distance of 561 to Terminator = 7.2"; to 3km sunlit peak = 0.4"
25 Dec  4  5 15 27   Gr     561SB7  5.1  5.1V  99+ 168     12 ** GRAZE: CA 14.7S; Dist.141km in az. 216deg. [Lat = 50.44-0.44(E.Long-5.00)]
   Distance of 561 to Terminator = 2.0"; to 3km sunlit peak = 0.0"
25 Dec  5  3 59 38   Gr     732pK3  7.5  6.8  100- 175     35 ** GRAZE: CA 70.5S; Dist.144km in az. 211deg. [Lat = 50.48-0.37(E.Long-5.00)]
   Distance of 732 to Terminator = 3.3"; to 3km sunlit peak = 0.0"
25 Dec  5 19  4 28.9 r   77379 A   8.3  8.1v  99- 167     27  80  80S 240 283 242 +3.7 -5.7 -0.1+1.8 .566 -157.9      5 40 32.5  27 26 34 355.81054.8
     77379 = V1164 Tau, 8.18 to 8.48, V, Type GCAS
25 Dec  5 19 38  0.4 r   77415cB9  8.3  8.2   99- 167     33  85  40N 301 345 302 +3.7 -5.7 +0.7+0.7 .463  141.7      5 42  2.6  27 46 15 355.31015.2
     77415 is double: ** 9.3 9.3 0.10" 135.0, dT = +0.21sec
     77415 has been reported as non-instantaneous (OCc 738). Observations are highly desired
   Distance of 77415 to Terminator = 10.6"; to 3km sunlit peak = 2.3"
25 Dec  5 20 36  8.3 R     868SA0  7.5  7.5   99- 166     41  97  65N 276 320 278 +3.7 -5.8 +0.7+1.2 .537  166.6      5 44 21.2  27 43 53 354.7 949.8
       868 is triple: AB 7.5 9.8 8.6" 254.1, dT = -15sec : AC 7.5 12.7 47"  40.4, dT = +50sec
       868 is a close double. Observations are highly desired
25 Dec  5 21 57 35.8 r   77563 A3  8.2  8.0   98- 165     53 116  77S 239 278 241 +3.7 -5.8 +0.8+2.0 .459 -154.5      5 47 45.2  27 38  9 354.0 873.4
25 Dec  5 22 33 13.6 R   77604 K0  7.0  6.2   98- 165     57 126  43S 206 240 207 +3.7 -5.8 +0.5+4.2 .245 -119.7      5 49 38.1  27 33  3 353.8 848.1
   Distance of 77604 to Terminator = 15.0"; to 3km sunlit peak = 5.1"
25 Dec  5 22 45 14   Gr  77619 F2  7.1  6.9   98- 165     58 ** GRAZE: CA 14.2S; Dist.172km in az. 344deg. [Lat = 53.61+0.18(E.Long-5.00)]
   Distance of 77619 to Terminator = 2.9"; to 3km sunlit peak = 0.0"
25 Dec  5 23 20  9.8 R   77621 M3  7.5  6.6s  98- 165     62 144  77S 240 265 241 +3.6 -5.8 +1.2+1.7 .426 -152.5      5 50 48.2  27 41  9 353.6 823.2
     77621 = NSV 16688, 7.47, range 0.02, 6V, Type VAR, Period 4.88496 days
25 Dec  5 23 24 42.4 R     885wG7  5.6  5.1   98- 165     63 145  43N 300 324 301 +3.6 -5.8 +1.5-0.7 .406  147.9      5 50 58.1  27 58  4 353.6 821.5
       885 is double: AB 5.7 12.5 10.8" 233.1, dT = -10sec
   Distance of 885 to Terminator = 15.4"; to 3km sunlit peak = 5.4"
25 Dec  5 23 37 14.2 D     890cA0  4.6  4.6s  98- 165     63 150 -22S 141 161 142 +3.6 -5.8 +1.6-2.1 .292  -52.2      5 53 19.6  27 36 44 353.6 817.3
   R890 = 136 Tauri
       890 is double: ** 4.8 6.3 0.050" 270.0, dT = -0.11sec
       890 has been reported as non-instantaneous (OCc 206). Observations are highly desired
       890 = NSV 2696, 4.50 to 4.61, V
25 Dec  5 23 48 54.9 r   77639 K0  8.3  7.7   98- 165     65 157  71N 272 288 273 +3.6 -5.8 +1.4+0.3 .474  177.0      5 51 40.2  27 50 31 353.5 813.8
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      day  Time      P   Star  Sp  Mag  Mag    % Elon Sun  Moon   CA   PA  VA  AA Libration    A    B   RV    Cct durn  R.A. (J2000)   Dec    Mdist   SV
 y   m  d  h  m    s       No  D    v    r V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o  "/s     o  sec  h  m   s     o  m  s    Mm   m/s

25 Dec  6  0 21 51.4 R     890cA0  4.6  4.6s  98- 164     66 173  55S 218 223 219 +3.5 -5.8 +1.4+2.8 .289 -127.8      5 53 19.6  27 36 44 353.5 808.5
   R890 = 136 Tauri
       890 is double: ** 4.8 6.3 0.050" 270.0, dT = -0.11sec
       890 has been reported as non-instantaneous (OCc 206). Observations are highly desired
       890 = NSV 2696, 4.50 to 4.61, V
25 Dec  6  1 39  7.4 R   77724 B1  7.0  7.0   98- 164     63 212  86S 251 229 251 +3.4 -5.8 +1.4+0.2 .439 -156.7      5 55 40.3  27 42 56 353.8 820.0
25 Dec  6  2 11  4.9 r   77752 K2  8.8  8.3   98- 164     60 225  63S 228 199 229 +3.4 -5.8 +1.6+1.2 .330 -132.8      5 57  5.0  27 36  3 354.1 834.0
25 Dec  6  3  5 16.9 r   77798 B9  8.5  8.5   98- 163     54 242  77S 243 205 243 +3.4 -5.7 +1.3-0.1 .417 -145.6      5 58 54.5  27 36 42 354.6 869.3
25 Dec  6  3  6 19.2 R   77804 A0  7.3  7.1   98- 163     53 243  65S 231 193 231 +3.4 -5.7 +1.5+0.5 .350 -133.7      5 59  5.6  27 33 43 354.6 870.0
25 Dec  6  3  9 48.6 r   77806 A0  8.6  8.6   98- 163     53 244  69S 235 196 235 +3.4 -5.7 +1.4+0.3 .375 -137.6      5 59 10.5  27 34 25 354.6 872.8
25 Dec  6  4  0 49.4 R     909SB9  6.0  5.9s  98- 163     46 256  82S 249 206 249 +3.3 -5.7 +1.1-0.6 .462 -150.1      6  1  0.5  27 34 21 355.2 917.8
       909 is triple: Aa,Ab 6.1 9.2      194.0, dT = 0.00sec : AB 6.1 12.4 9.5" 242.3, dT = -20sec
       909 is a close double. Observations are highly desired
       909 = NSV 16751, 6.04, range 0.01, 2V, Type VAR, Period 9.26012 days
25 Dec  6  5 15 57.4 R   77909wA0  7.6  7.6   98- 162     35 272  77N 271 226 270 +3.3 -5.6 +0.4-1.4 .571 -171.3      6  4  1.0  27 34 14 356.4 997.6
     77909 is double: AB 7.6 10.8 21.6" 132.5, dT = +28sec
25 Dec  6  6 44 14.1 r     927 G0  8.0  7.7   97- 162  -7 22 287  78N 272 230 271 +3.4 -5.4 +0.0-1.4 .628 -172.1      6  7 59.1  27 25 42 357.81101.3
25 Dec  6 21 21 29.0 R   78853 A0  7.7  7.7   94- 152     37  93  52S 230 274 225 +5.7 -5.2 +0.2+2.6 .403 -138.1      6 54 29.2  26 31 51 358.8 942.5
25 Dec  6 22 44 28.6 r   78909 F8  8.9  8.6   94- 151     49 111  41N 318 358 313 +5.7 -5.2 +1.3-0.7 .363  136.9      6 57 48.5  26 52 26 358.0 863.6
25 Dec  6 22 55 42.2 r   78914 K2  8.6  8.0   94- 151     51 115  72S 251 290 246 +5.7 -5.2 +0.9+1.8 .449 -155.8      6 57 53.2  26 34  8 358.0 854.8
25 Dec  6 23 17  0.0 r   78940 K8  8.9  8.0   94- 151     53 120  30S 210 246 204 +5.7 -5.2 +0.6+5.3 .193 -113.5      6 59 13.5  26 24  6 357.9 840.0
25 Dec  6 23 42  8.2 R   78957 G8  7.5  7.0   94- 151     57 128  22N 337  10 332 +5.6 -5.2 +1.5-2.9 .236  119.8      7  0 14.8  26 52 42 357.7 825.0
   Distance of 78957 to Terminator = 19.4"; to 3km sunlit peak = 7.4"
25 Dec  7  0 43 23.2 r   78983DB9  8.7  8.7   94- 151     63 152  85N 274 293 269 +5.5 -5.1 +1.4+0.3 .460 -174.5      7  1 36.1  26 34 25 357.6 802.1
     78983 is double: AB 8.7 10.0 2.3" 272.1, dT = -5sec
     78983 is a close double. Observations are highly desired
25 Dec  7  0 55  8.2 r   78988dM0  8.8  8.1   93- 150     63 157  78N 282 297 276 +5.5 -5.1 +1.4-0.1 .461  178.4      7  2  1.5  26 35 41 357.6 800.1
     78988 is double: AB 8.7 10.0 2.3" 272.1, dT = -5sec
     78988 is a close double. Observations are highly desired
25 Dec  7  2  0 25.7 r   79032 G5  8.4  7.9   93- 150     64 190  71S 251 244 245 +5.4 -5.1 +1.6+0.6 .393 -148.1      7  4 15.8  26 20 52 357.8 802.5
25 Dec  7  4 45 50.1 r   79128 A0  9.0  9.0   93- 149     48 250  63N 298 258 292 +5.2 -4.9 +0.6-1.8 .509  169.2      7 10  5.1  26 12 25 359.3 902.3
25 Dec  7  5 57 45.7 R    1094 A0  7.1  7.1   93- 148     37 265  60S 242 199 235 +5.2 -4.7 +1.0-0.7 .387 -134.0      7 12 49.4  25 44 55 360.5 975.0
   R1094 = 49 Geminorum
25 Dec  7  6 52 44.1 r   79206cF8  8.5       92- 148  -6 29 276  57N 306 263 299 +5.2 -4.6 +0.0-1.9 .562  161.9      7 15  7.9  25 52 49 361.41036.9
     79206 is double: AB 9.43 8.84 0.53" 309.0, dT = -0.9sec
     79206 is a close double. Observations are highly desired
25 Dec  7 20 13 44    r    1195 B8  6.8  6.9   88- 139     16  72   9S 197 237 187 +7.2 -4.1 -3.0+8.9 .088  -98.4      7 56  6.5  23 37 26 365.71064.3
   Distance of 1195 to Terminator = 8.5"; to 3km sunlit peak = 0.0"
25 Dec  7 20 25 37.5 r   79804cG0  7.4       88- 139     18  74  42S 230 270 220 +7.2 -4.2 -0.5+2.6 .391 -131.3      7 56  2.8  23 41 33 365.51049.8
     79804 is double: AB 7.90 8.57 0.11"  99.5, dT = +0.19sec
     79804 is a close double. Observations are highly desired
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      day  Time      P   Star  Sp  Mag  Mag     % Elon Sun  Moon   CA   PA  VA  AA Libration    A   B   RV    Cct durn  R.A. (J2000)   Dec    Mdist   SV
 y   m  d  h  m    s        No  D    v    r V  ill     Alt Alt Az   o    o   o   o   L    B   m/o m/o "/s      o  sec  h  m    s    o  m  s     Mm   m/s

25 Dec  7 22 34 16.7 R   79868DK0  7.4        87- 138     37  98  35N 333  15 322 +7.3 -4.2 +1.1-1.1 .317  128.3      8  1 30.3  23 54 46  364.1 903.9
     79868 is double: AB 7.43 10.98 1.30" 168.9, dT = +4sec
     79868 is a close double. Observations are highly desired
25 Dec  7 22 37 16.9 R    1208DK1  6.4        87- 138     37  99  65S 253 295 242 +7.3 -4.2 +0.6+2.0 .447 -151.3      8  1  0.8  23 34 59  364.1 900.8
     1208 is double: AB 6.48 9.95 1.95" 325.2, dT = -1.3sec
     1208 is a close double. Observations are highly desired
25 Dec  8  0  1 52.5 r   79906 K2  8.7  8.1   87- 137     49 119  60S 248 285 237 +7.2 -4.1 +1.1+2.1 .379 -143.5      8  3 58.9  23 24 21  363.5 830.7
25 Dec  8  0 25 17.2 r   79917 G5  8.4  7.9   87- 137     52 125  65N 304 338 293 +7.1 -4.1 +1.2-0.3 .440  161.6      8  4 52.2  23 36 49  363.4 816.8
25 Dec  8  3 23 24   Gr  79997 K0  8.0  7.3   86- 136     58 ** GRAZE: CA 13.2S; Dist.162km in az.  31deg. [Lat = 53.70-0.37(E.Long-5.00)]
25 Dec  8  3 25 29   M   79997 K0  8.0  7.3   86- 136     60 199  14S 203 190 192 +6.8 -3.9 +9.9+9.9 .000  -90.0      8 10 54.7  22 43 43  363.6 803.2
25 Dec  8  6 10  9   m   80054 F8  8.4  8.1   85- 135     41 252  15S 205 166 193 +6.6 -3.6 +9.9+9.9 .000  -90.0      8 16  5.0  22 10 15  365.6 919.1
25 Dec  8 23 44 19.2 r   98297 K2  8.5  7.8   78- 124     35 105  64S 259 298 244 +8.2 -2.9 +0.7+1.9 .416 -149.1      9  1 26.9  19  2 14  370.6 870.9
25 Dec  9  0 25 38.4 r   98314p    8.9  7.9   78- 124     41 114  58N 317 354 302 +8.2 -2.8 +1.0-0.4 .421  154.5      9  3  4.9  19 10 16  370.3 837.3
     98314 is double: ** 9.7 9.7 0.25"  98.0, dT = +0.46sec
     98314 has been reported as non-instantaneous (OCc1077). Observations are highly desired
25 Dec  9  0 40  3   Gr  98329kG5  8.5  8.0   78- 124     43 ** GRAZE: CA  6.9S; Dist. 12km in az. 185deg. [Lat = 51.89-0.05(E.Long-5.00)]
25 Dec  9  0 44 38   r   98329kG5  8.5  8.0   78- 124     43 119  13S 209 243 193 +8.1 -2.8 +9.9+9.9 .051  -96.4      9  3 52.5  18 41  9  370.2 824.8
25 Dec  9  1 42 35.4 r   98349     8.7  7.9   78- 123     50 136  56N 319 346 304 +8.0 -2.8 +1.1-0.9 .404  155.7      9  5 22.5  18 56 59  369.9 794.2
25 Dec  9  1 58 10.1 r   98351     8.7  7.9   77- 123     52 141  85S 281 305 265 +8.0 -2.7 +1.4+0.4 .425 -165.2      9  5 26.5  18 44 51  369.9 788.9
25 Dec  9  5 48  0.0 R    1370WA0  6.9  6.8   76- 122     48 229  67N 310 281 294 +7.6 -2.3 +0.8-1.8 .463  171.1      9 11 56.9  18  2 39  371.2 843.4
   R1370 = 80 Cancri
     1370 is double: AB 6.9 9.5 128" 253.1, dT = -152sec
25 Dec 10  1 36 39.2 R    1463 K0  8.2  7.7   68- 111     39 123  52N 328 360 309 +8.5 -1.3 +0.9-0.9 .387  150.5      9 57 52.6  13 36 26  377.1 813.4
25 Dec 10  4 34 40.6 r   98909 K2  8.9  8.3   67- 110     51 183  65N 315 313 296 +8.1 -1.0 +1.1-1.4 .417  169.7     10  2  6.8  12 54  4  377.0 774.8
25 Dec 10  7 31 50.6 D    1487SB7  1.4  1.4s  66- 109  -1 36 239 -71N  92  59  73 +7.8 -0.7 +1.1-1.5 .398   32.2     10  8 22.3  11 58  2  379.0 864.2
   R1487 = Regulus = alpha Leonis
     1487 is triple: AB 1.4 8.2 176" 308.0, dT = -356sec : AD 1.4 12.1 193" 274.0, dT = -484sec
     1487 = NSV 4750, 1.33 to 1.40, V
25 Dec 10  8 27 23.3 R    1487SB7  1.4  1.4s  66- 108   5 28 252  46N 335 298 315 +7.7 -0.6 +0.1-2.2 .420  147.7     10  8 22.3  11 58  2  379.9 914.8
   R1487 = Regulus = alpha Leonis
     1487 is triple: AB 1.4 8.2 176" 308.0, dT = -374sec : AD 1.4 12.1 193" 274.0, dT = -225sec
     1487 = NSV 4750, 1.33 to 1.40, V
25 Dec 11  1 32  0.1 R  118479kK0  7.6  7.0   58-  99     28 116  52S 255 289 234 +8.5 +0.2 +1.1+2.5 .314 -133.8     10 45 33.7   7 30 51  384.4 844.4
25 Dec 11  3 28 15.6 r  118507 K5  8.9  8.3   57-  98     40 146  41S 243 263 222 +8.2 +0.3 +2.5+3.1 .195 -117.9     10 48 28.7   7  0 37  383.7 776.5
25 Dec 11  3 37  1.7 r X 16210DF0  8.8  8.6   57-  98     41 149  41S 243 262 222 +8.2 +0.4 +2.6+3.1 .192 -117.5     10 48 40.8   6 58 28  383.7 773.5
   X 16210 is double:  8.8 9.9 4.3"  77.5, dT = +22sec
   X 16210 is a close double. Observations are highly desired
25 Dec 11  5 10 55.8 r  118527 A0  8.9  8.9   56-  97     45 180  76N 306 306 285 +8.0 +0.5 +1.2-1.0 .410 -178.7     10 50 51.0   6 51 45  383.8 762.4
25 Dec 11  5 29 11.1 R    1579kA0  8.3  8.2   56-  97     45 186  83N 300 296 279 +7.9 +0.6 +1.3-1.0 .407 -172.3     10 51 11.3   6 45 48  383.8 764.5
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y	m	day d	Time h	m	s	P	Star No	Sp D	Mag v	Mag r	V	% ill	Elon	Sun Alt	Moon Alt	Moon Az	CA o	PA o	VA o	AA o	Libration L	Libration B	A m/o	B m/o	RV "/s	Cct durn o	Cct durn sec	R.A. (J2000) h	R.A. (J2000) m	R.A. (J2000) s	Dec o	Dec m	Dec s	Mdist Mm	SV m/s
25	Dec	11	7	41	51.8	d	1589	pM5	5.9	5.3	v	56-	96	0	35	226	-42N	64	38	43	+7.6	+0.8	+2.2	-0.6	.207	61.7		10	56	1.5	6	11	7	385.2	816.7
R1589 = 56 Leonis (VY)																																			
1589 is double: 6.2 7.1																																			
1589 = VY Leo, 5.69 to 6.03, V, Type SR, Period 46.34 days, Phase 20%																																			
25	Dec	11	8	15	19.8	r	1589	pM5	5.9	5.3	v	55-	96	4	31	235	16N	7	336	346	+7.5	+0.9	-0.5	-2.8	.213	118.2		10	56	1.5	6	11	7	385.7	840.9
R1589 = 56 Leonis (VY)																																			
1589 is double: 6.2 7.1																																			
1589 = VY Leo, 5.69 to 6.03, V, Type SR, Period 46.34 days, Phase 20%																																			
25	Dec	12	2	41	1.0	r	118912	kF8	8.5	8.2	v	47-	87		26	125	64S	267	297	245	+7.8	+1.7	+1.2	+1.7	.345	-142.5		11	32	36.4	1	20	25	390.4	823.2
118912 = EPIC 201553491, 8.45, range 0.00, 2Kp, Type VAR, Period 1.973114 days																																			
25	Dec	12	2	59	23.1	r	118915	K0	8.4	7.8		47-	86		28	130	68S	272	300	250	+7.8	+1.7	+1.2	+1.4	.357	-146.6		11	33	2.2	1	17	9	390.3	810.3
25	Dec	12	5	29	37.8	r	118944	K5	8.7	7.9		46-	86		38	173	53S	256	260	234	+7.4	+2.0	+2.4	+0.9	.241	-127.3		11	36	20.4	0	35	49	389.9	751.8
25	Dec	13	2	35	33.9	R	138684	kK0	8.1	7.6		37-	75		15	118	75S	278	311	256	+7.0	+3.1	+0.7	+1.4	.404	-154.3		12	16	16.1	- 4	27	7	396.3	862.6
25	Dec	13	3	51	50	m	138705	wF5	8.7	8.4		37-	75		24	136	14S	216	242	194	+6.9	+3.2	+9.9	+9.9	.000	-90.0		12	18	24.0	- 5	1	54	395.6	802.8
138705 is double: AB 8.7 11.5 53" 281.0																																			
25	Dec	13	6	38	18.1	r	138732	K2	9.0	8.4		36-	74	-9	33	181	89N	294	293	272	+6.4	+3.5	+1.5	-0.6	.373	-165.4		12	21	39.0	- 5	22	49	395.2	738.7
25	Dec	16	5	43	19.9	R	2084	A3	6.5	6.4		12-	41		8	140	89N	283	308	266	+3.0	+6.4	+1.0	+1.1	.393	-162.6		14	34	50.7	-20	26	22	404.9	808.0