

RASC Double Star Observing Supplemental Information

Use this supplemental list to learn detailed information for each target including the magnitude of each star, the position angle of each pair in degrees, and the separation in arc-seconds.

Many "double stars" are in fact multi-star systems. Many of the targets in this programme are triples or have additional stars. While there are many beautiful pairs, there are an equal number of stunning, breath-taking triples and quadruples. This is part of what makes double star observing fun!

List Notes

Data from the Washington Double Star database and Stelle Doppie.

Pairs with separations less than 1.0 arc-second omitted.

Stars dimmer than magnitude 13.0 omitted.

The "PA" column shows the most recent position angle.

"Sep" column shows the most recent separation.

"M1" and "M2" columns show magnitudes of each star in the pair.

The other stars you may log, note, describe, and sketch, if inclined.

If "Pair" column is blank, there are only 2 stars in the system.

Bolded text indicates pair you must observe.

Position Angle or PA is taken from north, revolving through the east direction, which is 90 degrees, and continuing through south (180), west (270), and returning to north for a full 360.

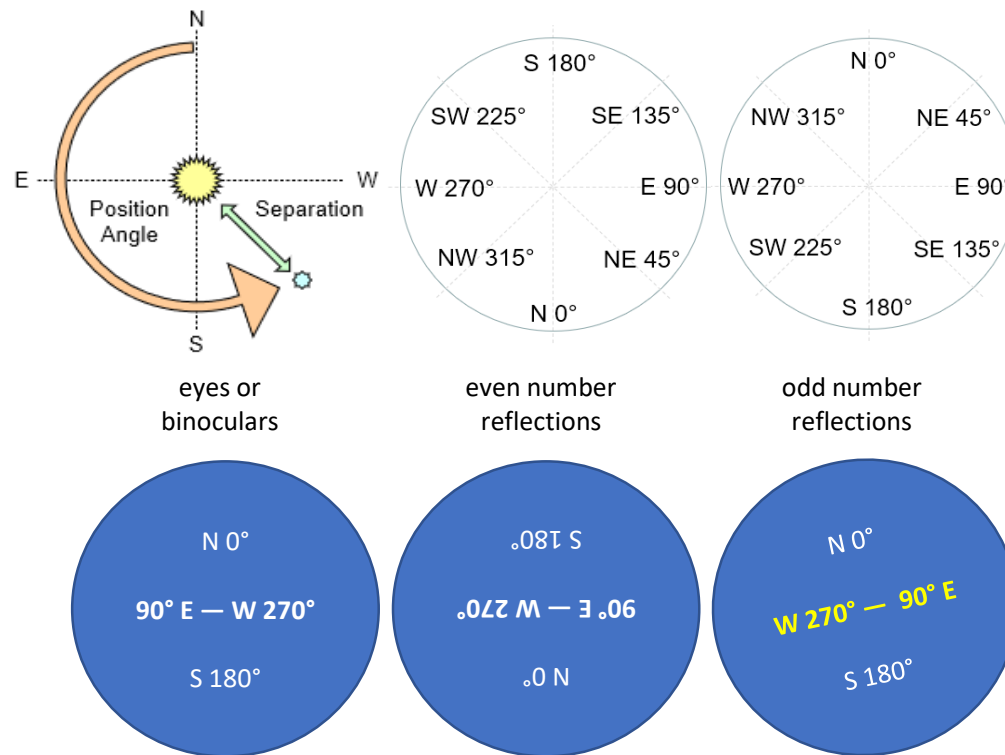
A telescope with an even number of reflections rotates the field. An odd number, flips east and west like looking in a mirror.

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To complete the program, you need to observe ALL 110 "target" pairs. You do NOT need to observe every pair on this list. Only the brightest or most obvious pair is required. **The target pair is noted on this list in bold.**

Example: Phi Tauri is a triple. Observe and log the A and B pair of stars. They are wide, about 49 arc-seconds apart, and at a position angle of 259° (that's nearly due west). A is bright at magnitude 5.1 and B is dimmer at mag 7.5.

The C star, on the other hand is mag 12.3, at PA 25°, and separated by 118". It's north-north-east and 2½ times the distance. You might need a 4 or 5-inch telescope or larger to spot the C star, assuming good sky conditions. It is an optional target.



Target	Parent	WDS	Pair	PA	Sep	M1	M2	Con	Notes	Type
WINTER (part 1)										
HD 21700	STFA 7	STFA 7	AB	234	44.1	7.4	7.8	Tau	Wide pair. Nearly equal. Oriented NE to SW. Yellow or orange and blue. Beside double HR 1065.	Physical
Phi Tau	SHJ 40	SHJ 40	AB	259	48.7	5.1	7.5	Tau	Widely separated. Intense colours, gold and blue. Unrelated bright orange-red star opposite B.	Optical
		WAL 29	AC	25	118.1	5.1	12.3		Very dim partner, NNE.	Uncertain
32 Eri	STF 470	STF 470	AB	349	6.9	4.8	5.9	Eri	Colourful pair, yellow and pale blue. Tight. May be called HR 1211 as opposed to HR 1212.	Uncertain
		STF 470	AC	5	164.7	4.8	10.5		Dim star beyond secondary, further north. Colourless.	Optical
Keid	STF 518	STF 518	AB	102	83.7	4.4	9.3	Eri	Very wide. Primary is orange or yellow. B is blue or red? B nearly due east.	Physical
		STF 518	AC	98	78.1	4.4	11.2		Another dim companion. C is very close to B, 9" apart! C north of B.	Physical
		STF 518	AD	38	481.4	4.4	12.6		Very faint and a long ways away. Looks like a field star. To the NE.	Optical
1 Cam	STF 550	STF 550	AB	309	10.4	5.8	6.8	Cam	A and B bright. B NW of A. Very tight. Both look blue-white. A showcase pair for many.	Uncertain
		STF 550	BC	217	150.9	6.8	11.4		C much dimmer and well away to the SW. Looks pale blue?	Optical
Beta Cam	S 459	S 459	AB	209	84.2	4.1	7.4	Cam	Wide pair. Yellow and deep blue. B to the SW. Lots of field stars.	Uncertain
		ES 58	BC	170	14.8	7.4	12.4		Interesting triple. Very dim. Close to B. In a hockey stick shape. C south of B.	Physical
Rho Ori	STF 654	STF 654	AB	65	6.4	4.6	8.5	Ori	Fantastic colours. Gold and deep blue. Quite tight. To the NE.	Uncertain
		STF 654	AC	157	183.4	4.6	11.4		90° to A and B. Very far away, 20 to 25 times!	Optical
Mintaka	BU 558	STFA 14	AC	4	56.2	2.4	6.8	Ori	Widely separated, very attractive. Primary is white, a little yellow. Next star medium blue.	Optical
HR 1887	STF 747	STF 747	AB	225	36.0	4.7	5.5	Ori	Very similar, pale yellow. Easily separated at 145x. Near Iota Orionis and Messier 42.	Physical
		CLL 22	AC	12	68.2	4.7	9.0		Faint companion to the N.	Physical
Trapezium	STF 748	STF 748	AB	32	8.8	6.6	7.5	Ori	The Trapezium in the middle of M42. Stunning. B is NNE of A. Both white. Some report diff. colours.	Uncertain
		STF 748	AC	132	12.8	6.6	5.1		A, B, C, and D are all fairly easy. C is SE of A.	Optical
		STF 748	AD	97	21.5	6.6	6.4		A, B, C, and D are all fairly easy. D is kitty-corner from and east of A.	Uncertain
		STF 748	AE	352	4.6	6.6	11.1		E and F get harder. Need good seeing. E is between A and B (but not in-line).	Uncertain
		STF 748	BF	154	20.5	7.5	11.5		And higher magnification. F is SE of C.	Uncertain
		MZA 16	CZ	338	6.5	5.1	12.7		Bonus points!	Uncertain
Beta Mon	STF 919	STF 919	AB	133	7.1	4.6	5.0	Mon	Same colour, white. Extremely tight. Bright. B a tiny bit dimmer than A. SE of A.	Uncertain
		STF 919	AC	125	9.8	4.6	5.4		At low power B is not round. B very tight to C. C slightly dimmer than B. SE of B.	Uncertain
		BU 570	AD	55	26.6	4.6	12.1		Four or five times the AB sep., to the NE, a right angle to A-B-C. Very faint, needs averted.	Uncertain
HD 34071	GAL 378	GAL 378		318	39.1	7.8	9.2	Lep	Yellow and orange. Nice. Primary is a K2 star. Near Mu Lep. Shown as single star in PSA.	Optical
Gamma Lep	H 6 40	H 6 40	AB	350	97.4	3.6	6.3	Lep	Colourful, unequal stars. Bright primary, yellow. Faint secondary, orange.	Physical
		H 5 50	BC	8	112.1	6.3	11.4		Faint distant companion to the N.	Optical
HD 51502	STTA 80	STTA 80	AB	53	124.1	7.3	7.4	Gem	Appears as a little triangle of stars in finder. Yellow primary, yellow secondary. To the NE.	Optical
		STTA 80	AC	112	81.2	7.3	8.4		The tertiary star was orange. To the SE. Neat! In a rich field.	Uncertain
		ARN 1	AD	286	86.3	7.3	10.3		Dim. Orange-red. To the W.	Optical
Mekbuda	SHJ 77	SHJ 77	AB	85	87.4	4.1	11.5	Gem	In an obvious triangle. Awesome. Light yellow primary. B dim to the E. In a neat field.	Uncertain
		SHJ 77	AC	347	100.2	4.1	7.7		Fairly bright star to N. A light yellow; B blue. At a 90° angle to A and B. Much brighter than B.	Optical
		SHJ 77	AD	354	67.8	4.1	12.5		Use averted vision. Between C and A stars.	Uncertain
HR 2764	HJ 3945	HJ 3945	AB	50	26.8	5.0	5.8	CMa	The Winter Albireo. Main star orangey. Companion is pale, sky blue. Wonderful sight.	Optical

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
WINTER (part 2)									
19 Lyn	STF1062	STF1062	AB	316	14.8	5.8	6.7	Lyn A, B, and D obvious in a flattened triangle. Primary is white; secondary blue? Oriented SE to NW.	Physical
		STF1062	AD	6	215.3	5.8	7.6	A, B, and D obvious in a flattened triangle. Bright. Well to the N.	Physical
		STF1062	BC	288	74.1	6.7	12.8	To the west. Dim!	Physical
HD 75353	STF1282	STF1282	AB	279	3.5	7.6	7.8	Lyn Equal, similar colours. Both white? Pleasing separation at 71x; tight at 54x. Many field stars.	Physical
		SLE1025	AC	10	49.4	7.5	12.4	Dim and distant. Nearly due N. Orange.	Physical
Alpha Lyn	STT 571	STT 571	AB	43	223.3	3.3	8.8	Lyn Great system. The BC pair was far away NE. Incredible orange and blue at low power.	Optical
		STF1342	BC	313	16.7	8.8	11.1	Faint. Use high power. Visible at low power in good seeing. Colourless. 90° to AB line.	Uncertain
HR 2910	H N 19	H N 19		117	9.6	5.8	5.9	Pup aka HR 2909. Cool! Car headlights. Nearly same brightness. Same light yellow colour.	Physical
2 Pup	STF1138	STF1138	AB	341	16.8	6.0	6.7	Pup To the N. Nearly equal colour. Yellow and blue. Nearly equal brightness. Not far from Messier 46.	Physical
		STF1138	AC	229	100.0	6.0	10.6	Dim and distant. To the SW. White.	Uncertain

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
SPRING (part 1)									
Tegmen	STF1196	STF1196	AB	8	1.1	5.3	6.3	Cnc or Tegmine. At high power, not round, a figure-8. Almost in-line with C. Split at 391x in 2012.	binary
		STF1196	AC	51	6.3	5.3	5.9	Pleasing at 52x. Main pale yellow colour, companion hint of orange? To the NE.	Physical
		STF1196	AD	107	275.6	4.9	8.9	Faint, well away to the E.	Optical
		ENH 1	AE	26	562.2	4.9	10.1	NNE, further away than D.	Optical
		ENH 1	AF	46	638.1	4.9	10.3	The faintest of all. East of the E star. aka TYC 01381-0323 1.	Optical
		ENH 1	AG	332	672.3	4.9	10.2	G is to the NW, at a right angle to E star, about the same distance that E was from A.	Optical
HR 3395	STF1245	STF1245	AB	25	10.1	6.0	7.2	Cnc Yellow and white. In middle of a triangle. B was roughly north.	Physical
		STF1245	AC	109	100.4	6.0	10.7	C was to the east, was dimmer than E. C looked red. Opposite D.	Optical
		STF1245	AD	292	110.3	6.0	11.9	Dim. Opposite C.	Optical
		STF1245	AE	207	114.8	6.0	9.6	Brighter than C. Blue. To the south.	Optical
		ANT 4	AG	211	120.5	6.0	12.3	The dimmest of all. Furthest out.	Uncertain
HD 75646	STTA 96	STTA 96	AB	312	50.0	7.7	8.5	Cnc Sparse field. Colourful. Bright primary SE, secondary NW. Lovely. A great system. Yellow-blue.	Optical
		STTA 96	AC	267	35.6	7.7	10.7	C is red. Very dim. W of A. At apex of right-angle bend, so B due north of C and A due east.	Uncertain
HD 73668	STF1255	STF1255	AB	30	26.0	7.3	8.6	Hya Near ε and ζ. Faint pair. Easy split at 62x. Yellow and orange. NE.	Physical
		STF1255	BD	22	71.5	8.6	12.6	Additional companion needs a bigger aperture. Beyond B star.	optical
Tau 1 Hya	HJ 1167	HJ 1167		4	67.5	4.6	7.3	Hya Pleasing warm yellow main star and pale orange companion. Widely separated at 110x.	Physical
HR 3963	BU 1072	BU 1072	AB	53	12.7	6.2	12.1	Hya "HR 3963 fun starhop from Alphard." Will need larger aperture for B star. East of the primary	Optical
		SHJ 110	AC	273	21.2	6.2	7.0	Wide pair at 48x. Blue or blue-white and orange. Faint. Oriented to the W.	Optical
HR 4363	STF1520	STF1520		344	12.4	6.5	7.8	UMa Slightly unequal intensities. Nice. Medium tight. Secondary orange and main yellow.	Physical
HD 100054	STF1544	STF1544		91	12.2	7.3	8.0	UMa Wide pair. Easy in big 'scope. Yellow and pale blue. Very similar brightness, B very slightly dimmer.	Uncertain
83 Leo	STF1540	STF1540	AB	150	28.4	6.6	7.5	Leo Bright stars. B SE. Easy split, tighter than Tau AB. West of Tau Leo. Both yellow. Two in the view.	Binary
		STF1540	AC	191	205.2	6.6	11.1	Faint and well away, 10x. To the S.	Optical
Tau Leo	STFA 19	STFA 19	AB	182	88.5	5.1	7.5	Leo Neat system. A yellow-white, B blue, much dimmer. South. Wide. Beside 83 Leo. Two in the view.	Optical
		STFA 19	AD	92	761.2	5.1	9.5	D, far afield east, very wide. Brighter than B! About 90° from AB angle. White, maybe blue white.	Optical

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
SPRING (part 2)									
HD 105590	STF1604	STF1604	AB	88	9.0	6.9	10.0	Crv Very cool. Tight. Equilateral triangle. B faint. Fantastic colours at 217x! Yellow and red. Sparse field.	Physical
		STF1604	AC	3	10.5	6.9	8.1	C, aka SAO 157112, is brighter than B. To the N. Fantastic colours again, A yellow; C blue.	Optical
Algorab	SHJ 145	SHJ 145	AB	215	24.0	3.0	8.5	Crv Contrasting brightness. Wide. Pretty at low power. Main is white or pale yellow. Companion: white.	Uncertain
HD 109556	STF1659	STF1659	AB	351	28.1	7.9	8.3	Crv Lots going on! A triad shape, close faint pair in the middle. A is to the south. Slightly warmer colour.	Physical
		STF1659	AC	69	43.8	7.9	10.9	Extremely faint, spotted at 139x. Right angle to A and B. Blue-white. Near HD 109875.	Uncertain
		STF1659	AD	32	189.8	7.9	9.9	D was very faint to the NE. Further out from A than E. Blue-white.	Optical
		STF1659	AE	275	151.2	7.9	6.8	West (opposite C, a right-angle again). Fairly bright. Tiny bit closer to A than the D star. Blue-white.	Optical
		STF1659	AF	139	209.4	7.9	6.6	F brightest of all the members, to the SE. Slightly further from A than D. Blue-white.	Optical
2 CVn	STF1622	STF1622		260	12.1	5.9	8.7	CVn Colourful pair. Orange and blue. Pleasingly close at 78x. Lovely.	Optical
Cor Caroli	STF1692	STF1692	AB	230	19.5	2.9	5.5	CVn Main very white blue, partner pale yellow green? Fairly close. Easy to separate at 40x Nice at 48x!	Physical
HR 4698	STF1633	STF1633		245	8.9	7.0	7.1	Com Not far from open cluster Collinder 256. WSW. Pale yellow, both.	Uncertain
12 Com	SHJ 143	SHJ 143	AB	57	36.7	4.9	11.8	Com Fainter than the eastern triangle stars including TYC 1989-0807 1. Shown as single star in PSA.	Optical
		SHJ 143	AC	168	59.0	4.9	8.9	To the S. Wide pair, about double AB. Yellow and orange. Within open cluster Collinder 256.	Physical
		ARN 6	AD	132	213.1	4.9	10.1	A star further along, more to the east, making a hockey stick with A and C, same brightness as C.	Optical
24 Com	STF1657	STF1657		272	20.2	5.1	6.3	Com A nice wide colourful double. Yellow is the primary and white-blue is the secondary.	Physical
HD 110932	STF1678	STF1678		170	37.5	7.2	7.7	Com Nearly equal stars. Maybe orange. And white or yellow. Nice. Quite wide at 48x but attractive.	Optical
32 Com	STFA 23	STFA 23	AB	51	196.3	6.5	7.0	Com Extremely wide at medium power. 32-33 Com. Orange and blue. To the NE.	Optical
		STFA 23	AC	262	905.1	6.5	9.0	C star is dim grey or yellow. A and C might be opposite edges of field of view at very low power!	Optical
HD 112278	STF1689	STF1689		223	30.2	7.1	9.1	Vir In a hook shape of stars. Tight pair. Yellow-white and orange-red. Challenging. Near NGC 4762.	Optical
Asellus Tertius	STF1821	STF1821	AB	236	13.7	4.5	6.6	Boo Beside iota Boo. Two in the view. Nice double. Pale yellow and very pale blue?	Physical
Iota Boo	STFA 26	STFA 26	AB	33	38.9	4.8	7.4	Boo Beside kappa Boo. Two in the view. Main pale yellow; companion medium pale orange.	Physical
Delta Boo	STFA 27	STFA 27	AB	78	105.0	3.6	7.9	Boo Yellow and pale blue-green. Wide. Easy at 48x. ENE.	Physical
Alkalurops	STFA 28	STFA 28	AB	172	109.0	4.3	7.1	Boo At 54x, a wide pair. Primary pale yellow or white. Companion quite dim. White? South.	Physical
		STF1938	Ba,Bb	4	2.3	7.1	7.6	Split at 145x. Both white. Angle of tight pair almost same A and the pair.	Binary
HR 5397	SHJ 179	SHJ 179	AB	296	35.0	6.6	7.2	Lib NW. Nice. Nearly equal brightness. White or yellow and orange. Surrounded by doubles.	Physical
		BU 225	BC	91	1.2	7.2	8.4	Very tight. Large aperture and good seeing needed. C east of B.	Physical
Zuben Elgenubi	SHJ 186	SHJ 186	AB	314	231.1	2.7	5.2	Lib Use binoculars! Extremely wide. White, bright; pale orange. NW.	Physical
		AOT 53	AC	291	275.6	2.7	12.5	Even further away but so dim a telescope is needed. WNW.	Uncertain
HR 5816	STF1962	STF1962		190	11.7	6.4	6.5	Lib A nice pair in a 100mm at 55x. Pleasing, tight. Equally bright. Identical in colour: pale yellow.	Physical
HD 139691	HU 1167	HU 1167	AB	81	1.2	8.1	9.9	CrB Requires aperture greater than 90mm. Near Zeta 1 and 2 Coronae Borealis. E of A.	Binary
		STF1964	AC	90	14.5	8.1	8.1	Wide, equal brightness. Orange and blue. C is due E of A. Fainter than zeta CrB.	Physical
		STF1964	AD	84	15.1	8.1	9.0	Dim. C and D are inline and are very close to each other. Likely merged together.	Physical
HR 6043	STT 305	STT 305	AB	263	5.7	6.4	10.2	CrB B medium-bright star immediately west, very close, almost touching primary! Beige and pale blue.	Physical
Sigma CrB	STF2032	STF2032	AB	239	7.3	5.6	6.5	CrB Nice double star. Similar magnitudes. Pretty tight. White; pale orange. Oriented NE to SW.	Binary
		STF2032	AD	82	93.5	5.6	10.8	Faint. Very wide. Nearly due E of A.	Optical
		STF2032	AE	241	634.8	5.6	12.3	Dimmer. Extraordinarily wide. To the SW, beyond B.	Physical

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
SPRING (part 3)									
HD 144564	STF2007	STF2007	AB	322	37.5	6.9	8.0	Ser Colourful stars. A is yellow with a hint orange while B is white. B is NW. Nice triple. Interesting field.	Optical
		STF2007	AC	137	162.7	6.9	10.8 (Cap)	Wide pair, easily separated. Opposite B. The C attendant is in an arc of stars. Serpens Caput.	Optical
SUMMER (part 1)									
Xi Sco	STF1998	STF1998	AB	9	1.1	5.2	4.9	Sco Grafias. Very low through high power. AB is super-tight. Pale gold both. Big 'scope and 200x?	Binary
		STF1998	AC	43	7.5	5.2	7.3	Colourful stars. NE of A. Bright stars. C is easy split, at low power. C is orange.	Binary
Theta 1 Ser	STF2417	STF2417	AB	104	22.5	4.6	4.9	Ser aka Alya. Identical stars, like eyes. Tight. A nice double, white stars. Serpens Cauda. ESE.	Physical
		STF2417	AC	58	421.0	4.6	6.8	(Cau) Slightly fainter but much further out. NE. White and yellow.	Optical
Rasalgethi	STF2140	STF2140	AB	103	4.6	3.5	5.4	Her Lovely. A brilliant shimmering orange star with pale blue companion. Relatively tight at 217x.	Binary
		STF2140	AD	39	79.2	3.5	11.1	D obvious in good conditions. To the NE. White. Comparatively far away.	Optical
100 Her	STF2280	STF2280	AB	183	14.3	5.8	5.8	Her A and B are Identical. Exact same brightness and colour. Both white. South.	Optical
		STF2280	AC	127	79.9	5.9	11.8	Dim, to the SE, and about 5 times the AB separation.	Uncertain
17 Dra	STF2078	STF2078	AB	104	3.3	5.4	6.4	Dra Very tight. Switch from low power to high power. ESE. Both white.	Physical
		STFA 30	AC	193	90.0	5.4	5.5	16 and 17 Draconis might well be a binocular target. Similar colours and brightness. Nice. South.	Physical
		STFA 30	CD	123	123.9	5.5	11.2	Possible beyond the light grasp of binoculars or a small telescope. To the SE.	Optical
Kuma	STFA 35	STFA 35		311	62.1	4.9	4.9	Dra aka Dragon's Eyes. Wide. Same brightness. One is white; the other a hint of yellow. Very good.	Physical
Dsiban	STF2241	STF2241	AB	17	30.1	4.6	5.6	Dra Wide pair. Surprisingly. Main bright yellow; companion dark yellow or yellow with a hint of orange.	Binary
		STF2241	AC	107	78.1	4.6	11.1	Dim and twice the separation. Right angle. C is nearly due E of A.	Optical
41 Dra	STF2308	STF2308	AB	232	18.8	5.7	6.0	Dra Nice. Wide. Nearly equal colour and brightness. Not very colourful... SW.	Binary
		STF2308	AC	129	224.8	5.7	8.3	Wide pair, C is to the SE. Surprisingly close to Ursa Minor.	Optical
HR 7083	H 6 50	H 6 50	AB	358	24.8	6.2	12.5	Sct Dim close-in companion. Due N. Beside Wild Duck Cluster.	Uncertain
		H 6 50	AC	171	111.8	6.2	8.2	The stars looked yellow and blue. Wide. S.	Optical
Epsilon 1 Lyr	STF2382	STF2382	AB	345	2.3	5.2	6.1	Lyr Tight pair to the north. This pair is the same colour, white.	Binary
		STFA 37	AB,CD	172	209.5	4.7	4.6	The Double Double. Tim Horton Star! :-). Easy in binoculars. Can you see naked eye?! White.	Physical
		STF2383	CD	74	2.4	5.3	5.4	Tight pair to the south. Slightly different colours. Subtle. 90° angle to AB alignment.	binary
		STFA 37	AI	137	149.5	5.2	10.1	Faint. Bright, east of F. Easily seen at 226x. Pale yellow.	Optical
		SHJ 277	CF	0	93.3	4.6	12.7	Very faint. Between AB and CD. Closer to AB and eastward. Use averted. Pale yellow.	Uncertain
		STF2383	CE	334	63.2	5.3	12.3	Very faint. Between AB and CD. Westward. Brighter than F. Pale yellow.	Optical
Sheliak	STFA 39	STFA 39	AB	149	45.7	3.6	6.7	Lyr Close at 17x but wide at 71x. Primary brilliant white with hint of yellow. Secondary looks green.	Uncertain
		BU 293	AE	317	67.2	3.6	10.1	No trouble at 78x. Blue-white? To the NW.	Optical
		BU 293	AF	18	86.0	3.6	10.6	Blue-white? To the NE. This whole multi-star system is not far from the Ring Nebula.	Uncertain
HR 7140	STT 525	STT 525	AB	130	1.8	6.1	9.1	Lyr Very faint companion very close to the primary. Visible in large 'scope. Orange or yellow.	Uncertain
		SHJ 282	AC	350	45.4	6.1	7.6	Nice wide double. Classic colours: pale yellow and pale blue. Near the Ring Nebula. To the N.	Physical
		SHJ 282	AD	295	214.8	6.1	11.0	Very faint and far from primary. To the NW.	Optical
HR 7099	STF2404	STF2404		182	3.5	6.9	7.8	Aql Pretty. South. Yellow and orange at lower power. Interesting. Near open cluster NGC 6709.	Uncertain
15 Aql	SHJ 286	SHJ 286		211	39.6	5.5	7.0	Aql Very interesting pair. Hard to get colours. Bright one seemed a dark yellow; companion looks red.	Optical
57 Aql	STF2594	STF2594		171	35.7	5.7	6.4	Aql Nice pair. Almost equal in magnitude. The brighter one is a pale blue; fainter star is pale yellow.	Physical

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
SUMMER (part 2)									
HR 7294	STF2486	STF2486	AB	204	7.1	6.5	6.7	Cyg Two gold stars, equally coloured, equally bright. Easily split at 145x. Beside triple HR 7311.	Binary
		STF2486	AD	104	196.0	6.5	11.1	Very faint. Far away to the SE. May be referred to as HD 179957 and HR 7293.	Optical
HR 7529	STF2578	STF2578	AB	125	14.9	6.4	7.0	Cyg Nearly equal. White and orange. Almost east-west. Lots of faint stars. Attractive at 48x.	Optical
		STF2578	AC	356	44.3	6.4	12.5	The C and D stars popped at 226x. C to the north.	Uncertain
		STF2578	AD	70	95.0	6.4	12.4	The C and D stars popped at 226x. D to the NE.	Uncertain
		STF2578	AF	251	144.5	6.4	9.2	The curious star to the far west.	Optical
U Cyg	BLL 49	BLL 49		231	65.4	8.0	9.0	Cyg The A star is highly variable, may be dimmer than B. Pale orange and red. SW.	Optical
61 Cyg	STF2758	STF2758	AB	153	31.8	5.2	6.1	Cyg Close. SE. Both light gold. Almost equal brightness. B is slightly fainter than A. Pretty system.	Binary
		STF2758	AC	219	839.8	5.4	10.2	Ay carumba! Very wide. To the SW. Rich field. Surrounded by many faint stars.	Optical
		STF2758	AD	250	748.0	5.4	10.5	Use a detailed atlas or powerful software to identify field stars from official companions. Very wide.	Optical
		STF2758	AE	267	340.8	5.4	9.6	Use atlas or software to identify field stars from official companions. Very wide. Due W.	Optical
		STF2758	AF	240	371.2	5.4	11.3	Use atlas or software to identify field stars from official companions. Very wide. SW.	Optical
		STF2758	AG	236	260.4	5.4	11.3	Use atlas or software to identify field stars from official companions. Very wide. SW.	Optical
		STF2758	AH	268	117.5	5.4	10.0	Use atlas or software to identify field stars from official companions. Wide. W.	Optical
		SMR 1	AI	239	28.3	5.4	10.7	Use atlas or software to identify field stars from official companions. Close. SW.	Optical
		HZE 4	AJ	241	17.5	2.3	12.4	Use atlas or software to identify field stars from official companions. Tight. Faint. SW.	Uncertain
		SMR 40	AO	281	163.4	5.4	12.7	Use atlas or software to identify field stars from official companions. Wide. Faint. W.	Optical
		SMR 40	AP	285	159.6	5.4	12.8	Use atlas or software to identify field stars from official companions. Wide. Faint. W.	Optical
HD 200392	BU 69	BU 69	AC	241	74.6	8.4	8.0	Vul In a hockey stick, in the blade. Main was a touch brighter than B. Wide. WSW. White and orange.	Uncertain
HR 8101	STF2769	STF2769	AB	300	18.2	6.7	7.4	Vul Obvious. Bright star yellow. B blue? Nearly equal brightness. Oriented nearly perfectly east-west.	Physical
HD 183014	STF2523	STF2523	AB	148	6.4	8.0	8.1	Vul Nearly equal. Part of a triangle, at north apex. Very tight, blue-white stars. Near Coathanger.	Physical
		STF2523	AC	147	250.8	8.0	7.2	Very wide. SE. Similar brightness to AB.	Uncertain
		KRU 8	CD	139	10.5	7.2	12.8	Fantastic. Unequal stars in brightness and colour. White and orange. Classic! Near HLM 23.	Uncertain
V340 Sge	H N 84	H N 84		301	28.4	6.4	9.5	Sge WNW. Wide at 55x. Orange and blue. Or green? Unequal. Interesting. Near epsilon Sge.	Uncertain
Theta Sge	STF2637	STF2637	AB	332	11.6	6.6	8.9	Sge NNW. Tight. Primary yellow-white, partner orange-yellow. Interesting. Low and high power.	Physical
		STF2637	AC	222	91.3	6.6	7.5	C is yellow with a touch of orange. To the SW!	Optical
		STF2637	AD	226	172.8	6.6	11.9	Harder. Grey? D is beyond C. Surrounded by other doubles.	Optical
HR 8281	BU 1143	STF2816	AC	121	11.8	5.7	7.5	Cep Within open cluster IC 1396. In Elephant Trunk. Wow! White-yellow; companion SW yellow-orange.	Physical
		STF2816	AD	339	20.6	5.7	7.5	The companion to the north, D, the bright one, slightly further, is dull yellow.	Physical
HR 8357	STF2840	STF2840	AB	197	18.1	5.6	6.4	Cep SSW. Nearly equal brightness stars, whitish in colour. Near some close colourful stars.	Optical
Alkurhah	STF2863	STF2863	AB	274	8.4	4.5	6.4	Cep Tight. Main is light yellow. At low power partner looks blue. Pretty, near a loose gaggle of stars.	Binary
		STF2863	AC	206	109.5	4.5	12.6	Very faint start to the south-west, well away.	Optical
Delta Cep	STFA 58	STFA 58	AC	191	41.0	4.2	6.1	Cep S. Very wide pair, wide even at 36x. Yellow and blue. Assess variable brightness while here.	Physical
Kappa Cep	STF2675	STF2675	AB	120	7.3	4.4	8.3	Cep ESE. White and orange. Many magnitudes different. Very close together. A neat system!	Physical
		STF2675	AC	334	170.2	4.4	10.3	The C star is dimmer and to the north-west. Bluish.	Optical
Alpha 1 Cap	BU 295	HJ 607	AC	222	46.9	4.2	9.6	Cap C is south-west. Yellow-blue. Do not get distracted by binocular double with alpha 2.	Optical
Dabih	STFA 52	STFA 52	AB	267	205.4	3.2	6.1	Cap Use binoculars! Very wide. Bright yellow and bright blue stars. To the W.	Physical
		STFA 52	AC	133	226.1	3.2	8.8	Flanking. SE. Dark blue. They form an isosceles triangle.	Physical
Omicron Cap	SHJ 324	SHJ 324		239	21.9	5.9	6.7	Cap Two equal pale blue white stars. WSW.	Physical

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
SUMMER (part 3)									
HD 196411	STF2703	STF2703	AB	289	25.0	8.4	8.4	Del NW. A and B are blue-ish. Equal brightness. Faint. Near multi-star system Rotanev.	Uncertain
		STF2703	AC	234	77.8	8.4	8.8	Blue-ish. C slightly fainter than A and B. South-west of B.	Optical
		STF2703	AD	347	84.7	8.4	12.8	Very faint. Flanking, to the north.	Uncertain
Gamma 2 Del	STF2727	STF2727	AB	266	8.9	4.4	5.0	Del Bright yellow gold pair of stars, fairly tight at 77x. West.	binary
Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type
AUTUMN (part 1)									
3 Peg	STFA 56	STFA 56	AB	348	38.8	6.2	7.5	Peg NNW. White and orange. Equal. Stunning. Near a faint double. Two in the view.	Physical
Epsilon Equ	STF2737	STF2737	AC	67	10.6	5.3	7.1	Equ Easy in a large 'scope. C to the north-east. Bright yellow and light yellow. Hints of green?	Optical
8 Lac	STF2922	STF2922	AB	186	22.3	5.7	6.3	Lac Both white? Or pale yellow? B to the south. Slightly dimmer than A. Near double HR 8588.	Optical
		A 1469	AC	168	48.8	5.7	10.4	C was further south of B, slightly east, much dimmer. Orange!	Uncertain
		A 1469	AD	145	81.6	5.7	9.1	D was brighter than C, south-east of B, and blue.	Uncertain
		A 1469	AE	239	335.2	5.7	7.3	E, well away to the SW, pale orange, dimmer than B.	Optical
	COM 8	BF		175	127.6	6.3	11.0	Dimmer still. And well away from B, same direction, but not as far as E.	Uncertain
10 Lac	S 813	S 813	AB	47	62.6	4.8	10.3	Lac Bright star, blue-white. B might look purple!? B much fainter. Cool! Shown as single star in PSA.	Optical
WZ Cas	STTA254	STTA254	AB	89	57.8	7.4	8.3	Cas Incredible. Wide. A, orange, B, blue. In a rich field. May not be obvious. Due E.	Uncertain
		STTA254	AC	324	155.4	7.4	9.6	Forms a spire. Well away to the north-west. Fainter.	Uncertain
		STTA254	AD	118	181.4	7.4	10.4	Opposite C from the B star. Fainter still.	Optical
HR 9094	STF3053	STF3053	AB	70	15.0	6.0	7.2	Cas A little Albireo. Lovely light gold primary and a wide blue companion. Almost equal brightness. E.	Optical
		STF3053	AC	291	98.5	6.0	11.0	Much fainter and much further away. To the NW.	Uncertain
Achird	STF 60	STF 60	AB	326	13.4	3.5	7.4	Cas Wow! Burnt yellow and dull orange. Close, to the NW.	binary
		STF 60	AC	260	225.0	3.5	11.4	Faint and wide. Between B and G. Due W of A.	Optical
		STF 60	AD	354	189.4	3.5	12.8	D star to the N. Faint.	Optical
		STF 60	AE	126	75.6	3.5	10.2	E star to the south-east. Blue. In-line with A and B.	Optical
		STF 60	AF	276	378.3	3.5	11.5	To the west. Faint. Orange.	Optical
		STF 60	AG	259	419.7	3.5	9.5	G star to the west of A and south of F. White.	Optical
		STF 60	AH	355	701.1	3.5	8.4	H star far to the north.	Optical
		SMR 2	AI	73	90.3	3.5	11.6	Faint and wide. NE.	Optical
		SMR 2	AJ	262	237.1	3.5	12.3	Faint and wide.	Uncertain
Pi And	H 5 17	H 5 17	AB	174	35.8	4.4	7.1	And Wide, easy, low power. Nice yellow and blue. B south. Faint 3rd star. Shown as single star in PSA.	Physical
56 And	STFA 4	STFA 4	AB	298	202.5	5.8	6.1	And Equal in brightness. Citrus-orange and pale or straw-yellow. Binoculars? Near NGC 752.	Optical
		BU 1368	AC	79	18.4	5.8	11.9	Faint. Much closer. East.	Physical
		BU 1368	BD	258	204.4	6.1	9.8	Further out from B star. Nearly due W of B.	Optical
Almaak	STF 205	STF 205	AB	63	9.4	2.3	5.0	And A close pair of yellow (A) and blue (BC) stars, like a miniature Albireo. Beautiful.	Physical
59 And	STF 222	STF 222		36	16.5	6.1	6.7	And Wide pair. Yellow and blue. Wow. NE.	Physical
77 Psc	STF 90	STF 90	AB	84	32.7	6.4	7.3	Psc B is bright star to the east of A. Nearly the same magnitude. Wide. Yellow and pale yellow.	Physical

Target	Parent	WDS	Pair	PA	Sep	M1	M2	Notes	Type	
AUTUMN (part 2)										
Zeta Psc	STF 100	STF 100	AB	63	23.2	5.2	6.3	Psc	ENE. Bright stars. The main is yellow. The companion is slightly redder.	Physical
		BU 1029	BC	75	2.0	6.3	12.2		Very faint and very tight. E of B.	Uncertain
HD 3125	STF 39	STF 39	AC	45	20.1	7.1	8.7	Cet	Decent star hop from iota. White and orange. Very close! SW-NE. AB (WDS D 2) are <0.5".	Physical
		ALL 1	AD	159	200.8	7.1	10.0		Outlier. The D star was to the south-south-east. 10 times the AC sep. Slightly dimmer than C. Nice!	Optical
HD 9336	HJ 2052	HJ 2052		114	80.8	6.9	7.5	Cet	Equal. Wide. ESE. Yellow and blue.	Optical
Nu Cet	STF 281	STF 281		80	8.4	5.0	9.1	Cet	Bright primary and delicate dim star. B is east. Pale yellow and white.	Physical
66 Cet	STF 231	STF 231	AB	235	16.8	5.7	7.7	Cet	Interesting. Yellow and orange? Blue? delicate. Not far from Mira. SW.	Optical
		STF 231	AC	53	147.0	5.7	11.5		Faint star to the north-east.	Optical
Mesarthim	STF 180	STF 180	AB	2	7.4	4.5	4.6	Ari	Same magnitude and colour. Yellow-white. Easy to split at 52x. They look like moth eyes!	Physical
		STF 180	AC	81	216.8	4.5	8.6		Dim and very far away, to the east.	Optical
HD 13247	STF 219	STF 219		186	11.7	8.0	8.9	Tri	Faint. Interesting field stars. B is slightly dimmer and nearly due south. Pale blue both.	Physical
15 Tri	AG 304	AG 304		16	142.4	5.6	6.8	Tri	Amazing colours. Wide pair. NNE. Easy target in binoculars. Pale orange. B is aquamarine.	Uncertain
Polaris	STF 93	STF 93	AB	236	18.4	2.0	9.1	UMi	Yellow and blue and beautiful! SW.	Physical
Zeta Per	STF 464	STF 464	AB	209	12.9	2.9	9.2	Per	aka Atik. Tight. A is pale yellow. Near triple HD 24601.	Physical
		STF 464	AC	286	33.3	2.9	11.2		Faintest of all. NW.	Uncertain
		STF 464	AD	195	98.6	2.9	10.4		A pair, dim, to the south. D and E stars. D is closer. Hard to get colours, orange?	Optical
		STF 464	AE	186	120.0	2.9	10.0		A pair, dim, to the south. D and E stars. Hard to get colours, blue?	Physical
Miram	STF 307	STF 307	AB	301	28.7	3.8	8.5	Per	Miram. Light orange with blue-green. NW.	Uncertain
		STF 307	AC	269	64.0	3.8	11.6		Grey. To the W. Same distance as F.	Optical
		SHJ 34	AE	297	242.9	3.8	9.2		Blue-white. Beyond B. Well away	Optical
		WAL 19	AF	25	57.7	3.8	11.4		Dull yellow. Same distance as CD. Nearly due N.	Optical
		WRD 1	CD	116	5.2	11.6	12.7		Grey. Same distance as F. D is the "inner" star while C is the "outer."	Uncertain