

In 2 different recent NavList posts (by [Peter Hakel](#) and with the [initial reply by Frank E. Reed](#)) the issue of the proper motion of Multiple stars has been raised.

While earlier Star Catalogs such as [FK5](#) did publish the coordinates of some Multiple Stars GC's, most Current Star Catalogs, e.g. [HIPNEWCAT 2007](#) no longer list multiple Stars Systems Gravity Center proper motions, thus rendering accurate position determination of one specific component much more complicated than with the former catalogs.

2 relevant Celestial Navigation Stars fall in this category:

- **Rigil Kentaurus ( $\alpha_1$  Cent)** which apparently is a triple star system. And:
- **Sirius ( $\alpha_1$  CMa)** which looks like a double star system.

Nonetheless, 3 facts definitely mitigate this difficulty:

- By to-day standards, Celestial Navigation only requires quite low accuracy ephemeris i.e. +/- 0.1'. And:
- The **Sirius System GC** is found in the **FK5** while ( $\alpha_1$  CMa) is found in **HIPNEWCAT**. And also:
- The **Rigil Kentaurus System GC** is also found in the **FK5** while ( $\alpha_1$  Cent) is found in **HIPNEWCAT** as follows:

Names	Reference	Vr km/s	Parallax mas	Vis. Mag	Alpha h.ms	$\mu_a^*$ mas/yr	Delta d.ms	$\mu_d$ mas/yr
$\alpha$ CMa Sirius	<a href="#">FK5 G.C 257</a>			-1.46	06 45 08.871	-557.05	-16 42 57.99	-1205.3
	<a href="#">HIPNEWCAT #32349</a>	-7.6	379.21	-1.47	06 45 08.91728	-546.01	-16 42 58.0171	-1223.07
$\alpha$ Cen Rigil Kentaurus	<a href="#">FK5 G.C 538 A</a>	-22.2	742.2	-0.01	14h39m35s885	-3642.183	-60°50'07"44	699.3
	<a href="#">HIPNEWCAT #71683</a>	-24.6	754.81	-0.01	14 39 36.49400	-3679.25	-60 50 02.3737	473.67

A careful comparison between both catalogs led to use: the full [Sirius HIPNEWCAT data](#) which is quite close from the FK5 GC data, and the [Rigil Kentaurus FK5 Gravity Center](#). See the following results:

*Note: extra non-significant digits for more meaningful comparisons since some results fall very close to mid-intervals*

	01 Jan 1922 12:00 UT		01 Jan 1939 12:00 UT	
	Own Results SHA / Dec	<a href="#">Connaissance des Temps</a>	Own Results SHA / Dec	<a href="#">Connaissance des Temps</a>
Rigil Kent	141°25.670' / S 60°30.534'	141°25.512' / S 60°30.460'	141°08.274' / S 60°34.831'	141°08.263' / S 60°34.865'
Sirius	259°33.886' / S 16°36.641'	259°33.568' / S 16°36.698'	259°22.549' / S 16°37.997'	259°22.557' / S 16°38.047'
	01 Jan 1950 12:00 UT		01 Jan 1961 12:00 UT	
	Own Results SHA / Dec	Benchmark SHA / Dec	Own Results SHA / Dec	<a href="#">Ephémérides Nautiques</a>
Rigil Kent	140°57.773' / S 60°37.640'		140°46.189' / S 60°40.164'	140°46.2' / S 60°40.1'
Sirius	259°15.503' / S 16°38.634'		259°08.248' / S 16°39.835'	259°08.3' / S 16°39.8'
	01 Jan 1983 12:00 UT		01 Jan 2022 12:00 UT	
	Own Results SHA / Dec	<a href="#">UK/US Nautical Almanac</a>	Own Results SHA / Dec	<a href="#">Compact NAL</a>
Rigil Kent	140°24.103' / S 60°45.619'	140°24.0' / S 60°45.5'	139°44.017' / S 60°55.229'	139°44.0' / S 60°55.2'
Sirius	258°53.861' / S 16°41.538'	258°53.9' / S 16°41.6'	258°28.064' / S 16°44.814'	258°28.1' / S 16°44.8'
	01 Jan 2036 12:00 UT		01 Jan 2050 12:00 UT	
	Own Results SHA / Dec	Benchmark SHA / Dec	Own Results SHA / Dec	Benchmark SHA / Dec
Rigil Kent	139°29.123' / S 60°58.526'		131°14.125' / S 61°02.070'	
Sirius	258°18.725' / S 16°46.253'		258°09.163' / S 16°47.476'	

Even though the "Benchmarks" - and certainly the ones from **Connaissance des Temps** - apply to  $\alpha_1$  Cent itself and not to its System CG, the choice made here-above seems a correct one. It certainly has fulfilled Celestial Navigation requirements for the past 100 years. Hence it is likely to remain correct in this respect throughout the 21<sup>st</sup> Century.