Compass Check

Over the 2019/20 Christmas/New Year holiday period I treated myself to some books. HO200, HO214, Inmans, Davis and Burdwood to be precise. I wanted to make use of the books but did not want anything too complicated. I hit upon the idea of checking the compass on my phone using Burdwood.

As I got into the project I realised that I could do it the old fashioned way using EOT. This required Inmans, which hadn't arrived, for arc to time conversion. However I do have a copy of Raper (1906) which has a similar table.

Here is what I did. I rounded to the nearest minute if time. It may be pure luck that the numbers came out the way they did!!!!!

********** Measure Sun's Bearing **********

I placed my AH on the ground to provide a shadow, moved the phone in the recomended figure of eight motion and noted the sun's bearing with the app *GPS Test Plus.*

DR 41S 175E

Time 9/1/2019 1658 NZDST by wristwatch.
9/1/2019 0358 UT

Sun's bearing 246° M
Variation 22.3°E

Bearing 268° T or S 92 W

?????? S W According to Burdwood but my logic calls it N 92 W

********** Air Almanac 2020 **********

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Dec 22° 10.9'

GHA 235° 48.6'
+8min 2°
237° 48.6'

+Long 175° 00'
412° 48.6'
-360 52° 48.6'

Thus LHA = 52° 48.6'

Burdwood is entered with time in am/pm notation so from Raper (1906, 647)

	h	m	s	
50°	3	20		
2°	0	08		
49'		03	16	(rounding arc minutes)

Hence LAT = 3 hours 31 min PM (rounding to minutes of time)

********** 1904 almanac data **********

The only book I have with me is Burdwood 1914. My life depends on knowing the compass error to a few degrees. Fortunately Burdwood gives me a way of estimating the dec and LAT. EOT and dec are listed for 1904 and will be accurate every fourth year for 20 years. OK, 116 years (divisible by 4) have passed but my life depends on it…….....

For the 9th day of January dec = 22° 16'

The EOT is sub 6m 48s (assume that convention is to subtract the number to get apparent time)

GMT is 0358 so GAT is 0351. (rounding the numbers)

Now use the arc to time table in Raper to convert DR long to time.

170°	11	20
5°		20

So 175° = 11 hr 40 min

Now can calculate LAT

GAT	03	51
+ long	11	40

15hr 31min

Subtracting 12 hours gives LAT = 3hr 31min PM.

********** Extract azimuth from Burdwood **********

I am extremely stressed out and short on water so I want an azimuth as quickly as posible. Therefore I will not extrapolate as I take the numbers out.

	2020 data	1904 data
Dec	22° 10.9'	22° 16'
LAT	3hr 31min PM	3 hour 31min PM
DR lat	41S	41S
Azimuth	S96W	S96W

(Note: SW Burdwood; NW me)

********** Compass Error **********

Compass error	4°	4°

I have not specified + or - because there are probably two different conventions!

Maybe luck that the numbers are the same? I do not know!