Avg sights:

Moon (LL) $Alt_m = 54° 32.4'$ } corrected for IC

Sun (LL) $Alt_s = 38° 48.6'$ }

$LD_{obs} = 79° 10.3'$

Central time: 15:19:36

PRE-CLEARING

Quick Alt corrections:

sun (LL): $Alt_s = 38°48.6' + 12' = 39°00.6'$ $(39.01°)$

moon (LL): $Alt_m = 54°32.4' - 20' = 54°12.4'$ $(54.21°)$

$SD_s = 16.06'$

$HP = 54.57'$

$SD_m = 0.2724 * HP + 0.25' * \sin Alt_m$

$= 15.07$

near Lunar: $LD = LD_{obs} + SD_s + SD_m$

$= 79° 10.3' + 16.06' + 15.07$

pre-cleared $\boxed{LD_{pc} = 79° 41' \quad (79.63°)}$

CLEARING (Thomson-Bowditch "3rd Correction")

$P_1 = HP * \sin Alt_m / \tan LD_{pc}$

$= 54.57' * \sin 54.21° / \tan 79.63°$

$= 8.10'$

$P_2 = HP * \sin Alt_s / \sin LD_{pc}$

$= 54.57' * \sin 39.01° / \sin 79.63°$

$= 34.92'$

$P = P_1 - P_2 = -26.82'$

3rd Correction table with: $Alt_m = 54°12.4'$, $Alt_s = 39°00.6'$, $LD_{pc} = 79°41'$

$LD_{below} = 1.4'$

$LD_{above} = 1.6'$

$\Rightarrow LD_c = LD_{pc} + P + 3^{rd}\text{correction}$

$= 79°41' - 26.82' + 1.6'$

$\boxed{LD_c = 79°15.8'}$

GMT from LD_c

central time: 15:19:36

LD_{pre} (@1500): $79°07.1'$

LD_{post} (@1600) $79°34.4'$

$\Delta = 27.3'/1hr$

$\Rightarrow Rate = \frac{3600\,sec}{27.3'} = 131.9\ sec/arc\ min$

$dT = (LD_c - LD_{pre}) * Rate$

$= (79°15.8' - 79°07.1') * 131.9$

$= 1147.53\ sec$

$\simeq 19m\,08s$

$\Rightarrow GMT = GMT_{pre} + dT = 15:19:36 + 00:19:08$

$GMT = 15:38:44$