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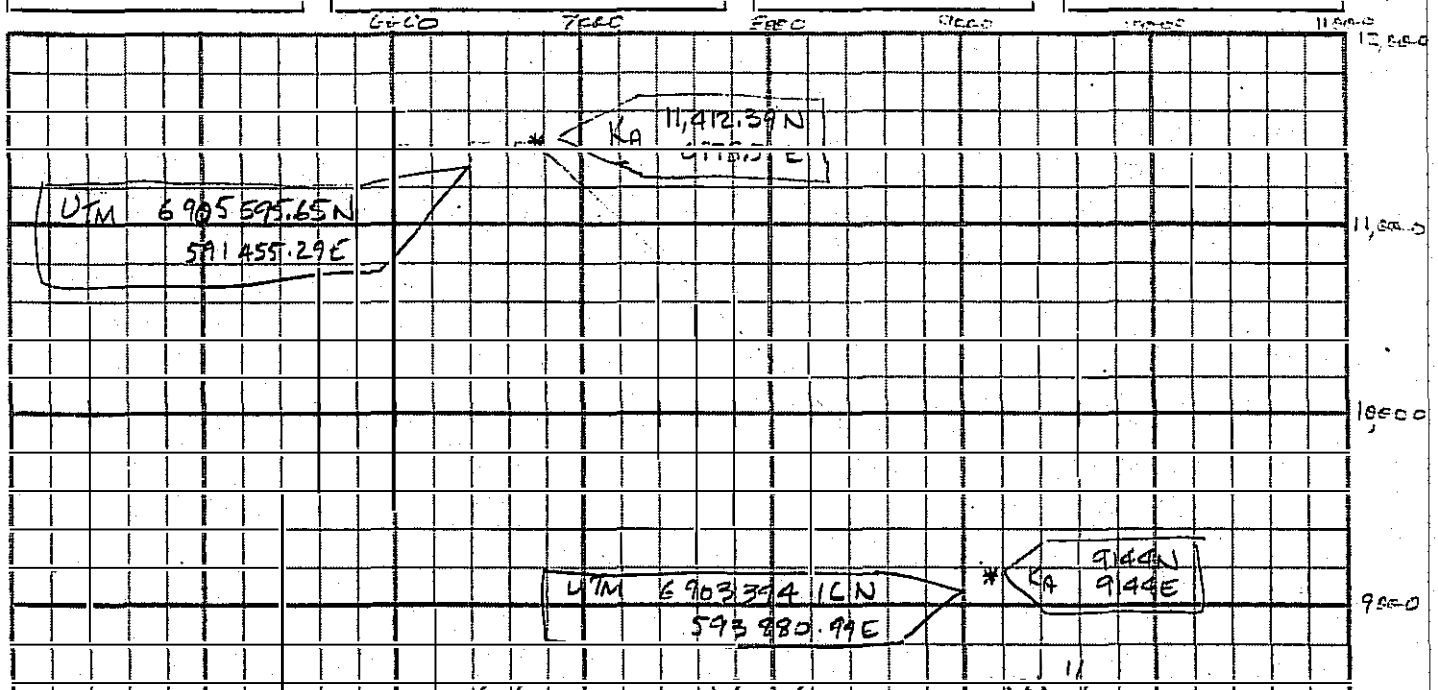

KA - BASELINE LENGTH = $\left((11412.39-9144)^2 + (6778.51-9144)^2 \right)^{1/2}$

$= \left((2268.39)^2 + (-2365.49)^2 \right)^{1/2}$

$= 3277.3672$ m.

UTM - BASELINE LENGTH = $\left((2201.49)^2 + (-2425.70)^2 \right)^{1/2}$

$= 3275.7562$ m.

Scale Factor $S = \frac{3275.7562}{3277.3672} = 0.9995084$

KA - BASELINE ANGLE = $\tan^{-1}(2268.39 / -2365.49) = -43.799579°$

UTM - BASELINE ANGLE = $\tan^{-1}(2201.49 / -2425.70) = -42.225908$

diff = $1.573670 = \alpha$

$\sin\alpha = 0.0274623$

$\cos\alpha = 0.9996228$

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ORIGIN $N_{KA} = 9144$ $N = 903,394.16$

$E_{KA} = 9144$ $E = 593,880.99$

$N = N_0 + S\,(N_{KA}\cdot\cos\alpha + E_{KA}\cdot\sin\alpha)$

$N_0 = N + S\,(N_{KA}\cdot\cos\alpha + E_{KA}\cdot\sin\alpha)$

$= 903,394.16 - 0.99950754\,(9144\,(0.9996228) + 9144\,(0.0274623))$

$= 903,394.16 - 0.99950754\,(9144)\,(1.0270851)$

$= 903,394.16 - 9387.032$ 9387.05

$N_0 = 894,007.12$ 894007.11

$E = E_0 + S\,(-N_{KA}\cdot\sin\alpha + E_{KA}\cdot\cos\alpha)$

$E_0 = E - S\,(-N_{KA}\cdot\sin\alpha + E_{KA}\cdot\cos\alpha)$

$= 593,880.99 - 0.99950754\,(-9144\,(0.0274623) + 9144\,(0.9996228))$

$= 593,880.99 - 0.99950754\,(9144)\,(0.9721605)$

$= 593,880.99 - 8885.066$

$E_0 = 584,995.92$

.9996228
.0274623
1.0270851

.9996228
.0274623
.9721605

Check OTAI 108A $N = 903,595.65$ $E = 591,455.29$

$S = 0.99950754$

$\cos\alpha = 0.9996228$ $\frac{\cos\alpha}{S} = 1.0001146$

$\sin\alpha = 0.0274623$ $\frac{\sin\alpha}{S} = 0.0274758$

$N - N_0 = 11588.64$ $E - E_0 = 6459.37$

$N_{KA} = 11588.53 \times 1.0001146 - 6459.24 \times 0.0274758$

$= 11589.858 - 177.4036$

$= 11412.382$

6459.37
6459.24

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According to P. Clarke

$N_o = +877,650.80$ 594,007.113
$E_o = +609,321.33$ 594,995.737

Convert UTM 1927 To Ks

$N = 903,394.16$
$E = 593,850.99$

$S = 0.99950754$ $\cos\alpha = 0.9996229$ $\sin\alpha = 0.0274612$

$\frac{\cos\alpha}{S} = 0.0274747$ $\frac{\sin\alpha}{S} = 1.00457$

$(N-N_o) = 27793.36$ 9387.05 $(E-E_o) = -15,440.34$ 5855.06

$N_{KA} = +1.00457\,(9387.05) + 0.0274612\,(27793.36) + 1.00457\,(-15,440.34)$ 5855.06

$= 232.47462$ 5925.6647 − 232.4746 = 9768.7023

5429

E