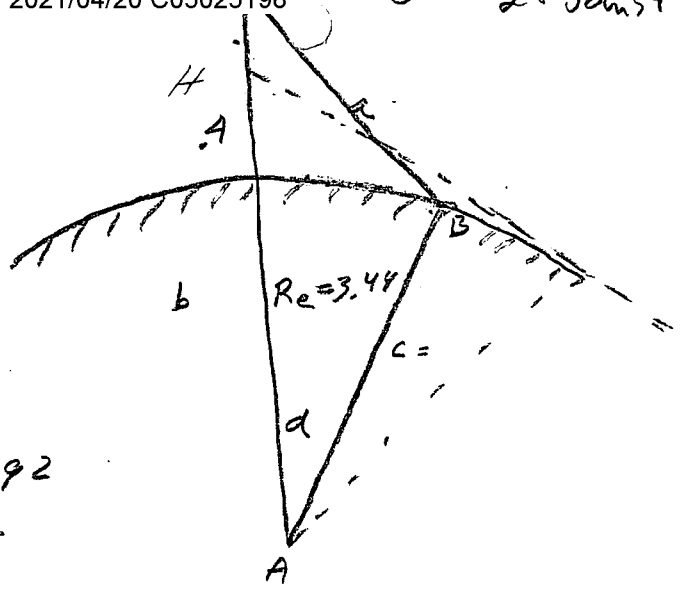
 n. mi. slant range ① 28 Jan 59

$$\cos\alpha = \frac{b^2 + c^2 - a^2}{2bc}$$



$$= \frac{(3.44+H)^2 + (3.44)^2 - (1.71)^2}{2(3.44+H)(3.44)}$$

$$= \frac{11.82 + 6.88H + H^2 + 11.82 - 2.92}{6.88(3.44+H)}$$

$$= \frac{H^2 + 6.88H + 20.72}{6.88(3.44+H)}$$

R_e = 3440 n. mi.

Slant Range = 1710 n. mi.

At 400 mi: $H = .4$ $H^2 = .16$

$$\cos\alpha = \frac{.16 + 2.76 + 20.72}{6.88(3.84)} = \frac{23.64}{26.4} = .898 = 26.1^\circ$$

Ground Range 60 × 26.1 = 1565 mi.

At 600 mi. $H = .6$ $H^2 = .36$

$$\cos\alpha = \frac{.36 + 4.13 + 20.72}{6.88(4.04)} = \frac{25.21}{27.8} = .907 = 24.9^\circ$$

Ground Range = 60 × 24.9 = 1495

At 800 mi: $H = .8$, $H^2 = .64$

$$\cos\alpha = \frac{.64 + (6.88 \cdot .8) + 20.72}{6.88(4.24)} = \frac{26.88}{29.2} = .922 = 22.8^\circ$$

Ground R. 1370 mi.

At 1000 mi. $H = 1$ $H^2 = 1$

$$\cos\alpha = \frac{1 + 6.88 + 20.72}{6.88(4.44)} = \frac{28.60}{30.6} = .935 = 20.8^\circ$$

1250 mi.

HANDLE VIA BYEMAN CONTROL SYSTEM ONLY

(3) 28 Jan 59

At 12 ~~SECRET~~ [redacted] $H = 1.2$ $H^2 = 1.44$

$$\cos\alpha = \frac{1.44 + (6.88 \times 1.2) + 20.72}{6.88(4.64)} = \frac{30.41}{31.9} = .952 = 17.8°$$

$60 \times 19.1° = 1070$

At 1500 mi. $H = 1.5$ $H^2 = 2.25$

$$\cos\alpha = \frac{2.25 + (6.88 \times 1.5) + 20.72}{6.88(3.44 + 1.5)} = \frac{33.27}{34} = .98$$

$= 11.5°$

$60 \times 11.5 = \underline{690}$ mi.

~~SECRET~~ [redacted]

HANDLE VIA
BYEMAN
CONTROL SYSTEM ONLY