

~~SECRET~~

Aug. 58

CODING BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS.



NO. 31,793. 20 DIVISIONS PER INCH (120 DIVISIONS) BY TWO 4 1/2-INCH CYCLES RATIO RULING.

INTERAGATION RANGE IN 1700 MILES

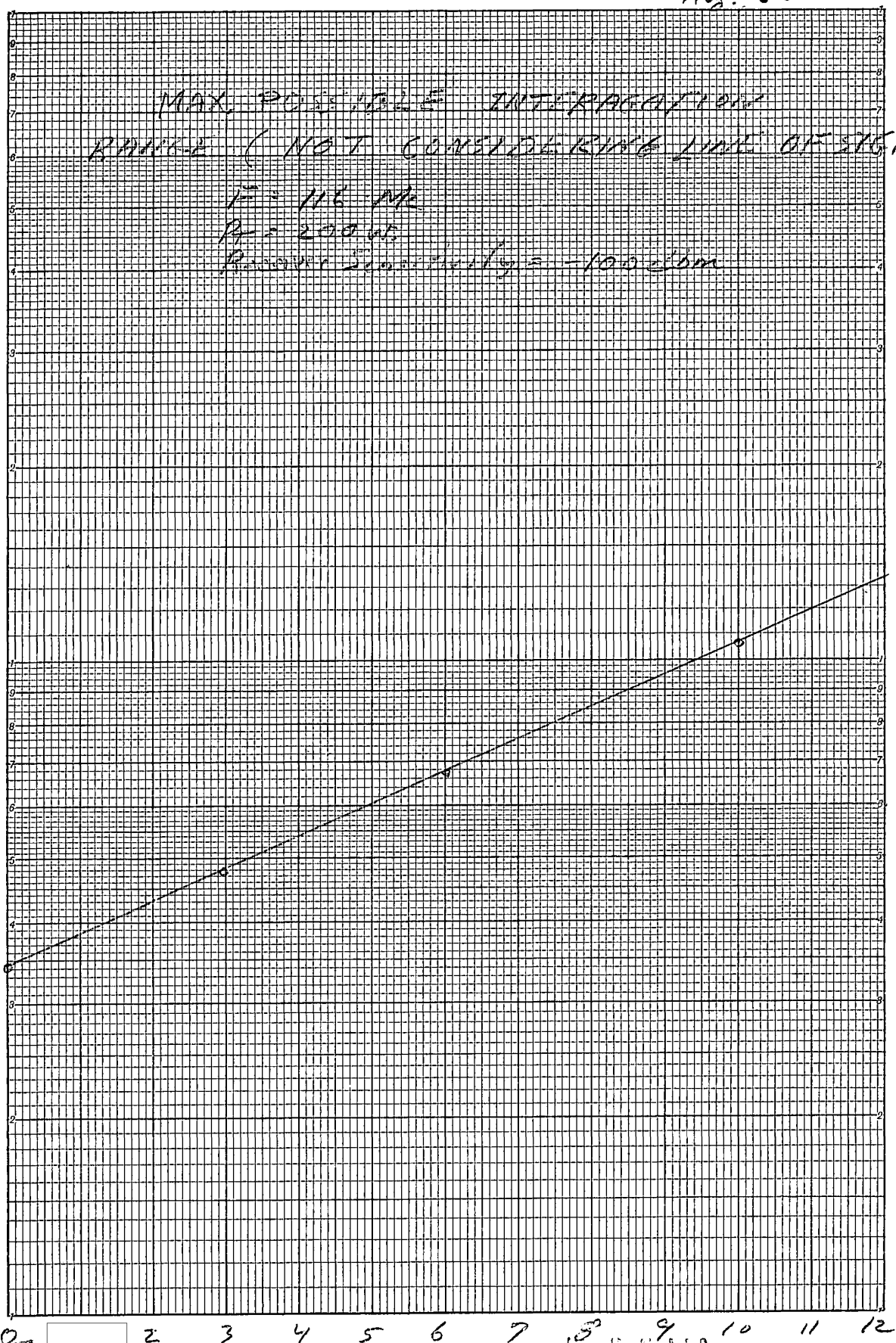
20,000

10,000

5,000

2,000

1,000



MAX. POSSIBLE INTERAGATION RANGE (NOT CONSIDERING LINE OF SIGHT)

F = 116 MC

R = 2000 ft

Receiver Sensitivity = 100 dbm

~~SECRET~~



TRANSMITTER ANTENNA GAIN - DB
CONTROL SYSTEM ONLY

~~SECRET~~

With Command Receiver

$$G_R = .5$$

$$P_R = -100 \text{ dbm} = 10^{-13} \text{ W}$$

$$F = 116 \text{ mc}$$

$$\lambda = 259 \text{ cm} = 2.59 \text{ m}$$

$$\lambda^2 = 6.68$$

$$P_T = 200 \text{ W}$$

$$G_T = 10 \text{ db} = 10$$

$$D = \sqrt{\frac{P_T G_T G_R \lambda^2}{P_R}}$$

$$4\pi$$

$$= \sqrt{\frac{140 \cdot 10 \cdot 5 \cdot 6.68}{10^{-13}}}$$

$$4\pi$$

$$= \sqrt{\frac{4.67 \times 10^{16}}{4\pi}}$$

$$\frac{2.16 \times 10^8}{4\pi}$$

$$= .172 \times 10^8 \text{ meters}$$

$$= 17,200 \text{ Kilometers}$$

$$17200 \times .6214 = \underline{\underline{10,700 \text{ miles}}}$$

3 db Ant

$$.448 \times 10,700 = 4800 \text{ miles}$$

6 db Ant.

$$.676 \times 10,700 = 8175 \text{ miles}$$

13 db Ant.

$$15,000 \text{ miles}$$

20 db

$$\sqrt{1} = .33 \times 10,700$$

$$= 3400 \text{ miles}$$