11-8-47

Jansky Data 20.6 mc.
Proc IRE, Oct 1935, Vol 23, No 10, p 1159
Data in arbitrary DB.

Referring to 1938 U. of C. calculation the major peak has a value of 0.078 microvolt/meter/kc band. This is an intensity of 0.16×10^{-13} ergs/cm²/sec/kc bd. equals, $0.16 \cdot 10^{-17}$ watts/sq. cm, mc. bd.
Antenna cone $37^\circ \times 30^\circ = 1110$ cir. deg.
Intensity = $14.4 \cdot 10^{-22}$ watts/sq. cm., cir. deg; mc. bd, on maximum.

Thus by a peculiar coincidence the peak in Sagittarius is directly in 10^{-22} watts/sq cm.; cir. deg; mc. bd.

Doubling this for random polarization gives $28.8 \cdot 10^{-22}$ watts/sq. cm., cir. deg., mc. bd. from Sagittarius maximum.

(over)

DB	I
14.4	28.8
14.0	26.3
13.3	22.4
13.0	20.9
12.5	18.6
12.0	16.6
11.3	14.1
11.0	13.2
10.9	12.9
10.8	12.4
10.5	11.8
10.4	11.4
10.3	11.2
10.1	10.8

4-3-41

Computation of Vertical Pattern

$$\rho = \frac{1 - \cos\left[\pi/2\,(1+\cos\delta)\right]}{2}\cos\delta$$

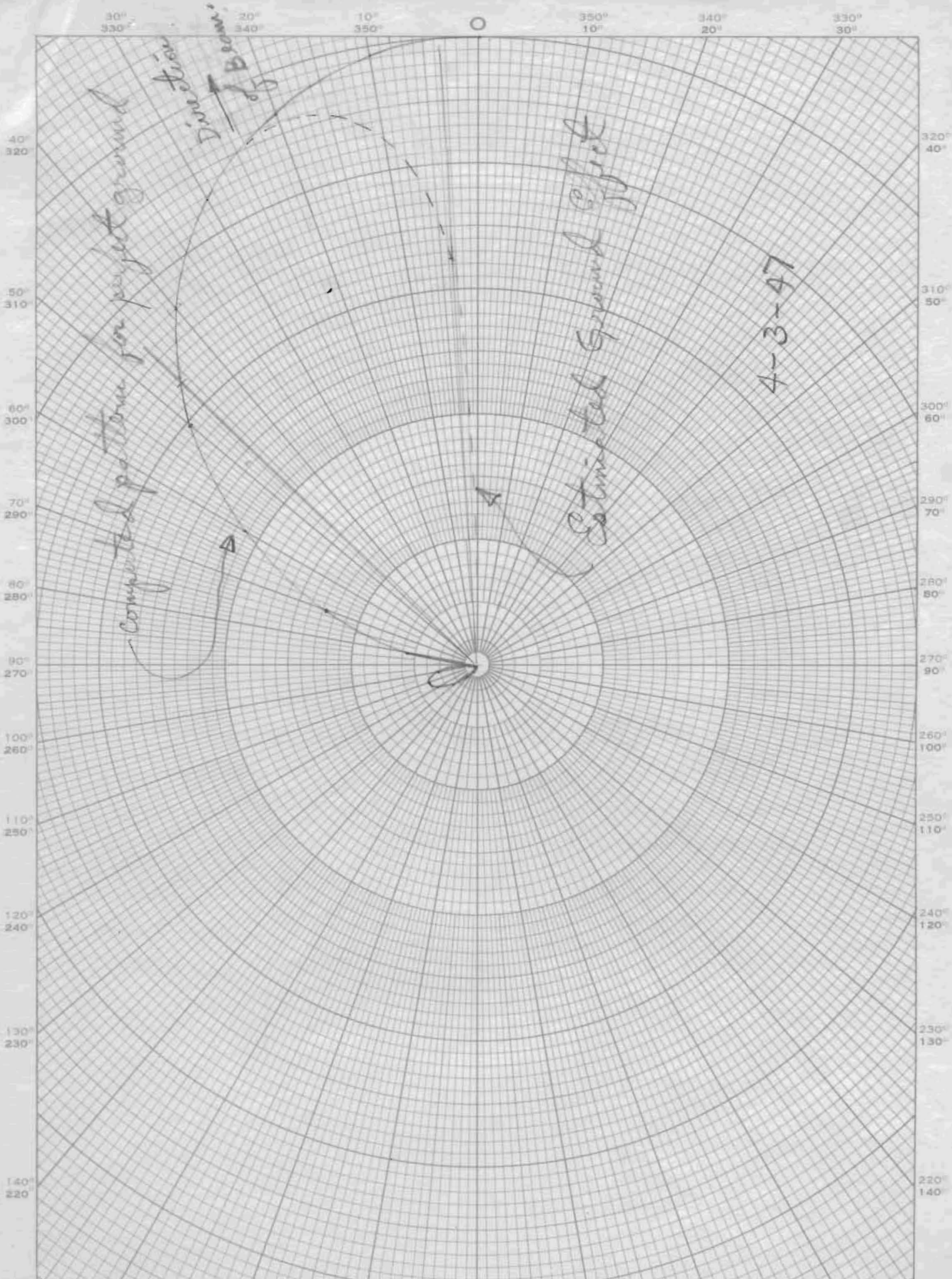
δ in deg.	$\cos\delta$	$1+\cos\delta$	$\frac{\pi}{2}(1+\cos\delta)$	$\cos\left[\frac{\pi}{2}(1+\cos\delta)\right]$	$1-\cos[-]$	ρ
0	1.000	2.00	180.0°	−1.000	2.000	1.000
10	.985	1.985	177.6	−.997	1.997	.984
20	.939	1.939	174.2	−.992	1.992	.935
30	.866	1.866	167.9	−.978	1.978	.857
40	.767	1.767	158.9	−.932	1.932	.741
50	.642	1.642	147.8	−.845	1.845	.592
60	.500	1.500	135.0	−.707	1.707	.427
70	.342	1.342	120.9	−.512	1.512	.258
80	.174	1.174	105.7	−.271	1.271	.111
90	0	1.000	90.0	.000	1.000	.000
100	−.174	.826	74.3	.271	.729	−.063
110	−.342	.658	59.1	.512	.488	−.083
120	−.500	.500	45.0	.707	.293	.073
130	−.642	.358	32.2	.845	.155	.050
140	−.767	.233	21.0	.932	.068	.026
150	−.866	.134	12.1	.978	.022	.010
160	−.939	.061	5.5	.992	.008	.004
170	−.985	.015	1.4	.997	.003	.002
180	−1.000	.000	0.0	1.000	.000	.000

Data is in amplitude. Thus half power points are at 0.707 amplitude.

Center of beam 24½° above horizon.

Vertical height of beam 43°,

Horizontal [illegible] 20°



Computation of Time and Position

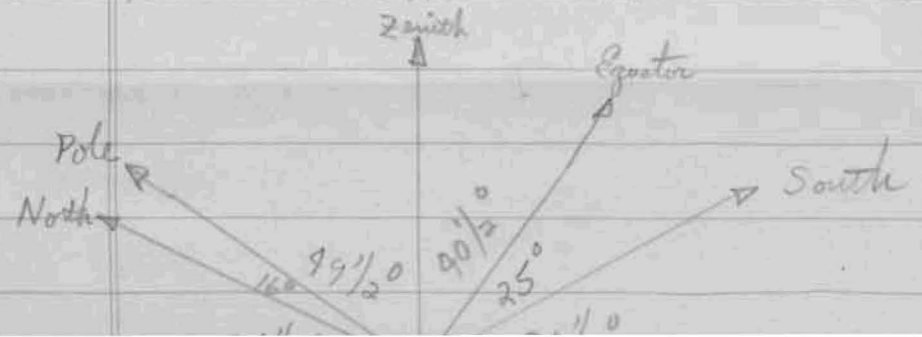
Position Lat. 40°22' North, Long 74° 10' West
Date Sept 16th 1932 ↳ = 4 hrs 57 min

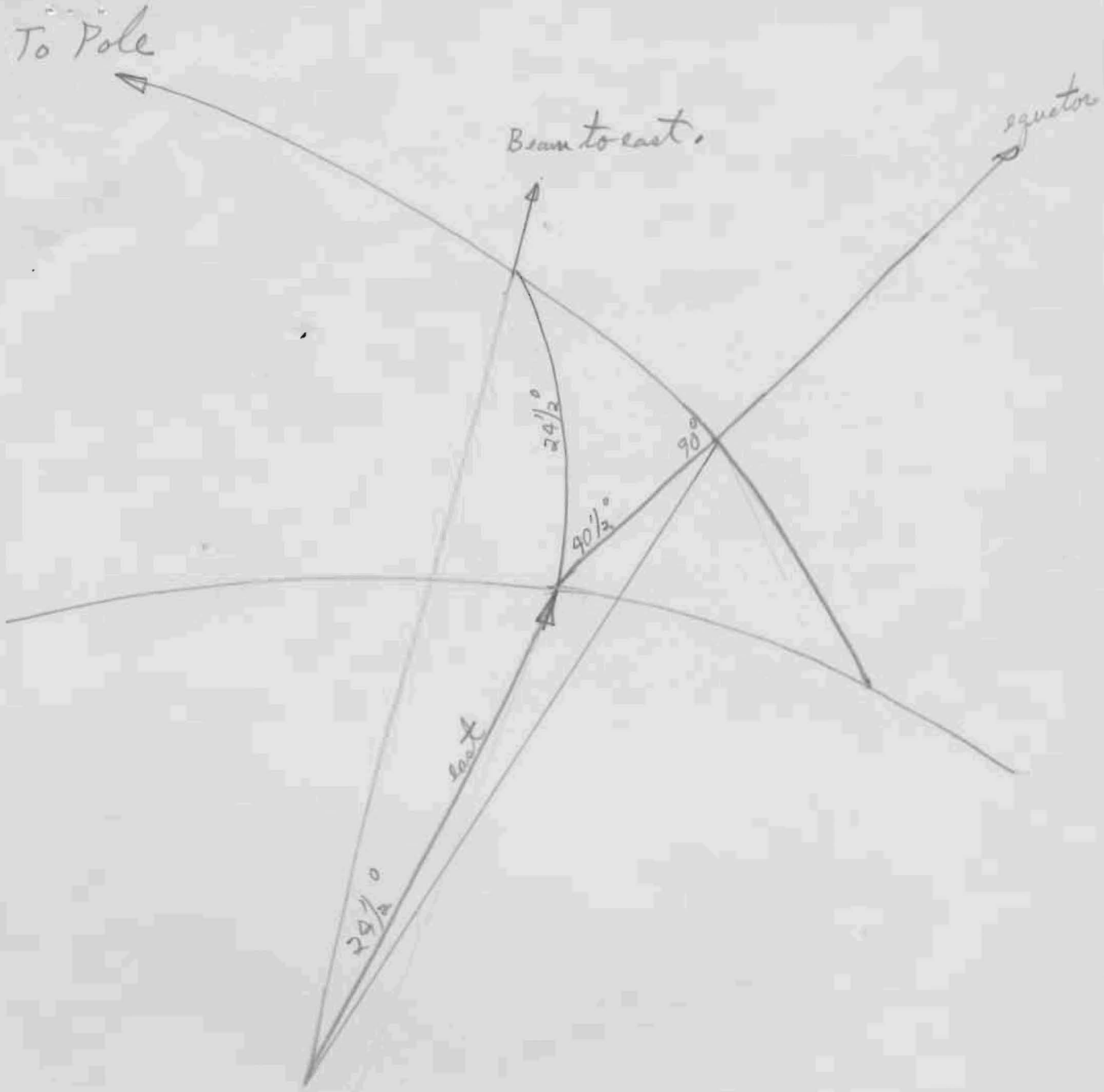
Example 1 page 303

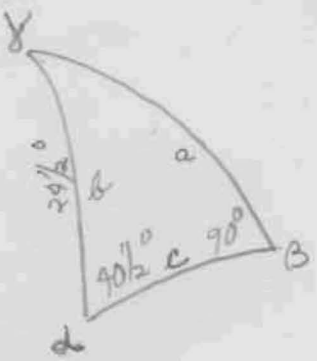
Calculation of Meridian Time at Holmdel

GST of 0h GCT	23	38	58
Reduction for 4 hrs 57 min		+	49
LST of 0h LCT	23	39	47
Req'd Civil Time	12	03	00
Reduction for 1203		+ 1	59
RA of meridian at 1200 NEST	11	44	46

EST and local civil time agree at Long 75° west.
at 74°10' west LCT is 3 min ahead of EST
Thus 1200 Noon EST is 1203 PM LCT




To Pole
Beam to east.
equator
24½°
90°
40½°
24½°
east


24½°
b
a
40½°
c
90°
B

Case VI page 207, Palmer & Leigh

$$\sin a = \frac{\sin b \sin d}{\sin B} = \frac{\sin 24\frac{1}{2}^\circ \sin 40\frac{1}{2}^\circ}{\sin 90^\circ} = .27$$

$$a = 15\frac{2}{3}^\circ$$

Thus when antenna points east or west it scans out a line in the sky along dec $+15\frac{2}{3}^\circ$

$$\tan \tfrac{1}{2}C = \tan \tfrac{1}{2}(a-b) \frac{\sin \frac{1}{2}(d+B)}{\sin \frac{1}{2}(d-B)}$$

$$= \tan \tfrac{1}{2}(15\frac{2}{3} - 24\frac{1}{2}^\circ) \frac{\sin \frac{1}{2}(40\frac{1}{2}+90^\circ)}{\sin \frac{1}{2}(40\frac{1}{2}-90^\circ)}$$

$$= \tan -4\frac{1}{2}^\circ \frac{\sin 65\frac{1}{4}^\circ}{\sin -24\frac{3}{4}^\circ} = -.079 \frac{.910}{-.419} = .1715$$

$$C = 19\frac{1}{2}^\circ$$

$90 - 19\frac{1}{2} = 70\frac{1}{2}^\circ = 4.7 =$ 4 hrs 40 min.

When antenna points east it points to a place in sky 4 hrs 40 min later than meridian so add 4 hrs 40 min to sidereal time of meridian to convert to Right ascension of antenna.

When antenna points west subtract 4 hrs 40 min from R.A. of meridian to convert to R.A. of antenna

When these corrections are applied to east and west data, the two sets may be plotted on same sheet.