# Redaman Hujan

# Hitung Redaman Hujan Terestrial

**1.** Tetapkan nilai a dan b sesuai polarisasi dan frekuensi kerja, dari tabel

**2.** Cari laju curah hujan R sesuai daerah pada tabel curah hujan

**3.** Hitung $A = a\,R^b$ [dB/Km]

**4.** Hitung faktor reduksi $r = \dfrac{1}{1 + (d/d_o)}$

d : panjang lintasan radio [Km] $\quad d_o = 35 e^{-0,015 R_{0,01}}$ [Km]

$R_{0,01} > 100\ mm/h\ \ digunakan\ R_{0,01} = 100\ mm/h$

**5.** Hitung redaman lintasan $A_{0,01} = A\,d\,r$ [dB]

**6.** Untuk prosentasi waktu lainnya :

$$\frac{A_p}{A_{0,01}} = 0,12\,p^{-(0,546 + 0,043 \log p)} \quad [dB]$$

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**TABLE 9.2  Regression Coefficient Values for Estimating Specific Attenuation in Equation (9.2)[a]**

| Frequency (GHz) | $a_h$ | $a_v$ | $b_h$ | $b_v$ |
|---|---|---|---|---|
| 1 | 0.0000387 | 0.0000352 | 0.912 | 0.880 |
| 2 | 0.000154 | 0.000138 | 0.963 | 0.923 |
| 4 | 0.000650 | 0.000591 | 1.121 | 1.075 |
| 6 | 0.00175 | 0.00155 | 1.308 | 1.265 |
| 7 | 0.00301 | 0.00265 | 1.332 | 1.312 |
| 8 | 0.00454 | 0.00395 | 1.327 | 1.310 |
| 10 | 0.0101 | 0.00887 | 1.276 | 1.264 |
| 12 | 0.0188 | 0.0168 | 1.217 | 1.200 |
| 15 | 0.0367 | 0.0335 | 1.154 | 1.128 |
| 20 | 0.0751 | 0.0691 | 1.099 | 1.065 |
| 25 | 0.124 | 0.113 | 1.061 | 1.030 |
| 30 | 0.187 | 0.167 | 1.021 | 1.000 |
| 35 | 0.263 | 0.233 | 0.979 | 0.963 |
| 40 | 0.350 | 0.310 | 0.939 | 0.929 |
| 45 | 0.442 | 0.393 | 0.903 | 0.897 |
| 50 | 0.536 | 0.479 | 0.873 | 0.868 |
| 60 | 0.707 | 0.642 | 0.826 | 0.824 |
| 70 | 0.851 | 0.784 | 0.793 | 0.793 |
| 80 | 0.975 | 0.906 | 0.769 | 0.769 |
| 90 | 1.06 | 0.999 | 0.753 | 0.754 |
| 100 | 1.12 | 1.06 | 0.743 | 0.744 |
| 120 | 1.18 | 1.13 | 0.731 | 0.732 |
| 150 | 1.31 | 1.27 | 0.710 | 0.711 |
| 200 | 1.45 | 1.42 | 0.689 | 0.690 |
| 300 | 1.36 | 1.35 | 0.688 | 0.689 |
| 400 | 1.32 | 1.31 | 0.683 | 0.684 |

*Source:* Table 1, ITU-R Rec. 838-4, 2005 (Ref. 9).

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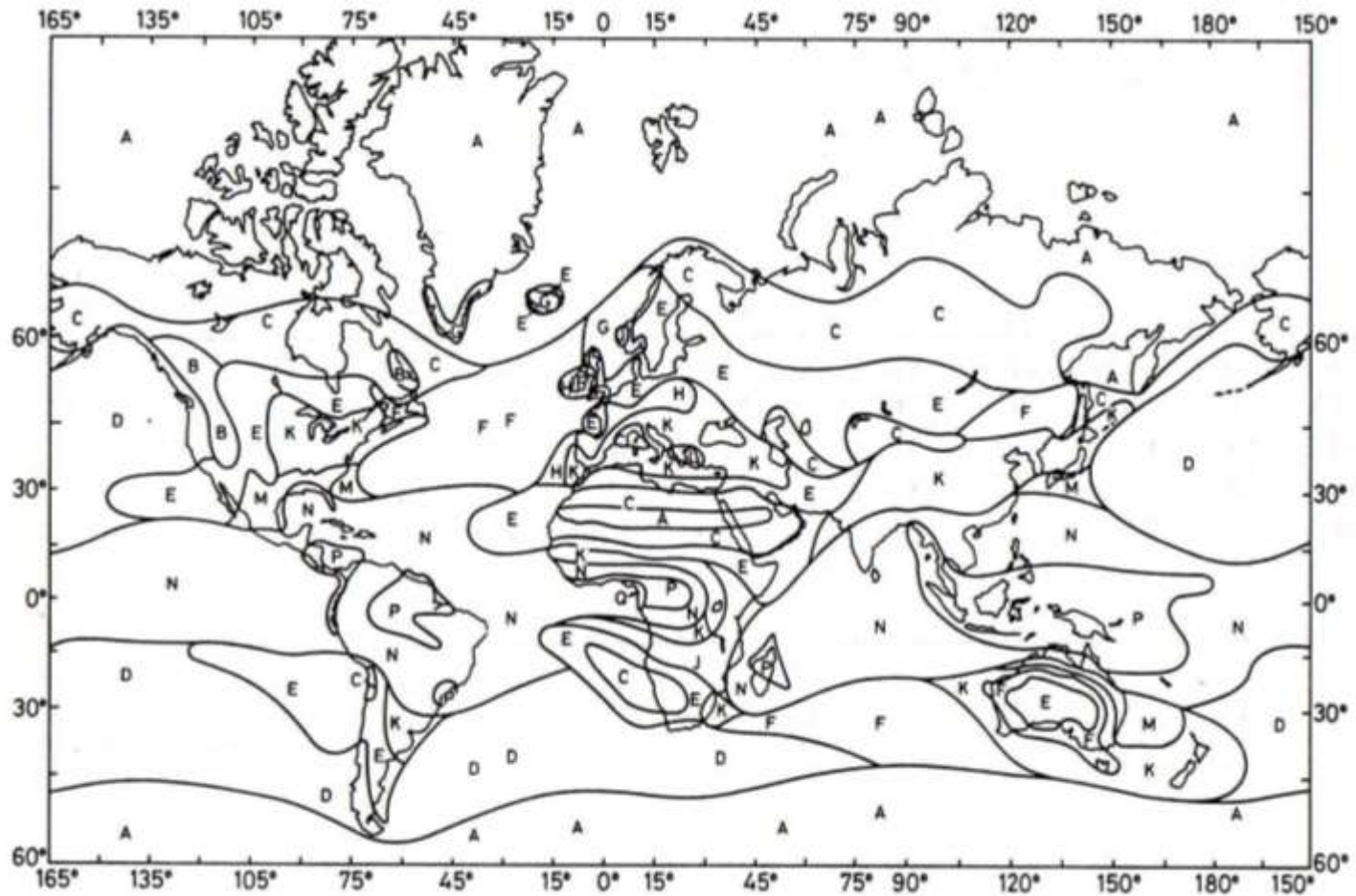
# Peta daerah hujan oleh CCIR [1988 ITU]

**TABLE 9.3   Rain Climatic Zones—Rainfall Intensity Exceeded (mm/h)**
(See Figures 9.4, 9.5, and 9.6 for Rain Regions)

| Percentage of Time (%) | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | < 0.1 | 0.5 | 0.7 | 2.1 | 0.6 | 1.7 | 3 | 2 | 8 | 1.5 | 2 | 4 | 5 | 12 | 24 |
| 0.3 | 0.8 | 2 | 2.8 | 4.5 | 2.4 | 4.5 | 7 | 4 | 13 | 4.2 | 7 | 11 | 15 | 34 | 49 |
| 0.1 | 2 | 3 | 5 | 8 | 6 | 8 | 12 | 10 | 20 | 12 | 15 | 22 | 35 | 65 | 72 |
| 0.03 | 5 | 6 | 9 | 13 | 12 | 15 | 20 | 18 | 28 | 23 | 33 | 40 | 65 | 105 | 96 |
| 0.01 | 8 | 12 | 15 | 19 | 22 | 28 | 30 | 32 | 35 | 42 | 60 | 63 | 95 | 145 | 115 |
| 0.003 | 14 | 21 | 26 | 29 | 41 | 54 | 45 | 55 | 45 | 70 | 105 | 95 | 140 | 200 | 142 |
| 0.001 | 22 | 32 | 42 | 42 | 70 | 78 | 65 | 83 | 55 | 100 | 150 | 120 | 180 | 250 | 170 |

Source: Table 1, ITU-R Rec. PN.837-4 (Ref. 11).