Name: APERR_002V01

Type: Earth station, Receiving and Transmitting

Region(s): 123

Description:

Appendix 30B reference Earth station pattern with the improved side-lobe for coefficient A = 29.

Required Input Parameters:

gain,coefa

Validation Warnings/Errors:

Type	Message
Error	CoefA () wrong value. Must be 29 or 32.
Error	Gmax () is less than G1 (). Square root of negative value.
Error	Phib () is less than Phir ().

Pattern Information:

Appendix 30B Earth station antenna reference pattern applicable for D/lambda > 100. It is used for the determination of coordination requirements and interference assessment in FSS Plan.

Pattern contains an optional improved near side-lobe (coefA=29) which may be used if so desired by administrations, particularly in the cases where an aggregate C/I ratio of 26 dB cannot be obtained.

Pattern is extended for D/lambda < 100 as in Appendix 8.

Original Plan was based on the antennas having diameter 7 m for the 6/4 GHz band and 3 m for the 13/10-11 GHz band and the antenna efficiency of 0.7.

WRC-03 replaced this Appendix 30B reference antenna pattern for coefA=32 by pattern APEREC015V01 (RR-2003). This pattern (APERR_002V01) is still used as improved side-lobe Appendix 30B reference antenna pattern with coefA=29 for D/lambda > 100.

BR software sets antenna efficiency to 0.7 for technical examination.

Co-Polar Component:

If $D/\lambda \geq 100$:

$G = G_{max} - 2.5 \times 10^{-3} (D/\lambda \ \varphi)^2$ for $0° \leq \varphi < \varphi_m$

$G = G_1$ for $\varphi_m \leq \varphi < \varphi_r$

$G = CoefA - 25 \log \varphi$ for $\varphi_r \leq \varphi < \varphi_b$

$G = -10$ for $\varphi_b \leq \varphi \leq 180°$

If $D/\lambda < 100$:

$G = G_{max} - 2.5 \times 10^{-3} (D/\lambda \ \varphi)^2$ for $0° \leq \varphi < \varphi_m$

$G = G_1$ for $\varphi_m \leq \varphi < \varphi_r$

$G = CoefA + 20 - 10 \log (D/\lambda) - 25 \log \varphi$ for $\varphi_r \leq \varphi < \varphi_b$

$G = 10 - 10 \log (D/\lambda)$ for $\varphi_b \leq \varphi \leq 180°$

where:

CoefA = 29 or 32.

$$D/\lambda = \sqrt{\frac{10^{\left(\frac{G_{max}}{10}\right)}}{\eta \pi^2}} . \qquad \varphi_b = 10^{\left(\frac{CoefA+10}{25}\right)} .$$

$G_1 = 15 \log (D/\lambda) - 30 + CoefA$. $\varphi_m = 20 \lambda/D \sqrt{G_{max} - G_1}$.

$\varphi_r = 15.85 (D/\lambda)^{-0.6}$ for $D/\lambda \geq 100$,

$= 100 \lambda/D$ for $D/\lambda < 100$.