

RECOMMENDATION ITU-R BO.1445

**IMPROVED PATTERNS FOR FAST ROLL-OFF SATELLITE TRANSMIT ANTENNAS
OF THE REGIONS 1 AND 3 BSS PLANS OF RR APPENDIX S30**

(Question ITU-R 93/11)

(2000)

The ITU Radiocommunication Assembly,

considering

- a) that Resolution 532 (WRC-97) (World Radiocommunication Conference (Geneva, 1997)) invites ITU-R to study the possibilities to improve the efficiency of the Appendix S30 Plan of the RR by taking due account of the technical progress;
- b) that the existing RR Appendix S30 Regions 1 and 3 satellite transmitting antenna patterns with roll-off in the main beam can be improved to reflect technical progress;
- c) that the use of antennas with improved radiation patterns will lead to a more efficient use of the radio spectrum and the GSO,

recognizing

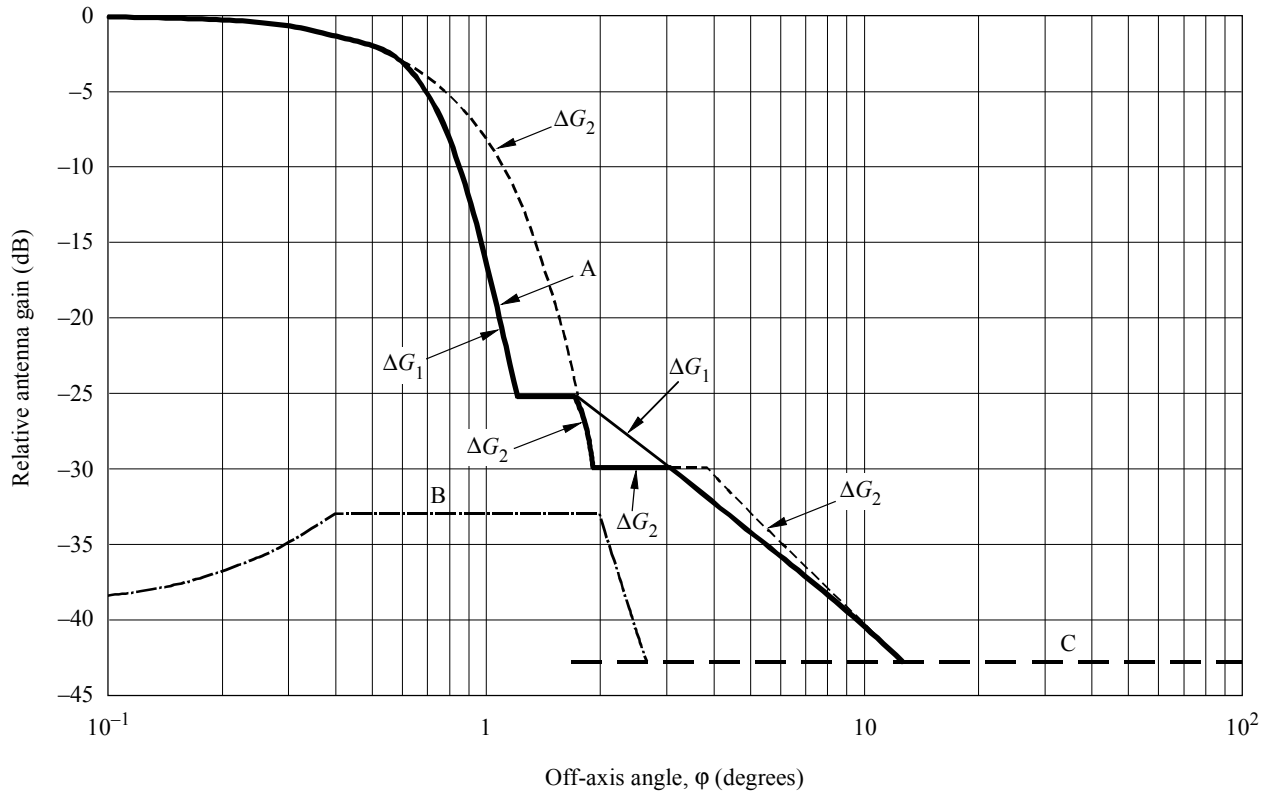
- a) that the adoption of improved satellite transmitting antenna patterns with fast roll-off in the main beam does not prevent the use of other antennas that have been coordinated or will be coordinated in the future on the basis of different patterns;
- b) that the next competent conference may include these patterns into Annex 5 of RR Appendix S30,

recommends

- 1** to use the improved satellite antenna co-polar and cross-polar patterns with fast roll-off in the main beam as provided in Annex 1, for elliptical beams of fast roll-off when such fast roll-off antenna is required, e.g. in studies in accordance with Resolution 532 (WRC-97).

ANNEX 1

FIGURE 1
Improved fast roll-off satellite transmitting
antenna patterns for Regions 1 and 3



- Regions 1 and 3 transmitting fast roll-off co-polar (Curve ΔG_1)
- Improved fast roll-off co-polar (Curve A defined as ΔG below)
- Regions 1 and 3 transmitting co-polar (Curve ΔG_2)
- · - · - Improved fast roll-off cross-polar (Regions 1 and 3 transmitting cross-polar) (Curve B)
- - - - Curve C (minus the on-axis gain)

Note 1 – The diagram gives the example curves in case of a satellite antenna beamwidth of $\varphi_0 = 1.2^\circ$ (circular).

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Curve A: co-polar relative gain $\Delta G = \min(\Delta G_1, \Delta G_2)$ (dB):

where:

$$\Delta G_1 = -12\left(\frac{\varphi}{\varphi_0}\right)^2 \quad \text{for } 0 \leq (\varphi/\varphi_0) \leq 0.5$$

$$\Delta G_1 = -12 \left(\frac{\frac{\varphi}{\varphi_0} - x}{\frac{B_{min}}{\varphi_0}} \right)^2 \quad \text{for } 0.5 < (\varphi/\varphi_0) \leq \left(\frac{1.45}{\varphi_0} B_{min} + x \right)$$

$$\Delta G_1 = -25.3 \quad \text{for } \left(\frac{1.45}{\varphi_0} B_{min} + x \right) < (\varphi/\varphi_0) \leq 1.45$$