

RECOMMENDATION ITU-R BO.1295

**REFERENCE TRANSMIT EARTH STATION ANTENNA OFF-AXIS e.i.r.p. PATTERNS
FOR PLANNING PURPOSES TO BE USED IN THE REVISION OF THE
APPENDIX 30A (Orb-88) PLANS OF THE RADIO REGULATIONS
AT 14 GHz and 17 GHz IN REGIONS 1 AND 3**

(Question ITU-R 218/11)

(1997)

The ITU Radiocommunication Assembly,

considering

- a) that Resolution 531 (WRC-95) of the World Radiocommunication Conference (Geneva, 1995) invites the ITU-R to study the possibilities to improve the efficiency of the Appendix 30A (Orb-88) Plans of the Radio Regulations (RR) by taking due account of the technological progress;
- b) that for the feeder link of the broadcasting-satellite service planning purposes a simple transmit earth station antenna reference pattern is necessary;
- c) that the existing RR Appendix 30A (Orb-88) Regions 1 and 3 transmit earth station antenna patterns are no longer appropriate due to technological improvements (see also Recommendations ITU-R S.465, ITU-R S.580 and ITU-R S.731);
- d) that measured data in support of an improved transmit antenna reference pattern is available;
- e) that the use of antennas with the best achievable radiation pattern will lead to the most efficient use of the radio-spectrum and the geostationary-satellite orbit;
- f) that the transmit earth station antenna in the feeder-link Plans are operated by professional users,

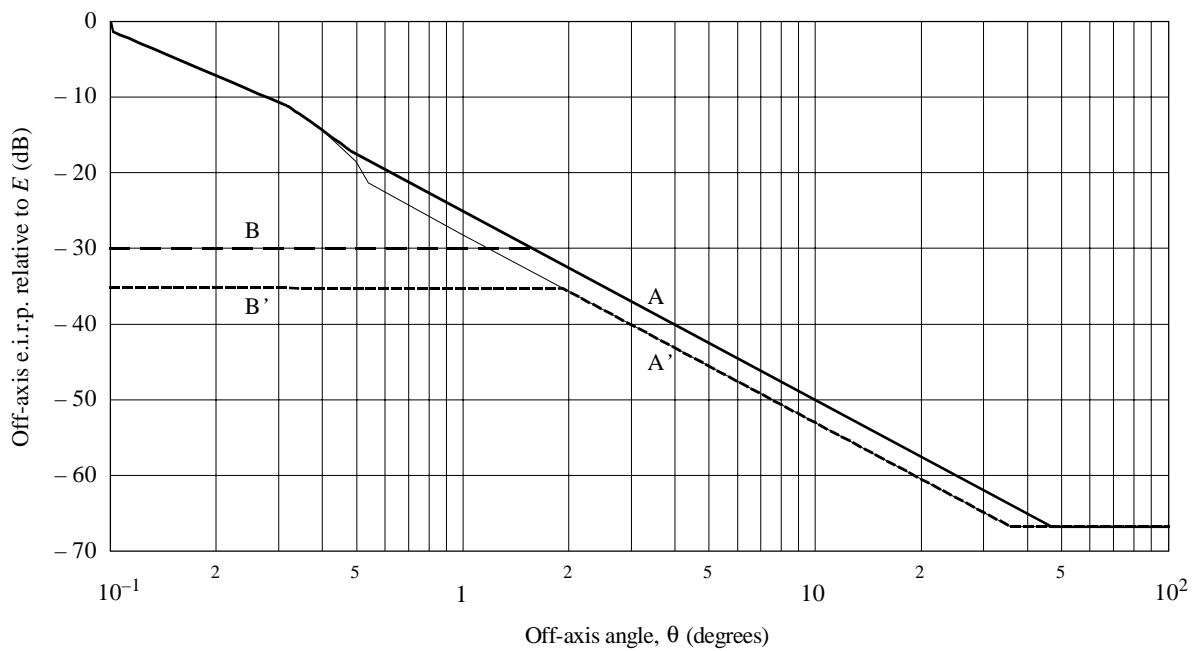
recognizing

- a) that the adoption of improved reference transmit earth station antenna patterns for planning purposes 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 off-axis e.i.r.p. values were used in the development of the RR Appendix 30A (Orb-88) Plans,

recommends

- 1** the use of co-polar and cross-polar off-axis e.i.r.p. values given in Fig. 1 together with their associated formulae provided in Annex 1 for replanning purposes of the RR Appendix 30A (Orb-88) Plans in Regions 1 and 3.

FIGURE 1
Earth station e.i.r.p. at off-axis antenna angles



Curves A: new transmit earth station co-polar
 B: new transmit earth station cross-polar
 A: RR Appendix 30A (Orb-88) Regions 1 and 3 co-polar*
 B: RR Appendix 30A (Orb-88) Regions 1 and 3 cross-polar*

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* Curves included for information only.

ANNEX 1

Formulae associated to the curves of Fig. 1

Curve A': co-polar component (dBW):

E	for	$0^\circ \leq \theta \leq 0.1^\circ$
$E - 21 - 20 \log \theta$	for	$0.1^\circ < \theta \leq 0.32^\circ$
$E - 5.7 - 53.2 \theta^2$	for	$0.32^\circ < \theta \leq 0.54^\circ$
$E - 28 - 25 \log \theta$	for	$0.54^\circ < \theta \leq 36.31^\circ$
$E - 67$	for	$36.31^\circ < \theta$

Curve B': cross-polar component (dBW):

$$E - 35 \quad \text{for} \quad 0^\circ \leq \theta \leq 1.91^\circ$$

$$E - 28 - 25 \log \theta \quad \text{for} \quad 1.91^\circ < \theta \leq 36.31^\circ$$

$$E - 67 \quad \text{for} \quad 36.31^\circ < \theta$$

where:

E : earth station e.i.r.p. on the antenna axis (dBW)

θ : off-axis angle referred to the main lobe axis (degrees).

For replanning purposes, an antenna diameter of 5 m for the band 17.3-18.1 GHz and 6 m for the band 14.5-14.8 GHz are to be assumed.

The on-axis gain for the 5 m antenna at 17.3 - 18.1 GHz and for the 6 m antenna at 14.5-14.8 GHz is taken as 57 dBi.
