

## The Research of Exciter Frequency Characteristics of a Quad-Band Antenna Based on a Corrugated Horn

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**Abstract.** The objective of the paper is to study the frequency characteristics of the exciter based on a corrugated horn for a quad-band antenna for satellite communications.

The problems of the construction of the corrugated horn as the basis for the radiating system of the quad-band reflector antenna for satellite communications with overlapping of *C*-, *X*-, *Ku*-, and *Ka*-bands are considered. The conducted analysis of the interrelation of the characteristics of the multiband reflector antenna with the characteristics of the radiating system permits defining a set of the requirements to the parameters of the corrugated horn, which is the base of a radiating system.

The corrugated horn, which provides the required characteristics in *C*-, *X*-, *Ku*- and *Ka*-bands, is developed.

The radiation pattern of the corrugated horn within the specified bands and the frequency dependences of the mode converter providing the interface of the horn with a circular feed waveguide are analyzed. The experimental checking proved that within *C*-, *X*-, *Ku*-, and *Ka*-bands, an average value of the VSWR does not exceed 1.12, and the maximum value makes 1.15 at the frequency.

**Keywords:** multiband reflector antenna, corrugated horn, performance indicators of the radiating system and feed horn