

FULL-BAND FREQUENCY-INTEGRATED ANTENNA MONITORING SYSTEM

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Abstract

The paper presents full-band frequency-integrated antenna monitoring system. Module optimization of full-band structures is conducted on the basis of the use of different type antennas for some separate basic frequency ranges (modules), which in the process of the integration create the integrated full-band system with the maximum factor of the use of effective capacity.

Fast increase in the amount of information to be transmitted to the consumer requires increasing in the variety of data transfer systems, digital formats, modulation formats, types of multiplexing, mastering super HF range (Ka-band), operating frequency bandwidth expansion.

Full-band frequency range is one of the principal criteria for updating old communication systems and creation new ones in order to optimize performance.

The following parameter is functionally connected with the geometric characteristics of antenna equipment, operation speed of sending and receiving data, data content, amplification factor and converting frequency ranges down for the best processing.

$$\Delta F = f\{\text{Dant. (m), lant. (m), VTx (b/sec), B (Gb), Grx}\}$$

The principal functional element of the radio-engineering monitoring system is the special antenna which is responsible for the power supply parameters, frequency range, selection of electromagnetic waves according to polarization, frequency, selectivity, input noise component, phase characteristics maintenance. Module optimization of full-band structures is conducted on the basis of the use of different type antennas for some separate basic frequency ranges (modules), which in the process of the integration create the integrated full-band system with the maximum factor of the use of effective capacity.

Three antenna structures were integrated in the correlation (VHF-, L-, S- band) + (C-, Ku- band) + (K-, Ka-band) in order to create the full-band monitoring system in the frequency range from VHF to SHF (Ka - band).

Small-size logoperiodic antenna with the factor of interception of 1: 2,2. frequency range operates in the range of (VHF-, L-, S- band).

Full-band double-reflector antenna is used in the (C-, Ku- band) range. It is designed on the ADE type with the interception factor of 1: 6. frequency range.

The separate double-reflector antenna operates in the (K-, Ka- band) range. It is designed on the ADE type. The given model allows to minimize the side lobes, which, in their turn, decrease the influence of the Earth noises when the system operates in the horizontal position.

The general view of the antenna system is shown on the fig. 1.



Fig. 1. Antenna system.