A cost effective receiver for meteorological balloon telemetry application using RTL-SDR and LabVIEW

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Abstract

In this paper we present design of RTL-SDR based low cost receiver for meteorological balloon telemetry. In developed receiver all the demodulation processes are performed in software developed in LabVIEW. Design and fabrication of Quarter Wave Monopole Antenna and Quadrifilar Helix Antenna (QHA) is also presented for use with the receiver. Antennas are selected such that the combined beam pattern provides optimum coverage in both low and high elevation angles. This system is designed to operate in meteorological-aids frequency band of 400-406 MHz. Paper presents bit error rate performance of developed receiver. Performances of the RTL-SDR receiver using both the antennas are assessed by processing the signals received from the radiosonde flights at Gadanki (13.46°N, 79.17°E). Finally it is shown that RTL-SDR based receiver can receive signals up to the range of about 75-80 Km.

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