

MONOPOLE ANTENNA FOR EXPERIMENTAL FLIGHT APPLICATIONS

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Abstract

A monopole dual band antenna for experimental flight applications on a small scale Unmanned Aerial Vehicle available in the Aero modeling lab of Department of Aeronautical Engineering at Manav Rachana International Institute of Research and Studies is presented in this paper. Radiating patch of proposed antenna consists of concentric circle at resonance frequency of 1.35 GHz and 5.25 GHz. The minimum reflection constant at 1.5 GHz is -20 dB and 5.2 GHz is -36 dB. The bandwidth of 300 MHz and 830 MHz achieved during the design process is considered adequate for efficient and effective utilization of the designed antenna. Radiation pattern of proposed antenna show Omnidirectional pattern. Designed antenna provides solutions for L and C band aviation application for early reported geometry. Various parameters like return loss, gain, radiation pattern surface current and Voltage Standing Wave Ratio (VSWR) have been studied and analyzed using the application software CST Microwave Studio. The experimental antenna designed for experimental flight evaluation can also be used as Global System for Mobile Applications (GSM), Worldwide Interoperability for Microwave Access (WiMAX), Wireless Local Area Network (WLAN), Walkie-Talkie and Air Traffic Control (ATC) antenna. In the overall perspective, the proposed antenna can also be utilized for ground communication and other airport facilities in addition to the experimental role envisaged.

Keywords: Aviation, Micro-stripline Antenna, Aeronautical, Radio Navigation