

# Design Description of a Stand-Alone, Auto-Frequency Ultrasonic Brand of Weaver Bird Pest Control Device for Field Applications

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## Abstract

Preliminary studies conducted in the field of ultrasonic broadcast for bird pest control has identified among others, that ultrasound of specific frequencies and certain audio sounds can serve as effective parameters in weaver bird pest scaring. Of interest is ultrasound frequency of 35 kHz as the put-to-flight and stay-away frequency in bird homes, while 25 kHz holds in farm conditions. These findings set the stage for this work which is aimed at determining the compositions, dimensions and specifications of a stand-alone device capable of electronically generating ultrasound of the required frequencies and incorporating audio sounds of predators to effectively scare weaver birds away from farms while overcoming the challenge of habituation. The design consists of sections as: the solar power supply, tripping, timing, oscillatory, frequency selection, amplification, microcontroller, predator cry, LCD and ultrasonic transducer sections and their respective circuits. The design if implemented and tested, will ensure 360° horizontal ultrasound coverage and a vertical boost to effectively repel weaver bird pests from the vicinity of broadcast.

**Index Terms:** Ultrasound, stand-alone device, design considerations, integrated circuit (IC), habituation, weaver birds.

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## 1. Introduction

Electronic pest control devices are electronically designed devices used to keep away pests from vicinity where they are deployed. They have the advantage of being safe, cheap, environmentally and ecosystem friendly [1], especially when compared with chemical pest control method [2]. However, controversies trail its application, as they are regarded as being effective [3], partially effective [4] and ineffective [5]. Habituation was identified as the sole reason for this controversy [6]. Design considerations and practices to technically fortify the device against habituation were proffered and prominent among them was field survey [6]. The common practice whereby electronic pest control devices were purchased off the shelf and deployed to combat pests, but no sooner than they are installed than they become ineffective, was discouraged and specialized field survey (preliminary studies) was recommended [7]. In view of the foregoing, an intensive

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