

Electronics vs. Creepy Crawlers

*Build this ultrasonic oscillator and drive pests crazy.
Your pet hamster, too.*

One thing you will find out when you become interested in electronics or have ham radio as a hobby is that eventually your curiosity will expand to investigating all sorts of electronic devices. This includes accessories for the ham shack, microwave downconverters, radar speed detectors, cable TV gadgets, and other interesting items. This article describes a gadget which has recently appeared on the electronics scene and really caught my attention as something I

needed very badly in my ham shack.

Now, I don't know about your ham shack, but mine is firmly delegated to a room in the basement of my house. The only problem is that since it is at ground level, all sorts of unwanted creepy crawlers invade my shack and take up residence in my ham gear. For many years, pet supply and garden stores have sold all sorts of products to rid a home of those pesky bugs and such. Well, now the

electronics industry has taken on the challenge and thinks this is the answer on how to run those bugs out of my ham shack.

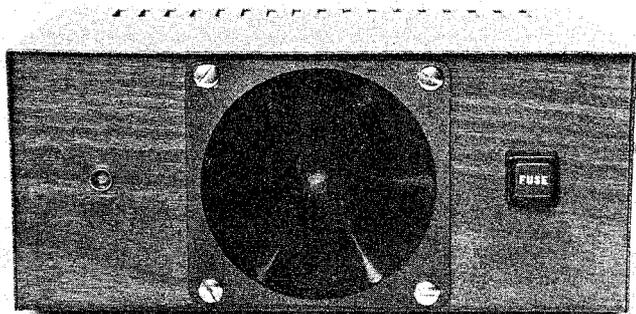
Circuit Description and Construction Notes

Low-intensity ultrasonic sound waves have been used to repel insects and small rodents. Square waves and pulsed waves have been tested and square waves are reported to be most effective in the 30-45-kHz frequency band. The ultrasonic sound waves are intended to

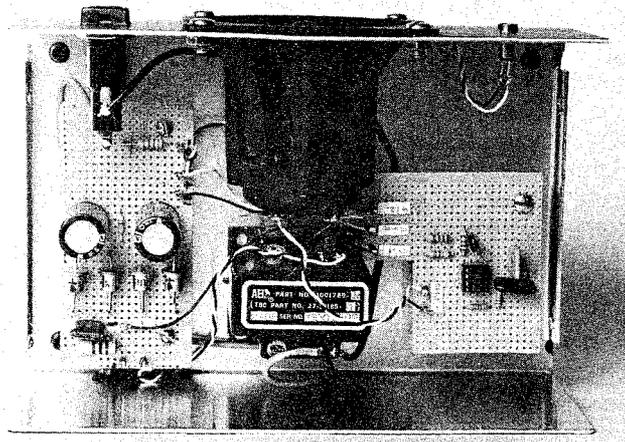
damage the insects' nervous systems. The goal is to drive those creepy crawlers right out of the house. The ultrasonic sound waves are shifted in frequency 60 times per second to cover all of the communication frequencies of the most common pests (how about that—legal jamming!).

The ultrasonic sound emitted by the unit is above the hearing range of people, dogs, cats, and birds. It is reported as not affecting plants, TVs, and radios, but will bother gerbils, ham-

Photos by Betty Hutton



Front view of unit.



Component layout for the ultrasonic bug-chaser.

sters, and other pet rodents.

Several commercial models of bug-chasers have recently appeared on the market (see box). The schematic diagram shown is typical of such units and is designed to generate a swept square wave from 30 to 45 kHz. The LM555 IC is wired as an ultrasonic oscillator driving a piezoelectric speaker of the hi-fi super-tweeter type. The output of the oscillator is swept by a 60-Hz signal from the ac input of the bridge rectifier. The LED acts as a pilot light to let you know the power is on, as the only noise you will hear when this unit is running is a slight buzzing noise coming from the speaker.

An oscilloscope is necessary to observe the square-wave signal on pin 3 of the LM555 oscillator. My unit is built in a cabinet 3-1/2" x 7-1/8" x 5-11/16" (Radio Shack #270-269). The speaker is a 3.5-inch Piezo

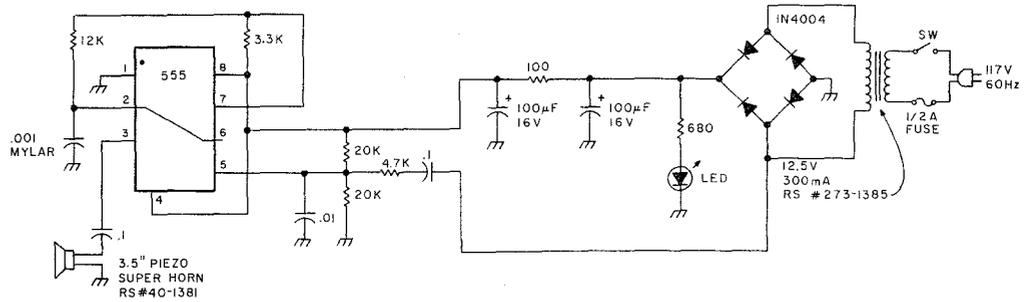


Fig. 1. Ultrasonic bug-chaser schematic.

Super Horn (Radio Shack #40-1381). The oscillator and power supply were built on two small perfboards and bolted on metal standoffs to the chassis floor. No effort was made to design a PC board or to miniaturize the design. The front, bottom, and rear of the cabinet were covered with simulated wood-grain shelf paper to improve the appearance of the unit.

Operation

I set my unit in one corner of my ham shack facing out

into the room so that the ultrasonic sound waves would fill the room by bouncing off the walls, floor, and ceiling. Things like curtains, rugs, and upholstered furniture will absorb the sound waves. You should expect it to take several weeks before the full effect of the irritating ultrasonic sound waves will get to the bugs. I have had several visitors in the shack and they soon note the slight buzzing noise coming from that strange-looking box on the shelf. When told what it is, they

unanimously say they want to build one for their own ham shack. Try it; the only thing you will have to lose is those pesky creepy crawlers. ■

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