



The PeerSonic ultrasound microphone tester.

Release date : 16/11/2018

Introduction:

The microphone tester will emit a series of frequencies over the ultrasonic spectrum to give a reasonable check that equipment is operating satisfactorily before deployment in the field. Microphones can degrade, mainly due to humidity or direct saturation, although they can recover by drying, there is a tendency for the response to diminish at higher frequencies. Testing at a fixed frequency, eg 40 or 60kHz alone is not sufficient.

The PeerSonic ultrasound tester is a PIC processor driven approximate sine wave generator. It will generate a series of frequencies that will give assurance that equipment is ready for the field.

As an aside, and as the circuit is programmable, some simulated bat sound patterns have been added. These give a general additional assurance that the equipment will receive bat sound. The simulations are not intended for lures, or professional training, however I have found that they are useful when educating total novices on bat walks on how to use their new equipment.

As the unit is programmable it can be made to do much more than the current release provides, feedback will help improvements.

Use:

The Unit has a very simple user interface, two buttons and an LED.



When placed on end as shown above -

The upper button – UB, starts the mic test pattern.

The lower button – LB, performs some emulated bat sounds.

For repeatable results, place the tester about 1 mtr away from your bat detector or bat recorder. Some frequencies will vary in strength , although the software is designed to average out the variations in response from the speaker as far as possible. It will depend upon the receiving equipments own sensitivity too.

If you are using a bat recorder it would be a good idea to make a reference recording as soon as possible, in that way a reasonable comparison can be made to best condition as time goes by. If using a simple detector, then just tune to each frequency step and be sure that your equipment is covering the range. Try to operate in repeatable environmental conditions.

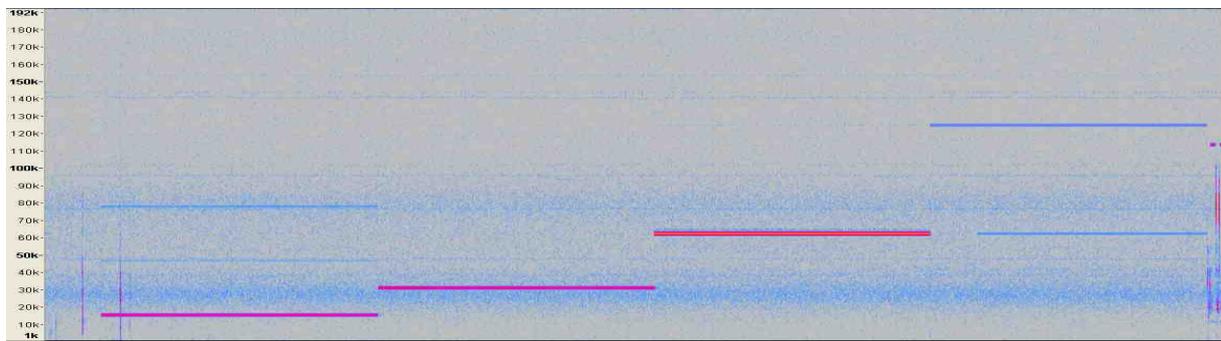
The LED will indicate whether the mode is “in sequence” or waiting a choice of mode.

Power is provided via the micro USB type B connector, this is power only no data..

On power up, the LED will flash rapidly. This indicates it is ready to enter either frequency test mode or bat emulation mode.

Frequency Test mode:

Frequencies are derived from the processor clock which is an RC oscillator and 2% accurate.



Press UB and release.

First frequency is 15.625kHz.

Press UB and release.

Next frequency is 31.250kHz.

Press UB and release.

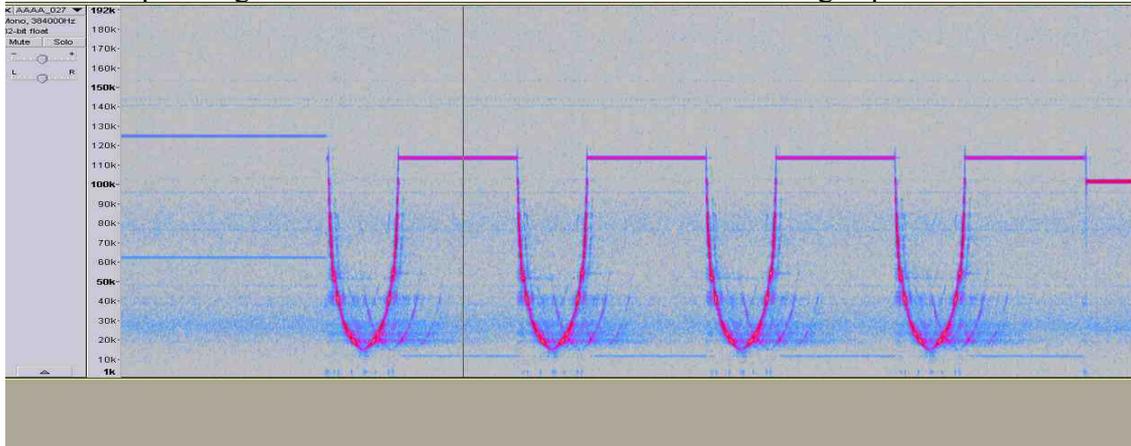
Next frequency is 62.50kHz.

Press UB and release.

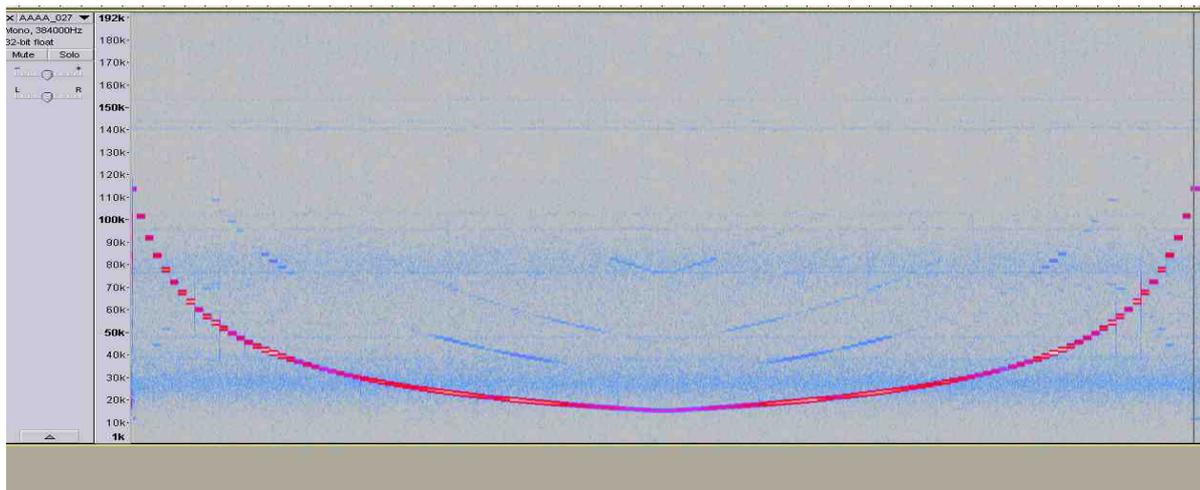
Next frequency is 125.00kHz.

On pressing and releasing the UB the tester will run through the following cycles.

1/ four short chirps that go from 125kHz down to 14kHz and back at high speed.



2/ A ramp down from 125kHz to 14kHz and back up.



Then the unit will return to fast flashing LED and you can start again or go to bat emulation LB.

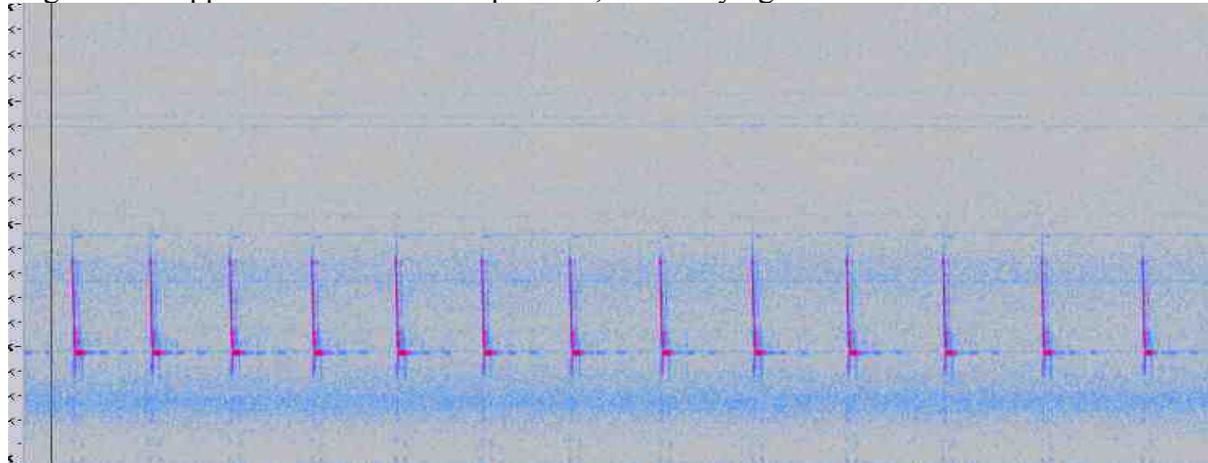
Note, there will be harmonics due to features in the speaker, but the fundamental will be prominent.

Bat Emulation mode:

As mentioned this is a bat style of emulation, in no way a wav file playback, but useful for a quick assurance that you are receiving bats. Also useful for novice demonstrations.

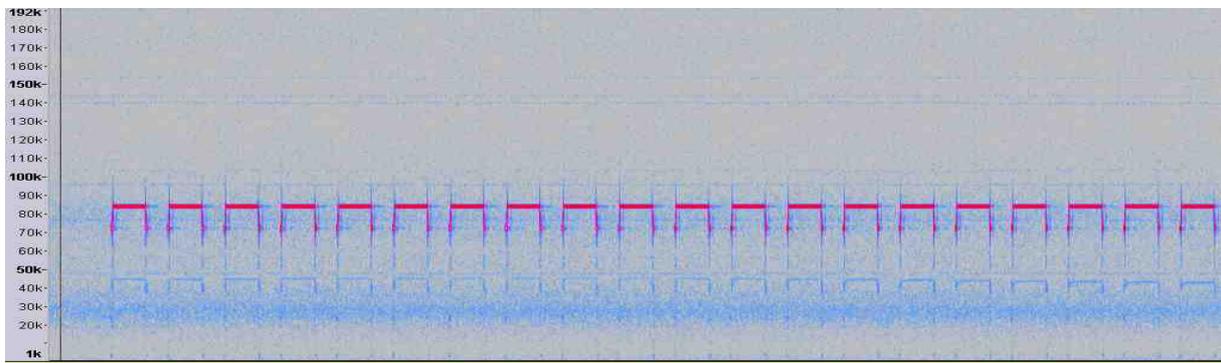
Press LB.

The signal is an approximate common Pipistrelle, with varying IPI.



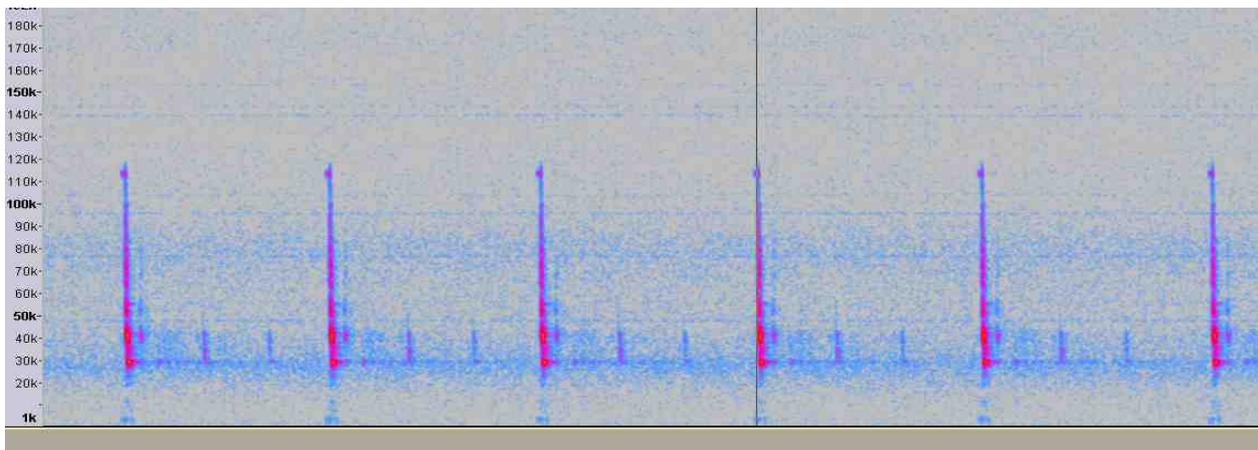
Press and release LB.

The signal is a GH emulation.



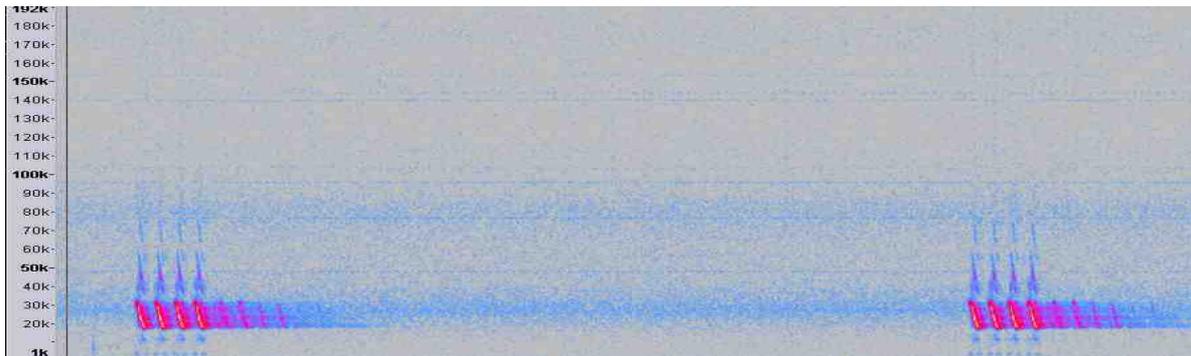
Press and release LB.

The signal is a Myotis type signal.



Press and release LB.

The signal is a typical Pipistrelle social call.



Press and hold then release LB to return to main menu – fast flashing LED.

Notes:

On initial start-up (ie when plugging in the USB power) , if both U&L buttons are held in the output will be set to maximum, this might be useful for novice training sessions on use of basic equipment in the outdoors.

If more bat sounds are required I can write them, the device is programmable but would have to be sent to me for reprogramming. Price would be P&P only in the case that I can do them (time and effort).

The unit is a programmable frequency generator, the microcontroller is a Microchip PIC, I might be happy to make the source code available to a developer (but it is not tidy, although well documented).

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