younger people can hear those animals hunting without batdetector.
Your batdetector simply transfers the signals of the bats into the audible frequency range which makes it possible not only to hear bats hunting in the darkness but you can try to find out, what kind of bat you have found.
The easiest way to start your observation is to go to a small lake or pond with trees along its shore. With dawn beginning to fall, you might hear one of europes biggest bats hunting (*Nyctalus noctula* ~ 25kHz) and as dawn proceeds you may find smaller bats (*Pipistrellus pipistrellus ~ 45 kHz*) flying very close around you. After dawn has ended and it has become night, use a bigger torch and direct its beam towards the surface of the water. Now you are very likely to see a medium size bat (*Myotis daubentonii* ~ 60 kHz) hunting very fast only a few centimeters over the surface of the water.

You cand find lots of additional information in the internet - e.g. have a look at
http://www.batcon.org
http://www.bats.org.uk

Perhaps you find the chance to attend a guided bat expedition.

Problems / warranty:

If once you find your batdetector not working properly, please first check the battery. Should the problem still not be solved, try to replace the headphone by a „walkman“ headphone.
If nothing has helped, please send the batdetector to:

CSE Armin Lenk
Meginhardstrasse 50
88356 Ostrach – Magenbuch
Germany

We offer a 24 month warranty on the functionality of the product. During this time we will repair the batdetector free of charge.
After this periode we will repair the product and if costs exceed 10 EURO (additional postage/packaging) we will first inform you.
Please provide your telephone number or your email adress for this reason.

CE

Manual for the

CSE - Batdetector

(March 2003)

Introduction:

Thank you for choosing our CSE-Batdetector! We have desinged this detector as a cheap and easy to use alternative to other ultrasonic- and batdetectors.
The idea for this product was born in the NABU Group Mengen. This is a group interested in protecting our environment when we planned excursions with children and adults to watch bats.
The detector is built in surface-mount technology, is very handy and robust. It even does not matter if the detector falls to the ground now and then. Please keep the batdetector dry. We offer a 24 month warranty on the functionality of the product.

And now we wish you success observing bats.

What you get:

You receive the CSE-Batdetektor, a headphone and this manual. A battery is **not** included in this package and has to be orderd additionally. Please use a 9 Volt block battery, preferably alkaline type.

Additional items:

For two people using the Mono or the Stereo version of the CSE-Batdetector at the same time we offer a set consisting of adaptor and additional headphone.
If you use the Mono version of the CSE-Detector you can plug in a small passive speaker instead of the headphone.

Functional description:

The batdetektor we offer is a direct conversion type ultrasonic receiver. Ultrasonic sounds from the microphone are mixed inside the detector with a variable frequency ranging from 20 kHz to 100 kHz by tuning the frequency tuning knob.

When mixing the microphone and the internal signal, the sum- and differential frequency of both signals are formed.

1. Example: internal frequency 37 kHz
microphone signal 35 kHz

sum signal: 37 + 35 kHz = 72 kHz (not audible)
differential signal: 37 - 35 kHz = 2 kHz (audible)

2. Example: internal frequency 37 kHz
microphone signal 39 kHz

sum signal: 37 + 39 kHz = 76 kHz (not audible)
differential signal: 39 - 37 kHz = 2 kHz (audible)

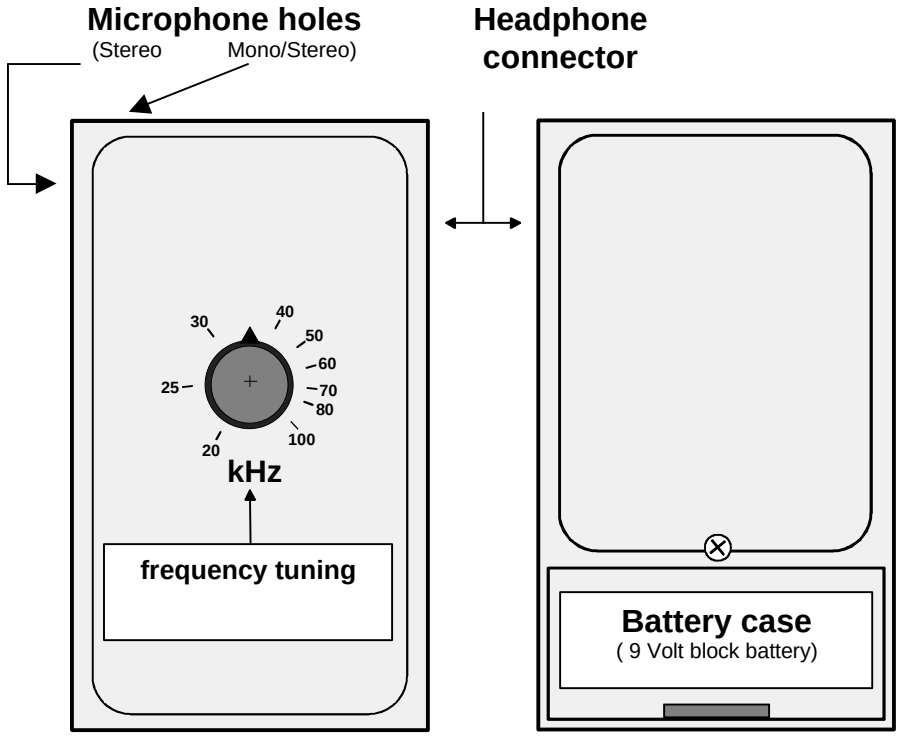
Both frequency ranges 25 - 37 kHz and 37 - 49 kHz are hereby transformed into the audible range 0 kHz - 12 kHz. Thus our batdetektor offers double the bandwidth of standard heterodyne-detectors. Audible signals finally are filtered and an internal amplifier drives the headphone.

Inserting the battery:

Please open the battery case at the rear side of the housing by lifing the battery cover lid with your finger nail. Connect the contacts of the 9 Volt block battery with the battery clip and insert the battery into the battery case. Now close the battery case cover – ready!
The battery may remain inserted in the housing of the detector. Only if you intend not to use the detector for a longer periode of time (winter) you ought to take out the battery to prevent damage to the electronics by leaking batteries.
If you use an alkaline battery type the battery life will be approx. 48 hours.
Please make shure to unplug the earphone after use to automatically switch off the detector and maximize battery life.

Initial setup and test:

After plugging in the headphone into the connector at the side of the housing (see picture) the detector is automatically switched on and ready to use.
Now you ought to hear a slight hissing noise in the headphone.
You can start with a first test of your detector even without bats:
Rub you fingertips in front of the microphone to hear a scraping sound.
Or take a bundle of keys and shake it. Or try to listen to a PC - monitor or an electronic energy saving lamp – you will be amazed what your dog or cat is bothered to hear all the time !
Only for users of the **CSE-Batdetector STEREO**:
Please point the printed bat on your batdetectors housing to the observation direction. Thus the two microphones look to the right / left side and the stereo effect is optimized.



Tuning the frequency of your batdetector:

The CSE-Batdetector offers variation of the observation frequency range. This makes it possible, to listen to ultrasonic sounds with a bandwidth of 25 kHz in the frequency range of approx. 20 kHz – 100 kHz.
This provides additional info when you try to determine the different bat types.

Observing bats:

Bats use to sleep during daytime and they hunt for insects after dawn. They can fly and navigate even in total darkness.
They use some kind of ultrasonic-radar (sonar) system and although they use quite loud signals (up to 100 dB), we humans can not hear them as the frequency is too high.
Most European bats use the frequency range between 30 kHz and 60 kHz for hunting. That means 30.000 – 60.000 cycles per second. Young humans can hear sounds within 20 and 20.000 cycles, elder peoples upper frequency limit decreases to 10.000 cycles per second and sometimes even less.
Only one big bat (Nyctalus noctula) uses tones below 20 kHz and sometimes