



Protocol for recording from a frequency division detector on the Waterway Survey

NEW protocol for making audio recordings on the Waterway Survey

In previous years we asked volunteers to only make recordings at each Spot. If you are still using the old method, please note that we would now like you to make audio recordings while walking between spots as well as at Spots (though just carry out heterodyne counts at spots as usual).

Thank you for taking part in the Waterway Survey and considering making recordings from your frequency division detector. If you can help in this way it will enable us to analyse the recordings in order to assess the accuracy of species identification using the heterodyne system. It will also collect data on additional species that are recorded during the survey.

If you wish to help us with this, please follow the protocol outlined below when undertaking the Waterway Survey.

Carrying out the standard Waterway Survey protocol in heterodyne mode

In addition to making frequency division recordings, it is vitally important that you also follow the standard heterodyne method as specified in the Instructions booklet as this will enable your data to be included in our species population trends analysis.

Making recordings in frequency division mode

At the same time as carrying out the standard survey method, which involves stopping for four minutes at each of your ten spots and identifying and counting Daubenton's bat passes in heterodyne mode, you will be making audio recordings in frequency division mode via your detector connected to a recording device. **Make audio recordings along your whole survey route, creating a new track each time you start a new spot count and each time you begin walking between one spot and the next. You should end up with ten four-minute spot recordings, interspersed with nine "walk" recordings.**

Equipment needed

- A dual heterodyne/frequency division bat detector, e.g. BatBox Duet, Pettersson D230, Ciel CB301 etc. Alternatively you can use a heterodyne detector and a separate frequency division detector, e.g. BatBox Baton. The heterodyne detector will be for carrying out the standard survey method and the frequency division detector will be for making audio recordings.
- A recording device, e.g. a digital recorder with appropriate file formats (WAV, MP3, WMA etc) or a mini disc recorder.
- A stereo audio lead.
- Headphones.

Setting up your equipment

- Connect your audio lead to the **tape** or **line out** socket of your detector and the **line in** socket of your recorder.
- Record in **stereo** to ensure that the heterodyne and FD signals are recorded in separate channels (if you are using an FD only detector such as the BatBox Baton you can record in mono to reduce the file size).
- Ensure that the recording level on your recorder is set to medium so that the bat sounds are not recorded so loud that they are distorted or so quiet that they are difficult to hear. You may need to experiment with recording levels in the field.
- If there is the option to change the bit rate on your recorder (given as 160k or 160 kbps for example) then set it to the highest bit rate available as this will capture more detail from the bat calls and make them more suitable for analysis.
- Make sure you use fresh batteries each time.
- If you need advice on set-up please contact us at nbmp@bats.org.uk or on 020 7501 3622.

Beginning the survey

- When you have connected your detector to your recorder and are ready to begin the survey, plug your headphones into the headphones socket of the recorder to check that you can hear sound from your detector (a good way to test this is by rubbing your fingers in front of the detector microphone). You may need to press record in order to hear sound coming through your recording device. Keep this test recording short (ideally only a few seconds) so that it does not get mistaken for your first Spot recording.
 - On the BatBox Duet you should hear heterodyne through the Right (R) channel and frequency division through the Left (L) channel when the recording is on.
 - The Pettersson D230 is the other way around.
 - On the Ciel CB301 you can select which channel is FD.
 - On the BatBox Baton you will only hear FD and you will need a separate heterodyne detector.
- If you cannot hear anything, you may not be recording correctly: check that the recorder is set up to record and check all connections.
- It is recommended that you listen through headphones when carrying out the survey as sound coming out of the speaker can interfere with your recordings.
- When doing the survey it is better to only hear the heterodyne signal as this will make it easier to carry out the standard survey method. With some detectors (e.g. the Duet) this can be achieved by plugging the headphones into the headphone socket on the detector rather than the recording device. If the only option is to listen to both heterodyne and frequency division signals through headphones then you can tell which side of your headphones has the heterodyne signal as the tonal quality of the sound will change as you tune the detector.

Recording on Spots

- When you have set up and you are ready to start the survey (your starting point will be Spot 1), **press record** and note the **track/file number** on your recording device next to **Spot 1** on the survey form. As described in the Waterway Survey Instructions booklet, stand at the spot for four minutes with your detector initially tuned to 35kHz, identifying and counting any Daubenton's bats by listening for their calls in heterodyne mode and looking for visual confirmation that the bats are foraging close to the surface of the water (a torch can help confirm this but use it sparingly).

Recording between Spots

- When you have finished your four minute count at Spot 1, stop your recording and then press record again to start a new track and begin walking towards Spot 2. You don't need to identify any bats as you walk as we will do this through analysing your recordings at a later date.
- When you reach Spot 2, stop your recording and carry out the same procedure as at Spot 1, making a new audio recording lasting four minutes while identifying and counting Daubenton's bat passes with your heterodyne detector.

Continue this procedure until you have completed your survey. You should end up with audio recordings at all 10 Spots interspersed with 9 recordings made while walking between spots.

Sending us your recordings

- If possible, please transfer your recordings to your computer and then burn them on to a CD for sending to us. Preferably they should be WAV files but we can convert other formats for analysis. It is quite simple to transfer your recordings from a digital recorder via a USB cable.
- If you are using mini disc then there is a free program that can be downloaded that enables you to transfer your recordings to your computer. See our instruction booklet **Transferring mini disc recordings onto your computer using Audacity** at www.bats.org.uk/pages/waterway_survey.html.
- Please label the CD (or mini discs if you have not been able to transfer your recordings to CD) with your name, the site grid ref and the survey dates. We will return CDs and mini discs to you if you wish.

Thank you for your help and good luck with your surveys. If you need any assistance please contact us at nbmp@bats.org.uk or on 020 7501 3622.