Royal Geographical Society with IBG

Communicating your discoveries workshop

Radio and Sound

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Communicating your discoveries: radio and sound

Timetable 3.00 - 4.30

Why record sound?

- to illustrate a scientific paper
- promote an event
- to be used with a presentation so people can listen to your conference
- to make educational audio slide-shows
- to record a journey
- to make an oral summary
- to sell yourself to the media by creating a show-reel
- to make a podcast that people can download and listen to on the go
- for a radio production
- for an archive of human or wild-sound
- to describe an environment

Sound formats

The file format you choose depends on how you intend to use the sound. Low quality mp3 is sufficient for transcribing an interview. A musical recording requires a high quality file. Recordings for archival purposes demand the highest quality settings. You want to aim to produce your material to a technical quality suitable for radio or CD. The following are commonly followed guidelines:

CD/Music for broadcast	44.1/48 WAV* 16 bit - stereo
Archive quality	48.0/96.0 WAV 16bit / 32 bit stereo
Biological recording	specific to the frequency range, but generally archive+

Equipment: **Recorders**

Most modern recording devices record a digital file to a card in a similar way to digital cameras. This sound file can be readily transferred from recorder to computer for editing. You need to consider the maximum quality format the recorder can record at, the quality of built-in microphones, the quality of the pre-amps (hissy recordings) and **the battery life**.

Make and model	*@ £*	*Max format (bit/kHz)*	*On-board mics*	*Pre-amps*	*XLR*	*Battery life (hours)*
Smartphone				Hissy	-	
Tascam DR07	95	24/96		Hissy	-	17
Olympus LS-P2 8	170	24/96		OK	+	up to 16
Tascam DR100 MK3	290	24/96	Use directional	Ok	+	4+2
Zoom H4nNpro	210	24/96		Hissy	+	20
Marantz PMD 661 MKII	440	24/96		Good	+	4

http://transom.org/2014/portable-digital-recorder-comparison/

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Microphones (mono only)

Microphones and recorders do not respond to sound like your ears and brain. You need to get your microphone close to what you are recording. To hear what you are recording you need to use closed headphones connected to your recorder.

Type (Condenser needs power)	*Pick-up pattern*	*Use*
Dynamic	omnidirectional	interviews, ambient sound (more robust but lower signal)
Condenser	omnidirectional	interviews, ambient sound (best for cheaper recorders)
Condenser	cardioid / directional / shot-gun	sound for video, wild-sound recording

Reputable makes: Bayer, Sennheiser, Audio Technica, Sony
Omnidirectional: Audio Technica AT 8010
Shotgun: Audio technica AT-897, Rode NTG-2, Sennheiser ME66/K6

Other equipment

Headphones: when recording use closed-back headphones so you can hear the recording as it happens; any good quality set for listening back to your recordings when you edit.

Wind-shielding: see Rycote (the best) or Rode (affordable)

Accessories: cables; wireless connections - see Sennheiser G3

Connectors for microphones / headphones to smartphones:

Recording situations

Recording people: ask open questions, ask lots of questions, and ask permission to use the recording!

You can use omnidirectional mono microphones and digital recorders for voice interviewing. The most common mistakes when using this equipment are:

- 'Handling noise' from the microphone, avoid by holding the microphone firmly and looping excess cable over your hand, and hold the microphone within a couple of fists and slightly below the mouth.
- Excess background noise: choose a quiet place, or get your microphone close to the mouth, use a directional mic.
- Poor microphone position – see above
- Wrong recording level - the volume should peak about 80% up the scale, better to be a little low than have distortion.
- Failing to turn the recorder on!
- Not realising you are not recording because you are not using headphones

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Recording wild-sounds

One arbitrary division of wild-sound is into physical and biological sounds. The first might be rain, wind and water; the second insect, bird or beast. It's an area where art meets science in the production of soundscapes. In the UK Chris Watson and in the US Bernie Kraus are current high-masters. A soundscape can describe an ecosystem or habitat and can be captured with omni-directional recordings. Capturing species need directional microphones or parabolic microphones. Hydrophones record in water or in damp sand/soil, ultrasound microphones make bats and insects audible to humans, infrasound mics reveal elephants in conversation, contact microphones allow us to listen in to insects burrowing in wood.

Some tips from Cornell University (http://macaulaylibrary.org/field-recording/audio-techniques)

- Night before: assemble the entire recording system and check record and playback
- Plan to arrive at the field site before first light to capture sounds just ahead of and at dawn.
- Position the microphone so that a clear path exists between it and the vocalizing animal.
- When using a directional microphone take care to aim it directly at the subject. This is especially important when using a parabolic microphone system given their extreme directionality.
- Improve your recording by halving the distance between you and the animal. Halving the distance will yield a 6dB improvement in the desired signal and reducing the level of undesired background sound.
- Announce basic data at the end of each recording.
- Review and organize your recordings at the end of each day.

Recording Data (meta-data)

The list below is a quick reference of data that a recordist should consider announcing at the end of a recording.

1. Species name
2. Date
3. Time of day
4. Location
5. GPS coordinates
6. Behavioral context of sound
7. Natural sound or response to playback. If playback was used announce this on tape.
8. Number of individuals
9. Habitat description
10. Weather (e.g. degree of overcast, air temperature, water temperature (important for amphibian recordings.)
11. Recording equipment-Audio recorder make and model; microphone make and model; if used filter positions
12. Distance to animal

Long-term recording (more than 8 hours)

No easy route, see the camera-trap literature. Commercially available here:
http://www.wildlifeacoustics.com/products/song-meter-smzc

Hacked Go-pro here: http://cam-do.com/GoProMotionDetector.html

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Analyzing and editing sound

Audacity is a very good, free, sound editing software package that can be used to make your material ready to share. It will convert your high-resolution files into mp3 files.

Analyzing wildsound is a sophisticated topic beyond the scope of this workshop. One starting point is here:

http://www.birds.cornell.edu/brp/software

Sharing - making sound available to others

Upload / download sites have come and gone but these have prevailed over a few years at least**:**

https://soundcloud.com/, iTunes, www.ipodder.net, www.podcaster.net, www.podcasts.org,

www.ipodder.org, www.podfeeder.com, www.audible.com, podomatic, jellycast

Archiving

Store your interviews and sounds and their associated metadata in sound library archives for others to use. Typically you would deposit in the archives of the nation you are recording in and your own.

Labeling your file – metadata and tags

Your listener and indeed you will search for your audio-file by the way it is labelled. Make sure you label your material including your name as the originator, date and so on. Different editing tools provide different options for doing this.

Lastly, feel free to contact me, I'm very happy to help.

My contact details: riscrase@yahoo.co.uk / 0778 779 4250

