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Developing DIY Solar-Powered, Off-Grid Audio Streamers for Forest Soundscapes: Progress and Challenges

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***Abstract*— This project presents the ongoing development and challenges of building two permanent listening stations for one year located in the Alice Holt Forest in the UK using DIY practices and techniques.**

***Index Terms*—** acoustic ecology, DIY, solar power, soundscapes

I. INTRODUCTION

Sensing the Forest [1] is a project funded by the UKRI Arts and Humanities Research Council that aims to raise awareness among forest visitors/aficionados, artists, scientists, and the general public about the connection between forests and climate change.

As part of the project, we are developing two DIY solar-powered, off-grid audio streamers. Here, we present the progress and the challenges encountered so far.

II. THE STREAMERS

We installed two streamers in the Alice Holt Forest operating as listening/recording stations: one is near the permanent installation *Dendrophone* [2] by Peter Bachelor, whose sounds are affected by the environmental data. The second streamer is placed in a reclusive meadow near a large pond on the Lodge Pond Trail. In this way, everyone with an internet connection can go online and listen to the current state of the installation, or they can listen to the natural sounds happening in the meadow at any hour of the day or night [3].

The key aspects of the development are:

- Started from the Locusonus streambox project [4].
- Adjusted for the current standards found in the online community (Raspberry Pi, Darkice, Computer Music Tools).
- Added features specific to our project (solar crontab, safety measures, user independence).
- Included eco-friendly design (3D printed PLA cases, beeswax for waterproofing, recycled battery protection boxes).
- Planned future software release and 3D print models.

The streamers' mission is not only to stream live soundscapes of the forests 24/7/365, but also to create a selection of 5-minute daily recordings based on astral time. We chose astral time with all its additional challenges because nature, especially birds, does not follow our standard chronological time. The recordings will be shared with the community on the Freesound database [5]. We plan to make the year-long recordings available to artists for their practices and to scientists interested in looking for any potential connection between forest soundscape and climate change.

III. CHALLENGES

Designing for the forest presents many challenges. Solar power is a welcome and reliable solution for DIY projects that have no mains, but what can we do when direct sunlight is scarce? With DIY materials, how can we achieve good sound quality and reliable weather protection?

Most of these challenges stem from the DIY approach chosen. In an age where the race to AI will likely result in an upward redistribution of social and economic capital [6], DIY approaches have the potential to make these projects available to a broader number of people, both inside and outside the academic world.

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V. REFERENCES

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