

# Plural Radio- Listening

## SHORTWAVE COLLECTIVE

What does it mean to radio-listen collectively, as feminists? Do we listen to the same things, differently? Do we listen to different things, in the same ways? Can we listen collectively from distant spaces? Do we listen to each other? To ourselves? We do not always agree—this is the joy of working collectively, from a plurality of positions—but we use radio-listening as a way to consider together the situatedness and the material and cultural ecologies of radio, as well as how we understand what listening is and can be.

At sunset on top of the local hill, next to the one remaining wall of an old building, we had our first ‘grey line’ listening experience; this is the time of day on the cusp of nighttime when radio transmissions travel more easily around the globe, enabling stronger signals to be received from further away. This is an ideal time for listening through our no-power devices that rely on the energy within the radio wave itself. As the sun rapidly fell, we discovered that almost any configuration of diodes we placed into our circuits were able to pick up the transmissions: the ‘foxhole’ razor and pencil combination, the crystal and cat’s whisker combination, even a piece of scrap metal that we found on the ground. The air was full. And what we heard were layers and layers of radio, wafting in waves over the top of one another, an air that was thick with voices, languages, singing, static and buzzes. We were hearing distance and the weight of the signal all in the air, feeling the fullness of the radio experience all around us.

Shortwave Collective is an international group of 10 people from various backgrounds and disciplines interested in feminist practices and the radio spectrum. One of the reasons it was initially formed was as a counter initiative to the (gendered) learning and culture of amateur radio, which is predominantly interested in signal strength, size and/or reach of antennas, and clarity of reception and transmission. It is within this culture that the markers OM (Old Man), YL (Young Lady) and XYL (referencing the wife of an amateur radio operator) are still perpetuated; this unnecessarily genders operators and omits an entire spectrum of ways for people to participate outside of this binary logic. As a collective, we have a desire to learn together and to open a space to learn together-with-others as equal non-experts. We spend time in each other's company making, testing, listening and sharing; sometimes 'failing', but more often laughing our way into serendipitous results that lead us to new practices and new situated ways of listening. We're not listening for clarity and strength of signal, but are rather interested in the fragile, uncertain pluralities of hearing radio within the interconnectedness of different spaces, bodies and materials. Such listening places importance not only on what is being transmitted, but the systems, infrastructures and ecologies that they are part of.

*We broke the rules of antenna use quite quickly, swinging our aerial like a giant skipping rope, pushing away from the bounds of the fixed horizontality that we'd been taught. The sound rushed with each swing, pushing through the radio waves, creating an expanded dialling of an invisible tuning knob where we got to hear everything all at once on each loop through the air. We balled the ariel up and threw it vertically upwards, unravelling as it flew higher and then back to the ground. This sounded out the height that radio could be accessed, revealing a ceiling that we had to move into to hear anything at all, with more and more voices the higher we went before it crashed to the ground and, after a delay of energy still rushing through the radio circuit, it all went quiet.*

Part of our feminist ethos is 'learning through doing'. This is a way to de-mystify aspects of technology, which enables us to share our experiences more easily with each other, and with others. The collective's approach aims to create an inclusive, collaborative, tech-based learning environment, one which acknowledges and attends to gendered education gaps and one that purpose-

fully removes potential hurdles, such as unexplained components lists that assume knowledge. In 2021, we decided to explore the basic principles of radio technology in order to better understand radio reception. We researched and learned collectively, tinkering, testing, and feeling energised by our questions and as experimenters. With the knowledge acquired through these experiences, we support others interested in learning about radio in a different way. Our feminist ethos is also practised through our structures of working: we are a non-hierarchical group who share the organising roles (usually by means of rotation based on personal capacity) for both collective and project-based activities, recognising differing needs, access requirements and types of labour within the group.

*We walked in the cold November dusk to the hill where we would test our Open Wave-Receivers, a group of twenty of us with scarves and mittens. We arrived at our spot and by a street light set up our receivers, lassoing our antennas made from speaker wire to a chain-link fence above us and putting our tent pegs into the grass as a ground. We started testing each radio, hooking it up to a digital recorder and battery powered speaker. Each Open Wave-Receiver was unique, some had meticulously wrapped copper wire around a stick and taped on the cardboard platform, others with wire falling off a toilet roll and a tangle of clipped wires, but they all worked. Groups of us gathered around and tested one Open Wave-Receiver at a time, shrieking with delight as we heard signals: I heard them say Pakistan! That's the signal from Askoy! It's the quietest rave in the world, Hannah said, as we leaned in closer to hear soft thumping beats, and we laughed. People out for a walk on the hill stopped to make sense of this scene. Some lingered long enough, and we drew them in to listen in amazement with us.*

We began by researching early radio receiver designs, in their simplest form. Such circuits only have a small number of parts: a coil, an antenna, a ground, a diode, and a way to listen. The earliest radios were called crystal radios, because a crystal (usually galena) was used in combination with a thin wire (known as a 'cat's whisker') as a point-of-contact diode.

Listening on a Summer Solstice in the Scottish countryside, I heard sferics for the first time: cracks of static in the air all around me, very low frequency emissions from lightning strikes all around the world, accessed through just a handful of wires, a clothes peg diode and a long metal fence.

We started to build our own receivers, working with various print and video guides, and learning about the relevance of each individual part. At an artist residency at Buinho Creative Hub, in Portugal and online (some of us were there in person, others participated from afar) we delved more into the research and put some of the circuits to the test—also together with others in the form of a workshop. The residency gave us an opportunity to experiment further with the sociability of radio-making, and the dynamism of a community of listening. Because we worked together in a group and conducted a discovery workshop, we were able to experience first-hand the potential in sharing both the research on making receivers, and how collaborative construction and exchange can influence listening practices in proximal spaces. During that time, we also created the first iteration of our ‘how-to guide’ for MAKE magazine, which has continued to perpetuate both listening practices and involvement in radio-listening throughout the Maker, radio and DIY communities.

Today was the hottest day on record in the UK. Tonight, the air is still and thick with a slight breeze coming off the water’s edge. I’m on the Thames foreshore in central London at 1am, testing my Open Wave-Receiver. I’m really familiar with this particular location, which by day is consistently punctuated by building construction, traffic hum, and buskers. At night time I hear new details; the usually hidden church bells chiming every quarter hour, or taps and pats of rain on the river’s surface. The sound of a single ambulance siren slices smoothly through the city’s nocturnal sounds, almost slick in the air. My antenna is slung over a gruesomely mossy wooden pole, (remnants of the ancient docks?) which has been freshly revealed by the receding tide. My ground wire is jammed into the mud. Tiny, barely audible, river waves are accompanying my troubleshooting efforts in the dark. I can’t get the radio receiver to work tonight.

Probably the most well-known simple radio circuits are the foxhole radios from the 1940s, named after the small pit designed for one or two soldiers to use in a defensive fighting position. The main difference between the early crystal radio receivers and foxhole radios was the materiality of the diode. In foxhole radios, the crystal was replaced by materials available to soldiers at the time; it was usually the combination of a razor blade and a pencil that became the point-of-contact diode. As with the crystal sets, these were no-power devices, meaning that they couldn’t be detected by others, but also that the sound output would have been low, requiring sensitive headphones.

Leaning out of my third floor window on a cold evening I was just about able to connect into a transmission from a Red Cross worker reporting on the Ukraine war. My Open Wave-Receiver barely made the connection, it was an incredibly fragile listening experience with my speaker wire antenna dangling out of the window. With my pencil held firmly on my razor blade diode, trying not to keep losing their voice, I listened intently to their accounts of disaster. I felt their words so sharply in contrast to the calm evening dog-walking scene below me, our urban worlds so devastatingly different but connected fleetingly through these vibrations.

Because of the listening positionalities and associations of the foxhole, we took it upon ourselves to think of our work with the circuit more as a reinterpretation, a reclamation, an intentional moving away from roots entangled with the military, and the singular (national) subject, from which much radio technology stems.

It was about 4AM, Pacific Standard Time, and the night was still. Cars were stopped, and roads quieted. I was up on the top floor of our narrow Silicon Valley Townhouse, sitting by the window. There was some special solar activity that was promised to increase listening at this hour, so I got up to try it. I was listening through a tiny shortwave radio, scanning for sounds... somewhere. The sky was lit by the moon, which reflected onto the grey clouds that were against the dark indigo night sky, making them appear white. They were scattered and close with a gentle breeze rolling them eastward. It was beautiful, the kind of scene that if one were to be in it, one would wish for a conveyance to float up

to the window to go off sky exploring. In absence of that, I turned on the radio and got to the business and practice of listening, another kind of sky exploration.

Like the moon lighting the sky, radio waves were open, and populating my radio: fast, broad, and clear. I was in Northern California on the West Coast of the United States, and I could hear and visualise it all stretched across the Great Pacific Ocean: Russian broadcasts to the north west, Japan coming in a bit lower, China and India, and locally, Mexican songs and talk shows. I heard Japanese lullabies on one channel, and what sounded like a very clear broadcast on female reproductive rights clearly moving over the airwaves from further afield. I was new to this, and to collecting what I heard. To capture sounds. I pressed my phone microphone to the radio speaker, gathering clips as they came through with each scan of the frequencies. Instead of traveling and taking photographs, the sounds came to me, and I collected pieces of them, parts of people's productions, thoughts, and radio lives, mostly much farther away from my own.

On this night, the sounds of the Pacific Rim opened to me looking out the window in my little room with my tiny radio. And that, in turn, opened me to hear sounds and to visualise geography across the Pacific Ocean. But I could also hear right down the street—for punctuating these far away listenings, were local commercials for Italian food, specifically from a restaurant 5 miles away. “MEATBALLS! Blah blah blah MEATBALLS! MEATBALLS!” blasted through my radio, louder than the other stations. As American an ad as one could find right there amidst the slow roll of the Great Pacific Ocean gems that I listened to, and collected from further afield.

Our re-naming of this device as an ‘Open Wave-Receiver’ has multiple connotations and shows how we want to think and engage with these simple circuits differently. Firstly, it is a design that doesn't have a tuner, it is open to a broad range of multiple frequencies received simultaneously. Secondly, it is adaptable and forgiving: the circuit is open to having parts switched out for alternatives,

pieces can be sculptural, and it can be literally built into a location. Thirdly, our research and experiments are to be shared, to be further experimented by and with others, to be in-process. So we mean “open” as in open access; open as in untunable; open to the elements, unhoused; open to different parts; open for experimentation. We often make Open Wave-Receivers with others and test them out giddily, listening together as a social practice. “Why is this so fun?” one adult participant recently said in a workshop. This kind of open approach to creativity and collaboration is too rare in most people's day-to-day lives.

I was driving down Old County Road listening to 89.1 FM, Atherton, a station that usually broadcasts “all the hits from the 20's, 30's, and 40's”, mostly swing (and sometimes high school baseball). It's a small station, located about 10 miles from our place, and as I drove, the radio blended into a fleeting Spanish language station that only broadcasts in a few mile radius. I loved listening to the mash up of swing with the other broadcasts as I drove, (safely) pulling over to one side of the road and the other, to change the mix of what I was hearing. My car became the tuner for this blended station, with the road as the dial as I moved, and probed the range of the mash-up of these stations.

Along with time-specificity comes the site-specificity of radio-listening, especially with Open Wave-Receivers. In our research, we've examined each part of the circuit and experimented with each piece as a part of our listening practice. For example, the receiver requires a ground, literally connecting the circuit to the earth to disperse excess signals within a specific location. The ‘ground’ is where we learn about the conditions of and access to the soil, whether it is moist, frozen, full of rocks or deeply inaccessible under layers of construction, sometimes accessible only by water pipes or following tree roots. It challenges us to find a way to connect our receivers from wherever we may wish to listen, such as high up in a building. In this case, in order to ‘ground the ground’, we might have to dangle wires out of windows, or attach them to the copper pipe of a heating system. Our antennas also usually work in relation to local architecture or natural elements and allow us to listen through the physical geography that they occupy. For example, we may use trees, walls, fences, a hillside along which a barbed wire fence runs at great length, or even landmarks or ruins.

The coil is another opportunity for creative experimentation: copper wire can be wrapped around a roof tile, or any material with a hollow or non-conductive centre that lends itself to structure and meaning (we like to find items that are local to the area of listening). Finally for the diode or detector—a material or combination of materials that act as a kind of gate, allowing the alternating signal to move around the circuit in only one direction—we might use a razor blade and pencil, crystal and wire (as in the versions we learnt from), or a random material, perhaps an alloy in the form of a tent peg, clothes peg or scrap piece of metal. Our bodies are part of these circuits too: we physically connect into the circuit as we handle it. We influence reception by the moisture on our skin, the material of our shoes, the mood and context in which we listen, as well as the location and situation that we set the radio within. With these aspects in mind, the circuits—and ourselves—physically become a part of a particular environment, and the signals received are connected to this moment.

I'm sitting at an open window, above the main street of Finsbury Park. I can hear that I'm high up, and I feel safe from the unpredictable space below. There is a black spider comfortably visible in its web next to me, appearing alert and poised. Other dark windows are open across the street, as it's a very hot night for London. The pencil is planted on the razor-blade with some warped, non-descript wire keeping it relatively in place. While sparse traffic ebbs and flows below me, micromovements from this trio gently manoeuvre around my mounting board and determine my radio listening for the evening. In the background of my radio reception, heavier voices murmur and laugh, almost manically. In the foreground, people are calling in to a late-night talk-back show to discuss the current extreme weather and climate crisis. A woman mentions that there are six children from Portugal who are in court right now suing 33 European governments for failure to take action on climate change. The conversation shifts to news about bison and a Punjabi singer acrobatically interrupts from her own station as reception crossfades. I disconnect my pencil, breaking the circuit, to momentarily re-tune my ears to the streetscape, as heat can make people do strange things.

In line with our intention to learn through doing, together with others, we facilitate Open Wave-Receiver workshops, engaging participants as co-researchers, experimenting with different designs, different objects and different placements and settings. We like to have a making session and a listening session, the latter ideally taking place at dusk. We choose twilight, the grey line between day and night, because in this phase radio signals at the higher end of the spectrum (shortwave/AM, VHF, amateur radio) can propagate around the world along the grey line, so that we can potentially listen to more varied signals and from further away. This makes the time-specificity of radio reception all the more palpable, as we notice the changes in reception and changes in light at the same time. By listening over time, we notice the atmospheric and environmental influences on radio reception. We think of these and other radio devices in-situ as part of a larger constellation of bodies, materiality, and connection experienced through listening.

There's something really special about nighttime radio-listening, maybe it's the surrounding quiet in combination with the signals from afar. It's late at night and the sky is clear, the stars are out. I'm listening to my shortwave receiver in the countryside, a couple of hours outside of Berlin. The landscape is totally flat, so it feels like there's a lot of sky. The signals are coming in really clearly. I tune around a little bit, the spectrum is completely full... there are sounds that I never hear in the city, sounds I recognise from WebSDR (online) receivers—the more abstract radio sounds of beeps, analogue rhythms, a computer voice reciting random numbers. It's amazing, I can't believe there is so much to pick up here. And then I realise... the landscape may seem flat, but it's actually a slow gradation up from all around. This is actually the highest point in Brandenburg. The fullness of the radio spectrum makes me realise my topological position, and imagine how the signals may be bouncing around the planet to be picked up here.

Radio-listening to Open Wave-Receivers with others is not about the sound as much as it is about connectivity. Through these happenings, we can feel connected to the immediate environment/location, the other listening humans, to signals near and far... and what is behind those signals.

It's 3pm in the afternoon and I'm listening online through WebSDR, which is currently singing to me "And I know if she had me back again I would never make her sad"...

...Station 12653.99 recommended by anon18092 in the chat  
Dooon doooon doooon intermittent louder doooon doooon  
dooon background phaser effect. 1 blip 2 blip. Descending, widening. Descending forever loud t t

4625.00  
He uuuur  
He uuuur  
He uuuur  
Over a ripple tone abrasive but a softness, like it's on the edge  
He uuuur sometimes a microsecond faster, fading in and out but constant  
Now out, now in. Out where? Now in.  
**Quud quud then returned to he uuur.**  
**Quud quud dudududuh**  
**Qudududud duh**

4810.00  
haunted  
Pin pricks, like nerves  
Background swarm of small things  
Abrupt pause. Then daaaaaaaaaaaaa da da da da  
Da da da da da da da da da da da da da da  
Da da d d da da da da  
swarming  
Receiver snck. snck.

For the Radio Art Zone project in 2022, we made a 22-hour work called 'Constellations of Listening', with the intention of sharing our plural radio-listening experiences, of transmitting moments of reception. In the months leading up to the festival, we recorded many moments in many locations with many different radio receiving devices (Open Wave-Receivers, VHF and VLF receivers, software-defined radio, walkie-talkies, electromagnetic detectors). We tried

to pick up signals individually from the places where we live and work, and we also recorded the collective listening sessions at Open Wave-Receiver workshops. Our collective material was sourced over many months and seasons, and across different time zones, from listening sites that connect environments, technologies and voices. We compiled our recordings so that they would be broadcast back at around the same time of day or night that they were made, the sharing of radio-listening experiences.

In a garden somewhere in the seaside town of Chania, in Crete, Greece, an old bitter orange tree becomes the ground for receiving a multitude of signals, made of different languages, dialects, data-packages, interferences mixed with topical sounds of insects, avian activity and heavy military air traffic. Altogether the signals are picked-up by a pair of omnidirectional microphones and streamed in -realtime- via a raspberry-pi based streambox to a server and played live on RAZ's main stream, as well as on analogue FM broadcasts in Esch and via international broadcast partners. A delicate yet elaborate network of (mediations and) relays.

Coils are curled around branches and small radio receivers are hanging from the tree. The tree becomes a transceiver. The afternoon sun warms up the soil and the line of reception becomes inundated. Listening starts in the porosity of the signals, frail, sparse and topical. Interference becomes a mechanism for navigating what can be heard; listening to many at once; an open wave-listening. Interference becomes a gateway to interreferential listening, receiving from different directions, different branches, foreground and background, simultaneous and ambiguous, difficult to be defined, a radio with many heads and tongues, some heard, some not; a plural radio-listening.

This transmission aspires to balance liveness, site-specificity with remoteness, as I try to interject existing frequencies with prerecorded contributions and receptions by Kate, Lisa, Brigitte, Sally, Hannah, Georgia, Sasha and Alyssa. Their voices narrate and clash with each other and reclaim frequencies usually occupied by music, news and commercial radio content. Their voices and

receptions articulate the infrastructure of the tree as it is mapped out via the hanging radios, becoming embedded in the flora and fauna of the site.

I try to listen as I try to transmit. I move around the tree in circles, moving closer and away from the different receptions. I hold another device to sporadically tune in and amplify what I try to hear but my listening is constantly destabilised by an abrupt change in signals, interferences, a passing plane, the sounds of insects. I am aware that all these changes and my moving body are transmitted across the network to multiple receiving ends, reminding the listeners that this is a live transmission.

Remote becomes topical, and the in-situ becomes extended across the network. Interreferential listening is prompted through these deliberate interferences, and the high-jacking of the mainstream airwaves.

Each small radio receiver hanging on the tree becomes a tool for reverse-engineering transmission, for opening up the airwaves to unheard, lesser known stories, against the top-down, topical mainstream; allowing a kind of listening that sits in-between the established and the peripheral, a transient sounding space.

Elsewhere on this tree, FM/AM/MW/LW/SW live receptions pulsate across the leaves, only to be hijacked and perturbed by a micro-cast that diffuses my voice across different receivers. “Ραδιόφωνο=Αποτυχία”, “Transmission means Failure”, “Transmission means Loss of Signal”, “Transmission is Fragile”.

The transmission involves an iterative process of trial and error. A big part of what that transmission achieves can be found within radio's inherent fragility and failure to be received and the possibility of interreferential listening. It asks for an active making and “figuring out”, embracing failure as a way of accepting that there will always be signals that will never be heard.

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<https://www.shortwavecollective.net>