For More Information, please read:

ANIKA EDREI, SHAY HORSE, JAMES CRAVEN, KEEGAN STEPHAN, and MICHAEL NUSBAUM v. THE CITY OF NEW YORK, New York City Police Department ("NYPD") Commissioner WILLIAM BRATTON, and Officers NYPD LUETENANT "JOHN DOE #1" MAGUIRE and "JOHN DOE #2" (the names being fictitious as the officers' true names and shield numbers are not currently known), in their individual and official capacities: United States District Court Southern District of New York.

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Muff the police!

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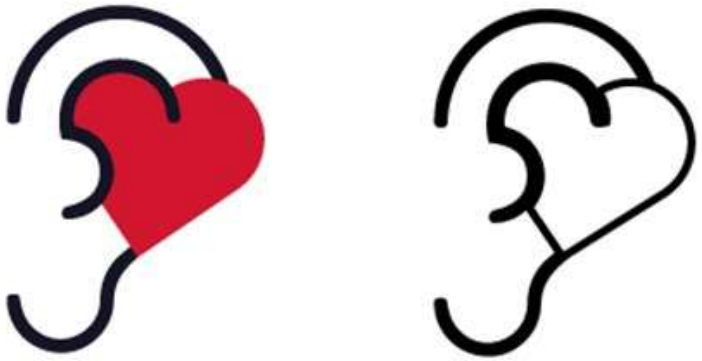
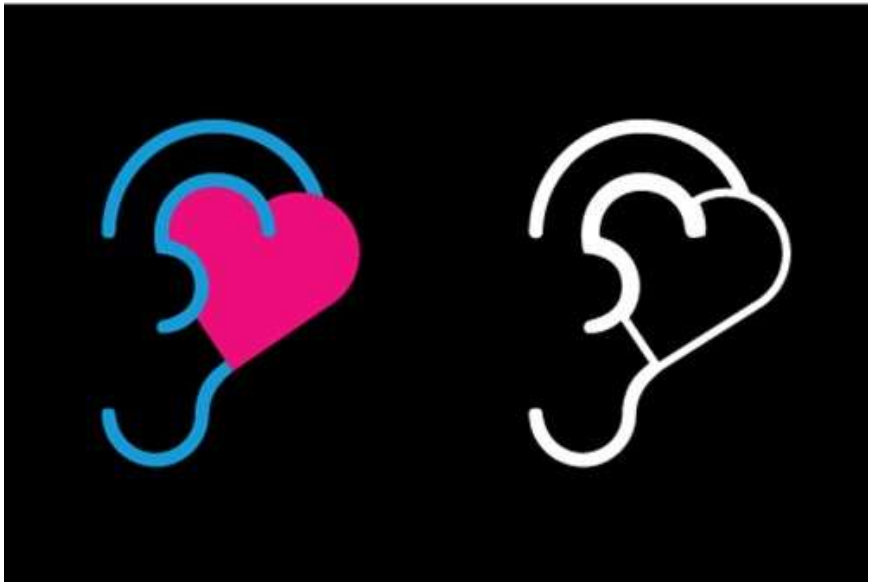
Muff the Police!





Sonic Care at Demonstrations

Muff the police!

The threat of police use of force, "non-lethal" and lethal, is part of daily life for many. Black Lives Matter is just the most recent of many generations of activist movements that have drawn attention to the ways in which police disproportionally target and justify excessive force on marginalized and vulnerable people.

When you choose to take part in activism, you become a potential target for escalated and violent tactics by police. This threat sometimes changes individual and collective behavior and planning, which can have a negative impact on public participation in mass action. Planning and having accurate information about the realities of police violence will help you make better decisions about when and how to participate in, and how to organize, demonstrations. Documenting, sharing, and seeking redress for violence can impact public perception about over-policing, contribute to legal cases against police violence, and effect policy change.

Why do we care about police sound?

The sonic is one aspect of policing that is often overlooked, but is a big part of the way in which police inhabit our public space and affect our movements when we engage in contentious public assemblies such as demonstrations, protests, and rallies. The excessive use of sonic force is one way that police create conditions of discomfort and pain for those wishing to assemble in public. Police often use excessive sonic focus at assemblies that call for police and military accountability, which can be heard as a form of retaliation.

What is sound? What is hearing?

Sound is an invisible form of vibrational energy that must travel through a medium (air, bones, flesh). As listeners, we hear because the wave energy is converted by our ears into sounds in our brains.

Sound is easy to measure. Sound frequencies are the number of waves per second, measured in Hertz. Sound energy is measured in decibels (dBs). The rate of dB increase is logarithmic, which means that for every 3dB increased, the sound energy is doubled. A sound at 83dB has twice as much energy as 80dB. This matters when measuring sonic energy and wearing hearing protection. See the chart for normal dB levels of common sounds.

Legal pathways of redress

Police departments usually promote the fiction that LRAD is never injurious and will only be used in communications mode. To date, no US police departments not used independent scientific research on the effects of LRAD exposure on the body to guide protocols for use, and instead follow biased manufacturer protocols for its use, parroting the claim that even the deterrence level of sound energy is within legal bounds.

The ACLU of Pennsylvania has successfully sued Pittsburgh police for a woman's LRAD-inflicted sonic injuries at the 2009 G20 protests, and the New York National Lawyers Guild is currently pursuing claims against the NYPD concerning the injuries of five journalist/activists who attended a Black Lives Matters action in New York City in December 2014.

These lawsuits claim that plaintiffs' First (rights to assembly, speech, and freedom of the press), Fourth (unreasonable search and seizure), and Fourteenth amendment rights (equal protection, due process, and right to life, liberty, and property) have been violated by improper LRAD use.

Your pathways to legal redress

- Identify and document LRAD injuries and keep note of the injured person's changing signs and symptoms
- If anyone recorded the LRAD usage, get their contact information and ask for a copy of the recording
- If you have any signs or symptoms of LRAD exposure, go to an ear, nose and throat specialist for a check-up.
- Call your local National Lawyers Guild chapter to report your injuries. If there is no local chapter of the NLG, speak with a civil rights lawyer.
- You may want to report the police related injury to your local Civilian Complaint Review Board or other police oversight committee. Before doing that, check with a lawyer, because in some cities filing a complaint renders you ineligible for other forms of redress.

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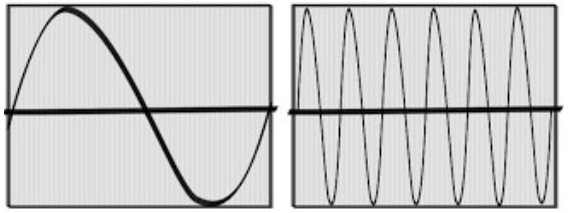
You need to do some math to figure out exposure to sound when using ear production. To do it, take the NRR number (in dB) of the protection, subtract seven, and then divide by two. Subject this number from the exposure dB recorded by your device.

After exposure

- Check in with your group immediately and encourage anyone with injuries to document them
- If you have any signs or symptoms of LRAD exposure, go to an ear, nose and throat specialist for a check-up
- Rest your ears by avoiding loud or sudden sounds
- Check in over time with those reporting injuries, continue to support them as they heal and if they decide to pursue legal redress for their injuries

How to build your event in an LRAD era

It is always a good idea to have first aid available at your demonstration. If you have street medics in your community, you can ask them to attend and ask them what the planners should have on hand for participants. It is a good idea to bring earplugs if you suspect LRAD will be on hand. Brief your organizers in advance about the LRAD and have them spread calm and information in case of its deployment, especially noting those with prior ear injuries and those with children. Always try to have multiple ways out of a space and know where they are at all times.



100 Hz 600 Hz

Sound measurement is not entirely synonymous with hearing measurement, because hearing happens in the body and is subject to each body's specific medical and emotional history, state of being, and proximity in space. Two people standing next to each other can experience entirely different sound worlds. This is important to remember when caring for each other at demonstrations.

In most cases, the body reacts quickest to auditory, not visual, signals. Hearing is an important sense for locating ourselves in space and alerting us to changing environmental conditions. We hear sound immersively, surrounded with a variety of natural and human made sounds that collectively form a "soundscape." A healthy and enjoyable soundscape is a public good that contributes positively to our sense of a good living place, our mental health and wellbeing.

Decibels	Sound Source
10	a pin dropping
20	rustling leaves, ticking watch
30	whisper
40	babbling brook, quiet library
50	light traffic, refrigerator
60	conversational speech, sewing machine
70	dishwasher, toilet flushing
80	vacuum cleaner, garbage disposal
90	shouting, lawn mower, MRI machine
100	subway train, blow dryer
110	rock band, leaf blower, jackhammer
120	thunder, screaming baby
130	stadium crowd, ambulance siren
140	jet engine at takeoff
150	cap gun, baloon popping
160	handgun, fireworks
170	shotgun
180	rocket launch

Noise is an "unwanted sound."

What is police sound?

There are hundreds of police sound technologies, but in this zine, we're just going to talk about those facing the public and used in crowd control, namely: 1) amplified police voices, 2) sirens, and 3) alarms. The police voice is the first sound technology used by police. The police train cadets to affect the voice of authority. When a police officer speaks while on duty, she is doing so in an official capacity and she is accountable to her words as representing the force. Public facing extensions of this voice include whistles, megaphones, radios, public address systems, and the LRAD.

The police use a variety of alert and warning sounds as a kind of "pure cry" of attention. Sometimes these sounds direct the gaze at the officer, sometimes at a potentially dangerous situation. Sometimes these sounds can also be used as part of a dispersal tactic due to their sheer volume of sound and irritating pitch(es).

Police whistles and sirens are designed to "penetrate" through the noise of streets. Whistles have been in use since the late 19th century, in two different forms: foot patrol and traffic whistles. These remain part of the officer's uniform but were mostly phased out of daily use in major US cities when police moved from foot patrol to car-based patrol. The electronic megaphone is a portable public address system with a handheld microphone, amplifier, and speaker, first introduced in the 1950s.

Police cars are equipped with electronic sirens on the hoods. Siren types include wails (descending tones from 1800-600Hz), yelps (linear rising falling 500Hz to 2000Hz), and high-low sweeps (950 and 1150Hz). Over the 20th century, the police adopted louder and louder voice, siren, and alarm technologies to cut through louder ambient soundscapes of modern cities. The sound of the police siren has risen 40dB in many North American cities since the early 1900s.

Research has shown that the use of siren in the "Lights and Sirens" protocol for vehicle response to emergency calls is effective only at short ranges and very low speeds. This protocol has been called "ineffective and dangerous" in other circumstances due to possibility of accidents at intersections, and contributes negatively to the wellbeing of those living in proximity to emergency response dispatch centers.

Another element of police sound is control over the soundscape of public space. Over the course of the 20th century, cities have adopted more and more noise ordinances, which gives police officers the pretext for engagement with people deemed sonically unruly. Additionally, police often control the location and duration of amplified sound in public space through permits, which are especially onerous for those practicing public speech daily, be they preachers or musicians.

If you attend demonstrations where LRAD or other loud police sound is used, you may consider buying musicians earplugs, which reduce sound volume up to 20 dB without sacrificing ability to hear language. Likewise, sport and hunting earmuffs can be worn, although these are more cumbersome part of your pack. When purchasing, check the Noise Reduction Rate (NRR) and try them on for good fit.

How to record

You have the constitutional right to photograph police and government officials as they work in plainly visible public spaces. To successfully record an LRAD interaction, make sure that you are sufficiently out of harm's way and stay situationally aware. Ideally you would start the recording before the exposure begins. Be far enough away to show the scene as it unfolds. Record the entire duration of the exposure. If there are important things that the police are doing but that cannot be seen, speak them out loud. Say how far away you are from the police, pointing out landmarks that could be useful later. Immediately upload the video to the cloud or email it to someone else. If possible use an app such as Mobile Justice (by the ACLU) to record the video.

You can easily monitor your police sound exposure levels if you have a smart phone. A dB meter just samples the moment, so you need to take continuous samples to get your whole exposure. A "noise dosimeter" will capture all the sound energy you have been exposed for the duration. The latter is used in workplace sound exposure measurement.

The dB meter sampling at its highest rate is the cheapest solution for activists. Standalone dB meters are relatively inexpensive. A simpler solution is a smartphone app, although it will drain precious battery life during an action. iOS users should download the NIOSH Sound Level Meter (NIOSH SLM) app.[i] Android users should try SoundMeter or Decibel Pro.[ii] iOS devices are better for accurate dB readings because their microphones are calibrated to the specific model. With these apps you can capture the duration of your exposure and download/email the results. It is a good practice to do this immediately after exposure if possible, in case of arrest.

Get to know the software in advance, test out daily life to see how loud it is. Once the LRAD is onsite, check your base level before exposure by monitoring crowd sound without the LRAD on. Once it seems likely LRAD will be turned on, start the meter. If you only start after, that's okay – just remember how long it took from first exposure until you turned your device on. Be sure to note the duration of your exposure, the dBs of your exposure, your distance from the sound, and any change in location closer to or further away from the sound. Keep this all in a log.

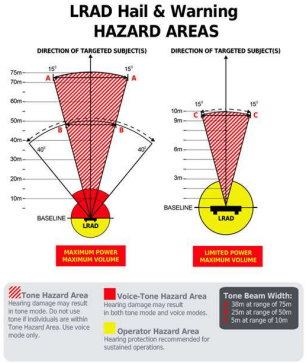
Stay calm, comrades!

- Breathe deeply and remind yourself this is only temporary
- Help panicking people to leave the scene calmly
- Do not spread rumors; actively question whether info is verified; get eyes on things if you can safely
- Always walk instead of running, unless it's a life-threatening situation
- Create solidarity through singing, linking arms, chanting, holding hands
- Engage those being quiet and make sure you aren't leaving people out
- Bring and share food, water, calming sprays (with consent)

If LRAD is deployed: protect your ears, get out of the way

If LRAD is deployed, assess the situation. If it is used as a communications device, put in ear plugs and check out the scene for routes of escape from possible injurious exposure. Be aware that LRAD is often used in injurious way in conjunction with or following other tactics, such as deployment of pepper spray or targeted arrests. If other tactics are deployed, be prepared for possible injurious LRAD exposure.

If the LRAD is turned to the deterrence tone or is used to project the police voice so loudly you cannot hear a comrade's voice over its sound, you may want to get out of the way. LRAD is a highly directional, cone-shaped ray of sound energy. Its rate of spread is about 30 degrees (see figure). Walking away from it will not be as effective as walking perpendicularly to it until you are out of the cone of sound. Covering your ears will lessen the amount of sound but render you less able to protect yourself from other police tactics. Other makeshift earplugs include wax or other non-toxic, semi-firm substances that will not break off into the ear and can be easily removed. Tissue is better than nothing.



What is LRAD?

The Long Range Acoustic Device (LRAD) is the name of a family of military-grade sound amplification devices used by police. The technological innovations of this device are a few: first, it renders low distortion sound reproduction for clear communication in directional focus at a 30-degree angle and at extreme volumes that allow for long distance communication. Second, the LRAD has a built-in "deterrent tone," which is specifically designed not just to be annoying in its frequency and repetitive pattern, but to be the loudest possible sound the device can make.

At extremes of loudness, proximity, and duration of sound, LRAD can function as a "directed wave energy weapon" that is used as a "less lethal" form of force by police. This means that the force of the wave energy acts so intensely on the body that it can cause temporary or permanent damage.

There are several different LRAD models in use. Some are worn by police as body chest packs, others are hitched to trailers or mounted on vehicles. Each model has a different maximum volume, but all can be operated at injurious volumes. Each LRAD consists of a square speaker system with built-in amplifier and a microphone handset attached by a cord. A knob on the back allows police to switch between microphone and deterrence signal.

Directional, like a water cannon
Filling the air of public space with invisible and harmful material, like pepper spray or tear gas
Broadcasting like a megaphone
Annoying like an alarm
Invisible force like microwave heat energy

LRAD History

The LRAD was developed by a private contractor after the al-Qaeda attack on the USS Cole in 2000. The US Navy requested a new type of device to communicate directionally and at long distance. The LRAD was one response to that request. It came to market in 2002 and was used in naval operations, Iraq, and Afghanistan.

Although built for long distance military applications, the LRAD became part of domestic US policing via the NYPD at the Republican National Convention in 2004. It was first deployed to injurious levels on civilians in Pittsburgh at the 2009 G20 convention. The exact number of US police departments that own LRADs is unknown. In the US, police LRAD use is largely made possible by the 1033 program signed into law in 1997, which makes US military surplus equipment available cheaply and without constraints to civilian law enforcement agencies (and public schools). To date, this program has transferred more than $5 billion in military gear to police departments.

Although LRAD has been used in the US since 2004, its use against demonstrators in Ferguson made the device nationally known. The LRAD Corporation used Fox News footage of the device's deployment in Ferguson in promotional materials, and reported significant sales increases in the months following. The LRAD is now a staple of policing of large crowds and is used frequently in its various modes: as a police megaphone, as a crowd dispersal device, and as a weapon.

Police violence, aka "excessive force": although there is no standard definition, generally this means use of force greater than that which a reasonable officer would use under the circumstances, the minimum amount force required to achieve an effective outcome during procedures.

LRAD Deployment

It is unlikely that US police have official procedures for how to use the LRAD safely. Documents obtained through Freedom of Information requests reveal that the NYPD, for instance, uses the manufacturer's recommendations for exposure levels as the basis of their operations of the device, never consulted independent research on exposure, and does not train officers about injurious sound levels, proximities, and durations. Such training is required for other "less lethal weapons" such as pepper spray, flash grenades, and Tasers and is required for the LRAD in Canada, where a federally run, independent scientific review has guided recommendations for police use of LRAD.

Ongoing LRAD-related injuries
permanent hearing loss
sensitivity to noise
ringing in one or both ears
reduced capacity to work in loud spaces
fear of re-injury
tinnitus
vertigo
barotrauma
ear fluid drainage
dizziness

We sound loudly too

In addition to police sounds, the sounds of demonstrators can fatigue the ears as well. The most obvious example is amplified sounds such as megaphones, especially those directed toward the crowd itself. The volume at the middle of a large chanting crowd is often between 85-90dB. Marching bands also produce loud sounds, and you should be careful to avoid long exposure to the direct path of the bells of horns. Similarly, drums produce powerful sound energy with sudden onset, which can damage ears with prolonged exposure. Megaphone operators should sporadically check in with listeners about volume and musicians should be careful about directing their sound energy away from nearby listeners.

How to protect yourself

The most important way to protect against harm at demonstrations is to control your fear. If you get afraid or make others afraid, the police have already done their job without using weapons. When we are afraid we make bad decisions and self-preservation trumps solidarity.

The reasons police first display weaponry and gear while policing demonstrations are to intimidate people into leaving, to pre-emptively censor behavior, or to enforce compliance. The first way to protect yourself is to have accurate information about the scene. Do not spread rumors of LRAD or other less lethal weapons, instead try to get a trusted person or yourself to set eyes on the gear. If you see LRAD on site, calmly let people know what it is and what its capacities are, dispel rumors and let people know how to move in relation to the LRAD. Alert organizers, legal observers, and medics, but keep and spread calm. Request that legal observers or media keep eyes on the LRAD and to be prepared to record if deployed.

Sensitivities: An adult with healthy ears can withstand more sound energy than others may be able to. These types of people are more sensitive:

Babies and children have a higher risk of hearing loss from exposure to loud sound. They have thinner skulls than adults, which means less protection from loud sound. Very young children cannot signal discomfort, and children cannot give consent to be in a space.

Those with pre-existing hearing loss: Exposure to loud sounds effects those with existing hearing loss differently. If you have not healed from a temporary hearing loss and are re-exposed to loud sounds, you are more likely to be injured.

Comrades hit by LRAD report the following:

In the moment:
surge of adrenaline
eardrums beating hard
feeling as if bleeding from nose/ears/mouth
sinuses, nose, throat, and ears "as though they were on fire"
immediate migraine
woozy feelings
acute pain in sinuses
disorientation
desire to leave scene

Afterwards, up to one week
migraines
sensitivity to sounds, especially loud sounds
wooziness
facial pressure
inability to sleep
dulled hearing
difficulty understanding speech
feeling full in the ears
ringing in the ears
hypersensitivity to sound

In protest policing protocol, US police departments usually issue warnings prior to escalations and arrest. This often happens through the LRAD. If you hear a warning from the police, it is likely that this signals that they are planning escalated next steps, be it arrests or use of the LRAD's deterrence tone.

Many protestors have reported that the LRAD was used in deterrence mode without prior warning. The wide spread and long range of the LRAD means that even those who have complied with directions are likely to be struck by its sonic force. The LRAD is often used simultaneously in deterrence mode and in communications mode, rendering police commands unintelligible.

Additionally, the LRAD is so loud and travels so far that its zone of audibility creates a wide de facto extension of police jurisdiction. Bystanders and those in private spaces can be assaulted by injurious sound energy just because they were in proximity to the event. Although LRAD is directional and has volume knobs, the invisibility of its reach makes it difficult for police to understand its impact on those affected.

MYTHS OF LRAD

Myth: The LRAD causes pain whenever it is directed at a person.
Reality: LRAD's injurious potential depends on its volume, the person's proximity to the device, and the length of exposure to the sound.

Myth: LRAD focuses primarily on infrasound (20Hz and lower) to trigger loss of bowel control, and this "brown note" has been used by militaries since the Nazis
Reality: It is true that during WWII, Nazis used sound to agitate crowds in halls before Hitler would speak, but they were not low frequency sounds. Low frequencies are hard to produce in even the best speaker technologies. Some film soundtracks mix inaudible but felt low frequency sounds to keep viewers agitated. There is no magical "brown note" that makes one's bowels resonate until they are loose. This theory was even debunked on Myth Busters!

Myth: Howling like a wolf at the same frequency can protect you from LRAD exposure because it equalizes the sound pressure in your skull.
Reality: The external sound energy of an LRAD cannot be negated by self-generated internal sound energy. Howling might give you courage but it won't give you protection.

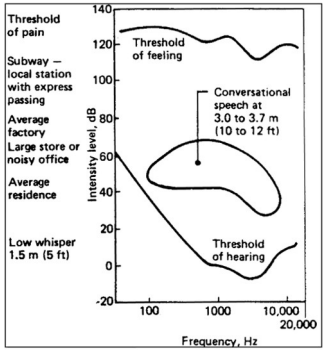
Myth: Folded cardboard or metal shields will protect you just fine
Reality: The LRAD sound is incredibly powerful, and the 1-2 dB dampening provided by these devices is likely not worth the corresponding loss of visibility and arm mobility.

Sound in/as Psychological Warfare

Even when police sound is not physically damaging to the ears, it can have profound consequences to listeners. Often, the most significant effects of police sound are psychological. Many police sounds, from sirens to running cars to overhead helicopters, are not deployed to warn anyone of anything or part of necessary police work. These sounds are part of a tactic of intimidation: a display of overwhelming force, a threat of possible future violence, and a form of dominance of the sonic space under contest. (This is the current policing style of NYC protests.) Police sounds as psychological warfare are often loud, repetitive, machinic, and may point to (index) their relationship to technologies that can be weapons.

What are the harmful effects of exposure to police sound?

The effects of exposure to police sound vary according to the sonic technology, exposure level, and one's age and preexisting health and wellbeing. Even sounds below the threshold of pain can produce negative bodily effects. High-decibel sounds can have severe negative impacts on hearing. Sounds that occur above the threshold of pain, a level affected by frequency and one's own body, will produce discomfort; continued exposure can lead to temporary or permanent hearing loss. Sounds at different frequencies become painful at different dB levels. For each increase in dBs, there is a corresponding decrease in the amount of time until exposure causes pain and possible damage.



Sounds below the threshold of pain

Sounds that are loud but below the threshold of pain still can create physical and psychological stress. They can:

-disrupt communication and concentration, making it hard to talk and listen
-make it harder to concentrate, which can lead to mistakes and accidents
-add to nervousness, annoyance, tension, stress, anxiety, and a sense of general dread
-trigger higher breathing and heart rates, higher blood pressure, and higher levels of stress hormones
-can trigger memories of traumatic exposure to other police violence or to violence in general

Temporary hearing loss: Traumatic exposure to loud can cause a temporary shift in the auditory threshold, where one experiences reduced hearing. People who experience a temporary threshold shift may also experience temporary tinnitus, which is ringing in the ears.

Permanent hearing loss: Traumatic exposure can break the hair cells ("cilia") of the cochlea in the inner ear. The hair cells convert the vibration of sound into electrical signal for the brain, and if they are broken they do not grow back. Permanent hearing loss can be aided by hearing aids or cochlear implants, but the hairs themselves cannot be regrown.