University of California, San Francisco
Police Department General Orders

10.1 Special Operations

10.1.17 Long Range Acoustic Device (LRAD) (Revised: 12/22/22)

A. Purpose and Scope

This policy establishes guidelines and procedures for properly deploying the Long Range Acoustic Device (LRAD).

B. Policy

It is the policy of the UCSF Police Department that an LRAD be used with live or recorded voice messages to communicate with the community during natural disasters, crowd management and control situations or when other forms of communication are ineffective in communicating messages from police, fire or other University departments to resolve situations where communicating with the public safely is paramount.

LRAD 100X is not designed or designated to be used as a weapon. Members of the UCSF Police Department shall not use any LRAD system as a weapon.

C. Definitions

1. Long Range Acoustic Device (LRAD): A high-intensity, directional, acoustical array for long-range, clear hailing and notification. The LRAD is primarily a communication device that can transmit live or prerecorded messages.
2. LRAD 100X: A self-contained, lightweight, compact, battery-powered LRAD used by the Department to communicate with great intelligibility at a range of up to 600 meters. Unlike handheld bullhorn devices, the LRAD-100X emits acoustic sound pressure levels up to 140 dB, resulting in clear, intelligible communications.
3. Decibels (dB): A decibel is a unit for expressing the relative intensity of sound, on a scale ranging from 0 dB to 194 dB. The threshold of audibility is at 0 dB, and the threshold of physical pain for the human ear is around 130 dB. These sound ratings (dB) are measured one meter from the device. To understand the producible volume level of the LRAD 100X in relation to normal sounds, see the table below:

20 dB	Leaves rustling
60 dB	Normal conversation
70 dB	Busy street traffic
80 dB	Vacuum cleaner
85 dB	OSHA requires hearing protection
100 dB	Large orchestra
105 dB	Lawn mower
110 dB	Front row of a rock concert
115 dB	Limit of sound permitted in industry
130 dB	Threshold of pain; deafening
135 dB	LRAD 100 at max. volume

140 dB	Military jet takeoff (50 meters)
146 dB	LRAD 500 at max. volume
160 dB	Permanent hearing damage.

4. Alert Tone: A high-pitched, pulsating sound generated by the device, similar to a car alarm.
5. ACGIH: American Conference of Governmental Industrial Hygienists.
6. NIOSH: National Institute for Occupational Safety and Health.
7. OSHA: Occupational Safety and Health Administration.

D. Use Policy

1. Officers responding to an event or gathering that warrants law enforcement involvement should carefully balance the right to free speech and expression with practical public safety concerns before taking enforcement action. Officers are encouraged to contact organizers or responsible persons to seek voluntary compliance that may address relevant public safety/order concerns.
2. The LRAD shall not be used as a "sonic weapon" or method of pain compliance. The LRAD shall only be used as a public address (PA) system to broadcast audible notifications and warnings over distance. The LRAD should only be used at decibel levels and frequencies that are safe for the intended purpose and that are not reasonably likely or intended to cause injury.
3. Department members may utilize the LRAD for the following:
    a. Communicating life-saving information to residents during disasters
    b. Communicating with large crowds during University events, parades, festivals, concerts and sporting events
    c. Traffic control management
    d. Conducting Systemwide Response Team (SRT) operations
    e. Communicating to protestors and dispersing crowds
    f. Communicating during hostage and barricaded-subject situations
    g. Serving high-risk search warrants
    h. Communicating with suicidal persons when other methods of communication are ineffective or impractical
    i. Conducting search and rescue operations.
4. In a rapidly evolving event where there is a likelihood of serious injury or property damage, trained personnel are only permitted to deploy the LRAD, for use as a communication device, with supervisory approval. The scene supervisor shall ensure that the Watch Commander or Incident Commander is notified of the deployment as soon as practical.

E. Operation

1. The LRAD can play pre-recorded messages, work as a PA system or emit a high-intensity tone. Personnel operating the LRAD should wear appropriate hearing protection, whether located in front of or behind the unit.

2. Authority to use the LRAD must be approved by the Watch Commander, Incident Commander, Supervisor or designee. Only trained personnel are authorized to operate the LRAD.
3. Never operate the LRAD-100X at maximum volume when personnel are within ten meters of the front of the device or when the reflected distance between personnel and an acoustically reflective object (e.g., a building or wall) is less than ten meters.
4. Never point the LRAD-100X directly at personnel in the immediate vicinity of its operating position.
5. Note that the output power of the warning tone is slightly higher than the output power of live broadcasts or other audio files.
6. The LRAD-100X can produce acoustic sound pressure levels that OSHA considers hazardous. Users should avoid prolonged exposure.
7. As with any high-energy acoustic device, proper usage of earplugs will minimize the risk of hearing loss to the operator and personnel in the immediate vicinity. Hearing protection is required when operating the device at maximum volume from less than a meter away.
8. Operators must ensure that the device is positioned, aimed and operated in a manner that avoids exposing nearby personnel and bystanders to excessive sound pressure levels.
9. Operators standing behind the unit hear only a small fraction of the sound energy being transmitted. This can lead to the operator falsely thinking the LRAD-100X is not producing the required output.
10. The LRAD 100X has a volume control with a graph that indicates intensity by color. Green is the lowest level of sound output. Yellow is intermediate, and red is the most intense volume. The LRAD should not be operated in the Red Zone if subjects are less than ten meters away.

F. Use Instructions

1. Point the LRAD in the direction of the subject(s) and turn the unit on. Increase the volume, within the restrictions of this procedure, until the message is clearly audible. It is recommended that another officer be positioned behind any subject(s)/the crowd to determine when the device is safely audible. Consider using a general-purpose sound meter to measure the sound levels for usage exceeding 15 minutes.
2. The LRAD shall not be operated in the red zone if subjects are closer than ten meters from the LRAD 100X.
3. Use the alert tone in a "short burst" (2-5 seconds) to gain attention, transmit a pre-recorded message saved on the MP3 player (e.g., an order to disperse, evacuation order) or use the microphone for live, PA-type messaging.
4. "Voice boost" should be off when using the microphone.
5. The table below shows the permissible sound levels for a given period of time:

Duration of Exposure	Sound Level – dB(A)

(hrs./day)	ACGIH	NIOSH	OSHA
16	82	82	85
8	85	85	90
4	88	808	95
2	91	91	100
1	94	94	105
0.5 (30 minutes)	97	97	110
0.25 (15 minutes)	100	100	115*

* NOTE: Subjects should not be exposed to continuous or intermittent noise in excess of 115 dB or to impulsive or impact noise in excess of 140 dB peak sound pressure level.

G. Reports

The use of an LRAD shall be included in incident or after-action reports. The reports will include the following:

1. User(s) and the supervisor providing authorization
2. Circumstances surrounding the use of the LRAD
3. Approximate distance(s) between the LRAD and persons in front of the device when in use
4. Dial settings on the LRAD at the time of its use(s)
5. Time, duration of use and total number of uses.