Hearing Loop Designer • SITE SURVEY PROTOCOL

Hearing Loop Designer

IEC 60118-4 PROTOCOL | GENERATED: 2026-10-16

1. TEST LOOP SELECTION GUIDE

In modern construction, reinforced concrete floors, steel-deck sheeting, steel support columns, and suspended aluminum ceilings produce secondary Eddy currents. These currents oppose the primary magnetic field of any hearing loop, creating flat attenuation (insertion loss) and severe high-frequency roll-off.

Before installing any permanent hearing loop system, measure on site with a temporary test loop. Its readings give the metal loss that the design and the driver calculations use.

CRITICAL SELECTION PARAMETERS:
• Aspect Ratio Representative: Set up your physical test loop with an aspect ratio roughly mirroring your intended permanent design segments. For phased arrays, test a standard modular grid element.

• Size Optimization Recommendations:
- Small Loops (1m x 1m - 2m x 2m / 3ft x 3ft - 6ft x 6ft): Suitable for spot-checking concrete slabs but severely underestimate global structural steel interactions due to small vertical propagation height.
- Medium Loops (3m x 3m - 4m x 4m / 10ft x 10ft - 13ft x 13ft): Ideal balance for modular spaces. Reliably captures average near-field floor slab attenuation.
- Large Standard Loops (>=5m x 5m / 16ft x 16ft): Highly recommended. Correctly stimulates structural iron girders, providing a true picture of signal roll-off at 1.2m (4ft).

• Feeder & Wire Type:
- Use robust single-core insulated cable (1.5mm² - 2.5mm² / 14-16 AWG) to keep loop DC resistance low.
- Ensure your test driver maintains steady current outputs across high inductive loads at higher frequencies.

2. SITE TESTING PROCEDURE

Follow these steps sequentially to measure metal loss and establish the site Calibration Factor in the Hearing Loop Designer engine:

SEQUENTIAL STEPS ON-SITE:
1. PHYSICAL DEPLOYMENT:
Arrange the test loop squarely on the floor. Avoid placing loop wires directly parallel with steel structural columns or expansion joints. Tape down corners firmly.

2. CONSTANT CURRENT CHECK:
Apply a consistent sinus signal using a signal generator. We recommend a constant test current of 2.0A RMS. Check and log current level (A) using an inline AC current clamp or RMS multimeter.

3. THREE-BAND FREQUENCY SWEEP:
Run discrete sinusoidal test signals at the three critical bands specified by the international standard:
• Low End Baseline: 100 Hz
• Mid Range Center: 1,000 Hz (1 kHz)
• Upper Intelligibility Limit: 5,000 Hz (5 kHz)

4. HEIGHT CONTROL & FSM PLACEMENT:
Hold the Field Strength Meter (FSM) vertical induction probe exactly at the standardized listening height: 1.2m (4ft) above finished floor for seated audiences, or 1.7m (5ft 6in) for standing zones.

5. ON-SITE DATA LOGGING:
Record FSM field strength measurements in dB referenced to 400mA/m, or in mA/m, at the loop center. Enter these values in Hearing Loop Designer under Set metal loss, Test loop method, to calculate the metal loss.

1. PROJECT & SITE SURVEY METADATA

Venue / Project Name: _____ Survey Date & Time: _____

Surveyed By: MAYA LINDQVIST FSM Model / Serial Number: _____

Structure Base Type: _____

Metal in ceiling/floor where loop will be installed:

2. TEST LOOP LOG

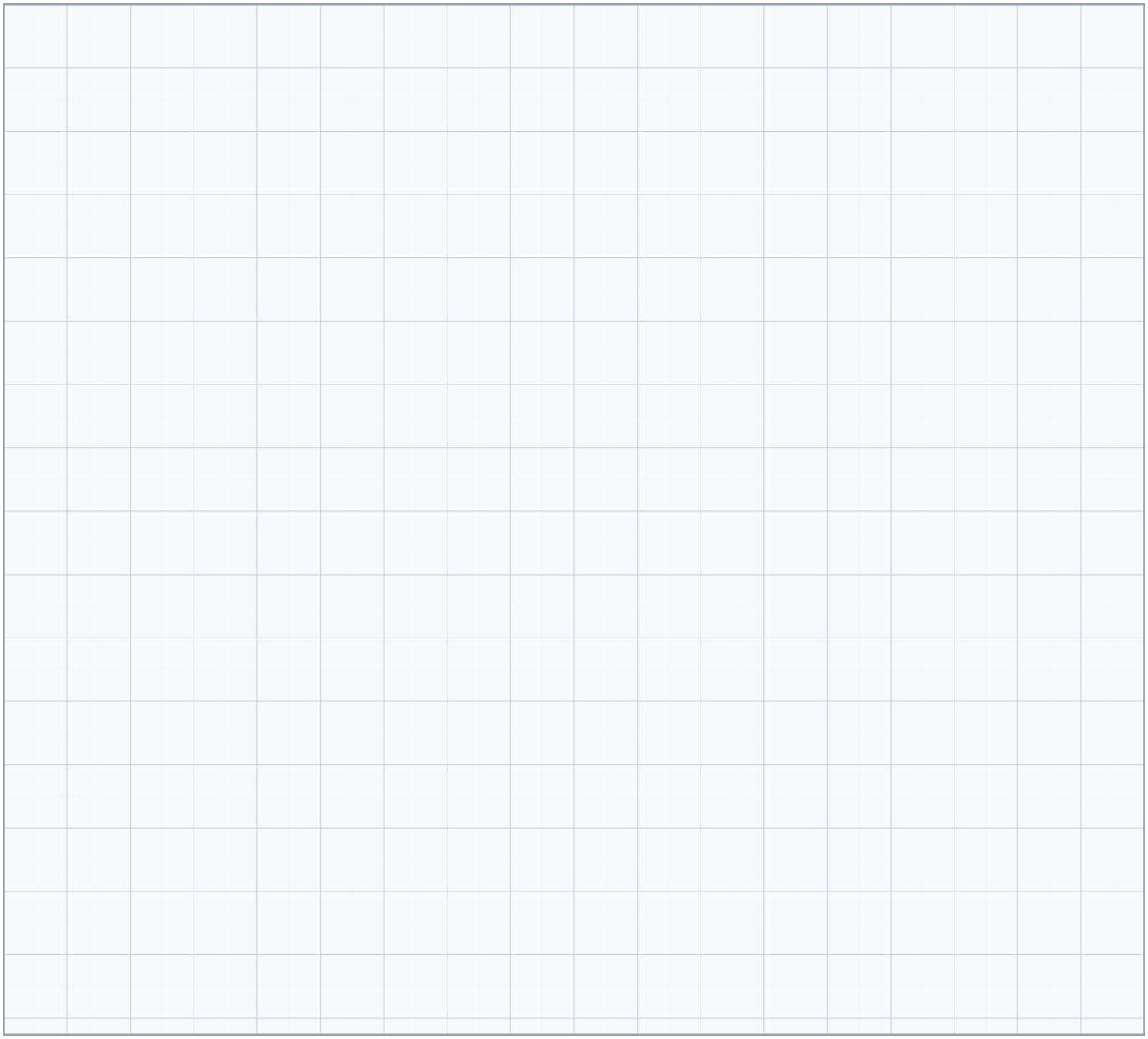
FREQUENCY	TEST CURRENT	MEASURED FIELD (FSM)	LOOP DIMENSIONS	TEST LOOP LOCATION

TESTED BY

Name: _____ Date: _____

3. FLOOR PLAN AND INSTALLATION SKETCH

Sketch the floor plan and include room dimensions, dimensions of each looped section, fixed seating spacing, feeder cable route and approximate feeder length, rack space for the driver, and how the loop will be installed.



Additional field notes:

Hearing Loop Designer • SITE EVALUATION CHECKLIST

Use this page while walking the venue. Confirm physical access, owner permissions, construction risk, audio/rack readiness, and any future work that could affect the loop before the design is finalized.

VENUE USE & COVERAGE

- [ ] 1. Confirm the exact listener coverage zones and any excluded areas.
- [ ] 2. Ask if future seating layouts or room uses are expected to change.
- [ ] 3. Identify fixed seating, aisles, stages, lecterns, and service counters.
- [ ] 4. Note seated, standing, balcony, or tiered listening heights.
- [ ] 5. Ask if nearby rooms will be used at the same time.
- [ ] 6. Confirm signage, staff support, and assistive listening expectations.

CONSTRUCTION & METAL LOSS

- [ ] 7. Ask for drawings showing slab, rebar, post-tension cables, or metal deck.
- [ ] 8. Identify access floors, metal tiles, steel plates, or underfloor raceways.
- [ ] 9. Check ceiling grids, metal tiles, foil backing, and vapor barriers.
- [ ] 10. Note beams, girders, cladding, metal panels, or roof decks nearby.
- [ ] 11. Record large metal objects such as counters, lifts, bleachers, or pew frames.
- [ ] 12. Ask whether continuous conductive paths cross the proposed loop area.
- [ ] 13. Perform metal-loss testing when steel, rebar, or deck conditions are unknown.
- [ ] 14. Record test-loop sizes, locations, and readings at key frequencies.

FLOORING & SURFACE ACCESS

- [ ] 15. Identify carpet, carpet tile, wood, vinyl, tile, concrete, or stage decking.
- [ ] 16. Ask whether carpet can be lifted and re-laid without voiding warranties.
- [ ] 17. Ask if flooring replacement or refinishing is planned within a few years.
- [ ] 18. Check tack strips, adhesives, thresholds, and transition strips on the route.
- [ ] 19. Confirm whether saw-cutting, routed grooves, or under-carpet tape are allowed.
- [ ] 20. Check asbestos, lead, heritage, or landlord restrictions before disturbing finishes.
- [ ] 21. Confirm who repairs or signs off on disturbed floor finishes.
- [ ] 22. Photograph doors, ramps, steps, thresholds, and expansion joints.

CEILING & BELOW-FLOOR ACCESS

- [ ] 23. If installing below, confirm access exists under the entire looped area.
- [ ] 24. Check ceiling tile type, plenum rules, fire barriers, and conduit requirements.
- [ ] 25. Confirm ladder, lift, or scaffold access for every cable route.
- [ ] 26. Identify ductwork, sprinklers, cable trays, lighting, and hanging acoustic panels.
- [ ] 27. Confirm fire-rated penetrations can be sealed and documented correctly.
- [ ] 28. Ask about planned ceiling or floor service work that could damage cable.

RACK, POWER & AUDIO

- [ ] 29. Confirm rack or closet location and available rack units or shelf space.
- [ ] 30. Check spare power, voltage, grounding, circuit capacity, and surge policy.
- [ ] 31. Check ventilation and heat so the driver will not be blocked.
- [ ] 32. Identify the audio source: mixer, DSP, PA amplifier, or matrix output.
- [ ] 33. Confirm line level, balanced wiring, connector type, and spare output availability.
- [ ] 34. Ask who controls gain, EQ, passwords, and locked audio settings.
- [ ] 35. Trace the route from source to driver and driver to loop feeder.
- [ ] 36. Confirm network or remote monitoring needs for the selected driver.

CABLE ROUTING & PROTECTION

- [ ] 37. Sketch loop-wire and feeder paths separately with estimated feeder length.
- [ ] 38. Identify conduit, trunking, tape cover, sleeving, or burial protection.
- [ ] 39. Avoid carpet knives, drilling, cutting, moisture, heat, and abrasion risks.
- [ ] 40. Check required separation from electrical, data, fire, and security cables.
- [ ] 41. Keep terminations accessible for testing, service, and future troubleshooting.
- [ ] 42. Confirm array wire spacing tolerances can be achieved in the chosen method.

SPILL, NOISE & INTERFERENCE

- [ ] 43. Check adjacent rooms, confidential spaces, cinemas, classrooms, and other loops.
- [ ] 44. Ask about live music, guitars, dynamic microphones, recording, or broadcast gear.
- [ ] 45. Measure magnetic noise from dimmers, lighting, transformers, and display systems.
- [ ] 46. Identify elevators, motors, HVAC, switchgear, or other high-current equipment.
- [ ] 47. Decide if low-spill, array, or cancellation design may be required.

COORDINATION & OWNER DECISIONS

- [ ] 48. Confirm work hours, shutdown needs, security access, and lift permissions.
- [ ] 49. Ask who approves visible conduit, floor disturbance, and final cable route.
- [ ] 50. Collect owner contacts, drawings, photos, and route decisions before leaving.