Loopworks® Hearing Loop System Design

Design Name

Ampetronic Ref: L106-036-01-01_V03_ISSUED-1
Design Status: Issued
Design Date (Last Modified): 01-Sep-2017 9:32 AM
Report Generated On: 18-Apr-2018 9:59 AM

Report Contents

Project	System	Report Prepared by	Report Prepared for
Training Material 106-036	Meeting Room	Ampetronic Ltd Unit 2 Trentside Business Village Farndon Newark 01636 610 062	Ampetronic

System Design and Specification Summary

Area

Dimension X	6.80 m
Dimension Y	5.00 m
Loop Height	0.00 m
Gap around room	N 0.20 m E 0.20 m S 0.80 m W 0.70 m
Metal type (building structure)	Concrete with moderate reinforcement

Note on Metal type:

Unless measured on site and entered manually, metal loss has been estimated based on typical losses experienced with specific construction types. It should be noted that the actual loss may differ, which may affect the recommended loop driver.

Driver Specification

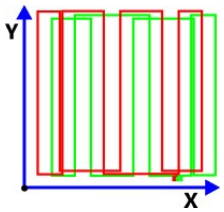
Driver selected	MLD5	**Voltage headroom**	2.0 dB
Current with no loss	2.9 Amps RMS	**Current headroom**	7.4 dB
Max loss with this driver	4.6 dB	**Estimated Loss**	2.6 dB

MLD5 MultiLoop Driver

- Dual loop outputs
- 5.0 A_{RMS} (7.1 A_{pk}) Max Per Output
- 10.2 V_{RMS} (14.4 V_{pk}) Max Per Output
- 1U 19" rack mount

Loop Design

Type	**Low spill multiloop, best side spill**	
Options	Best side spill, 1.7m Preferred segment width (if metal OK)	
	Array 1	**Array 2**
No. of segments	4	3
Cable length	43.00 m	33.15 m
Resistance Ω	0.63	0.52



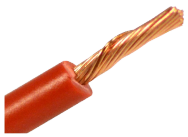
N.B. This representation is not to scale or dimensionally accurate. Do not use as an installation reference drawing.

Cable Specification

Loop cables	1.5 mm2	**Feed cable length**	10.00 m
Total length (m)	76.15 m	**Feed cable type**	Twist 2.5mm2
Number of 50m reels	2 x 50m rolls		

1.5mm^2 single core cable

- Widely available
- CSA 1.5mm^2
- Tri-rated switchgear cable recommended
- Standard PVC insulation



2 x 2.5mm^2 single core cables

- Widely available
- CSA 2.5mm^2
- Tri-rated switchgear cable recommended
- Standard PVC insulation

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System Design and Specification Summary

General Installation Notes

OVERVIEW

This is a summary of a design and equipment requirement for an audio induction loop system. It has been generated using Ampetronic design software tools. The accuracy of the design and specifciation of the equipment is based on the data provided.

Equipment required for the loop arrays is shown here. Please also note that test equipment is required to set up and commission this system, being a minimum of a field strength meter.

The venue should be provided with equipment to monitor the performance of the loop system (a listener or meter), suitable signage, and training for system operators.

LAYOUTS

The loop system consists of one or two arrays of loops or narrow segments. Each is a continuous run of cable or tape, connected to the loop output of the loop driver specified.

This document does not specify the location for the cable installation - ensure this is assessed and and appropriate location and materials are available and practical. Some materials have their own installation requirements, for example flat copper tape is designed for installation under floor covering (carpet etc.) with adhesive installation tape or under special purpose extrusion.

The loops must be installed and wired as shown in drawings provided.

The loop designs are based entirely on the data provided and it is assumed that it is compatible with any obstructions in the floor or areas where loop wires may not be placed, which must be checked by the installer prior to proceeding with this design.

SETUP

Set-up and test the loop system using a suitable test signal and loop receiver. You should, wherever possible, use field strength measuring equipment to determine that the correct field strength and frequency response have been achieved. Where there are two similar arrays, the output currents should be the ame on each channel.

The loop current per driver if there were no loss is specified here. The actual current required will depend on the loss experienced in practice. The equipment specified will cope with up to the loss level specified here in dB.

Follow set-up procedures provided with the drivers and test equipment. The field strength in the listening area should be 0dB +/-3dB re: 0.4Am-1 (RMS) where good coverage is required.

CAUTION!

Metal structures in buildings affect loop systems, sometimes in an unpredictable way. While reasonable estimates are made based on the type of metal loss anticipated in this system, there is potential for variation unless a test loop or survey has been used to determine accurate loss levels.

Loop systems will interfere with other nearby loop systems. Please ensure the designs provided control spill to -40dB or better where other systems are present.

Loop systems can cause interference or crosstalk with magnetically sensitive systems, including low cost dynamic microphones or electric guitars. If such equipment is used in the proximity of the loop system, please take advice from Ampetronic or its representatives.

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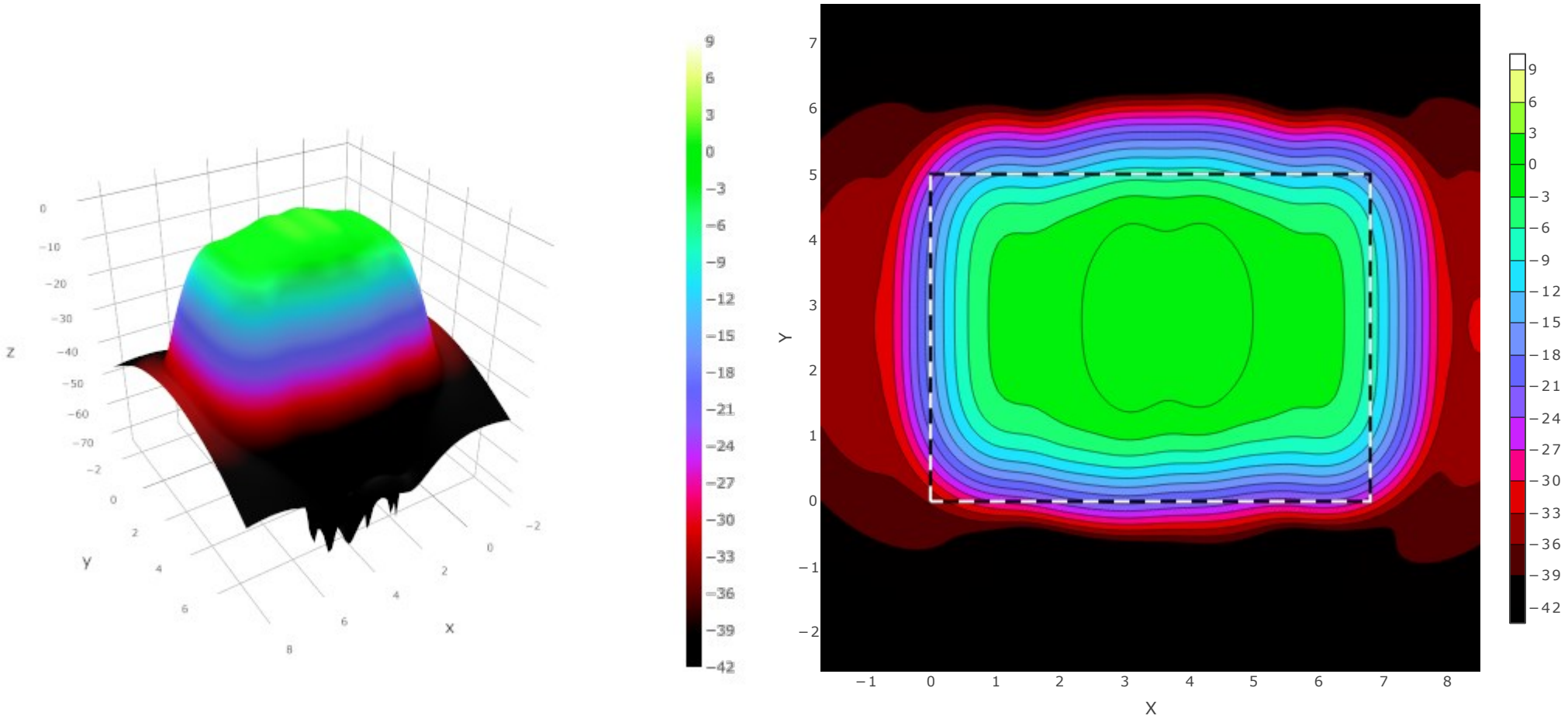
System Design and Specification Summary

Area Colour plots at 1.20 m Height



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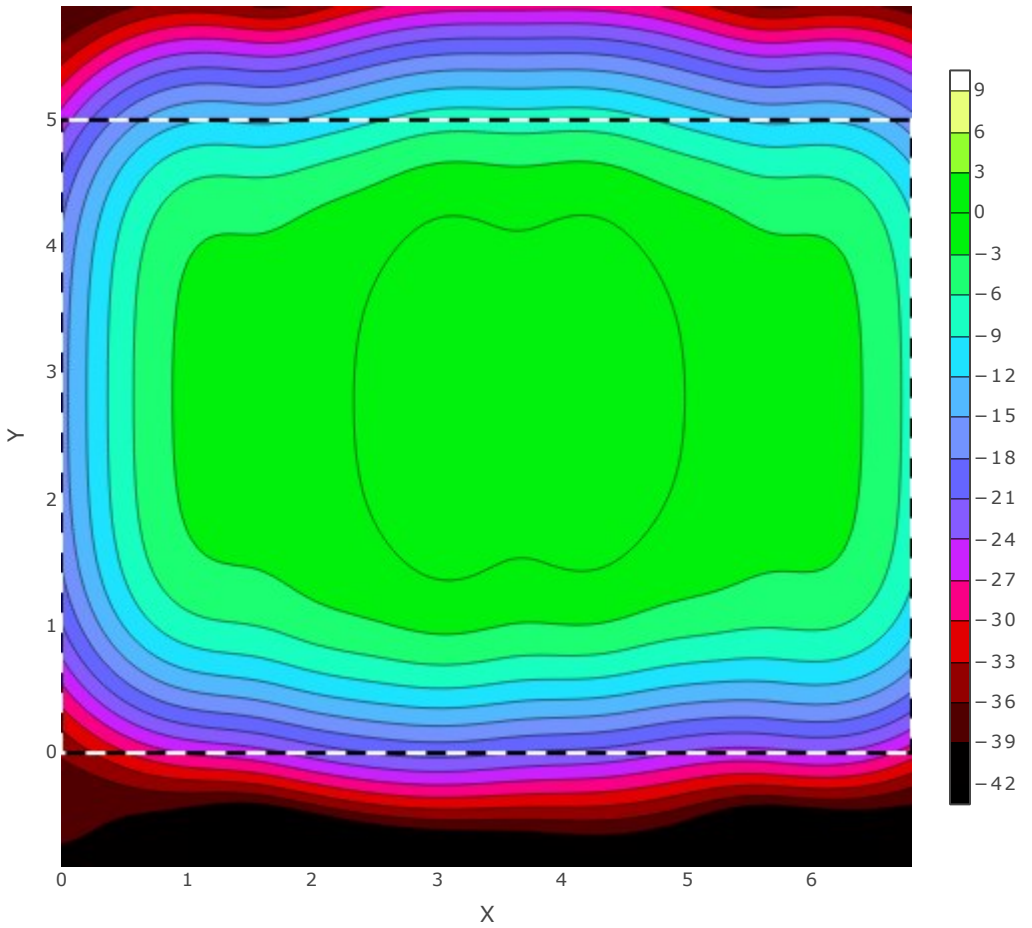
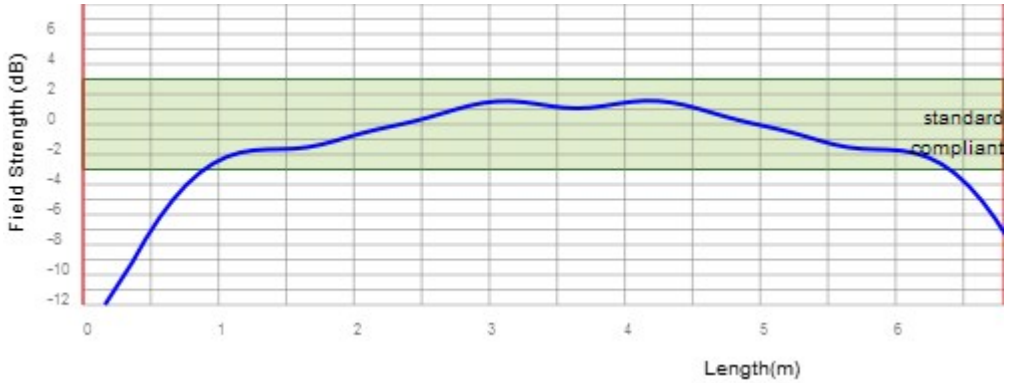
System Performance - Field Strength

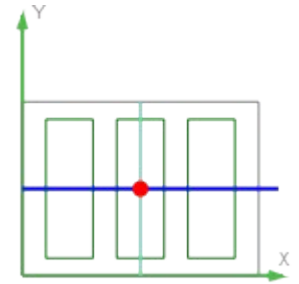
Area Colour plot at 1.20 m Height



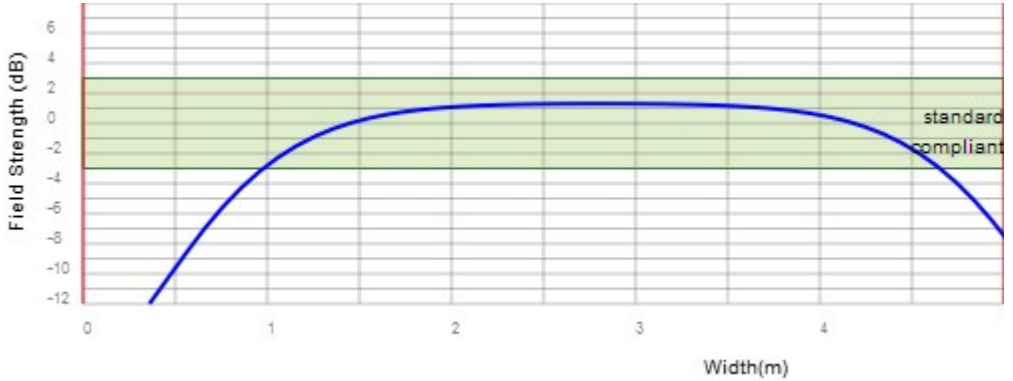
X Axis field strength plot across room at 1.20 m Height - Y = 2.50 m



Horizontal Coverage	X (Length)	Y (Width)
% area within +- 3 dB	81%	72%



Y Axis field strength plot across room at 1.20 m Height - X = 3.40 m



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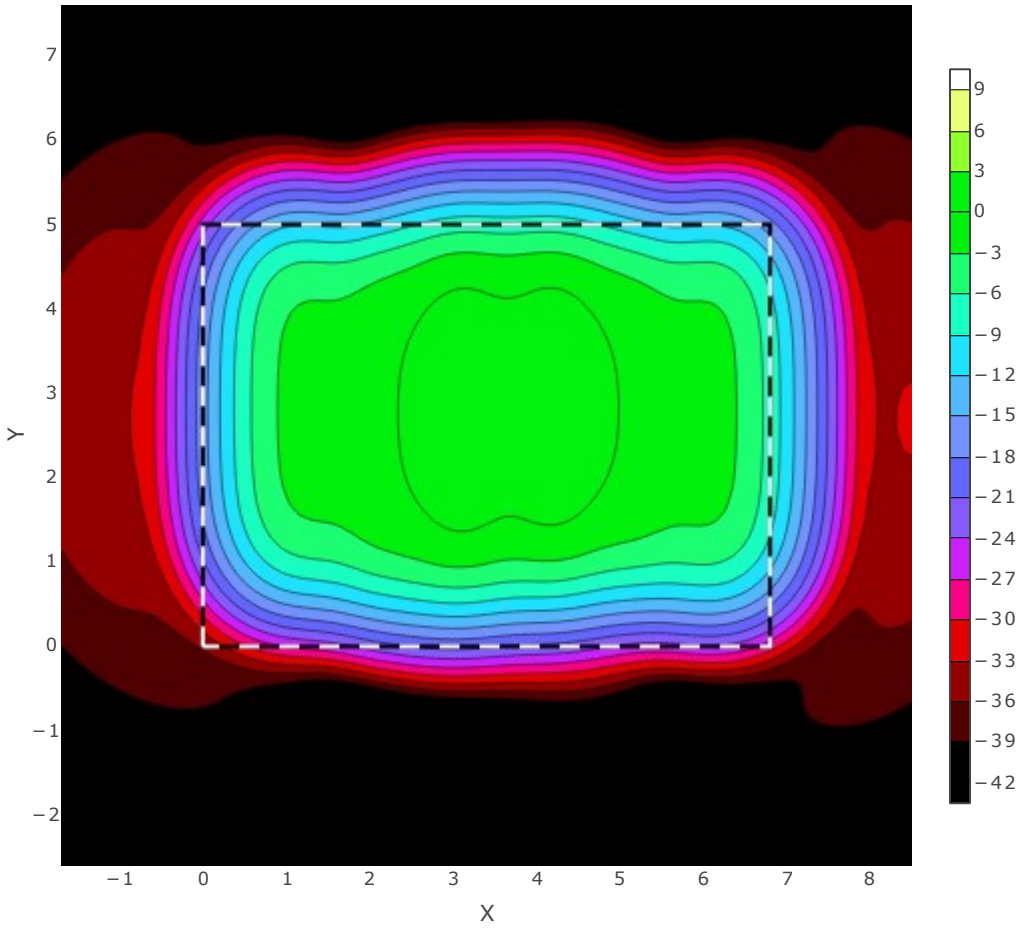
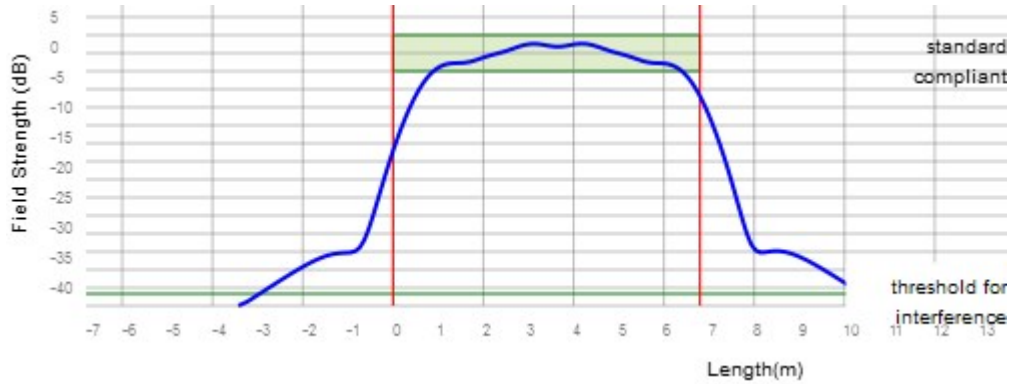
System Performance - Overspill

Area Colour Overspill plot at 1.20 m Height

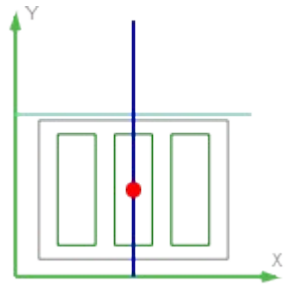


X Axis overspill plot across room at 1.20 m Height - Y = 2.50 m

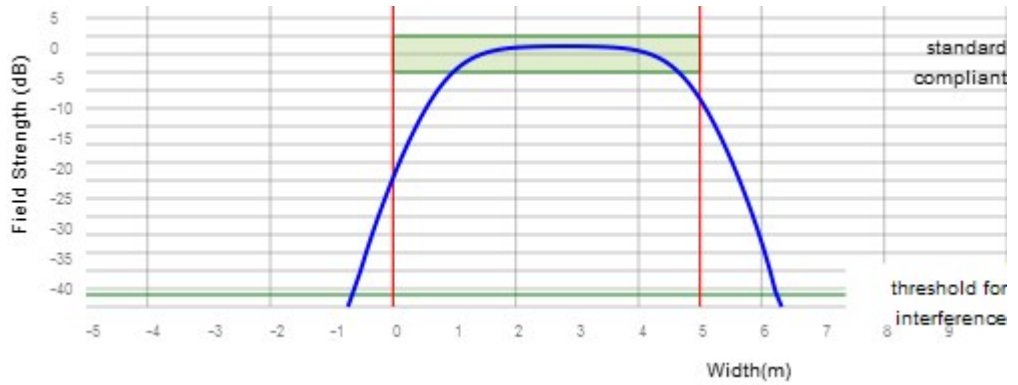


Overspill performance - Max dB level 2m outside the looped area			
North	-44.2 dB	**East**	-33.3 dB
South	-44.6 dB	**West**	-35.5 dB

Vertical overspill performance	
6m Above Floor Level	-53.0 dB
3m Below Floor level	-19.8 dB



Y Axis overspill plot across room at 1.20 m Height - X = 3.40 m



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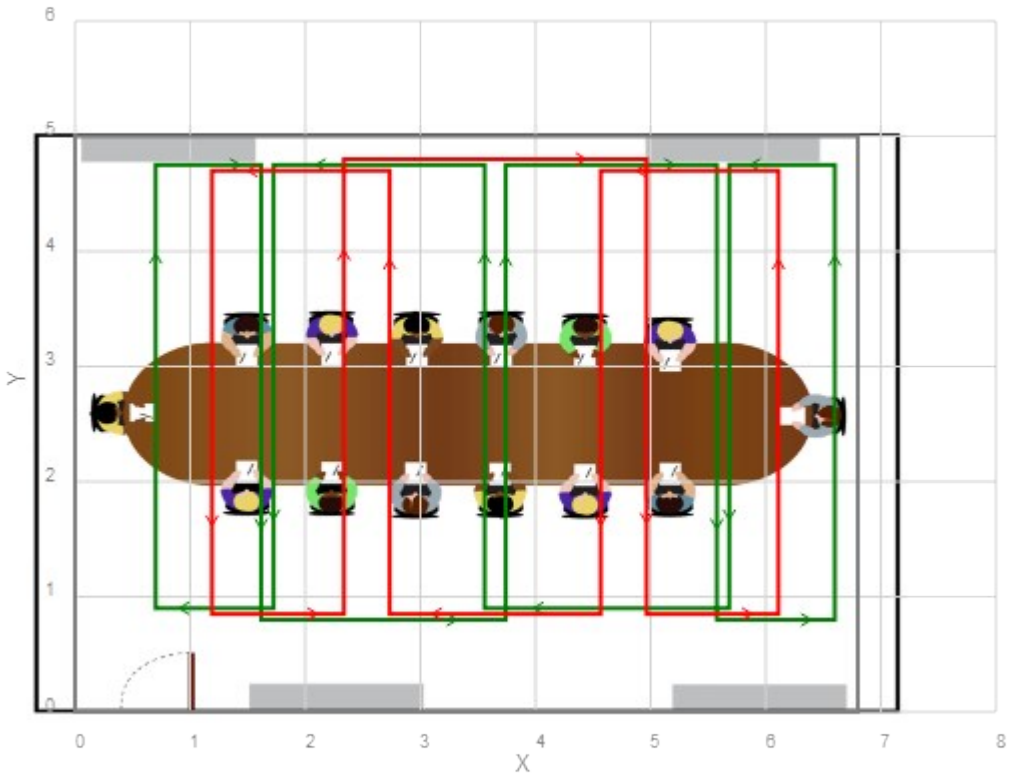
Plan View Installations Reference

Loop(s) Reference to Plan View Drawing



Installation Instructions

Layout drawings show the origin point and x-y axes to which all dimensions on the design drawings are referenced. Loop dimensions are all shown in metres relative to the reference point(X/Y origin).

Tolerance for the dimensions of any point is 50mm unless otherwise stated.

Mark the X and Y axes and origin on the floor before starting measurement or marking out.

If it is not possible to mark an axis in some part of the room (e.g. there are obstructions), derive a dimension line offset from the axis by a known (and preferably simple) amount.

For each array, mark out the loop dimensions on the floor (using chalk or tape – ideally use a different colour for each of the two arrays).

Start at one side of the feed point for the first array, and lay out the wire along the path of the electrical current slow as shown on the drawings.

At each corner, secure the wire in place, and continue around the whole of that array. Copper tape should be folded to make a 90^{O} corner.

If correctly installed, you should pass along every wire element of the array once, and you should return to the other side of the array's feed point.

In some cases, additional obstructions may be found which were not on the original drawings. If the deviation required to go around such an obstruction is not more than 400mm long (along the original line of the loop wire) and up to 300mm sideways, the loop wire may follow a small diversion around the obstruction.

If any diversion is larger, you should contact Ampetronic or your distributor for advice. In such a case, other changes to the loop design may be needed if performance is to be maintained.

Repeat the exercise for the second array (if present).

Connect the loop drivers through the feed cable, and then connect you audio input system.

Design Specific Installation Notes

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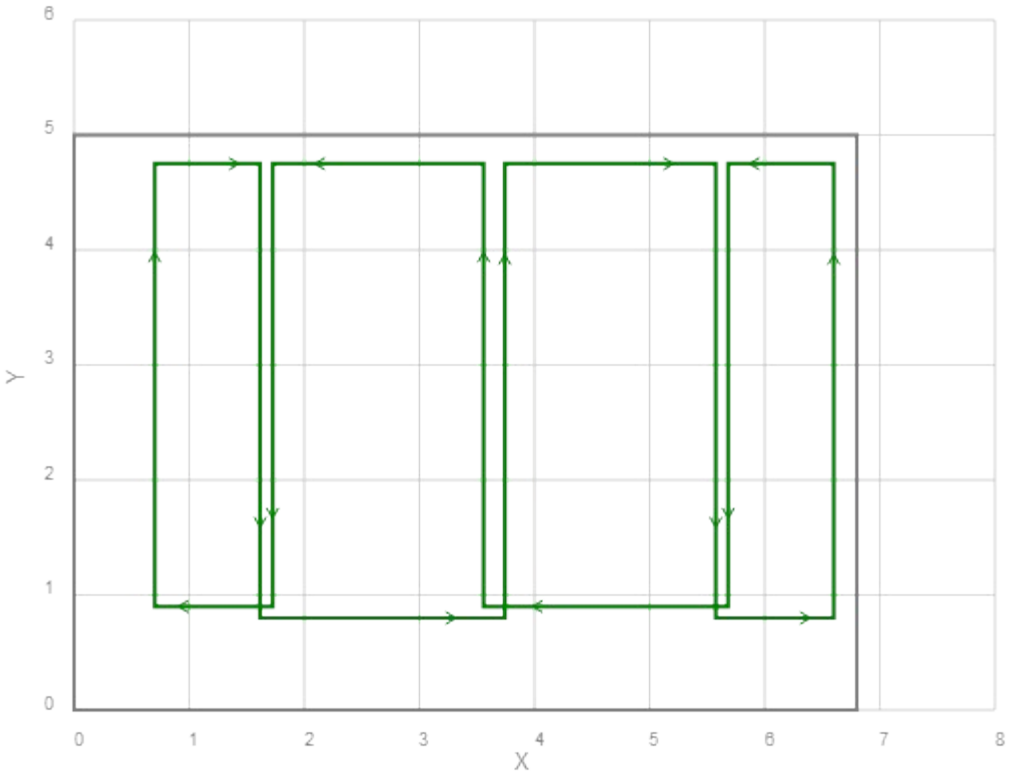
Installation Drawing: Loop Array 1

Array 1 Dimensioned Layout



Array 1 Dimensions

Dimensions (m relative to origin)
For all segments, y dimensions are:
y1 (bottom) > 0.80 m
y2 (top) > 4.80 m

Segment	x1 (left)	x2 (right)	Segment Width	Gap	Direction	Turns
1	0.70 m	1.60 m	0.90 m	0.10 m	↻	1
2	1.70 m	3.55 m	1.85 m	0.20 m	↻	1
3	3.75 m	5.60 m	1.85 m	0.10 m	↻	1
4	5.70 m	6.60 m	0.90 m	0.00 m	↻	1

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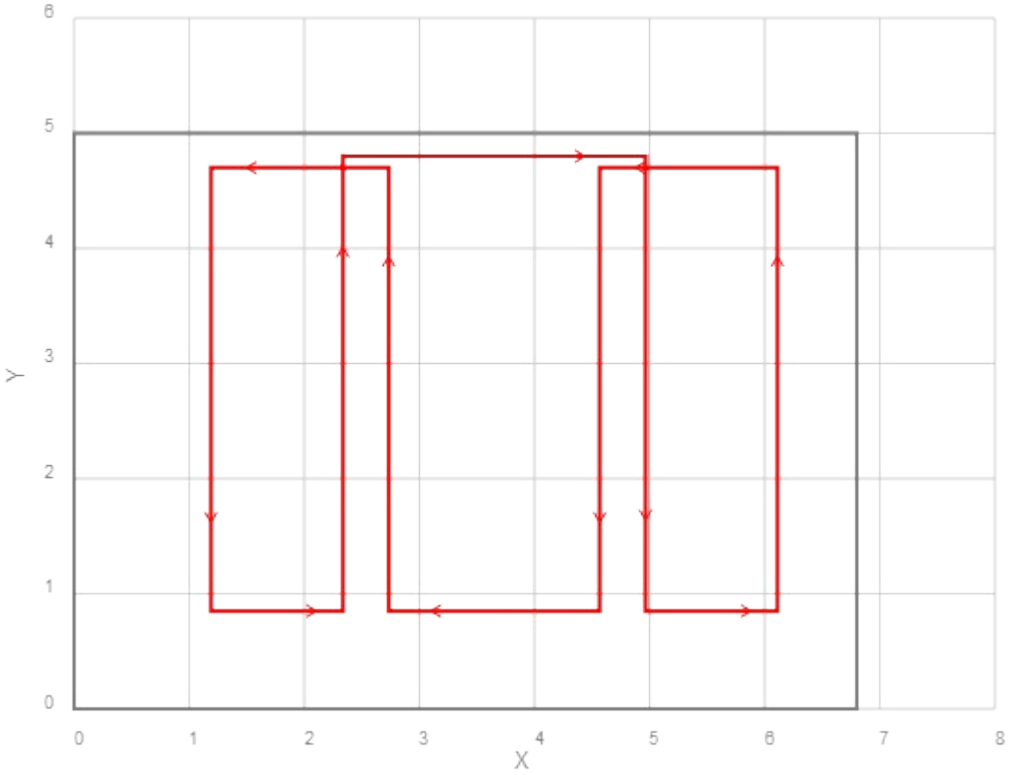
Installation Drawing: Loop Array 2

Array 2 Dimensioned Layout



Array 2 Dimensions

Dimensions (m relative to origin)
For all segments, y dimensions are:
y1 (bottom) > 0.80 m
y2 (top) > 4.80 m

Segment	x1 (left)	x2 (right)	Segment Width	Gap	Direction	Turns
1	1.20 m	2.35 m	1.15 m	0.40 m	↻	1
2	2.75 m	4.55 m	1.85 m	0.40 m	↻	1
3	4.95 m	6.10 m	1.15 m	0.00 m	↻	1

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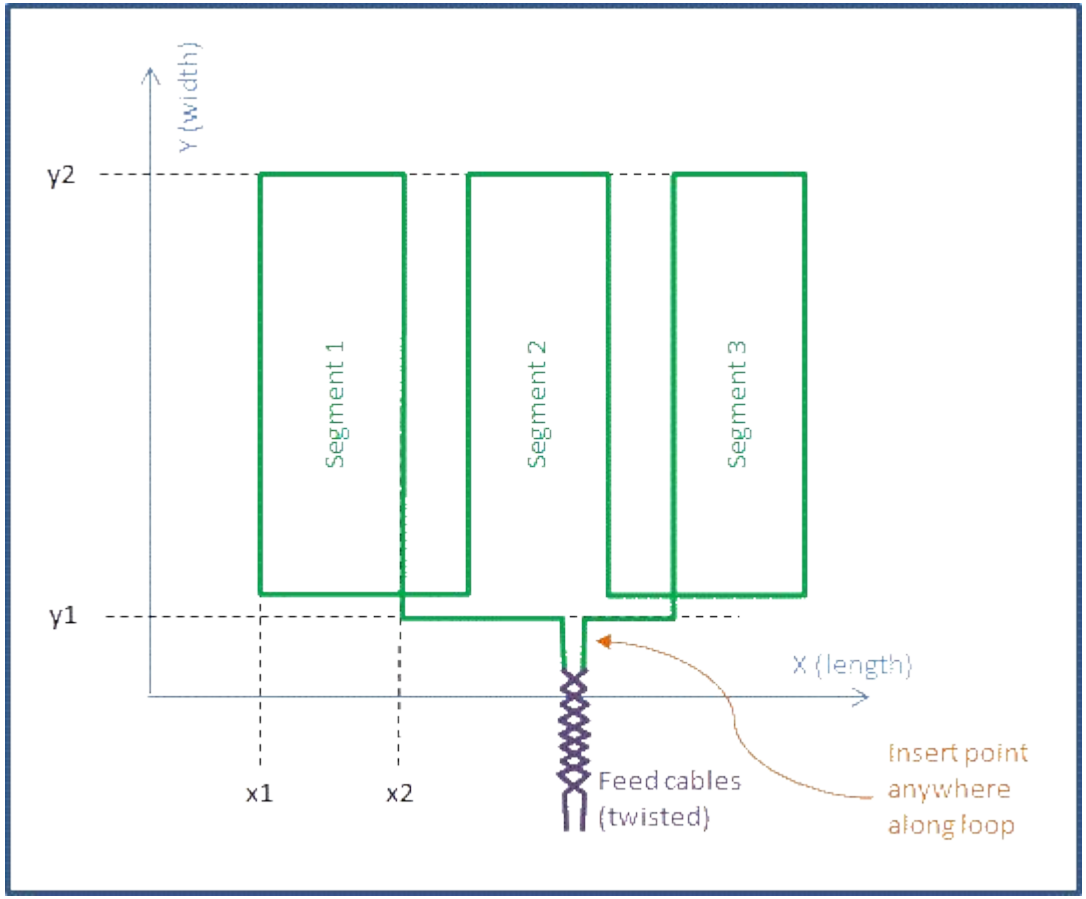
Electrical Connections

Representative Electrical Connections Diagram



Connection / Feeds Notes

Electrical connections shown on drawings are for illustration only.
The path of the cables shown on the layout must be followed to ensure each loop segment is in the correct polarity relative to each other. If the direction of one or more segments is reversed the system performance will be affected and it may not meet the required standard.
The loop wire path in each array must be broken at one point to connect the feed wires from the driver driving this array. This "feed point" is not marked on the drawing; it can be placed anywhere along the loop path that is convenient and practical.
All loop elements of each multiloop array are connected in series; there is only one electrical path from one side of the feed point, through all the loop elements, and back to the other side of the feed point.
The feed wires between each driver and the relevant array should be no more than the feed cable length specified here, assuming that these feed wires are as specified here. If the feed wires must be longer, this may affect the equipment specification, or a different feed wire may be needed. Please contact your distributor or Ampetronic for advice if this is an issue.

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