System Specification Guide

Introduction

This guide is intended to provide a framework for system designers, sound engineers and salespeople to use when specifying a Traction Sound system for specific events, venues or prospective customers. The suggested system configurations in this guide are by no means compulsory but instead provide a baseline that can be further modified to suit the project in question.

Traction Sound products and their intended use

The following chart shows each Traction Product and a brief description of their intended use case(s).

Product	Intended Use	Key Stats
Hawk Solo 8	- Low-Medium SPL background music in hospitality situations - DJ Booth	Type: Bandpass Subwoofer Max SPL: 120dB Freq Range: 45Hz-100Hz
Hawk Solo 12	- Medium SPL DJ or playback in both hospitality and event situations - DJ Booth	Type: Reflex Subwoofer Max SPL: 130dB Freq Range: 41Hz-150Hz
Hawk SW10	- Low-Medium SPL DJ or playback in both hospitality and event situations - DJ Booth	Type: Bandpass Subwoofer Max SPL: 124dB Freq Range: 45Hz-100Hz
Hawk 24	- Low SPL background music in hospitality situations - DJ Booth	Type: Point source mid-top Max SPL: 118dB Freq Range: 120Hz-18kHz
Hawk 6	- Low SPL background music in hospitality situations - DJ Booth	Type: Point source mid-top Max SPL: 118dB Freq Range: 78Hz-20kHz
Hawk 8	- Low-Medium SPL DJ or playback in both hospitality and event situations - DJ Booth	Type: Point source mid-top Max SPL: 121dB Freq Range: 77Hz-20kHz
Harrier 8-X	- Medium SPL DJ or playback in both hospitality and event situations - DJ Booth	Type: Point source mid-top Max SPL: 122dB Freq Range: 75Hz-20kHz
Harrier SW15	- Medium SPL DJ, playback or small live music situations - Higher output DJ Booth	Type: Reflex Subwoofer Max SPL: 133dB Freq Range: 35Hz-200Hz
Harrier SW15-2.1	- Medium SPL DJ, playback or small live music situations - Higher output DJ Booth	Type: Reflex Subwoofer Max SPL: 133dB Freq Range: 35Hz-200Hz
Harrier 50-X	- Medium to high SPL DJ or live music situations	Type: Point source mid-top Max SPL: 133dB Freq Range: 65Hz-20Khz
Harrier 80-X	- Medium to high SPL DJ or live music situations	Type: Point source mid-top Max SPL: 133dB Freq Range: 65Hz-20kHz
Harrier SW218	- Very High SPL DJ or live music situations - Very High SPL club installations - Temporary open-air events - Ground Stack systems - Spaced arrays - Gradient arrays	Type: Reflex subwoofer Max SPL: 142dB Freq Range: 32Hz-150Hz
Osprey FC10-X	- High SPL DJ or live music situations - High SPL club installations	Type: Constant curve mid-top Max SPL: 141dB Freq Range: 65Hz-18Hz

	- System should be flown if more than one unit in use	
Osprey FC20-X	- High SPL DJ or live music situations - High SPL club installations - System should be flown if more than one unit in use	Type: Constant curve mid-top Max SPL: 141dB Freq Range: 65Hz-18kHz
Osprey SW215	- Very High SPL DJ or live situations - Very High SPL club installations - Temporary open-air events - Ground Stack systems - Spaced arrays - Gradient arrays	Type: Reflex Subwoofer Max SPL: 141dB Freq Range: 35Hz-200Hz
Raptor APS212	- Very High SPL DJ or live situations - Very High SPL club installations - Long throw applications - Temporary open-air events - Ground stacked as single units or an array of up to three units - Flown as single units or arrays of up to three units	Type: Point source mid-top Max SPL: 146dB Freq Range: 65Hz-18Khz
Raptor HB218	- Very High SPL DJ or live situations - Very High SPL club installations - Temporary open-air events - Ground stacked up to 4 units high	Type: Bandpass/FLH Subwoofer Max SPL: 146dB Freq Range: 35Hz-160Hz
CX6-HD	- Low-Medium SPL background music in hospitality situations - DJ Booth	Type: Point source mid-top Max SPL: 121dB Freq Range: 80Hz-18kHz
15HD	- Medium to high SPL DJ or live music situations	Type: Point source mid-top Max SPL: 132dB Freq Range: 55Hz-20Khz
CX10-HD	- Medium SPL DJ or playback in both hospitality and event situations - DJ Booth	Type: Point source mid-top Max SPL: 128dB Freq Range: 65Hz-18kHz

Amplifier Power Output (per channel)

Product	8 Ohms	4 Ohms	2.7 Ohms	2 Ohms
Traction Engine 4|1000-N/DSP	500W 2000W (bridged)	1000W 2400W (bridged)	1400W	1200W
Traction Engine 4|2700-N/DSP	1400W 5400W (bridged)	2700W 7000W (bridged)	3700W	3500W

Calculating the impedance of multiple speakers in parallel

Use the following equation to calculate the nominal total impedance (Z_{Total}) of multiple loudspeakers connected in parallel, where $Z_{(n)}$ is the nominal impedance of each loudspeaker.

$$\boldsymbol{Total\ Z} = \frac{\mathbf{1}}{\frac{\mathbf{1}}{\boldsymbol{Z1}}+\frac{\mathbf{1}}{\boldsymbol{Z2}}+\frac{\mathbf{1}}{\boldsymbol{Z3}}+\boldsymbol{etc}}$$

Do not connect a load to an amplifier that is less than the quoted minimum impedance for that amplifier channel. In most cases this is 2 Ohms, and 4 Ohms for bridged operation.

Amplifier Current Draw (nominal maximum, see datasheet for more detail)

Product	8 Ohms	4 Ohms	2.7 Ohms
Traction Engine 4|1000-N/DSP	3.7A (240V) 7.7A (120V)	5.8A (240V) 11.7A (120V)	7.1A (240V) 14.5A (120V)
Traction Engine 4|2700-N/DSP	9.6A (240V) 19,6A (120V)	15.7A (240V) 31.9A (120V)	19.2A (240V) 38.7A (120V)

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Suggested Traction Sound systems for potential use cases

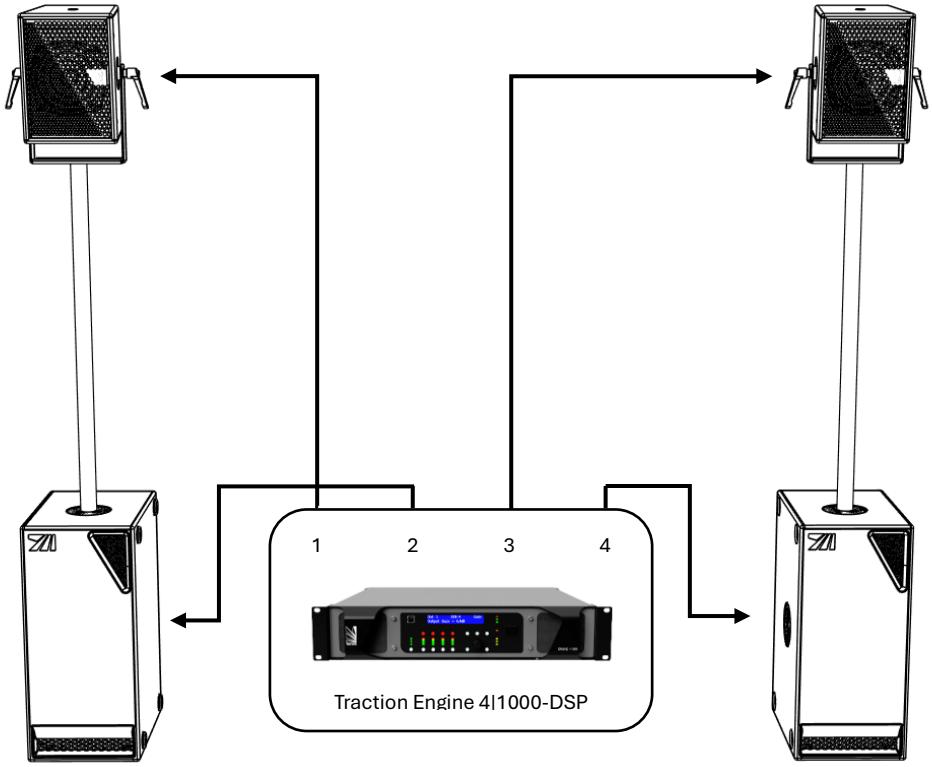
The following chart shows a range of potential real-world use cases and the Traction Sound products we recommend using to satisfy the specific needs of the situation. This is a rough guide and aims to illustrate the calibre of system required for a given event size.

Use Case	Suggested System Components	Additional Information
Hospitality (Bar, Restaurant, Lobby)	8x CX6-HD or 8x Harrier 8-X | 2x SW12 or 2x SW10	Scalable depending on venue requirements and layout. Subs can be placed under seating or behind furniture
Small-Medium DJ FOH <200 people	2x Harrier 80-X | 2x SW15 or 2x SW218	
Small-Medium DJ Booth	2x Harrier 8-X | 2x SW12 or 2x SW15	
Medium DJ/Live Music FOH <500 people	2x Harrier 80-X | 2x SW218 or 2x Osprey FC20-X | 4x SW215	
Medium Club Install - LR FOH <1000 people	2x Osprey FC20-X | 8x SW215 or 2x Raptor APS212 | 6x HB218 15HD or Harrier 80-X delays/fills	Both system options can be ground stacked
Medium Club Install - 4 Point <1000 people	4x Osprey FC20-X | 8 SW215 or 4x Raptor APS212 | 12x HB218 15HD or Harrier 80-X delays/fills	Both system options can be ground stacked
Large Club Install >1500 people	6x Raptor APS212 | 12x HB218 or 12-16x SW218 15HD or Harrier 80-X delays/fills	Raptor Array should be flown Subs should be ground stacked up to 3 high or placed in a horizontal spaced array
Medium-Large open-air DJ/Live Music <1500 people	4-6x Raptor APS212 | 8xSW215 or 8x SW218 or 2x Osprey FC10-X + 2x FC20-X | 8xSW215 or 8x SW218	Subs should be a horizontal spaced array Mid-tops should be flown
Large open air- DJ/Live Music >2000 people	10 Raptor APS212 | 16x HB218 or 16xSW215 or 16xSW218 Harrier 80-X or 15HD fills	APS212 should be split into 2x Triple Arrays at FOH and 2x Dual Arrays as flown delays. Subs should be double stacked and arranged as an 8-position horizontal delayed array, or an 8-position horizontal delayed gradient array.

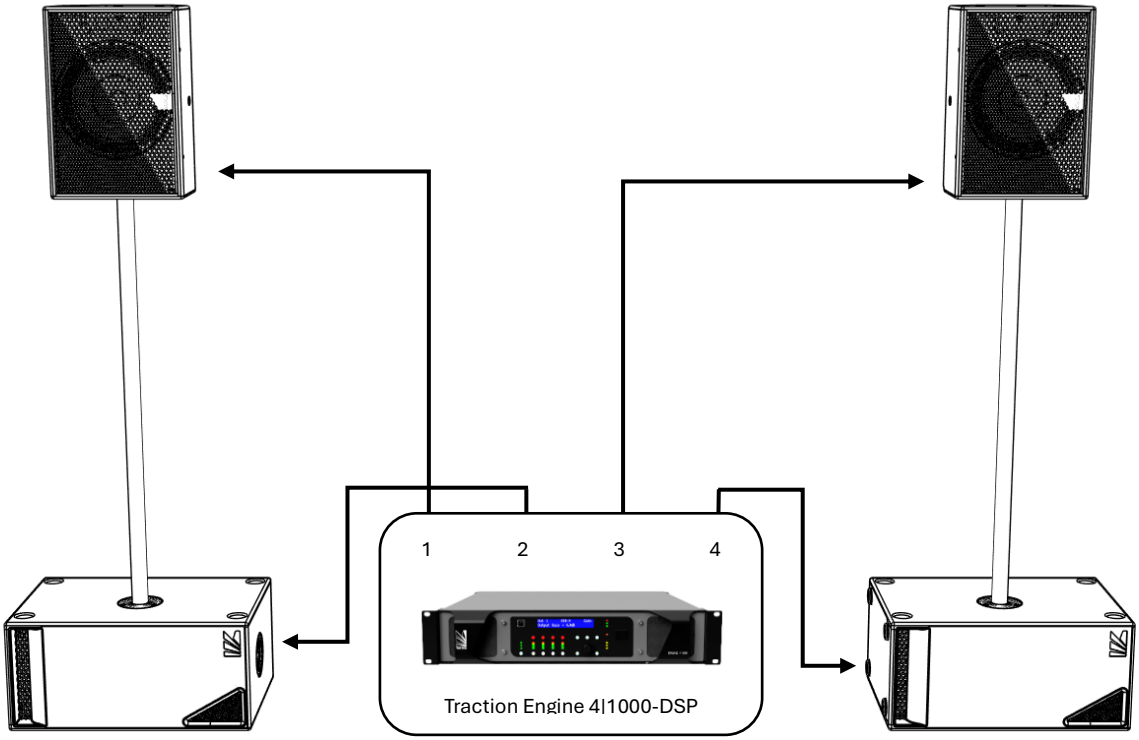
Example System Configurations:

HD:

2x CX6-HD| 2x SW10



2x CX10-HD | 2x SW10



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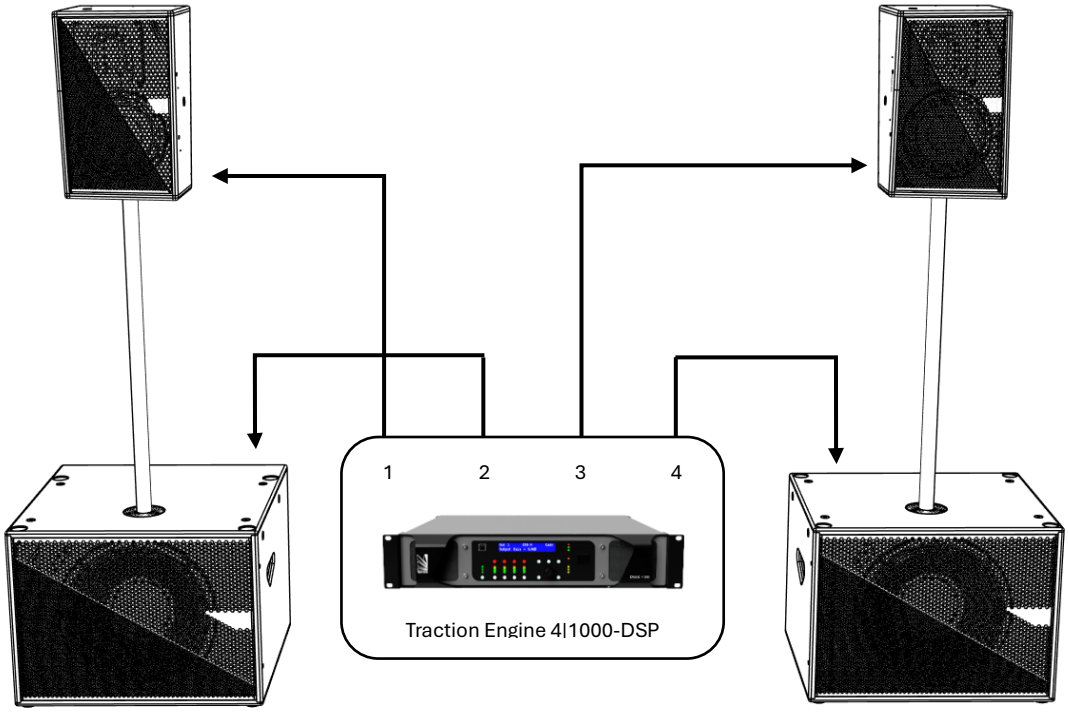
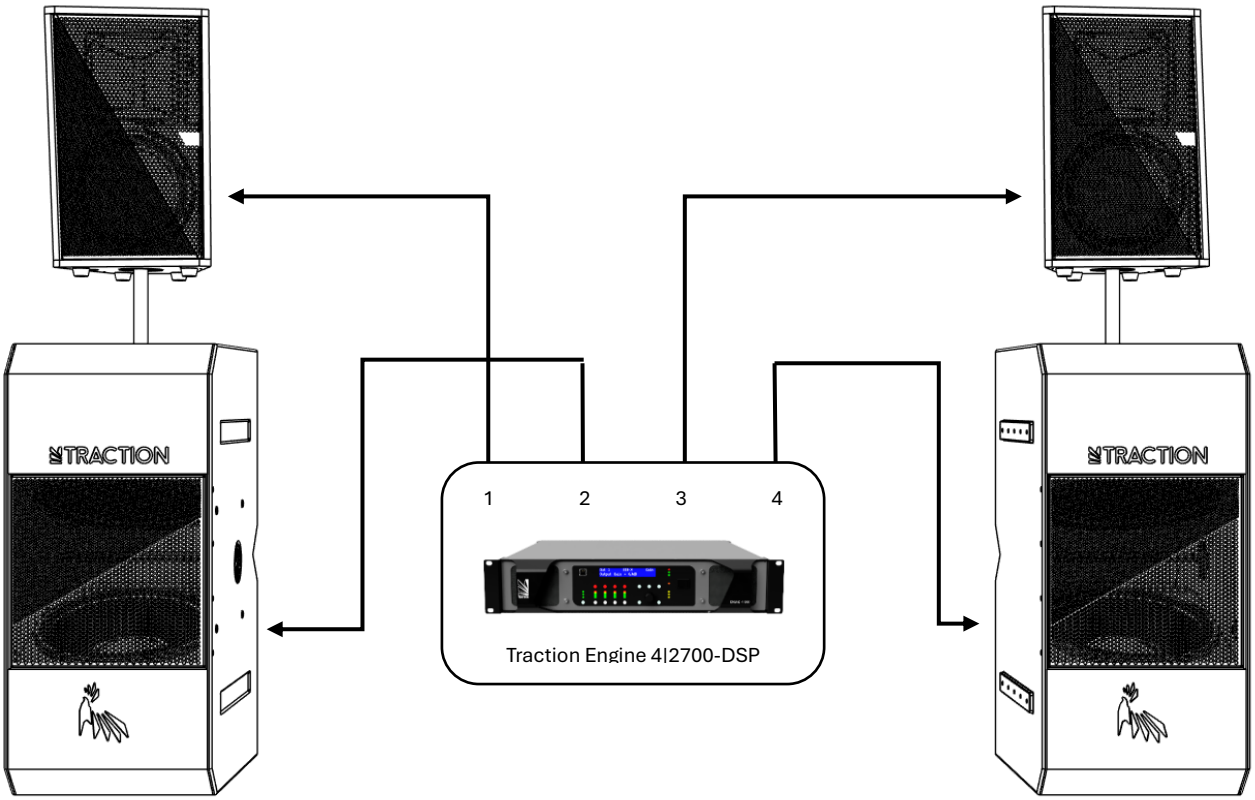
Harrier:

2x Harrier 8-X | 2x Harrier SW15



2x Harrier 80-X | 2x Harrier SW218



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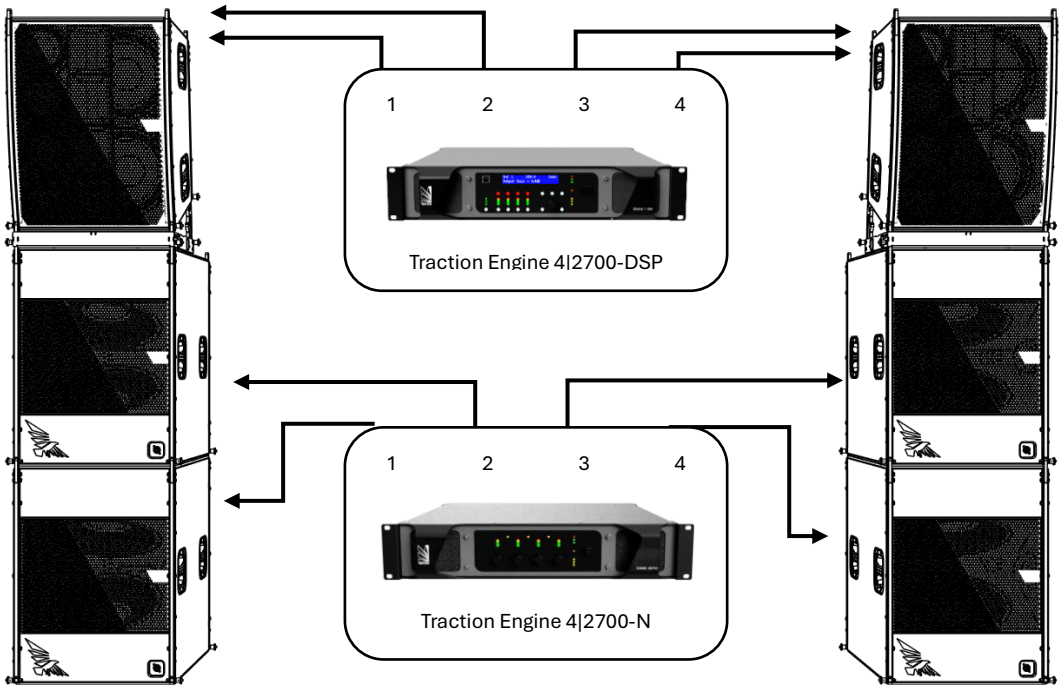
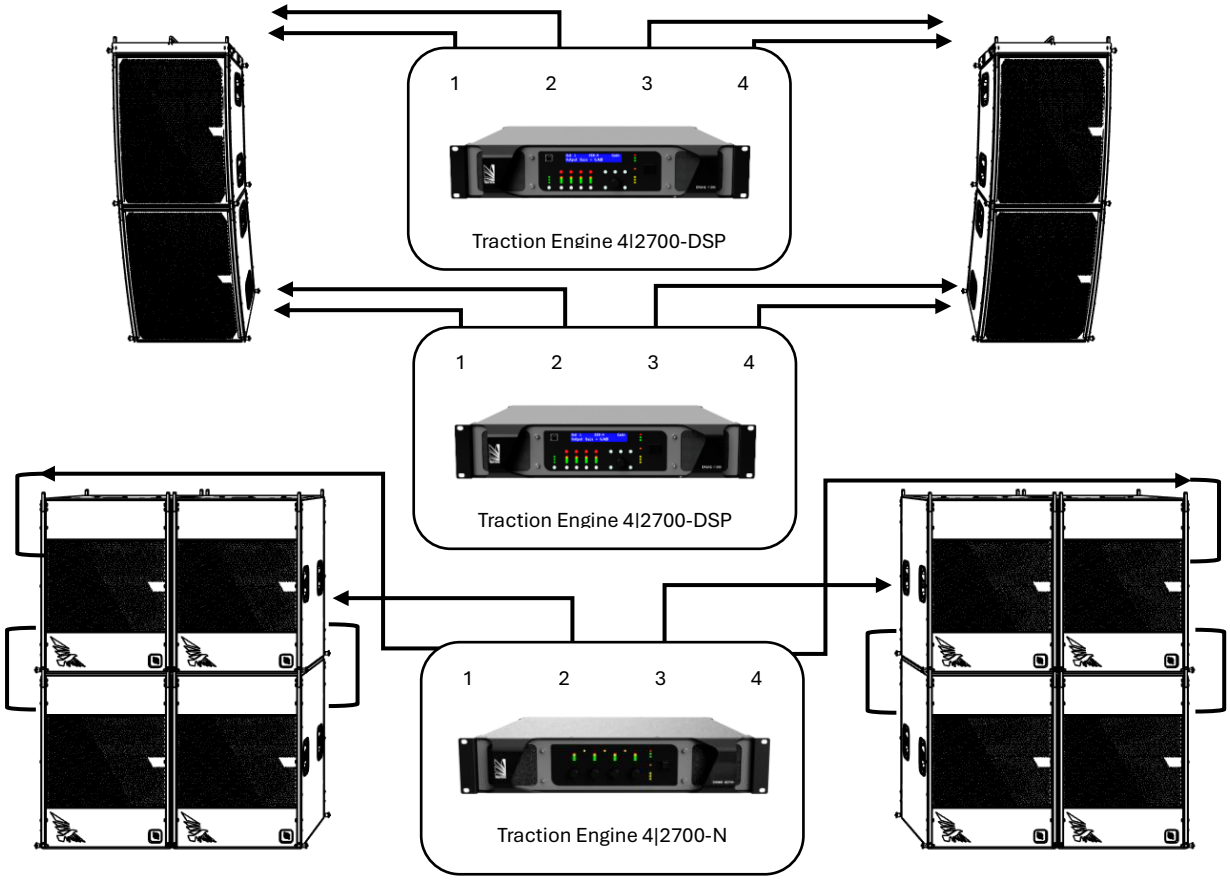
Osprey:

2x Osprey FC20-X | 4x Osprey SW215



2x FC10-X + 2x FC20-X | 8x Osprey SW215



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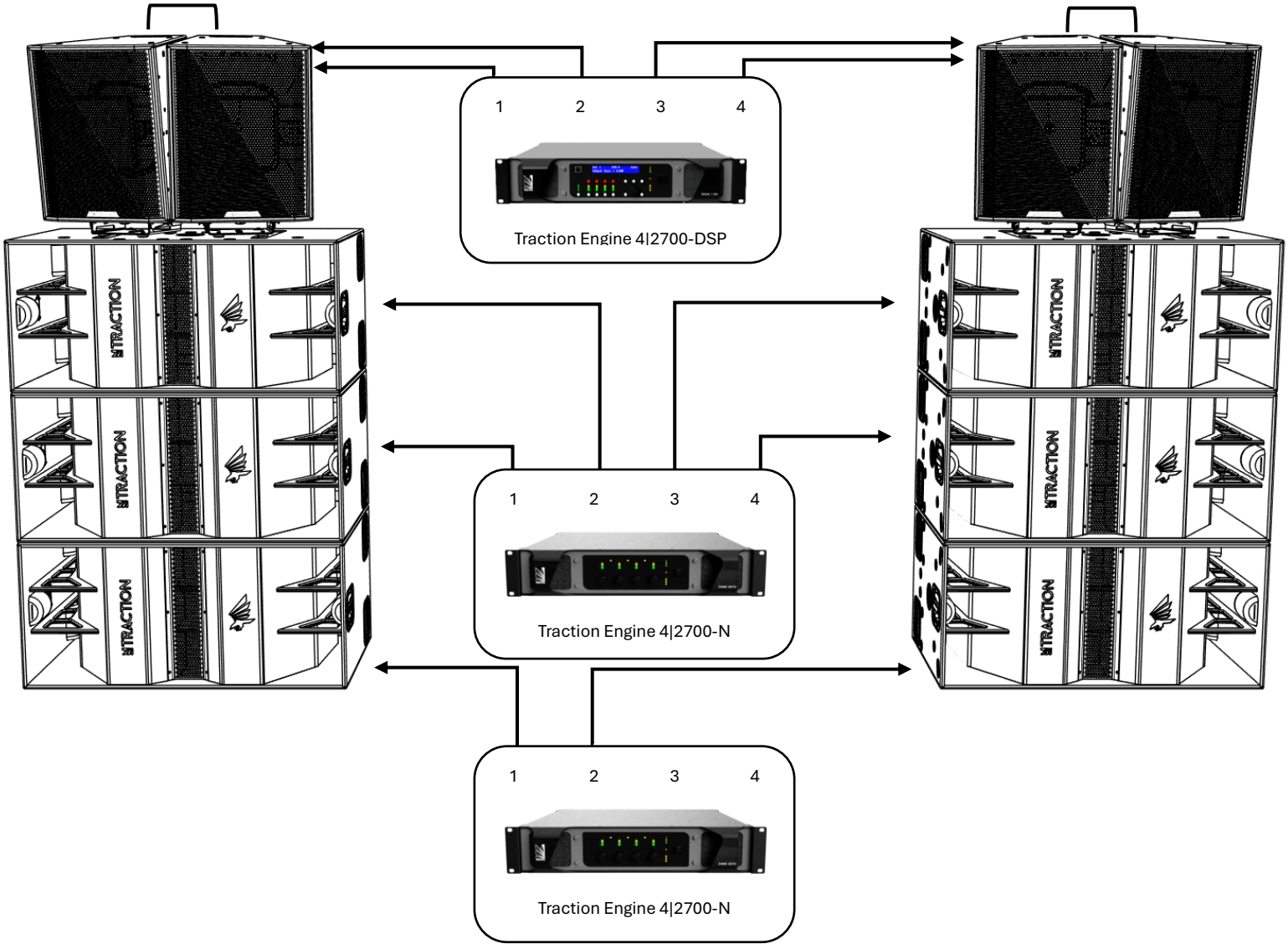
Raptor:

4x Raptor APS212 | 6x Raptor HB218



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6x Raptor APS212 | 8x HB218