

# GROUNDCONTROL

## Nodal Series

*Bass Modal Treatment for Small Rooms*

You spend hours getting the mix right. The low end feels solid, the kick sits perfectly, the bass has just the right weight. Then you play it somewhere else and it falls apart. The low end disappears, or there's too much of it, or the kick is buried. You go back to the room and it sounds fine again.

It's not your ears. It's not your monitors. It's your room.

Every rectangular room acts like a resonator at low frequencies. Certain bass notes excite the room into ringing — like a bell — and that ringing sits underneath everything you listen to, colouring every decision you make. You can't hear through it because you don't know it's there. You adapt to it without realising, and your mixes adapt with you.

*The low end that sounds perfect in your room isn't the low end in the recording. It's the low end plus your room. And your room is lying to you.*

**42–109 Hz**

**CONTINUOUS COVERAGE**  
*the full home studio problem range*

**Up to -51%**

**DECAY REDUCTION**  
*at 55 Hz in reference room*

**30 inches**

**UNIT HEIGHT**  
*three units fill an 8 ft ceiling*

### WHY YOUR ROOM SOUNDS THE WAY IT DOES

Bass frequencies behave differently from everything else in a small room. At low frequencies — roughly below 120 Hz — the room itself becomes a musical instrument. Sound at certain frequencies bounces back and forth between parallel walls and reinforces itself, building up into sustained resonances called room modes. Some notes ring for a second or more after the music stops. Others are artificially quiet. The result is a frequency response that can vary by 20 dB or more just by moving your head a foot in any direction.

Standard acoustic treatment — foam panels, hanging baffles, corner traps made from thick mineral wool — works well above 200 Hz where it can absorb mid and high frequencies. But these materials need to be impractically thick to have any meaningful effect below 100 Hz. A 4-inch foam panel does almost nothing at 55 Hz. To absorb bass with porous material alone you need panels 12 inches deep or more, and a room full of them.

The result is that most home studios are treated in the mid range and completely untreated in the bass — the frequency range that matters most for mixing decisions.

*In a typical untreated home studio, the room is still ringing audibly at 55 Hz for over a second after the music stops. Your monitors go silent. The room keeps playing.*

## A DIFFERENT APPROACH

The Nodal Series uses a different physical mechanism to absorb bass — not thickness, but resonance. Each unit contains one or two thin panel membranes mounted in front of a sealed air cavity. When bass at the target frequency strikes the membrane, the membrane flexes and vibrates, converting that acoustic energy into heat through internal damping material. The unit absorbs specifically at the frequency it's tuned to, efficiently and in a 179 mm total depth that fits against your wall without eating your room.

This is called a tuned panel absorber, and it's been used in broadcast and recording facilities for decades. The Nodal Series brings that engineering to the home studio in a product designed around the specific frequencies that cause the most problems in typical small rooms — 55, 70, and 85 Hz — and sized to fit in the corners where those problems are worst.

### Why corners?

Bass modes build up pressure at room boundaries — walls, floor, and ceiling. At a corner where two walls and the floor all meet, that pressure is at its absolute maximum. A panel absorber placed in a corner is working at the highest possible concentration of bass energy, making it far more effective than the same unit placed mid-wall. Four units in corners do more than eight units spread around the walls.

## THE PRODUCTS

### Nodal 55/70 — Dual-Chamber Panel Absorber

The Nodal 55/70 is the foundation of the system. Each unit contains two completely independent absorption chambers — one targeting 55 Hz and one targeting 70 Hz — stacked vertically within a single 630 × 762 mm enclosure. Both chambers share the same 179 mm depth, presenting a flush face to the room with a continuous natural birch ply frame surrounding two satin black membrane panels.

The 55 Hz chamber uses a mass-loaded panel face to hit the lowest tuning frequency in the system. The 70 Hz chamber uses a lighter panel face at a different internal geometry. Together they provide unbroken coverage from 42 to 86 Hz — cutting decay times by 43 to 51% at these frequencies in the reference room configuration.

	Chamber A — 55 Hz	Chamber B — 70 Hz
Tuning frequency	54.6 Hz	70.7 Hz
Coverage (-3 dB)	42–67 Hz	55–86 Hz
RT60: untreated room	1.34 s	0.86 s
RT60: treated (ref.)	0.65 s (-51%)	0.49 s (-43%)
Dimensions (W×H×D)	630 × 762 × 179 mm	—

630 × 762 × 179 mm (W × H × D) · 7 inches deep

### Nodal 85 — Single-Chamber Panel Absorber

The Nodal 85 completes the system. At exactly half the width of the Nodal 55/70, two units sit side by side to form a 630 mm wide pair that stacks seamlessly on top of two Nodal 55/70 units — the same

depth, the same frame profile, the same flush face. The Nodal 85 is tuned at 88.9 Hz, covering 69 to 109 Hz where the system hands off to the range where conventional broadband panels become effective.

In the reference room, four Nodal 85 units at corners reduce RT60 at 85 Hz by 49% — from 0.90 seconds to 0.46 seconds, landing squarely in the target range for critical listening.

Specification	Value
Tuning frequency	88.9 Hz
Coverage (-3 dB)	69–109 Hz
RT60: untreated room	0.90 s
RT60: treated (ref.)	0.46 s (-49%)
Dimensions (W×H×D)	315 × 762 × 179 mm

## WHAT THE SYSTEM COVERS

Used together, the Nodal 55/70 and Nodal 85 provide continuous absorption from 42 to 109 Hz — the full range of the home studio bass problem — with no gaps between tuning points. The overlapping coverage bands mean every frequency in this range receives meaningful treatment.

Frequency	Product	Coverage	Before	After	Reduction
55 Hz	Nodal 55/70 Ch. A	42–67 Hz	1.34 s	0.65 s	-51%
70 Hz	Nodal 55/70 Ch. B	55–86 Hz	0.86 s	0.49 s	-43%
85 Hz	Nodal 85	69–109 Hz	0.90 s	0.46 s	-49%
System	2+2 per corner × 4	42–109 Hz	—	—	43–51%

*Reference room: 6.10 × 4.88 × 2.44 m (20 × 16 × 8 ft) · 2 × Nodal 55/70 stacked + 2 × Nodal 85 side by side per corner · 4 corners*

*The industry target for critical listening is 0.25–0.55 seconds modal decay time. All three treated values land at or near this target — from a starting point of 0.86 to 1.34 seconds in the untreated room.*

## THE CORNER STACK

The Nodal Series is designed around a specific installation: two Nodal 55/70 units stacked vertically in each room corner, with two Nodal 85 units sitting side by side on top. The result is a single 630 mm wide column of treatment that runs from the floor to within 40 mm of a standard 8 ft (2440 mm) ceiling.

This arrangement is deliberate. The two Nodal 55/70 units occupy the lower section of the column, coupling into the floor-corner pressure maximum where 55 and 70 Hz modes concentrate. The Nodal

85 pair sits at the top, coupling into the ceiling corner where the higher frequency modes peak. Both pressure maxima are addressed simultaneously by a single flush column that takes up less than 8 inches of wall depth.

All four units in the stack share the same 179 mm depth and the same frame profile, so every face sits perfectly flush. The 762 mm unit height is chosen so that the full three-unit column reaches exactly 2286 mm — fitting comfortably under a standard 8 ft ceiling with clearance to spare.

### Starting with fewer units

If budget requires a phased approach, start with two Nodal 55/70 units at the two front corners behind your monitors. Front corners couple most strongly to the listening position and give you the greatest immediate improvement. Add the Nodal 85 units and rear corner treatment as a second phase.

## WHAT TO EXPECT

The first session in a properly treated room often feels unsettling. The low end sounds thinner, less impressive, less present. That's not a problem — it's the point. The resonant reinforcement you were mixing with is gone, and what you're hearing now is closer to what's actually in the recording.

Give it a few sessions. Once your ears adjust to the treated room, you'll find:

- Bass guitar and kick drum sit in the mix without needing heavy corrective EQ — you're hearing them clearly for the first time
- Low end decisions made in the room translate to other systems — the bass that sounds right actually is right
- The frequency balance at the listening position is more consistent — less variation as you move around the room
- Subwoofer integration becomes predictable — you can hear what it's actually doing

What the Nodal Series does not address:

- Flutter echo and mid-range coloration — these need broadband porous panels above the Nodal stack
- Room nodes above 120 Hz — conventional panels handle this range effectively
- Phase issues or stereo imaging problems — these are separate phenomena

*The goal isn't a room that sounds impressive. It's a room that tells the truth. Mixes made in a room that tells the truth travel well.*

## FINISH & CONSTRUCTION

Every element of the Nodal Series is chosen to look as considered as it performs. The enclosure is CNC-cut 12 mm Baltic birch plywood — precise, stable, and distinctive. The membrane panels are painted satin black. The contrast between the natural ply frame and the dark membrane face is the product's visual identity: a warm birch border surrounding each tuned surface, reading as intentional and technical rather than decorative.

<b>Frame &amp; lip</b>	12 mm Baltic birch ply · clear hardwax oil finish · natural grain visible
<b>Membrane panels</b>	MDF · satin black water-based paint · two coats over shellac primer
<b>Reveal</b>	6 mm continuous birch ply lip around all membrane edges · consistent on all four sides and crossmember
<b>Crossmember</b>	18 mm total · 6 mm ply face visible · 6 mm rebate each side for membrane seating
<b>Depth</b>	179 mm total · 7 inches · fits standard stud wall bay width
<b>Internal seal</b>	Membrane bonded with 3M 4200 flexible polyurethane adhesive · airtight cavity seal

The birch ply finish is applied before assembly, working on flat components for consistent coverage. The rebate zones are masked during finishing so the adhesive bond between membrane and frame is always to bare wood. The result is a unit that looks as clean on close inspection as it does from across the room.

## FULL TECHNICAL SPECIFICATIONS

### Nodal 55/70

Specification	Chamber A — 55 Hz	Chamber B — 70 Hz
Tuning frequency	54.6 Hz	70.7 Hz
Coverage (-3 dB)	42–67 Hz	55–86 Hz
Face panel	MDF + mass-loaded vinyl	MDF
Cavity depth	162 mm	162 mm
Internal damping	Mineral wool 32–45 kg/m <sup>3</sup>	Mineral wool 32–45 kg/m <sup>3</sup>
Quality factor Q	2.25	2.25
Overall dimensions (W×H×D)	630 × 762 × 179 mm	—

### Nodal 85

Specification	Value
Tuning frequency	88.9 Hz
Coverage (-3 dB)	69–109 Hz
Face panel	MDF
Cavity depth	164 mm

Internal damping	Mineral wool 32–45 kg/m <sup>3</sup>
Quality factor Q	2.25
Overall dimensions (W×H×D)	315 × 762 × 179 mm
System coverage (–3 dB)	42–109 Hz (combined with Nodal 55/70)
System RT60 reduction	43–51% (reference room · 4+4 corner config.)

## ABOUT INTEGER AUDIO

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Integer Audio is a boutique electronics and acoustics company based in Rochester, New York. The Nodal Series is designed and built to the same standard as the RMP2 ribbon microphone preamplifier — engineered from first principles, measured, and honest about what it does and doesn't do.

We build tools for people who take sound seriously.

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**[integeraudio.com](http://integeraudio.com) · [groundcontrol.audio](http://groundcontrol.audio)**

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