DESI DECIBEL

SWETON® SPEAKERS Since 1982

Loudspeaker, amplifier and mixer knowledge for the people who sell sound. Every week.

A note to our partners

Every operator knows it: the system that hit hard at 9 pm sounds tired at 2 am, and pushing the faders makes it worse. This week's Speaker School explains why, and it is not the amplifier. Our product is the CD 240 NEO, the compression driver that carries the top end in our larger cabinets.

Rahul Agarwal, Sweton Speakers

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Speaker School — Lesson 5

Thermal compression: the 2 am problem

A voice coil is a length of wire. Current heats it, and hot wire has more resistance, so the amplifier delivers less power into the same speaker. That loss is thermal compression, the quiet reason loud nights end badly.

1 The physics — copper gains 0.4% per °C

Copper's resistance rises about 0.4% per degree. A coil at 225 °C has nearly double the resistance it had at 25 °C. Double the resistance, half the power: 3 dB lost, like fitting an amplifier half the size.

> **Tell the customer**
> **A hot speaker is a smaller speaker.**

2 What it sounds like — loud but lifeless

Bass loses punch first, because the sub coil is hottest. The operator hears it dull, pushes the fader, the coil gets hotter, and the gain disappears into heat. By 2 am the sound is flat.

> **Tell the customer**
> **If turning it up no longer makes it louder, the coil is cooking.**

3 Why coil size matters — surface sheds heat

A 100 mm coil has over twice the surface of a 65 mm coil, so it sheds heat faster and stays cooler at the same power. That is why AES ratings rise with coil size, and why a big coil is worth paying for on a sub that runs all night.

> **Tell the customer**
> **The AES rating is a heat rating. Big coil, long night.**

4 What helps — headroom and air

Run bigger amplifiers under the limiter, not small ones into clip. Keep the vents clear so the magnet can breathe. Add a cabinet rather than pushing three harder: four at 70% stay cooler and louder than three at 100%.

> **Tell the customer**
> **Buy the extra sub. It is cheaper than reconing two.**

One sub, one night: how the sound fades

9 pm, coil 40 °C	Full output	Resistance normal; the amplifier delivers rated power
Midnight, coil 150 °C	2 dB down	Resistance up 50%; bass softer, fader goes up
2 am, coil 230 °C	3 dB down	Resistance nearly doubled; half the power reaches the cone
Past 250 °C	Failure	Adhesive and former give way; recone is the only fix

Typical figures; the direction is what matters. This is why Sweton tests AES ratings for two hours at full power.

Amp Corner — Amplifiers

Mains, generators and voltage drop

An amplifier makes its rated power only on its rated voltage. At 180 V the biggest amplifier on the truck behaves like a small one.

The rule: an amplifier turns mains power into speaker power. Starve the mains and you starve the speakers. Check the supply before blaming the amplifier or the speakers.

Mains	Generator	Phases
Thin wires lose volts 100 m of 2.5 mm² cable drops about 15 V at 20 A, and more on bass hits. Use 4 or 6 mm² for long runs, by the shortest route.	**Size for the peaks** Rate the generator at about three times the amplifiers' average draw: a 2 × 3000 W amplifier wants 10 kVA, not 5. A small set sags on every bass note.	**Share the load** On three-phase supply, split the amplifiers evenly. Loading one phase with every sub amplifier drops that phase and lifts the others.

Example: a rental operator says his new amplifier "is weaker than the old one". On site the supply reads 192 V under load: a 5 kVA generator, 8000 W of amplifiers, 60 m of 1.5 mm² cable. A 10 kVA set and 4 mm² cable brought back the 230 V and the bass.

Three things to check at the mains

Measure voltage at the amplifier inlet while music plays, not at the generator with nothing connected.

Keep audio and mains cables apart. A mains cable along a long mic line is a hum you cannot EQ out.

Earth every rack. A missing earth gives a hum at best, a shock from the mic grille at worst.

Mixer Desk — Mixers

The feedback hunt: finding the ringing band

Feedback happens at one frequency at a time: the one where the loop from mic to speaker and back gains most. Find it, cut it a little, and the system can go louder before the next one rings.

Ringing out in four steps

1. With the band on a break, set EQ flat and raise the mic channel slowly until the first ring appears. Hold it there.
2. Listen to the pitch: hum 100–250 Hz, honk 250–800 Hz, whistle 1–4 kHz, hiss above 5 kHz. Sweep a mid knob until the ring gets louder; that is the band.
3. Cut that band 3–6 dB. The ring stops. Raise the level to the next ring and repeat. Three cuts usually buy 6 dB more.
4. Stop after three or four. Deeper cuts make the voice hollow; move the speaker or the mic instead.

Usual suspects

Low hum, 100–250 Hz
Mic too close to the wedge, or a boomy floor

Honk, 250–800 Hz
Hollow stage or a reflective back wall

Whistle, 1–4 kHz
Mains behind the mic line; mic facing the horn

Hiss, above 5 kHz
Too much high EQ; mic too far away

Why small cuts: feedback needs only a little gain to start, so only a little cut to stop. A 3 dB cut on one band is inaudible on a voice; a 12 dB cut is a different singer. Cut the least that silences the ring.

Product of the week

Sweton compression drivers

CD 240 NEO

Sweton 1.4-inch neodymium compression driver with a 4-inch titanium diaphragm, 120 W AES and 106 dB sensitivity, for the top end of two-way and three-way cabinets.



Sweton CD 240 NEO, 1.4-inch compression driver

CD 240 NEO specifications

Throat (exit)	36 mm (1.4 in)
Impedance	8 Ω
Power handling (AES)	120 W
Program power	240 W
Sensitivity (1 W / 1 m)	106 dB
Frequency range	500–18,000 Hz
Voice coil	100 mm (4 in)
Winding	Copper-clad aluminium
Diaphragm	Titanium
Magnet	Neodymium
Gross weight	2.37 kg

Best use and crossover

The high-frequency driver for two-way and three-way DJ, PA and line array cabinets, on a 1.4-inch horn. Cross it at 1.2 kHz or higher with a 24 dB per octave filter, as Sweton's enclosure guides recommend for a 1.4-inch driver. Below 1 kHz the diaphragm is doing the woofer's job and will not last.

Amplifier power needed

120 to 240 W at 8 Ω, with a limiter. In an active system, the HF channel needs far less power than the mid-bass; do not share the big amplifier.

Keep in mind

- Neodymium loses strength if it gets very hot. Keep the driver out of direct sun on a closed roof rack and give the cabinet airflow.
- Titanium diaphragms are bright. If the top sounds hard, shelve down 3 dB above 8 kHz on the processor rather than crossing lower.

Read it with the four numbers

Power handling

120 W AES, 240 W program, on a 4-inch coil. For a compression driver that is a large coil, and it is why this driver runs cool through a long programme. The copper-clad aluminium winding keeps it light.

Sensitivity

106 dB on a plane-wave tube. On a horn in a cabinet it is louder still. It will keep up with two 15-inch mid-bass drivers at 98 dB with power to spare.

Impedance

8 Ω. One driver per cabinet, through the passive crossover or on its own amplifier channel in an active system.

Frequency response

500–18,000 Hz. The range starts at 500 Hz, but the crossover point is a different question: see below.

Three lines for your counter

1. A 4-inch coil and neodymium magnet in a driver that weighs 2.37 kg: half the weight of a ferrite driver of this power.
2. 106 dB sensitivity: 1 W gives the sound of a 100 W amplifier on an ordinary dome tweeter.
3. Made in Kolkata, India by Sweton, since 1982. Replacement diaphragms are available, so it is repaired, not replaced.

Watch the review video

Open the spec sheet

Horn and mounting data for cabinet makers

Throat (exit)	Bolt circle	Overall diameter	Depth	Weight	Impedance
36 mm (1.4 in)	101.6 mm (4 in)	127 mm (5 in)	60 mm	2.37 kg	8 Ω

Standard 1.4-inch bolt-on flange: four holes on a 101.6 mm circle. Fits any 1.4-inch horn with the same pattern.

Counter Talk

Selling

Customer

"Neodymium is just a lighter magnet. Why pay more for it than for a ferrite driver?"

How to answer: what the customer gets for the money

1. **Weight is money on a truck and a line array.** Roughly half the weight: eight flown cabinets with two drivers each is a lighter rig and a safer fly.
2. **Smaller magnet, same strength, better cooling.** It leaves room for a bigger coil and heat sink in the same housing, which is why the CD 240 NEO runs a 4-inch coil.
3. **The magnet does not wear out.** Kept out of extreme heat it holds its strength for decades. The diaphragm is the only wearing part, and it is replaceable.

Then ask what it is for. A fixed hall install can live with ferrite. A rental rig lifted every weekend earns its neodymium back in one season.

Myth or truth?

"A neodymium driver sounds better than a ferrite one."

Myth

The magnet does not decide the sound; the diaphragm, coil, phase plug and horn do. Neodymium gives the same strength in less weight and space.

Watch our video: ferrite vs neodymium

Question of the week

Last week's answer

Below 40 Hz the port stops loading the cone, so a 28 Hz drop drives it past Xmax. Fix: high-pass at 35–40 Hz, 24 dB/octave.

A sub system is fine at 10 pm and dull at 1 am; the clip light never comes on and the mains reads 230 V. Most likely cause, and what to do next time?

WhatsApp your answer to **70444 11800**

The answer is in the next issue.

Next week

Issue 06

- **Speaker School** — Why speakers fail: the five causes
- **Amp Corner** — Cables and connectors: Speakon vs jack
- **Mixer Desk** — Soundcheck in 15 minutes
- **Next product** — 21 PT 2500 SUB, 21-inch subwoofer

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Desi Decibel is the weekly dealer newsletter of Sweton Speakers. Sweton is an Indian loudspeaker brand, established in 1982 and manufactured by Octune Electronics LLP in Kolkata. Power ratings follow the AES2-1984 test standard. Specifications are as shown on swetonspeakers.com on 4 November 2026.