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 Sweton spec sheet ends with a box of letters and numbers: Fs, Qts, Vas, Bl. Most dealers skip it; cabinet makers live by it. This week we read that box in plain words, so you can talk to the cabinet maker as an equal. Our product is the 12 PT 400 LA MB, the 12-inch built for line arrays.

Rahul Agarwal, Sweton Speakers

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Speaker School Lesson 7

Thiele-Small in plain words

Thiele-Small parameters are a handful of measurements that describe how a driver behaves at low frequencies and tell a cabinet maker what box it wants. Sweton measures every one on the Klippel Analyzer. Four do most of the work.

1 Fs resonant frequency, Hz

The note at which the cone bounces on its own suspension, like a weight on a spring. Below Fs the driver gives up quickly. A sub has a low Fs (40–45 Hz); a mid-bass sits higher (55–70 Hz).

> **Tell the customer**
> **Fs tells you what the driver is for: low Fs for subs, higher Fs for mid-bass.**

2 Qts total Q, no units

How strongly the motor and suspension control the cone around Fs. Low Qts (0.2–0.35): strong motor, wants a ported box or horn. Medium (0.35–0.5): a normal ported box. High (above 0.5): a sealed box.

> **Tell the customer**
> **Qts chooses the box type before anyone cuts wood.**

3 Vas equivalent volume, litres

The volume of air as springy as the driver's own suspension. Big Vas: soft suspension, wants a big box. Small Vas: stiff, happy in a small box. Vas grows with cone area, so a 21-inch always has a big Vas.

> **Tell the customer**
> **Vas sets the box size. Fight it and the bass disappears.**

4 Xmax and Bl excursion, mm and motor, T·m

Xmax is how far the coil can move one way and stay in the magnetic field; past it, distortion climbs. Bl is motor strength: how hard the magnet pushes per amp. High Bl means tight control and punch, and a low Qts.

> **Tell the customer**
> **Xmax is how much air it can move; Bl is how fast it can stop.**

Three Sweton drivers, read from the box

18 PT 1500 SUB	Fs 45 · Qts 0.39 · Vas 110 L	Low Fs, big Vas: a sub for a 160–180 L ported box
15 PT 500 MB GOLD	Fs 49 · Qts 0.38 · Vas 127 L	Mid-bass with reach; ported 80–100 L
12 PT 400 LA MB	Fs 66 · Qts 0.41 · Vas 45 L	Higher Fs, small Vas: a compact 45–60 L array module

The full box is on page 3 of every issue. The enclosure guides on swetonspeakers.com turn these numbers into a drawing.

Amp Corner — Amplifiers

Class D vs Class H: what the letters mean

The class letter describes how the output stage handles power. It changes the weight, the heat and the fuel bill, and far less about the sound than people think.

The rule: any class can sound good or bad. Judge an amplifier by rated power at your load, mains draw, weight and protection, and leave the letter to the engineer.

Class AB / H	Class D	What matters
Heavy, warm, proven A linear output stage; Class H adds stepped supply rails to run cooler. Big transformer, 25–40 kg for 2 × 2000 W, about 50–60% efficient. Reliable and easy to repair.	**Light, cool, efficient** The output switches on and off hundreds of thousands of times a second. 85–90% efficient: 2 × 3000 W weighs 8–12 kg and needs a smaller generator. Harder to repair; buy a brand with service.	**Load, draw, protection** Rated power at 8, 4 and 2 Ω; mains current at full output; limiter and protection built in; a quiet fan. A Class D that cannot hold 2 Ω is no bargain.

Example: a rental operator replaces four 30 kg Class H amplifiers with Class D: 90 kg off the truck and half the generator load. The subs do not sound different. The driver's back and the fuel bill do.

Three questions before buying an amplifier

What is the continuous power at the load you will use, not the peak figure on the box?

Does it have a limiter and a high-pass filter per channel? Without them you are also buying a processor.

Who repairs it in your state, and in how many days? No service means a rental you cannot take.

Mixer Desk — Mixers

Compressors: taming the loud singer

A singer whispers one line and shouts the next; the fader cannot follow. A compressor does it automatically: it turns the loud parts down, so the whole voice sits in the mix without clipping the amplifier.

Setting a vocal compressor in four steps

1. Start flat: ratio 3:1, attack 10 ms, release 100 ms, threshold fully up so nothing happens yet.
2. Lower the threshold while the singer sings until the meter shows 3–6 dB of reduction on loud lines and none on quiet ones.
3. Raise the make-up gain by the same 3–6 dB, so quiet lines come up and loud lines stay put.
4. Listen. If the voice pumps, slow the release or lower the ratio. If shouts still clip, go to 4:1.

Where it helps most

Lead vocal
3:1, 3–6 dB; the voice sits still

MC on a wedding mic
4:1, fast attack; stops the shouts

Kick drum
4:1, attack 20 ms; keeps the click, tames the boom

Whole mix
2:1, 1–2 dB; a safety net before the amplifiers

Why it protects the speakers: the shouts are the peaks that push the amplifier into clip. A compressor shaves them first, so the limiter works less, the amplifier stays clean, and the HF driver sees fewer square waves.

Product of the week — Sweton PT Series

12 PT 400 LA MB

Sweton 12-inch line array mid-bass driver with 400 W AES, 97 dB sensitivity and a 3-inch voice coil, for compact array modules.



Sweton 12 PT 400 LA MB, 12-inch line array driver

12 PT 400 LA MB specifications

Nominal diameter	314 mm (12 in)
Impedance	8 Ω
Power handling (AES)	400 W
Program power	800 W
Sensitivity (1 W / 1 m)	97 dB
Frequency range	60–4500 Hz
Voice coil	76.2 mm (3 in), CCAW
Winding	In/out
Former	Glass fibre
Magnet	Ferrite
Gross weight	7.9 kg

Best use and cabinet type

Line array modules, touring PA and installs that need clarity at distance. Sweton's guide: vented 45–60 litres tuned at 55–60 Hz, or sealed 30–35 litres. High-pass at 60–70 Hz, low-pass at 3.2–3.5 kHz, 24 dB per octave; HF driver high-pass at 1.5–1.6 kHz.

Amplifier power needed

400 to 800 W at 8 Ω per driver, or 800 to 1600 W per 4 Ω module, with the high-pass always in.

Keep in mind

- It is a mid-bass, not a sub. Below 60 Hz hand over to the 18s; the high-pass is part of the design.
- Pair with a 1.4-inch compression driver: the CD 240 NEO from Issue 05 fits.

Read it with the four numbers

Power handling

400 W AES, 800 W program on a 3-inch coil. In an array you fly eight or twelve; each does less work than a single 15, so the power suits the job.

Sensitivity

97 dB from 7.9 kg: light enough to fly in numbers, loud enough for two per module to keep up with a 1.4-inch HF driver.

Impedance

8 Ω. Two per module in parallel make 4 Ω: one amplifier channel per module.

Frequency response

60–4500 Hz, Fs 66 Hz, Qts 0.41, Vas 45 L. Read with this week's lesson: the numbers ask for a compact ported box tuned at 55–60 Hz.

Three lines for your counter

1. Built for line arrays: tight tolerances so eight modules sound like one.
2. 97 dB and 7.9 kg: output without the weight on the truss.
3. Recone kit REC12PT400LAMB is available. Made in Kolkata, India by Sweton, since 1982.

Open the enclosure guide | Open the spec sheet

Thiele-Small parameters for cabinet makers

Fs	Qts	Qes	Qms	Vas	Xmax
66 Hz	0.41	0.43	13.5	45.26 L	± 6.0 mm
Bl	**Sd**	**Re**	**Le (1 kHz)**	**Mms**	**EBP**
17.14 T·m	551.55 cm²	5.5 Ω	0.44 mH	54.3 g	153 Hz

Overall diameter 314 mm, bolt circle 296 mm, baffle cut-out 282 mm, depth 137 mm, flange and gasket 15 mm.

Counter Talk

Selling

Cabinet maker

"I don't need your parameters. I have built boxes by ear for twenty years."

How to answer: respect the ear, offer the numbers

1. **Agree, then narrow it.** Twenty years of ear built his name. The numbers save him two prototypes on a driver he has not used before.
2. **Show him one line.** Vas 45 L, Qts 0.41, Fs 66 Hz. Ask what box he would build. If he says 50 litres ported near 58 Hz, he has just read Thiele-Small.
3. **Give him the guide, not a lecture.** Sweton's enclosure PDF has volume, port and crossover on one page. Use it once, and he asks for the driver by name.

A cabinet maker who trusts the numbers builds the same box every time, and his customers hear the same sound every time. That is what he sells.

Myth or truth?

"Higher Xmax always means a better driver."

Myth

Xmax matters only if the job needs it. A sub does; a mid-bass crossed at 60 Hz barely uses 6 mm. On a mid-bass, big Xmax usually means a heavier cone and lower sensitivity.

See the PT Series range on our website

Question of the week

Last week's answer

Over-excursion: clean coil, torn spider, bright ring on the former. First question: was there a high-pass filter on the sub?

Two drivers share the same Fs and Vas, but one has Qts 0.28 and the other 0.55. Which goes in a ported box, and which in a sealed one?

WhatsApp your answer to **70444 11800**

The answer is in the next issue.

Next week

Issue 08

- **Speaker School** — What a line array does, and why it curves
- **Amp Corner** — Amplifier input sensitivity
- **Mixer Desk** — Graphic EQ: 31 bands, 3 rules
- **Next product** — 15 PT 1000 MB, 15-inch mid-bass

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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 18 November 2026.