DESI DECIBEL

SWETON® SPEAKERS Since 1982

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

A note to our partners

A speaker comes back dead and the first word is "defective". Five issues have covered power, impedance, crossovers, cabinets and heat. This week we put them together: the five ways a driver dies, and what the dead driver tells you about which one it was. Our product is the 21 PT 2500 SUB, the largest driver in the PT range.

Rahul Agarwal, Sweton Speakers

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Speaker School — Lesson 6

Why speakers fail: the five causes

A loudspeaker almost never dies of old age. It dies of one of five things, and each leaves its own mark. Read the mark and you know the cause; know the cause and the replacement lives.

1 Heat — the burnt coil

Too much average power for too long: a small amplifier in clip, a limiter switched off, no airflow. The coil turns brown or black, the former may be charred, there is a smell. The cone is usually fine.

> **Tell the customer**
> **A burnt coil is a power problem, never a factory fault.**

2 Over-excursion — the torn cone

Too much low-frequency movement: a ported box with no high-pass, or an amplifier far above program power. The spider or surround is torn, the coil may be bent, and the former shows a bright ring where it hit the back plate.

> **Tell the customer**
> **Below tuning the cone has no brake. The high-pass filter is the brake.**

3 Wrong signal — the clean-looking dead coil

Bass into a compression driver, DC from a faulty amplifier, or a square wave from heavy clipping. The coil fails with little discolouring. Check the crossover and amplifier before fitting the new part.

> **Tell the customer**
> **If the coil looks clean but is open, the amplifier or the crossover did it.**

4 Mechanical — the physical damage

Dropped cabinet, loose magnet, water, dust in the gap, a screwdriver through the cone. Scraping when the cone is pressed by hand means something is in the gap. Rust on the top plate means water.

> **Tell the customer**
> **Push the cone gently with both hands. It should move freely and silently.**

The fifth cause: everything was fine, and then it was not

Ageing suspension	**Years**	Cloth hardens or softens; Fs drifts. A recone restores it
Loose lead wires	**Months**	Tinsel wire breaks from flexing; speaker cuts out. A repair, not a recone
Adhesive failure	**Heat cycles**	Dust cap or surround lifts after hot nights. A coil near its limit

Most returns we open are heat or over-excursion, both preventable with the amplifier and high-pass rules from Issues 1 and 4.

Amp Corner — Amplifiers

Cables and connectors: Speakon vs jack

Not all the amplifier's power reaches the speaker. Thin cable and poor connectors burn some of it on the way.

The rule: a speaker cable should add less than 5% to the load: under 0.4 Ω for an 8 Ω speaker, under 0.1 Ω for a 2 Ω load. Thicker and shorter is always right.

Cable gauge	Speakon	6.35 mm jack
Copper, not CCA 8 Ω up to 15 m: 2.5 mm². 4 Ω or longer runs: 4 mm². 2 Ω loads: 6 mm², kept short. Copper-clad aluminium (CCA) conducts 40% worse: avoid it.	**The professional choice** Locks, carries 30 A per contact, cannot short while plugging, and keeps two circuits apart for bi-amp cabinets.	**The weak link** Rated for a few amps, shorts the output when plugged in live, works loose with vibration. Fine for a guitar; wrong for a sub.

Example: a 2 Ω sub load on 30 m of 1.5 mm² cable adds about 0.7 Ω, a third of the load. The speakers get about 25% less power than the operator thinks. 6 mm² cable recovered more bass than a bigger amplifier would.

Three cable habits

Label every cable with length and gauge. Short, thick cables to the subs; long runs to the tops.

Wire every Speakon the same way (1+ to plus, 1– to minus) and check polarity with a battery: the cone moves out on plus.

Replace any cable with a warm connector, a nicked jacket or a crackling jack. It is the cheapest part of the system.

Mixer Desk — Mixers

Soundcheck in 15 minutes

A soundcheck is not a rehearsal. It is a sequence of checks that leaves every channel at a known level before the first guest arrives. Done in order, it takes fifteen minutes.

The sequence

1. 0–3 min: system. Play a familiar song at moderate level. Walk the room; listen for rattles and missing drivers.
2. 3–8 min: one channel at a time. Set gain by the PFL method from Issue 1, lead vocal first. Faders at zero, EQ flat.
3. 8–12 min: monitors. Ring out the main vocal mic as in Issue 5, then give each performer the mix they ask for.
4. 12–15 min: full song. Balance with the faders only, then mark the positions with tape. That is the night's starting point.

Things that eat the 15 minutes

A dead channel
Swap the cable, then the mic, then the channel

Hum on one input
Ground lift on the DI box; move the mains cable

Sub out of phase
Flip polarity on the sub; bass should get fuller

"More of everything"
More vocal only; everything else comes down

Why mark the faders: levels drift upward through the night as ears tire and the room fills. The tape marks show the drift, and give you a place to come back to when the sound turns harsh.

Product of the week

Sweton PT Series

21 PT 2500 SUB

Sweton 21-inch subwoofer with 2500 W AES power, a 6-inch voice coil and ± 13.75 mm Xmax, for high-output reflex and bandpass cabinets.



Sweton 21 PT 2500 SUB, 21-inch subwoofer driver

21 PT 2500 SUB specifications

Nominal diameter	545 mm (21 in)
Impedance	8 Ω
Power handling (AES)	2500 W
Program power	5000 W
Sensitivity (1 W / 1 m)	95 dB
Frequency range	43–500 Hz
Voice coil	152 mm (6 in), copper
Winding	In/out
Former	Glass fibre
Magnet	Ferrite
Gross weight	50.7 kg

Best use and cabinet type

Large DJ rigs, roadshows and SPL competitions. Sweton's guide gives three designs: a reflex box of 180–220 litres tuned at 38–42 Hz with dual 5–6 inch ports, 8–10 inches long, for PA and DJ work; a 4th-order bandpass (75–90 L ported front, 70–80 L sealed rear) for dance music; a 6th-order bandpass for competitions. Low-pass at 90–120 Hz.

Amplifier power needed

2500 to 5000 W at 8 Ω per driver, with an RMS limiter set for 2500 W and a subsonic high-pass at 35 Hz.

Keep in mind

- It weighs 50.7 kg. A dual-21 cabinet is a four-person lift; design handles and wheels before the box.
- A 21-inch box needs 25 mm plywood and proper bracing, or the panels sing louder than the port.

Read it with the four numbers

Power handling

2500 W AES, 5000 W program, on a 6-inch in/out coil: the largest in the PT range, built for long hot nights.

Sensitivity

95 dB with 1698 cm² of cone: lower sensitivity than a 15, but the cone area and ± 13.75 mm Xmax move far more air at 40 Hz, which is what a sub is for.

Impedance

8 Ω. One driver per channel on a large amplifier is usual; two in parallel make 4 Ω and need a 5000 W-class channel.

Frequency response

43–500 Hz, Fs 43 Hz, Bl 39.29 T·m. A strong motor and a heavy 460 g cone: deep, controlled bass rather than boom.

Three lines for your counter

1. 6-inch coil and ± 13.75 mm Xmax: the cone moves 27.5 mm peak to peak and the coil stays cool doing it.
2. Bl of 39.29 T·m: a motor strong enough to stop the cone as fast as it starts it, which is the difference between punch and boom.
3. Recone kit REC21PT2500SUB 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
43 Hz	0.48	0.49	19.94	119.29 L	± 13.75 mm
Bl	**Sd**	**Re**	**Le (1 kHz)**	**Mms**	**EBP**
39.29 T·m	1698.23 cm²	6.0 Ω	1.82 mH	460.2 g	88 Hz

Overall diameter 545 mm, bolt circle 525 mm, baffle cut-out 497 mm, depth 220 mm, flange and gasket 18.5 mm.

Counter Talk

Selling

Customer

"This sub died after one month. I want a free replacement; it is a manufacturing defect."

How to answer: let the driver speak

1. **Open it together, in front of the customer.** Look at the coil. Black or brown with a smell: heat. Torn spider, bent former: over-excursion. Neither is a factory fault, and the customer sees it with you.
2. **Ask three questions.** What amplifier, at what load? Was there a limiter and a high-pass? Did the clip light glow?
3. **Offer the fix, not just the recone.** The recone kit puts the driver back to work; the limiter and high-pass stop the next one. Sell both.

Sweton rectifies manufacturing defects. A coil burnt by clipped signal is not one, and a dealer who can show the difference at the counter saves the argument and keeps the customer.

Myth or truth?

"A 21-inch sub always goes deeper than an 18-inch."

Myth

Depth is set by Fs and cabinet tuning, not size. The 21 PT 2500 SUB and the 18 PT 1500 SUB are both tuned near 40 Hz. What the 21 adds is cone area and excursion: more output at the same low note.

See the PT Series range on our website

Question of the week

Last week's answer

Thermal compression: hot coils, higher resistance, less power delivered. Fix: more cabinets at lower level, a limiter at AES power, airflow.

A returned 18-inch sub has a clean, light coil, but a torn spider and a bright ring at the bottom of the former. Which cause is it, and what do you ask the customer first?

WhatsApp your answer to **70444 11800**

The answer is in the next issue.

Next week

Issue 07

- **Speaker School** — Thiele-Small in plain words: Fs, Qts, Vas
- **Amp Corner** — Class D vs Class H: what the letters mean
- **Mixer Desk** — Compressors: taming the loud singer
- **Next product** — 12 PT 400 LA, 12-inch line array driver

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think DESI think SWETON SPEAKERS Since 1982

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 11 November 2026.