Audio Recording Gain Staging Optimizer

How to Use

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Herbert Archer

⚠ **Note.** This tool is under active development. Specifications are sourced from manufacturer datasheets, published measurements, and topology-based estimates documented in the companion JSON data files. Use at your own risk. Results are intended as guidance for initially setting gain levels. *Use your own ears to adjust and refine these levels as needed*.

Preface

This project was motivated by a disastrous recording incident. A friend had been asked to do an on-location recording of a full orchestra and chorus performing *The Brahms Requiem* — a major work with huge dynamic range and relatively high peak sound pressure levels. He set up a dozen carefully-chosen microphones, placing them in key locations to capture the orchestra, the chorus, the soloists, and the conductor's comments. He set the gains for what appeared to yield 15 dB of headroom in each channel, and, during the pre-concert run-through, monitored the meters — watching for peaks and meticulously tweaking gain settings as indicated.

During the concert, the board's peak indicator never triggered, and in the loud concert hall where his mixing desk was located, he could not discern distortion in his headphones. Yet when he later started mixing tracks in post-production, he was distressed to discover significant double-digit THD clipping distortion in the chorus tracks. He invited me in to help with triage.

A Claude AI analysis of the distorted tracks pointed to *preamplifier/buffer* saturation. Since the gain control on his board had attenuated the signal *after* that saturating pre-amp, those clipped peaks never registered on the board's metering — not on the VU bars, their peak marks, nor the board's master peak indicator.

Thus was the motivation for the initial version of this tool. Had he calibrated the 45 dB SPL noise floor of the performance space and understood that the effective dynamic range was more limited than expected, he could have reduced gain at key places in his signal chain, thereby trading off a bit of un-needed Signal-to-Noise ratio in the recording signal path for significantly improved Headroom and THD.

The tool now includes pull-down menus for all 40 genres from the SPL reference database, an integrated SPL reference panel covering 140 microphone positions and 90 spot instruments, a venue noise floor slider, pre-optimization advisory calculations for the preamplifier section, a gain pin for intentional transformer saturation targeting, and manual entry panels for microphones and preamplifiers not yet in the database. The pulldown device lists now include 141 microphones, 58 preamps, and 36 A/D converter systems.

Acknowledgments

The author acknowledges the foundational research done over the past 35 years by authors cited in Appendices D1, D2, D3 and D4. I'd also like to acknowledge the assistance of Claude Sonnet 4.6 (Anthropic, 2026) in drafting sections of this manual, vetting the underlying data, coding the optimizer, and preparing the reference material. Claude Sonnet allowed this to come together in a fraction of the time than would otherwise have been the case. The tool is being expanded and matured through direct feedback from users like you.

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1 What the Optimizer Does

The Gain Staging Optimizer is a single-page HTML application that helps you set correct gain levels throughout your recording signal chain before you press Record. Given the acoustic properties of your recording situation, the specifications of your equipment, and your headroom target, it calculates the optimum preamplifier gain, recommends an A/D converter reference level, advises on in-line attenuator settings when needed, and reports estimated signal-to-noise ratio and total harmonic distortion for the complete chain.

Three optimization modes address different recording priorities:

- Maximize SNR sets gain as high as possible within your headroom constraints. It is the correct starting point for classical orchestral, chamber, and acoustic music recording where the noise floor competes with soft passages.
- Minimize THD finds the lowest gain that still achieves your selected THD quality standard while maintaining at least 40 dB of SNR. It is appropriate for scientific recording and any situation where distortion from a transformer or tube stage is the primary concern.
- Genre-balanced negotiates between SNR and THD priorities using genre-specific minimum SNR targets. It is the practical everyday choice for most recording applications.

2 Step-by-Step Workflow

Step 1 — Select your recording genre

The genre dropdown is populated from the SPL reference database and lists all 40 genres. Selecting a genre does three things: it populates contextual SPL hints alongside the Loudest and Quietest fields; it sets the minimum SNR target used by the Genre-balanced optimizer; and it sets the THD good-design target shown in the quality standard selector. When a genre is selected in either the main dropdown or inside the SPL Reference panel, both selectors stay synchronised automatically.

> ⚠ **Note.** If you are using Maximize SNR or Minimize THD mode, genre selection still affects the SPL hints and THD quality standard display, but the genre-specific SNR threshold applies only to the Genre-balanced mode.

Step 1a — Set the THD quality standard

Immediately below the genre dropdown, a three-button selector sets the session-level THD quality standard applied to all three optimization modes.

Standard	Target and intended use
Minimum acceptable	−70 dB (0.03%). For loud sources where distortion is not the primary concern — rock, close-mic drum kit, high-SPL instrument spot mics.
Good design target (default)	Genre-specific. Classical / Choral: −90 dB (0.003%). Jazz / Folk: −80 dB (0.01%). Rock / Drums: −70 dB (0.03%). The sub-label updates automatically when you change genre.
Excellent	−100 dB (0.001%). Reference-grade standard for archival, mastering, and scientific recording.

Step 1b — SPL Reference panel

The collapsible SPL Reference panel appears immediately below the genre section. Click the header to open it. The panel provides data-driven SPL estimates for your recording situation and operates in two modes:

- Ensemble / Main Array mode covers 40 genres and 140 microphone positions (Decca Tree, ORTF, mid-hall audience, AB omni pair, etc.). Select genre and position, then set horizontal distance and height using the sliders. SPL scales with slant distance using the inverse square law.
- Spot / Close Mic mode covers 9 instrument families and 90 instruments and vocal techniques, including DI sources and all classical voice types with passaggio ceiling data.

Both modes show estimated Loudest (fff), Quietest (ppp), dynamic range, and recommended headroom in dB SPL, ready to transfer to the optimizer.

The *→ Send* button populates four optimizer fields simultaneously: Loudest program material, Quietest program material, Venue noise floor (estimated as ppp − 15 dB, clamped to a practical range), and Desired minimum headroom. The SPL panel collapses automatically after the transfer.

After the Send button fires, a *Standard* / *Conservative* headroom selector appears beside the Desired minimum headroom field. *Standard* sends the database's headroom_min value (e.g. 20 dB for orchestral positions) — appropriate when you have run a sound check and have confidence in your levels. *Conservative* sends headroom_max (e.g. 24 dB for orchestral) — appropriate for unattended or untested sessions. The selector persists until you change genre or position in the SPL panel, and clicking either button immediately updates the headroom field without requiring another Send.

> ⚠ **Note.** When ISL-scaled distance moves beyond approximately 8 m in a reverberant hall, or when the slant ratio relative to the reference position exceeds 3× or falls below 0.3× for spot mics, a warning advises that room reflections will reduce the actual SPL change from the displayed estimate.

Step 2 — Enter Performance & Venue values

Field	What to enter
Loudest program material	Highest expected SPL at the mic capsule during the session. For orchestral work: a loud tutti or brass climax at the main pair position. For drums: a snare hit at close distance. Use the SPL Reference panel to derive this value if uncertain.
Quietest program material	Softest passage you need to capture cleanly above the noise floor. For classical: a ppp string passage at the main pair. For folk: soft fingerpicking between verses.
Desired minimum headroom	Margin in dB between your loudest signal and the clipping point at every stage in the chain. Values from the SPL panel range from 8 dB (heavy metal) to 24 dB (orchestral conservative). 20 dB is a reasonable starting point for classical acoustic work; 12 dB for rock or close-mic applications. See the Standard / Conservative selector in Step 1b.
Venue noise floor	Ambient noise at the recording location. Does not affect gain optimization directly but is used to compute Acoustic CDR — the usable dynamic range from clip to the loudest ambient noise source. The SPL panel estimates this as ppp − 15 dB. Adjust manually if you know the actual noise floor.

Step 3 — Select your microphone

Choose your microphone from the grouped dropdown. The spec badge shows sensitivity, self-noise, maximum SPL, polar pattern, and transducer type. The Tonal character box appears below and summarizes the mic's colour, presence character, and source provenance.

For passive dynamics and ribbons the self-noise figure shown in the spec badge is a calculated thermal noise estimate rather than a published A-weighted figure, since manufacturers do not publish EIN specs for passive transducers. The tonal character note and any provenance flags will indicate this.

Step 3a — Custom microphone entry

If your microphone is not listed, click "My microphone is not listed — enter specs manually." Fields required: Manufacturer, Model, Polar pattern, Self-noise (dB-A), Sensitivity (dBV/Pa), and Maximum SPL. Checkboxes for Passive ribbon, Tube, and Dynamic determine the tonal character preview. Custom entries are session-only and logged locally as a device request.

Step 4 — Select your preamplifier

Choose your preamplifier from the grouped dropdown. Selecting *None* routes the microphone signal directly into the A/D converter's built-in mic preamp (where available). The Character box summarizes the preamp's sonic character, topology, noise tier, and gain range suitability.

The pre-optimization advisory appears immediately below the Character box as a pale blue card. It shows estimated gain, pre output level, chain headroom, system SNR, and system THD at the likely operating point — computed before you run any optimization. It updates live whenever you change microphone, preamp, converter, SPL values, or headroom target.

The Pinned gain field (to the right of the preamp selector, visible once a preamp is selected) lets you lock the optimizer to a specific gain value. In SNR mode the pin acts as a ceiling; in THD and Genre-balanced modes it acts as a floor. Leave blank for automatic gain selection.

Step 4a — Custom preamplifier entry

If your preamplifier is not listed, click “My preamplifier is not listed — enter specs manually.” Fields required: Manufacturer, Model, Minimum gain (dB), Maximum gain (dB), EIN (dBu A-weighted), and Maximum output (dBu). Output transformer and Tube checkboxes set the THD model parameters automatically. Custom entries are session-only and logged locally as a device request.

Step 5 — Configure the Shure A15AS attenuator (optional)

The A15AS section sits between the Preamplifier and A/D Converter selectors. Check the box to add it to the signal chain. When enabled, choose position and attenuation:

Position	When to use it
Mic → Pre input	When no external preamp is selected, or when you want attenuation before the preamp to protect the pre input from overload. Phantom passes through with 215Ω simplex resistance in the supply path.
Pre → A/D line input	When an external preamp is selected and you want attenuation after the preamp output. Phantom is fully upstream; the 215Ω note does not apply. This is the position the optimizer selects when auto-applying in Stage 3 recovery.

Attenuation choices: −15, −20, or −25 dB. When the optimizer auto-applies the A15AS in Stage 3 recovery, the checkbox is checked, the controls open, and the position and pad buttons are set to match the chain diagram. Auto-applied pads are labelled “auto” in the chain diagram; user-specified pads are labelled “user” in blue.

Step 6 — Select your A/D converter

Choose your audio interface or standalone converter. The spec badge shows bit depth, noise floor, and whether the device has a built-in mic preamp.

For converters with multiple reference levels (RME devices with −10 dBV, +4 dBu, and LoGain / HiGain settings), the optimizer evaluates all available reference levels simultaneously. In SNR mode it selects the tightest level whose ceiling still clears the signal peak by the headroom margin. In THD and Genre-balanced modes it uses the highest-ceiling reference during the gain sweep. Stage 2 and Stage 3 recovery also iterate over all reference levels.

For converters with a variable line input trim (such as the Mytek AD096 variable mode), the optimizer accounts for the available positive trim in the gain formula. In SNR mode this prevents unnecessarily high preamp gain followed by negative trim compensation that would waste SNR. In THD and Genre-balanced modes the SNR check at each sweep step uses the trim-adjusted signal level.

> ⚠ **Note.** Line-only converters (no built-in mic preamp, such as the Mytek AD096 in fixed-gain mode) require an external preamplifier. Selecting None with a line-only converter will produce an error.

Step 7 — Click an optimization button

Three buttons appear at the bottom of the input area.

Maximize SNR

Sets gain as high as possible within the headroom constraint. This is the correct choice when your primary concern is keeping the noise floor as low as possible — quiet acoustic sources, orchestral main pair, distant room mics, passive ribbons and dynamics that need every dB of gain the preamp can provide.

The optimizer constrains gain by both the preamp output ceiling and the ADC input ceiling simultaneously, using whichever is lower as the binding limit. Full headroom recovery runs automatically: Stage 1 tries gain rebalance, Stage 2 tries a higher ADC reference level, Stage 3 auto-applies the A15AS at the Pre → A/D position. If Stage 3 fires, the breakdown shows an advisory with the SNR cost of the attenuator and what headroom target or mode change would avoid it.

Minimize THD

Sweeps from the lowest possible gain upward, finding the first gain where the THD quality standard is met and system SNR is at least 40 dB. Use this when you are recording a source where distortion quality is the primary concern — solo acoustic instrument close-mics, voice-over, mastering transfers. Because it starts from the lowest gain, it typically produces more headroom than Maximize SNR, at the cost of a lower SNR.

If the selected gain does not meet the headroom target, a warning is issued in the orange banner identifying which stage is the tightest constraint, how far short it falls, and what remedies are available. No automatic recovery runs; the gain choice is preserved as-is.

Genre-balanced (SNR & THD)

Sweeps from the lowest gain upward, finding the first gain where system SNR meets the genre-specific minimum SNR target. This is the most appropriate choice for most everyday recording sessions where you have used the SPL Reference panel to set realistic SPL and headroom values, and where neither pure noise minimization nor pure distortion minimization alone captures the right tradeoff for your material.

For classical orchestral and acoustic genres the genre SNR floor is 75–80 dB — high enough to preserve quiet passages, but without driving gain to the maximum. For rock, pop, and amplified genres it is 50–60 dB, matching the practical noise requirements of those applications. The same headroom warning as Minimize THD fires when the target is not met.

If you are unsure which button to use, Genre-balanced is the recommended starting point. Run all three if you want to compare the tradeoffs explicitly: the result cards for each will show the SNR, headroom, and THD figures side by side once you have run them.

> ⚠ **Note.** The genre SNR floor, headroom target, and THD quality standard are all set from the same genre selection. If you use the SPL Reference panel to populate your values and leave the genre as selected, all three parameters are consistently calibrated to your recording context.

3 Reading the Results

Signal chain visualization

A horizontal chain diagram shows every stage in the signal path: microphone, optional A15AS (mic→pre position), preamplifier with gain setting, optional A15AS (pre→A/D position), and A/D converter with reference level. Auto-applied A15AS stages are highlighted; user-specified stages appear in blue.

System performance cards

Two cards report overall chain performance:

- System SNR — signal-to-noise ratio from the microphone output to the ADC, accounting for all noise sources in quadrature.
- Captured dynamic range — the usable range between the quietest program material (or the noise floor, whichever is louder) and the onset of gain-staging-constrained distortion.

THD design-target warning

When the optimizer cannot meet the THD quality standard target at any gain setting, it fires a design-target warning. The warning distinguishes two cases:

- Device-floor-limited: the preamp or converter's THD floor is worse than the target at all gain settings. No gain adjustment will resolve this.
- Headroom-limited: THD improves at lower gains, but lower gains conflict with the headroom constraint. The A15AS attenuator in the Pre → A/D position can resolve this by allowing a lower pre gain while restoring the signal level at the converter input.

Headroom recovery

If the initial optimization cannot meet the headroom target, three recovery stages run in sequence:

Stage	Action
Stage 1 — Gain rebalance	Reduces preamplifier gain to its minimum and checks whether the signal can still clear the ADC ceiling with adequate headroom.
Stage 2 — Reference level upgrade	Switches to a higher ADC reference level (where available) to provide a larger input ceiling.
Stage 3 — A15AS attenuator (auto)	Inserts the A15AS between the preamp and the ADC. Tries all three pad values (−15, −20, −25 dB) and all available ADC reference levels, selecting the combination that satisfies both the preamp headroom and ADC headroom targets simultaneously. If a gain pin is active, Stage 3 respects the pin as a floor when computing the gain the chain can carry at each pad value.

4 Exporting Results

The "Copy CSV to clipboard" button below the results writes a formatted table to the clipboard. The table covers every row in the results panel: gain setting, output level, headroom at each stage, noise floor, SNR, THD by stage, and the complete chain diagram. Paste directly into a spreadsheet for session documentation.

5 Signal Chain Math Reference

Microphone output level

Converts acoustic SPL at the capsule to an electrical level in dBu:

$$\texttt{Mic output (dBu) = sensitivity (dBV/Pa) + (SPL - 94) + 2.21}$$

94 dB SPL is the IEC reference pressure (1 Pa). 2.21 dB converts dBV to dBu (0 dBu = 0.7746 V^{RM}_{s}; 0 dBV = 1 V^{RM}_{s}). For passive ribbons and dynamics the self-noise figure is computed by substituting the manufacturer's equivalent SPL noise figure into this formula, since A-weighted EIN is not published for passive transducers.

Slant distance and inverse square law (ISL)

The SPL Reference panel scales estimated SPL from a database reference position to the user's actual position using slant distance to account for both horizontal distance and height:

$$\texttt{d\_slant} = \sqrt{(\texttt{horiz}^2 + \texttt{height}^2)}$$

$$\texttt{SPL\_actual = SPL\_ref + } 20\times\log_{10}\texttt{(d\_ref\_slant / d\_actual\_slant)}$$

Both the reference position (d_ref_slant, from the database) and the actual position (d_actual_slant, from the user's sliders) use the same geometry. The ISL approximation is valid in free-field conditions up to moderate distances; a warning fires when the slant ratio exceeds 3× or falls below 0.3×.

Effect of A15AS attenuation

$$\texttt{Effective mic output = mic output - pad} \quad \texttt{[mic}\rightarrow\texttt{pre position]}$$

$$\texttt{Effective pre output = pre output - pad} \quad \texttt{[pre}\rightarrow\texttt{A/D position]}$$

The pad reduces both signal and noise at the insertion point. In the pre→A/D position the noise from the mic and preamp is already combined; the pad attenuates the combined signal by the full pad value before the ADC.

Combined noise floor (power sum)

All noise sources are combined as uncorrelated power sums (quadrature), referenced to the ADC input. For the external-preamp path:

$$\texttt{N\_mic = mic\_sensitivity + (self\_noise\_dBSPL - 94) + 2.21 + gain}$$

$$\texttt{N\_pre = EIN + gain}$$

$$\texttt{N\_combined\_pre} = 10\times\log_{10}\texttt{(10\^{}(N\_pre/10) + 10\^{}(N\_mic/10))}$$

$$\texttt{N\_ADC = adcNoise\_dBFS + adcMaxIn\_ref\_dBu}$$

$$\texttt{N\_total} = 10\times\log_{10}\texttt{(10\^{}(N\_combined\_pre/10) + 10\^{}(N\_ADC/10))}$$

For the no-external-preamp path (built-in mic pre), the preamp EIN term is replaced by the converter's own mic preamp noise, and N_ADC uses the same converter's ADC noise floor. The effective input ceiling for gain selection is maxInputAt0dBGain (the published maximum mic input level at 0 dB gain) rather than the ADC reference level ceiling, since these are distinct specifications on devices such as the RME Fireface series.

Signal-to-noise ratio

$$\texttt{SNR = signal\_peak\_at\_ADC - N\_total}$$

signal_peak_at_ADC is the mic output at the loudest program SPL, boosted by preamp gain, and reduced by any A15AS pad in the signal path. N_total is the combined noise floor as computed above.

Captured dynamic range and headroom

CDR and SNR are related by an exact algebraic identity:

```
CDR = adcMaxIn_ref − N_total
HR  = adcMaxIn_ref − signal_peak_at_ADC
CDR = SNR + HR
```

Every decibel added to the headroom target comes directly out of SNR. This is the fundamental tradeoff the optimizer navigates. Acoustic CDR is a separate figure computed using the louder of the electronic noise floor or the ambient noise floor (venue noise or mic self-noise) as the lower bound, rather than the electronic noise floor alone.

SNR mode gain formula

For the external-preamp path without A15AS in the line chain, the optimizer selects gain to place the signal at the ADC input ceiling minus headroom, constrained by whichever ceiling is lower:

```
effective_ceiling = min(pre.maxOut, adcMaxIn_ref)
idealGain = (effective_ceiling − headroom) − mic_output_at_loudest_SPL
```

Using the lower of the two ceilings prevents the optimizer from computing a gain that satisfies the preamp headroom constraint while violating the ADC headroom constraint — which would otherwise trigger unnecessary A15AS recovery. For devices with a variable line trim, the adcMaxIn_ref term is further adjusted by the available positive trim before computing idealGain.

For the no-external-preamp / fixed-topology path, the same principle applies using maxInputAt0dBGain as the effective ceiling (not the ADC reference level ceiling, which is a separate spec):

```
idealGain = (maxInputAt0dBGain − headroom) − mic_output_at_loudest_SPL
```

THD model

Each stage's THD is modelled as a linear slope anchored at the published thdFloor, referenced to a 20 dB headroom operating point:

External-preamp path (stageTHD — headroom-referenced):

Each external preamp and ADC stage uses a headroom-referenced slope. THD rises as signal approaches the stage ceiling:

```
stage_THD = max( thdFloor,  thdFloor + slope × (20 − headroom_at_stage) )
```

thdSlope is 2.5 for transformer-coupled stages (steeper rise near clip) and 2.0 for transformerless. System THD+N is the RSS combination of all stage figures:

```
system_THD = 10×log10( Σ 10^(stage_THD_i / 10) )
```

No-external-preamp path (micPreTHDplusN — gain-referenced, decomposed):

For the built-in mic pre, the model decomposes THD+N into two terms based on direct RME UCX measurement data:

```
THD_harm (dBr)  = max( thdFloor,  thdFloor + thdSlope × (gain / 30) )
noise_out (dBu) = adcNoise + padPenalty + gain
THD+N (dBr)     = 10×log10( 10^(signal+THD_harm)/10 + 10^(noise_out)/10 ) − signal
```

At low gain the harmonic term dominates; at high gain the amplified noise floor dominates and harmonic content becomes secondary. When the noise term exceeds the harmonic term by more than 1 dB the result card flags "noise-limited regime" and the warning panel names the device and shows both terms in dBr.

Pad noise penalty: when a Shure A15AS is inserted in the mic→pre/A⁄D position in the no-pre path, +3 dB is added to effective adcNoise in both the noise floor calculation and the THD+N model. This is a conservative proxy for the pad's insertion noise contribution.

Both models are directional approximations. Real THD curves are non-linear and device-specific. The models correctly identify which gain settings produce materially higher distortion, but absolute figures should not be taken as precision measurements.

Headroom constraint and recovery (SNR mode)

After the ideal gain is computed, the optimizer checks whether both the preamp output headroom and ADC input headroom meet the target (within a 0.5 dB tolerance). If not, three sequential recovery stages run:

Stage	Action
Stage 1 — Gain rebalance	Reduces preamp gain to its minimum and checks whether the signal can still clear both headroom constraints. Tries all available ADC reference levels.
Stage 2 — Reference level upgrade	Switches to a higher ADC reference level (where available) to provide a larger input ceiling.
Stage 3 — A15AS attenuator (auto)	Inserts the A15AS at Pre → A/D. Tries all three pad values (−15, −20, −25 dB) and all ADC reference levels, selecting the combination that satisfies both constraints simultaneously. If a gain pin is active, Stage 3 uses it as a floor. When Stage 3 fires, the result breakdown shows the SNR cost of the attenuator and what gain or headroom target would avoid it.

THD and Genre-balanced modes do not run recovery stages. If the selected gain produces insufficient headroom, a warning identifies the tightest stage, the shortfall in dB, and three suggested remedies: reduce the headroom target, switch to Maximize SNR mode, or add the A15AS manually.

6 Genre Balance Optimizer — Minimum SNR Targets and THD Standards

Genre	Minimum SNR (dB) | THD good-design target
Classical Orchestral / Choral	80 dB | −90 dB (0.003%)
Chamber Music, String Quartet, Piano Recital, Choral (all sizes)	75 dB | −90 dB
Pipe Organ (all variants)	75 dB | −90 dB
Scientific / Natural Phenomena — Quiet	75 dB | −90 dB
Jazz, Big Band, Klezmer, Gospel	65 dB | −80 dB (0.01%)
Folk, Bluegrass, Celtic, Flamenco, World, Country, Tejano, Zydeco, Indie	70 dB | −80 dB
Brass / Woodwind Band	65 dB | −80 dB
Rock, Blues, Pop, Hip-hop, Reggae, Heavy Metal, Electronic / EDM	55 dB | −70 dB (0.03%)
Drum Kit (close-mic studio)	50 dB | −70 dB
Scientific / Natural Phenomena — Impulsive / Loud	40 dB | −70 dB

7 Data Files and Maintenance

File layout

File	Purpose
gain_staging_optimizer_v22.html	The optimizer application. Contains all calculation logic and UI. Embeds full device data as fallback constants (FALLBACK_MICS, FALLBACK_PREAMPS, FALLBACK_ADS, FALLBACK_SPL).
data/microphones_V19.json	Microphone specifications organized by manufacturer → model. Contains the tone sub-structure described in Appendix A.
data/preamps_V22.json	Preamplifier specifications organized by manufacturer → model. Contains the character sub-structure described in Appendix B.
data/ad_converters_V22.json	A/D converter specifications organized by manufacturer → model.
data/performance_spl_reference_v3_2.json	SPL reference data: 40 ensemble genres, 140 mic positions, 90 spot instruments. Embedded as FALLBACK_SPL (102 KB) and fetched externally when online.

Online vs. offline behavior

When the tool is served from GitHub Pages, the HTML fetches all four JSON files on startup. The device and SPL dropdowns are populated from the fetched data and the status badge shows green: “Device data loaded from external JSON files.”

When the HTML is opened directly from a local hard drive (file:// protocol), the browser blocks cross-origin fetch requests. The tool falls back to the device data and SPL reference data embedded inside the HTML, and the status badge shows amber: “Using embedded device data (offline mode).” The tool is fully functional in both cases.

> ⚠ **Note.** The JSON files and the FALLBACK_* constants inside the HTML are separate copies of the same data. They are kept in sync manually. If you add a device to the JSON files but do not update the embedded fallback in the HTML, the new device will work online but not offline.

JSON file structure and entry formats

The core JSON structure is as established in V16–V17; schema additions since then are additive.

V19 added provenanceFlags and fieldConfidence to all entries.

V20 adds the following new fields.

Preamplifiers:

inputTransformer, outputTransformer (replace the ambiguous transformer boolean, which is retained for backward compatibility); inputImpedance (ohms); inputImpedanceSwitchable; maxInputLevel (dBu, derived as maxOut − gainMin for amplifying stages); dominantHarmonic (H2 / H3 / H2+H3 / null, derived from harmonicProfile). fieldConfidence coverage completed to 64/64 preamp entries. V21 changes: SCA entries renamed to ‘[Module] (SCA/PC01 Chassis, factory tested)’ pattern; kit-build flag removed from factory-tested units. potType field added to all 64 entries (fader / trim / null). fieldConfidence W code eliminated from both databases —

former W entries recoded to D; non-standard-measurement provenanceFlag carries the explanatory burden. padFlag on all 64 preamp entries. V22 introduces two pad types: type: input (PC01-N72 and PC01-J99 990C+ — relay pad pre-gain-stage, raises input ceiling, THD unchanged, phantom unaffected); type: output (Millennia HV-32P — post-gain pad, attenuates output only, does not raise input ceiling, confirmed by SOS bench measurement); null: all other entries.

A/D converters:

padFlag (null / hardware / external — see Step 6); thdFloorLinePath (line ADC path THD, separate from mic pre path; populated on 20 of 48 entries). V22 adds 3 new RME integrated mic-pre/converter entries: Micstasy (8-ch, PGA2500, gain 0–75 dB, three ADC reference levels +13/+21/+30 dBu), OctaMic XTC (8-ch, PGA2500, gain 0–65 dB, hardware PAD on channels 1–4), and OctaMic II (8-ch, THAT 1510, gain 6–60 dB, three switchable reference levels). All three carry adcNoise D-grade (snr-derived). These devices belong in the AD converter database rather than the preamp database because the integrated ADC is inseparable from the gain chain for optimizer calculations.

The performance_spl_reference_v3_2.json file uses schema version 3.2. Its structure is described in Section D.1 (primary bibliography), Section D.2 (ensemble genre sources), and Section D.3 (spot instrument sources) of Appendix D.

Provenance codes

Code	Meaning
P	Published, test conditions stated. Value from primary manufacturer documentation where measurement conditions are explicitly specified. Carries NONE flag tier — no optimizer indicator.
Pm	Published, no test conditions stated. Value from primary manufacturer documentation but measurement conditions are not described. Carries INFORM flag tier.
D	Derived. Value derived from an authoritative source by calculation or topology inference (e.g. dynamic range converted to noise figure). Carries INFORM flag tier.
W	Real but systematically misleading. The stored figure is genuine but deviates from the standard measurement condition (e.g. EIN at 50Ω rather than 150Ω). Optimizer fires a Caution indicator unconditionally when this field is exercised. See Appendix D.4 for W-coded entries.
E	Estimated. Value derived from topology class, comparable designs, or engineering principles when no published figure is available. Carries WARN flag tier.

8 Limitations and Open Questions

- The THD model (stageTHD) uses a linear slope approximation anchored at the published thdFloor. Real THD curves are non-linear and device-specific. The model provides directional guidance, not precision prediction.
- The SPL reference data for amplified genres (rock, metal, EDM, hip-hop) is rated E (extrapolated) because published measurement data for these genres at specific mic positions is limited. Conservative headroom values are used.
- Noise figures are modelled at a single operating point. Devices with gain-dependent noise (some variable-topology A/D converters) are approximated at maximum gain.
- The ADC noise model uses a single adcNoise figure independent of reference level. Some converters have meaningfully different noise floors at different reference levels; the current model does not capture this.

- Microphone self-noise and sensitivity values are taken from manufacturer datasheets at standard conditions (48V phantom, nominal load impedance). Measured deviations at non-standard conditions are not modelled.
- The tonal character data (Appendix A) and preamp character data (Appendix B) are analytical assessments synthesized from published descriptions. They are not independent acoustic measurements.

9 Version History

Version	Key changes
v22 12 May 2026	AD converter database expanded to 48 entries: three new RME integrated mic-pre/converter units added (Micstasy 8-ch, OctaMic XTC 8-ch, OctaMic II 8-ch). These are classified in the AD converter database, not the preamp database, because the integrated ADC is inseparable from the gain chain for optimizer calculations. Preamp padFlag schema: type field now distinguishes input pads (PC01 chassis — relay pad pre-gain-stage, genuinely raises input ceiling) from output pads (Millennia HV-32P — post-gain pad confirmed by SOS bench review, does not raise input ceiling). maxInputLevelWithPad removed from HV-32P. PC01 padFlag.phantomNote added confirming phantom delivery unaffected. Optimizer preamp input overload branch updated: matches type: input and type: hardware; the type: output pad is not offered as a solution to input overload. Beta label removed from header. Total: 48 AD converters + 64 preamplifiers + 141 microphones = 253 devices.
v21 05 May 2026	Databases: preamps expanded to 64 entries; SCA entries renamed to ‘factory tested’ pattern, kit-build flag removed. potType field added to all preamp entries (fader/trim/null). W fieldConfidence code eliminated from both databases (recoded to D; non-standard-measurement flag retains explanatory role). AD converters expanded to 45 entries (+9 new RME: ADI-2 FS, ADI-2 Pro FS R Black Edition, ADI-2/4 Pro SE, Digiface AES, Fireface 802 FS, M-32 AD Pro II, M-32 AD / M-16 AD, M-1620 Pro, MADIface XT II; adcNoise D-grade from published SNR except Digiface AES P-grade). thdFloorLinePath populated on 20 of 45 entries. SPL reference: Choral / Chamber Orchestra (50-voice choir) genre added (41 genres total). adcMaxIn_ref null fallback corrected to use maxInputAt0dBGain. Optimizer: potType mapped in convertPreEntry.
v20 14 April 2026	Preamp database expanded to 61 entries (32 brands): two new SCA PC01 chassis entries (PC01-N72, PC01-J99 990C+); five SCA modules upgraded to P-grade EIN, thdFloor, thdSlope, and dominantHarmonic from direct Akitika/UFX measurements (April 2026). N72 dominantHarmonic corrected H2→H3. A12 thdSlope 0.0 (DOA topology, flat THD). J99 (990C+) thdFloor −85→−107 dBr. padFlag added to all 61 preamp entries (hardware: PC01 units, passive 20 dB pre-gain pad). Five new preamp schema fields: inputTransformer / outputTransformer; inputImpedance; inputImpedanceSwitchable; maxInputLevel; dominantHarmonic. fieldConfidence completed 59→61. Red 1 maxInputLevel corrected to +26 dBu (negative gainMin is a passive pad step). AD converter database: padFlag and thdFloorLinePath on all 36 entries. UCX Original: thdFloor −90 dBr P-grade (direct measurement); thdFloorLinePath −105 dBr Pm-grade. Decomposed THD+N model (no-pre path): harmonic term gain-referenced (thdFloor + thdSlope×gain/30), noise term input-referred (adcNoise + gain), combined in quadrature; noise-limited regime flag. Preamp input overload padFlag-aware (hardware PAD message and transformer saturation annotation). THD warning corrected to ≥ threshold. Standard/Conservative headroom toggle. Sound check procedure notes.
v19 07 April 2026	Database expanded to 141 microphones (34 brands, +38 entries including Beyerdynamic, Warm Audio, Lewitt, SE Electronics, Heil Sound, Aston), 58 preamplifiers (31 brands, +19 entries), 36 A/D converters (15 brands, +12 entries). provenanceFlags and fieldConfidence schema added to all entries. Standard/Conservative headroom toggle. A15AS SNR cost annotation in result breakdown. Headroom warnings extended to THD and Genre-balanced modes. SNR mode gain formula corrected for no-external-preamp

	path (uses maxInputAt0dBGain). Appendix D.4 rebuilt as table format from live JSON. Provenance code scheme updated to P/Pm/D/W/E.
v18.1 30 March 2026	Bug fixes to preamp gain selection for converters with variable line input trim (e.g. Mytek AD096 variable pot). SNR mode: gain formula now constrains by both preamp output headroom AND ADC ceiling minus available positive trim, preventing unnecessarily high preamp gain followed by negative trim compensation that wastes SNR. Genre-balanced and THD modes: SNR check in the gain sweep now uses trim-adjusted signal at the ADC input, allowing lower gains to satisfy the SNR floor. Custom A/D converter manual entry panel added (same paradigm as microphone and preamplifier panels). iMaxIn reference-before-initialization error corrected.
v18 29 March 2026	SPL Reference panel (40 genres, 140 positions, 90 instruments). Genre dropdown sourced from SPL reference database. Venue noise floor slider. Send button populates four fields simultaneously. Pre-optimization advisory. Gain pin. Custom microphone and preamplifier entry panels. A15AS auto-apply UI sync. Stage 3 recovery respects gain pin.
v17 23 March 2026	THD quality standard selector (Minimum / Good / Excellent). THD design-target warning distinguishes device-floor-limited from headroom-limited shortfalls. Microphone tonal character box. Preamp character box. Mytek AD096 split into two entries. _meta version block in all JSON files. THD floor clamp. Spec verification pass.
v16.1 22 March 2026	Tonal character box below mic dropdown; character notes box below preamp dropdown. THD model floor clamp. Mytek AD096 split.
v16 21 March 2026	Device data moved to three external JSON files. Grouped dropdowns. Expanded to 103 microphones, 39 preamplifiers, 21 A/D converters. Embedded offline fallback.
v15.1 20 March 2026	A15AS two positions (mic→pre and pre→A/D). Phantom simplex-resistance warning.
v15 20 March 2026	Expanded microphone list. A15AS explicit user section.
v14 20 March 2026	CDR formula corrected. CSV export. Inline SPL hints. 11 A/D devices.
v1–v13 20 March 2026	Initial development. See repository commit log.

10 Links and Resources

- GitHub repository (private): https://github.com/HerbArcher3/gain-staging-optimizer
- GitHub Pages (live tool): https://HerbArcher3.github.io/gain-staging-optimizer/gain_staging_optimizer_v22.html
- AES preprint library: https://www.aes.org/e-lib/
- EBU Technical Recommendations: https://tech.ebu.ch/publications/tech3285
- RME product specifications: https://www.rme-audio.de
- Earthworks Audio specifications: https://www.earthworksaudio.com

Appendix A — Understanding Microphone Tonal Character

(Unchanged from V17. The tone data structure, field definitions, color/transparent classification, presence_boost, and provenance source codes are all as documented in the V17 edition of this guide.)

The four dimensions of microphone tonal character (color, transparent, presence_boost / presence_region, and source provenance) and the quick-reference table are retained without change in the V18 data files. Custom microphone entries (Step 3a) derive a simplified tonal character description from the transducer type, self-noise level, and polar pattern. This derived description is intentionally less detailed than database entries and does not use the color/transparent/presence_boost classification scheme.

Appendix B — Understanding Preamp Character

(Unchanged from V17. The character data structure, colorIndex, transparencyIndex, harmonicProfile, tags, and characterNotes fields are all as documented in the V17 edition of this guide.)

Custom preamplifier entries (Step 4c) derive a simplified character description from topology (transformer / tube checkboxes), EIN level, gain range, and maximum output. This derived description covers the four topics listed in Step 4c above. It does not use the colorIndex / transparencyIndex / harmonicProfile classification scheme and is intentionally less detailed than database entries.

Appendix C — A/D Converter Data Notes

(Unchanged from V17. Coverage, topology distinction, Mytek AD096 jumper configurations, and THD source notes are all as documented in the V17 edition of this guide.)

V22 expands the A/D converter database to 48 entries, adding Micstasy (8-ch), OctaMic XTC (8-ch), and OctaMic II (8-ch) — all integrated RME mic-pre/converter units classified in the AD converter database because the ADC is inseparable from the gain chain. The preamp padFlag schema now uses typed pads: type: input (PC01 chassis — pre-gain-stage relay pad, raises input ceiling) and type: output (Millennia HV-32P — post-gain pad, attenuates output only). The HV-32P maxInputLevelWithPad field has been removed; the +12 dBu input ceiling is unchanged regardless of pad state. Multi-reference-level devices are evaluated across all available reference levels as described in Step 6.

Appendix D — Reference Material

The following works are cited as sources or cross-references in the optimizer's four data files: microphones_V19.json, preamps_V22.json, ad_converters_V22.json, and performance_spl_reference_v3_2.json. Entries citing only the device manufacturer's own primary documentation (datasheets, product pages) are excluded; those appear verbatim in each data file's provenance field. This list covers independent measurement studies, standards documents, published acoustic references, third-party reviews, and dealer listings used as secondary cross-references.

D.1 SPL Reference Primary Bibliography

The following 24 works form the primary basis for the performance_spl_reference_v3_2.json data. They underpin SPL values for all 40 ensemble genres, 140 microphone positions, and 90 spot instrument entries.

[01] EBU R68 -- Alignment level in digital audio production

[02] EBU R128 -- Loudness normalisation and permitted maximum level

[03] AES-1id-2006 -- AES information document for digital audio:

[04] Katz, B. -- Mastering Audio: The Art and the Science (Focal

[05] Skritek, P. -- Handbuch der Tonstudiotechnik (1989)

[06] Dickreiter, M. -- Handbuch der Tonstudiotechnik, 7th ed. (De

[07] Streicher, R. & Everest, F.A. -- The New Stereo Soundbook, 3rd

[08] Woszczyk, W. -- Microphone techniques for orchestral recording

[09] Bech, S. & Zacharov, N. -- Perceptual Audio Evaluation (Wiley,

[10] Wittek, H. -- Perceptual differences between wavefield

[11] Rossing, T.D. & Moore, F.R. -- The Science of Sound, 3rd ed.

[12] Neumann GmbH application notes -- microphone placement and

[13] Schoeps GmbH application notes -- ORTF, MS, Jecklin disk

[14] IEC 60268-1 -- Sound system equipment: general

[15] WHO Environmental Noise Guidelines for the European Region

[16] European Commission SCENIHR -- Potential health risks of

[17] NIOSH -- Criteria for a Recommended Standard: Occupational

[18] Berger, E.H. et al. -- The Noise Manual, 5th ed. (AIHA, 2000):

[19] Strong, W.J. & Plitnik, G.R. -- Music Speech Audio (Soundprint,

[20] Organ Historical Society -- documented specifications and SPL

[21] ISO 1996-1:2016 -- Acoustics: description, measurement and

[22] Sundberg, J. -- The Science of the Singing Voice (Northern

[23] Titze, I.R. -- Principles of Voice Production (Prentice Hall,

[24] Howard, D.M. & Angus, J. -- Acoustics and Psychoacoustics, 4th

D.2 SPL Reference: Ensemble Genre Sources

Per-genre citations for the 40 ensemble genres in the SPL reference database. Provenance codes: M = Grounded in published measurement studies; P = Consistent with published engineering references; E = Derived from first principles.

Symphony orchestra [Measured]

- Woszczyk (AES) -- direct SPL measurements at array positions in major concert halls
- Wittek (2007) -- orchestral SPL data at ORTF and Decca positions
- Dickreiter (2008) -- documented orchestral recording practice
- Neumann GmbH application notes

Orchestral / Choral (grand combined forces) [Referenced]

- Dickreiter (2008) -- combined orchestral/choral recording levels
- Woszczyk (AES) -- orchestral SPL basis; choral contribution estimated from large choral measurement data
- EBU R68 -- choral/orchestral programme is a primary reference type

Opera [Measured]

- Dickreiter (2008)

- Neumann GmbH application notes
- EBU R68

Chamber music [Measured]

- Streicher & Everest (2006)
- Schoeps GmbH application notes
- Dickreiter (2008)

String quartet [Referenced]

- Streicher & Everest (2006)
- Schoeps GmbH application notes

Piano recital [Measured]

- Woszczyk (AES)
- Dickreiter (2008)
- Neumann GmbH application notes

Choral (large) [Measured]

- Dickreiter (2008)
- EBU R68
- Streicher & Everest (2006)

Choral (medium) [Referenced]

- Dickreiter (2008)
- Streicher & Everest (2006)

Choral (small) [Referenced]

- Streicher & Everest (2006)
- Schoeps GmbH application notes

Brass / Woodwind Band (concert band, wind ensemble) [Referenced]

- Rossing, Moore -- The Science of Sound: brass and woodwind instrument SPL data
- Dickreiter (2008) -- wind ensemble recording levels
- Berger et al. -- The Noise Manual (2000): concert band SPL measurements

Pipe Organ -- Portable / Portatif [Referenced]

- Organ Historical Society -- documented specifications
- Strong & Plitnik -- Music Speech Audio (1992): small organ SPL references
- Extrapolated from single-pipe and small organ measurement data

Pipe Organ -- Chamber [Referenced]

- Organ Historical Society -- documented specifications
- Streicher & Everest (2006) -- small organ recording guidance
- Strong & Plitnik (1992)

Pipe Organ -- Chapel [Referenced]

- Organ Historical Society -- documented specifications
- Dickreiter (2008) -- organ recording levels
- Strong & Plitnik (1992)

Pipe Organ -- Church [Referenced]

- Organ Historical Society -- documented specifications and installation measurements
- Dickreiter (2008) -- church organ recording
- Strong & Plitnik (1992)
- ISO 1996-1:2016 -- organ SPL measurement data cited in environmental noise assessments

Pipe Organ -- Theatre [Referenced]

- Organ Historical Society -- theatre organ documentation
- Strong & Plitnik (1992): high-pressure pipe SPL data
- American Theatre Organ Society technical documentation

Pipe Organ -- Cathedral [Referenced]

- Organ Historical Society -- cathedral organ documentation and specification databases
- ISO 1996-1:2016 -- large organ cited in environmental noise studies
- Strong & Plitnik (1992)
- Dickreiter (2008) -- cathedral recording notes

Drum Kit -- Close-mic'd [Referenced]

- Rossing, Moore -- The Science of Sound: drum and cymbal SPL data
- Berger et al. -- The Noise Manual (2000): drum kit SPL at musician and nearby positions
- NIOSH HHE reports -- drum kit peak SPL measurements

Scientific / Natural Phenomena -- Quiet Sources [Referenced]

- ISO 1996-1:2016 -- environmental noise measurement methodology
- Bruel & Kj?r -- Microphone Handbook (2012): calibrated measurement mic noise floors and SPL ranges
- Pijanowski et al. -- Soundscape Ecology (BioScience, 2011): natural soundscape SPL measurement data
- Passive acoustic monitoring literature: bat, insect, and avian bioacoustic recording practice

Scientific / Natural Phenomena -- Impulse or Loud Sources [Referenced]

- ISO 1996-1:2016 -- impulsive noise measurement methodology
- Bruel & Kj?r -- Microphone Handbook (2012): high-SPL capsule ratings
- NIOSH -- Occupational noise criteria for impulsive sources
- NASA technical reports -- rocket and jet engine acoustic measurement data
- NOAA -- lightning and thunder acoustic measurement literature

Big Band / Swing [Referenced]

- Streicher & Everest (2006)
- Rossing, Moore -- The Science of Sound

Jazz (small combo) [Referenced]

- Streicher & Everest (2006)
- Katz (2002)
- Rossing, Moore -- The Science of Sound

Blues [Extrapolated]

- Rossing, Moore -- The Science of Sound

Folk (acoustic) [Extrapolated]

- Streicher & Everest (2006)
- Rossing, Moore -- The Science of Sound

Bluegrass [Extrapolated]

- Rossing, Moore -- The Science of Sound

Klezmer [Extrapolated]

- Rossing, Moore -- The Science of Sound

Celtic trad. [Extrapolated]

- Rossing, Moore -- The Science of Sound

Flamenco [Extrapolated]

- Rossing, Moore -- The Science of Sound

Gospel [Extrapolated]

- Rossing, Moore -- The Science of Sound

Brass band [Referenced]

- Rossing, Moore -- The Science of Sound
- Dickreiter (2008)

World / Ethnic [Extrapolated]

- Rossing, Moore -- The Science of Sound

Country [Extrapolated]

- Rossing, Moore -- The Science of Sound

Tejano / Norte?o [Extrapolated]

- Rossing, Moore -- The Science of Sound

Zydeco / Cajun [Extrapolated]

- Rossing, Moore -- The Science of Sound

Indie / Alternative [Extrapolated]

- Rossing, Moore -- The Science of Sound

Pop / R&B [Extrapolated]

- Rossing, Moore -- The Science of Sound

Hip-hop / Rap [Extrapolated]

- Rossing, Moore -- The Science of Sound

Reggae / Dancehall [Extrapolated]

- Rossing, Moore -- The Science of Sound

Rock [Referenced]

- Rossing, Moore -- The Science of Sound
- WHO (2018)
- NIOSH HHE reports

Heavy metal [Referenced]

- Rossing, Moore -- The Science of Sound
- WHO (2018)
- NIOSH HHE reports

Electronic / EDM [Referenced]

- WHO (2018)
- European Commission SCENIHR (2008)

D.3 SPL Reference: Spot Microphone / Instrument Sources

Sources cited for instrument families and individual instruments in the spot microphone reference.

Strings [Referenced]

- Rossing, Moore -- The Science of Sound: string instrument SPL data
- Berger et al. -- The Noise Manual (2000)
- Strong & Plitnik (1992)

Woodwinds [Referenced]

- Rossing, Moore -- The Science of Sound
- Berger et al. -- The Noise Manual (2000)
- Strong & Plitnik (1992)

Brass [Referenced]

- Rossing, Moore -- The Science of Sound
- Berger et al. -- The Noise Manual (2000)
- Strong & Plitnik (1992)
- NIOSH HHE reports -- brass instrument SPL data

Percussion -- pitched [Referenced]

- Rossing, Moore -- The Science of Sound
- Strong & Plitnik (1992)
- Berger et al. -- The Noise Manual (2000)

Percussion -- orchestral unpitched [Referenced]

- Rossing, Moore -- The Science of Sound
- Berger et al. -- The Noise Manual (2000)
- NIOSH HHE reports

Percussion -- drum kit [Referenced]

- Rossing, Moore -- The Science of Sound
- Berger et al. -- The Noise Manual (2000)
- NIOSH HHE reports -- drum kit SPL measurements
- Strong & Plitnik (1992)

Keyboard [Referenced]

- Rossing, Moore -- The Science of Sound
- Dickreiter (2008)
- Neumann GmbH application notes for piano

Voice [Referenced]

- Sundberg, J. -- The Science of the Singing Voice (Northern Illinois University Press, 1987): passaggio SPL data, singer's formant, register transition physiology
- Rossing, Moore -- The Science of Sound: vocal SPL ranges by voice type
- Strong & Plitnik (1992): vocal SPL and register data
- Berger et al. -- The Noise Manual (2000): vocalist SPL at microphone positions
- Titze, I.R. -- Principles of Voice Production (Prentice Hall, 1994): register transition and SPL physiology
- Howard, D.M. & Angus, J. -- Acoustics and Psychoacoustics (Focal Press, 2009): vocal production technique and SPL
- NIOSH HHE reports -- vocalist SPL exposure data

Amplified sources [Referenced]

- Rossing, Moore -- The Science of Sound
- Berger et al. -- The Noise Manual (2000)
- NIOSH HHE reports

D.4 Device Data: Non-Manufacturer References (V19)

This appendix lists the source references for all 253 devices in the current database, organised by device type. Entries that cite primary manufacturer documentation only are included alongside those with independent or derived sources — the provenance flag tier (NONE / INFORM / WARN) and any W-coded fields are shown for every entry, making this a complete data quality register for the database.

Colour key

Blue header — NONE	**All key fields from primary manufacturer documentation, no caveats. Results are reliable.**
Amber header — INFORM or WARN	**Some fields derived, estimated, or sourced from non-primary documentation. Provenance summary explains which fields and why.**

W-coded fields (pink header): the optimizer always fires a Caution indicator when a W-coded field is exercised in a calculation, with tooltip text sourced from the provenance field. This is the highest-priority data quality flag and takes precedence over all other indicators.

A/D Converters (48 entries)

Key parameters: ADC bit depth · noise floor (dBFS) · reference level(s) and input ceiling (dBu) · THD floor (dBr) · built-in mic preamp gain range.

Apogee **Symphony I/O Mk2 (8x8 Mk II Module)** *INFORM — line converter only*	**Key parameters:** 24-bit · Noise -118 dBFS · +4 dBu → 24 dBu · -10 dBV → 6 dBu · THD floor -114 dBr · Line only P: Published Apogee Symphony I/O Mk II specification for the 8x8 Mk II analog I/O module (ZenPro Audio product listing reproducing Apogee datasheet values; confirmed by Sound On Sound review of the 8x8 Mk II module, October 2016).
Audient **ASP800** *INFORM — partial — some fields estimated · non-standard measurement conditions*	**Key parameters:** 24-bit · Noise -127 dBFS · +18 dBu (EBU) → 18 dBu · +12 dBu → 12 dBu · THD floor -88 dBr · Mic pre 0–70 dB P: Preamp EIN, THD+N, max input, gain range from published Audient ASP800 spec (audient.com/products/mic-pres/asp800/tech-specs/; confirmed by lunchboxaudio.com listing reproducing full Audient spec table). THD+N test conditions stated (0 dBu, 1kHz). D: ADC dynamic range 112 dB A-weighted and ADC THD+N 0.004% from Sound on Sound AP bench measurement (AES17), October 2015 review. thdFloor uses the ADC-path figure as the more complete measurement.
Audient **ASP880** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -127 dBFS · +18 dBu (EBU) → 18 dBu · THD floor -94 dBr · Mic pre 0–60 dB P: Preamp EIN, THD+N, max input from published Audient ASP880 spec (audient.com/products/mic-pres/asp880/tech-specs/; confirmed by lunchboxaudio.com). THD+N test conditions stated (0 dBu, 1kHz for preamp; -1 dBFS, 1kHz for ADC). P: ADC THD+N <0.002% @ -1dBFS published on audient.com and manualslib.com manual. D: ADC dynamic range 116.5 dB A-weighted (AES17) from Sound on Sound AP bench measurement, July 2014 review — closely consistent with published 115 dB. Published figure used for adcNoise; SoS measurement cited for confirmation.
Audient **iD14 MkII** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -129 dBFS · +4 dBu → 22 dBu · THD floor -96 dBr · Mic pre 0–66 dB P: Published Audient iD14 MkII specification (support.audient.com/hc/en-gb/articles/360054621132-iD14-MKII-Technical-Specifications; confirmed by specsradar.com). Same mic preamp as iD4 MkII confirmed by Audient. THD+N and EIN conditions stated.
Audient **iD4 MkII** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -129 dBFS · +4 dBu → 22 dBu · THD floor -96 dBr · Mic pre 0–58 dB P: Published Audient iD4 MkII specification (support.audient.com/hc/en-gb/articles/360055048851-iD4-MKII-Technical-Specifications; confirmed by specsradar.com comparison reproducing full Audient spec table). THD+N test condition (0 dBu input level) stated. EIN test conditions stated. Audient publishes complete spec tables with test conditions — among the better documentation standards in the entry/mid tier.
Audient **iD48** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -127 dBFS · +18 dBu → 18 dBu · THD floor -96 dBr · Mic pre 0–65 dB P: Published Audient iD48 specification (support.audient.com/hc/en-gb/articles/34969612593684-iD48-Technical-Specifications). EIN, THD+N, max input level, digital reference level all stated with test conditions.
Behringer **X Air X18** *INFORM — partial — some fields estimated*	**Key parameters:** 24-bit · Noise -128 dBFS · +4 dBu (nom) → 23 dBu · THD floor -86 dBr · Mic pre 0–60 dB P: Published Behringer X AIR X18/XR18 Quick Start Guide spec sheet (woodbrass.com/images/woodbrass/BEHRINGER+XR+18.PDF). EIN, THD, max input, and dynamic range figures are from that primary source. Gain range min/max not explicitly published in spec sheet — user should verify.

Behringer / Midas **WING + Midas DL32** *INFORM — partial — some fields estimated*	**Key parameters:** 32-bit · Noise -128 dBFS · +4 dBu (nom) → 21 dBu · THD floor -108 dBr · Mic pre 0–45 dB P: THD+N from published Behringer WING spec sheet (d1aeri3ty3izns.cloudfront.net/media/52/522463/download_522463_1.pdf). W: adcNoise EIN -128 dBu attributed to Midas PRO preamp design — sourced from WING on-board spec; DL32 preamp spec not independently verified from a Midas DL32 primary document.
Focusrite **Scarlett 2i2 (4th Gen)** *INFORM — non-standard measurement conditions · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -127 dBFS · +4 dBu → 22 dBu · THD floor -100 dBr · Mic pre 0–69 dB P: Published Focusrite Scarlett 2i2 4th Gen specification (focusrite.com product page; confirmed by bswusa.com and Steve's Music Store listings reproducing full Focusrite spec table). W: thdFloor -100 dB is at 8 dB gain per published spec — systematically optimistic vs. typical recording gain settings. Optimizer will flag Caution when THD model is exercised.
Focusrite **Scarlett 4i4 (4th Gen)** *INFORM — non-standard measurement conditions · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -127 dBFS · +4 dBu → 22 dBu · THD floor -100 dBr · Mic pre 0–69 dB P: Published Focusrite Scarlett 4i4 4th Gen specification (focusrite.com; confirmed by ihomi.com listing reproducing full spec table — 3rd gen 4i4 values; 4th gen mic preamp circuit confirmed same as 2i2 4th gen). W: thdFloor -100 dB at 8 dB gain — same caveat as 2i2 4th Gen.
MOTU **M2** *INFORM — performance estimated · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -129 dBFS · +4 dBu → 20 dBu · THD not published · Mic pre 0–60 dB P: EIN -129 dBu — published by MOTU as measured figure (motu.com/en-us/products/m-series/m2/). Pm: micGainMax 60 dB — stated on product page, test conditions not specified. E: adcMaxIn_ref derived; maxInputAt0dBGain null (not published). MOTU does not publish THD+N for mic input on any product page or spec sheet found. W: thdFloor null — optimizer cannot model distortion for this device; user will receive Warning when THD calculation is exercised.
MOTU **M4** *INFORM — performance estimated · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -129 dBFS · +4 dBu → 20 dBu · THD not published · Mic pre 0–60 dB P: EIN -129 dBu — same circuit and measured value as M2 (motu.com product page). Identical mic preamp PCB to M2 confirmed by teardown analysis. W: thdFloor null — same caveat as M2.
Mytek **AD096 (Fixed gain, JP3/JP6)** *INFORM — line converter only*	**Key parameters:** 24-bit · Noise -120 dBFS · +4 dBu → 24 dBu · THD floor -105 dBr · Line only P: Published Mytek Stereo96 ADC user manual (ManualsLib). Dynamic range, THD+N, and input sensitivity description all from that primary source. Gain mode documentation from internal jumper section of same manual.
Mytek **AD096 (Variable pot/trimpot, JP1/JP4 or JP2/JP5)** *INFORM — line converter only · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -120 dBFS · +4 dBu (professional) → 19 dBu · THD floor -105 dBr · Line only P: Published Mytek Stereo96 ADC user manual (ManualsLib). Dynamic range, THD+N, and calibration reference (-15 dBFS = +4 dBu) from that primary source. Jumper/topology documentation from internal jumper section of same manual. adcMaxIn +19 dBu derived directly from published calibration reference. lineGainMin -6 dB estimated from pot range covering +4 dBu down to -10 dBV sources. lineGainMax 0 dB: trimpots assumed permanently calibrated; no modeled boost above reference. [published + estimated pot range]
PreSonus **Studio 1824c** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -128 dBFS · +4 dBu → 21 dBu · THD floor -86 dBr · Mic pre 0–80 dB P: Published PreSonus Studio 1824c specification (ihomi.com product listing reproducing PreSonus published spec sheet). THD+N test conditions (frequency, level, gain setting) explicitly stated. One of the most complete consumer-tier spec sheets reviewed.
PreSonus **Studio 24c** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -126 dBFS · +4 dBu → 19 dBu · THD floor -88 dBr · Mic pre 0–50 dB P: Published PreSonus Studio 24c specification (ihomi.com product listing reproducing PreSonus published spec sheet; confirmed by presonus.com tech specs page). THD+N test conditions (frequency, level, gain setting) explicitly stated in published spec.

Prism Sound **Lyra-2** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -129 dBFS · +4 dBu → 22 dBu · -10 dBV → 10 dBu · THD floor -100 dBr · Mic pre 0–70 dB P: Published Prism Sound Lyra-2 specification (prismsound.com/music-audio/products-lyra2.php; confirmed by Prism Sound technical datasheet). AES17 measurement standard cited. Prism Sound is a reference-class manufacturer known for complete and honest specifications.
RME **ADI-2 FS** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -102 dBFS · +4 dBu → 19 dBu · THD floor -114 dBr · Line only
RME **ADI-2 Pro FS R Black Edition** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -105 dBFS · +4 dBu → 24 dBu · THD floor -116 dBr · Line only
RME **ADI-2/4 Pro SE** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -104 dBFS · +4 dBu → 24 dBu · THD floor -130 dBr · Line only
RME **Babyface Pro** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -113 dBFS · +4 dBu → 20 dBu · -10 dBV → 8 dBu · THD floor -110 dBr · Mic pre -11–65 dB P: Published RME Technical Specifications (archiv.rme-audio.de/en/products/babyface_pro.php, Technical Specifications section).
RME **Babyface Pro FS** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -128 dBFS · +4 dBu → 20 dBu · -10 dBV → 8 dBu · THD floor -112 dBr · Mic pre -11–65 dB P: Published RME specification (rme-audio.de/babyface-pro-fs.html; detailed specs confirmed via Trew Audio product listing reproducing RME datasheet values).
RME **Digiface AES** *INFORM — EIN directly published*	**Key parameters:** 24-bit · Noise -129 dBFS · +4 dBu → 8 dBu · THD floor -110 dBr · Mic pre 0–75 dB
RME **Fireface 802 FS** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -99 dBFS · +4 dBu → 10 dBu · THD floor -120 dBr · Mic pre 6–60 dB
RME **Fireface UCX (Original)** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -126 dBFS · +4 dBu → 13 dBu · -10 dBV → 3 dBu · HiGain (+19 dBu FS) → 19 dBu · THD floor -90 dBr · Mic pre 0–65 dB P: Published RME specification (archiv.rme-audio.de/en/techinfo_content/products/fireface_ucx_info.php). P: adcNoise -126 dBu A-weighted EIN directly measured April 2026 (150.0 ohm source @ 22.4 deg C, 20Hz-20kHz BW, gain 65 dB, phantom off, 39s recording, 0.08 dB stationarity across 39 segments, firmware v49). Johnson noise -130.9 dBu — negligible. P: thdFloor -90 dB (H2-H10) directly measured April 2026 (1kHz, +40 dB gain, no pad, direct loopback Out3->Mic1, 96kHz/24-bit). H2 -91.8 dBc dominant; pad chain confirmed to add ~7 dB H2.
RME **Fireface UCX II** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -128 dBFS · LoGain (+19 dBu FS) → 19 dBu · +4 dBu → 13 dBu · THD floor -110 dBr · Mic pre 0–75 dB P: Published RME Fireface UCX II specification. Primary source: avlgear.com product listing reproducing full RME datasheet spec table including mic preamp EIN and THD figures (avlgear.com/products/rme-fireface-ucx-ii-40-channel-advanced-usb-audio-interface); confirmed by catalogue.lang-ag.com UCX II manual PDF spec table and patch-point.com listing. adcNoise -112 from published SNR 112 dB RMS unweighted (same ADC path for mic and line inputs). EIN -128 dBu confirmed from avlgear.com spec table: mic preamp section.

RME **Fireface UFX (Original)** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -110 dBFS · +4 dBu → 13 dBu · -10 dBV → 3 dBu · HiGain (+19 dBu FS) → 19 dBu · THD floor -110 dBr · Mic pre 0–65 dB P: Published RME Fireface UFX specification (archiv.rme-audio.de/en/techinfo_content/products/fireface_ufx_info.php). adcNoise -110 from published line-input SNR 110 dB RMS unweighted. AD THD < -110 dB, THD+N < -104 dB; DA THD -104 dB, THD+N -100 dB — all from same source. Mic max input +12 dBu confirmed from spec sheet. Direct EIN and THD measurements pending (UFX session scheduled).
RME **Fireface UFX II** *NONE — Clean published data*	**Key parameters:** 24-bit · Noise -130 dBFS · LoGain (+19 dBu FS) → 19 dBu · +4 dBu → 13 dBu · -10 dBV → 3 dBu · THD floor -120 dBr · Mic pre 0–75 dB P: Published RME Fireface UFX II specification (archiv.rme-audio.de/en/products/fireface_ufx_2.php). adcNoise -115 from published mic input SNR 115 dB RMS unweighted / 118 dBA. thdFloor -110 from published line input THD < -110 dB (mic THD not separately stated). maxInputAt0dBGain +18 dBu confirmed from same source.
RME **Fireface UFX III** *INFORM — non-standard measurement conditions*	**Key parameters:** 24-bit · Noise -118 dBFS · LoGain (+19 dBu FS) → 19 dBu · +4 dBu → 13 dBu · -10 dBV → 3 dBu · THD floor -107 dBr · Mic pre 0–75 dB P: RME Fireface UFX III published specification (rme-audio.de). M: Sound On Sound AP bench measurement (December 2023): ADC dynamic range 119.1 dB A-weighted, THD worst case 0.00045% (-107 dB), best case 0.0001% (-120 dB). adcNoise -118 dBFS derived from published 118 dB dynamic range spec. thdFloor -107 dB uses conservative (worst-case) measured THD. [published/measured]
RME **M-1620 Pro** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -97 dBFS · +4 dBu → 24 dBu · THD floor -111 dBr · Line only
RME **M-32 AD / M-16 AD** *INFORM — line converter only · adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -97 dBFS · +4 dBu → 24 dBu · THD floor -110 dBr · Line only
RME **M-32 AD Pro II** *INFORM — line converter only · adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -97 dBFS · +4 dBu → 24 dBu · THD floor -111 dBr · Line only
RME **MADIface XT II** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -101 dBFS · +4 dBu → 18 dBu · THD floor -110 dBr · Mic pre 0–75 dB
RME **Micstasy (8-channel)** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -118.5 dBFS · +13 dBu → 13 dBu · +21 dBu → 21 dBu · +30 dBu → 30 dBu · THD floor -100 dBr · Mic pre 0–75 dB Pm: EIN from primary RME Micstasy product page / Studio Economik authorised dealer spec sheet (seventhcircleaudio.com and economik.com): −127.4 dBu @150Ω at 50/60/70 dB gain (best figure; rises to −122.3 dBu @30 dB gain). Test conditions not stated for gain setting → Pm. adcNoise D-grade derived from published SNR AD 118.5 dBA @+30 dBu ref (snr-derived). Three ADC reference levels confirmed from published spec sheet: +13, +21, +30 dBu at 0 dBFS. maxInputAt0dBGain +21 dBu confirmed from RME user forum (forum.rme-audio.de — Micstasy max input @0 dB gain). maxOut +27 dBu from Micstasy user manual v1.8 (rme-audio.de/downloads/micstasy_e.pdf). THD+N <−100 dB @30 dB gain from primary spec sheet. PGA2500 chip confirmed from SOS OctaMic XTC review (same chip used in Fireface UFX and Micstasy).

RME **OctaMic II (8-channel)** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -110.0 dBFS · -10 dBV → 4 dBu · +4 dBu → 13 dBu · Hi Gain (+19 dBu) → 19 dBu · THD floor -106 dBr · Mic pre 6–60 dB P: gainMin 6 dB, gainMax 60 dB, maxInputAt0dBGain +21 dBu, maxOut +21 dBu, three reference levels (−10 dBV, +4 dBu, Hi Gain +19 dBu) all from primary RME OctaMic II product page (rme-audio.de/octamic-ii.html). EIN "129 dB @ 150 Ohm" from Gearspace spec listing (D — stated as SNR-style figure, conditions not explicit). THD <0.0005% @30 dB gain; ADC SNR >110 dB(A); ADC THD <0.0003% / <−110 dB from Gearspace spec listing and primary product page. THAT 1510 chip from OctaMic II user manual (rme-audio.de/downloads/octamic2_e.pdf, §introduction). adcNoise D-grade derived from ADC SNR >110 dB(A).
RME **OctaMic XTC (8-channel)** *INFORM — adcNoise derived from published SNR*	**Key parameters:** 24-bit · Noise -117.0 dBFS · +12 dBu → 12 dBu · THD floor -110 dBr · Mic pre 0–65 dB Pm: EIN "typically 127 dBu at 150 Ohm input impedance" from OctaMic XTC user manual v1.3 (rme-audio.de/downloads/octamicxtc_e.pdf, §9.1). Word "typically" and absence of stated conditions → Pm. Gain range 0 dB + 10–65 dB (1 dB steps) from same manual. maxInputAt0dBGain +12 dBu confirmed by RME user forum (forum.rme-audio.de, Gain structure XTC vs 12Mic thread). PAD on channels 1–4 raises ceiling to +32 dBu (RME product page, manual). adcNoise D-grade derived from SNR AD 117 dBA (sweetwaveaudio.com dealer spec listing). THD AD <−110 dB, <0.0003% from same listing. PGA2500 chip confirmed from SOS OctaMic XTC review. Schema note: PAD applies to 4 of 8 channels only; padFlag reflects the device capability but not per-channel state.
Solid State Logic **SSL 18** *NONE — Clean published data*	**Key parameters:** 32-bit · Noise -130 dBFS · +24 dBu → 24 dBu · THD floor -100 dBr · Mic pre 0–67 dB P: Published Solid State Logic specification (solidstatelogic.com/products/ssl-18; confirmed by Sound On Sound review and SSL 18 User Guide at support.solidstatelogic.com).
Solid State Logic **SSL 2+ MkII** *NONE — Clean published data*	**Key parameters:** 32-bit · Noise -130 dBFS · +4 dBu → 24 dBu · THD floor -100 dBr · Mic pre 0–64 dB P: Published Solid State Logic specification (solidstatelogic.com/products/ssl-2-plus-mkii; SSL 2+ MKII User Guide at support.solidstatelogic.com/hc/en-gb/articles/20859917333789).
Sound Devices **MixPre-6 II** *NONE — Clean published data*	**Key parameters:** 32-bit · Noise -128 dBFS · -18 dBFS → 36 dBu · -20 dBFS → 36 dBu · THD floor -86 dBr · Mic pre 0–76 dB P: Published Sound Devices specification (sounddevices.com/mixpre-6-ii-specifications/; confirmed by gothamsound.com listing reproducing full SD spec table). THD+N test conditions fully stated. adcNoise set to -128 dBu (converted from published -130 dBV EIN figure).
Sound Devices **Sound Devices 833** *NONE — Clean published data*	**Key parameters:** 32-bit · Noise -129 dBFS · -18 dBFS → 36 dBu · -20 dBFS → 36 dBu · THD floor -86 dBr · Mic pre 0–76 dB P: Published Sound Devices specification (sounddevices.com/833-specifications-3/; confirmed by brochure PDF cdn.abicart.com/shop/ws42/76342/art99/170372499-de2c82-sound_devices_833_brochure.pdf).
Sound Devices **Sound Devices Scorpio** *NONE — Clean published data*	**Key parameters:** 32-bit · Noise -129 dBFS · -18 dBFS → 36 dBu · -20 dBFS → 36 dBu · THD floor -86 dBr · Mic pre 0–76 dB P: Published Sound Devices specification (sounddevices.com/product/scorpio/; sounddevices.com/scorpio-specifications-3/). Scorpio and 833 share identical preamp design and published audio specs.
Sound Devices **USBPre 2** *INFORM — non-standard measurement conditions · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -127 dBFS · +4 dBu → 18 dBu · THD floor -66 dBr · Mic pre 0–80 dB P: Published Sound Devices specification (sounddevices.com/product/usbpre-2/; USBPre 2 user guide PDF bhphotovideo.com/lit_files/66357.pdf). W: thdFloor -66 dB is measured at minimum gain / worst-case test condition per published spec; optimizer may show conservative (pessimistic) distortion estimates for this device. adcMaxIn_ref +18 dBu not fully verified as mic input ceiling.

Tascam **FR-AV4** *INFORM — EIN estimated · performance estimated · partial — some fields estimated*	**Key parameters:** 32-bit · Noise -127 dBFS · -18 dBFS=0 VU → 4 dBu · -20 dBFS=0 VU → 4 dBu · THD not published · Mic pre 0–76 dB P: Published Tascam specification (tascam.com/us/product/fr-av4). EIN and dynamic range figures confirmed by Tascam EU product page and multiple independent reports.
Universal Audio **4-710d (Quad)** *INFORM — partial — some fields estimated*	**Key parameters:** 24-bit · Noise -127 dBFS · +4 dBu → 24 dBu · THD floor -100 dBr · Mic pre 0–56 dB P: Published Universal Audio 4-710d specification (UA manual media.uaudio.com/assetlibrary/4/-/4-710d_manual.pdf; confirmed by incognitoguitars.com product listing reproducing published spec sheet). W: maxInputAt0dBGain may conflate line output level (+24 dBu) with mic input headroom. micGainMax 56 dB from published gain range; verify against manual block diagram.
Universal Audio **Apollo Twin X** *INFORM — partial — some fields estimated*	**Key parameters:** 24-bit · Noise -117 dBFS · +4 dBu → 24 dBu · -10 dBV → 14 dBu · THD floor -117 dBr · Mic pre 0–65 dB P: Published Universal Audio specification (Apollo Twin X hardware manual media.uaudio.com/support/manuals/hardware/Apollo%20Twin%20X%20Hardware%20Manual.pdf; confirmed by zzounds.com listing). W: adcNoise and thdFloor are both proxies from the 127 dB dynamic range figure — not independently published EIN or THD. Gen 2 spec distinction unverified — entry covers all Twin X variants.
Universal Audio **Apollo x (Rack)** *INFORM — model conflated · partial — some fields estimated*	**Key parameters:** 24-bit · Noise -119 dBFS · +4 dBu → 24 dBu · -10 dBV → 14 dBu · THD floor -113 dBr · Mic pre 0–65 dB P: Published Universal Audio Apollo x8p specification (ihomi.com product listing reproducing UA published spec sheet; confirmed by Sweetwater listing). W: adcNoise is THD+N-derived dynamic range proxy, not published EIN. W: thdFloor from line input spec — mic input THD not published by UA. W: model-conflated — covers x6/x8/x8p; x16 excluded (different converter).
Zoom **F6** *INFORM — performance estimated · partial — some fields estimated*	**Key parameters:** 32-bit · Noise -127 dBFS · -18 dBFS → 4 dBu · THD floor -86 dBr · Mic pre 0–75 dB P: EIN -127 dBu, max input +4 dBu mic / +24 dBu line, gain range — all from published Zoom F6 specification (zoomcorp.com/en/us/field-recorders/field-recorders/f6/; confirmed by Zoom F6 user manual and AudioTechnology review). W: thdFloor -86 dB is an E-grade class estimate — Zoom does not publish THD+N for the F6 or F8n preamp. Estimate derived from Sound Devices MixPre-6 II (same preamp class, matching EIN and analog ceiling). Optimizer will flag this as borderline data.
Zoom **F8n Pro** *INFORM — performance estimated · partial — some fields estimated*	**Key parameters:** 32-bit · Noise -127 dBFS · -18 dBFS → 4 dBu · THD floor -86 dBr · Mic pre 0–75 dB D: EIN -127 dBu, max input, gain range — published Zoom F8n Pro specification (zoomcorp.com; confirmed by Sweetwater listing). D: Preamp circuit identity with F6 confirmed by Sound on Sound review of F6 (June 2021). W: thdFloor -86 dB is an E-grade class estimate — Zoom does not publish THD+N. Optimizer will flag this as borderline data.

Preamplifiers (58 entries)

Key parameters: gain range (dB) · EIN (dBu A-weighted) · maximum output (dBu) · topology.

AMS Neve **1073DPA (Dual)** *NONE — Clean published data*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +26 dBu · Transformer I/O P: AMS Neve 1073DPA published specification from ams-neve.com product page and corroborated by 1073DPA/DPD user manual (ams-neve.com/wp-content/uploads/2021/08/1073dpadpdusermanual-1-1-.pdf). EIN <-125 dBu (22 Hz–22 kHz, 60 dB gain), THD+Noise <0.07% at +20 dBu / 600Ω. gainMin 20, gainMax 80, transformer Marinair I/O confirmed from primary source. [published]
AMS Neve **1073DPX (Dual)** *NONE — Clean published data*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +26 dBu · Transformer I/O P: AMS Neve 1073DPX published specification from ams-neve.com; same preamp circuit as 1073DPA with published EIN <-125 dBu, THD+Noise <0.07%. Confirmed TEC Award winner. [published — same preamp spec as 1073DPA]
AMS Neve **1073LB (500-series)** *NONE — Clean published data*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +28 dBu · Transformer I/O P: EIN (<−125 dBu, 22 Hz–22 kHz, 60 dB gain) and THD (<0.07% at +20 dBu/600Ω) from AMS Neve 1073LB product page (ams-neve.com/outboard/1073-range/1073lb/) — confirmed as identical to 1073/1073DPA published specification. Gain range (20–80 dB mic, −20 to +10 dB line), transformer topology (Marinair-spec input, Carnhill output), and maxOut (+28 dBu at 75Ω) from economik.com spec listing and AMS Neve product page. Carnhill output transformer (not original Marinair output) confirmed from Gearspace user thread referencing A/B comparison with vintage 1073 modules and Tape Op #82 review. [published — primary source: AMS Neve product page; maxOut from authorized dealer spec listing]
API **3124V** *NONE — Clean published data*	**Key parameters:** Gain 10–65 dB · EIN -129 dBu · Max out +28 dBu · Transformer I/O P: API 3124V published specification sheet as listed by ZenPro Audio, Sonic Circus, Perfect Circuit, and Professional Audio Design (all reproduce identical API factory spec). gainMax corrected from 66 to 65 dB, maxOut corrected from 26 to 28 dBu, EIN confirmed at -129. [published]
API **512** *NONE — Clean published data*	**Key parameters:** Gain 14–65 dB · EIN -129 dBu · Max out +30 dBu · Transformer I/O P: API 512c published specification sheet as listed on API website and confirmed by multiple authorized dealers (ZenPro Audio, Sonic Circus, Retro Gear Shop). gainMin corrected to 14 dB (padded), gainMax corrected to 65 dB, maxOut corrected to +30 dBu (clipping level). [published]
API **512v (500-series)** *INFORM — performance estimated*	**Key parameters:** Gain 14–65 dB · EIN -129 dBu · Max out +30 dBu · Transformer I/O P: EIN (−129 dBu), gain range (34–65 dB mic, 14–45 dB with pad), clipping level (+30 dBu), frequency response (+0/−0.3 dB, 20 Hz–50 kHz), and SNR (120 dB) from API 512v published specification as reproduced by windovertheearth.com (authorized dealer listing reproducing official API spec block) and confirmed against API product page (apiaudio.com/product/512v-discrete-mic-line-pre/). Circuit topology confirmed identical to 512c from API product documentation and Sweetwater listing. thdFloor estimated from 512c/API family topology — same basis as existing 512 entry. [published — primary source: API product page and authorized dealer spec]
ART **Tube Channel** *INFORM — partial — some fields estimated · performance estimated*	**Key parameters:** Gain 0–60 dB · EIN -129 dBu · Max out +27 dBu · Transformerless / tube P: ART Pro Channel published specification as cited in TalkBass.com product thread (reproducing ART spec sheet: EIN -129 dBu A-wtd, max output +27 dBu XLR, max gain 81 dB total). eiaNoise, maxOut, gainMax corrected from estimated values. thdFloor remains approximate for low-voltage tube topology. [partial — EIN/maxOut/gainMax published, thdFloor estimated]

Amek **9098 Dual Mic Amp** *INFORM — partial — some fields estimated · performance estimated*	**Key parameters:** Gain 0–72 dB · EIN -128 dBu · Max out +27 dBu · Transformer I/O P: gainMin, gainMax, and eiaNoise from AMEK System 9098 DMA manufacturer datasheet (sourced via GroupDIY forum post and muple.com spec listing). maxOut and thdFloor not found in published documentation — estimated from comparable TLA/Neve-class designs and documented in notes. Classification-bearing fields (gain range, EIN, topology) are all from the published datasheet. [published]
Aphex **1100 Tube Preamp** *NONE — Clean published data*	**Key parameters:** Gain 21–65 dB · EIN -135 dBu · Max out +27 dBu · Transformerless / tube P: Aphex Systems 1100 MkII manufacturer specification sheet as reproduced by Artsound.gr and corroborated by Mix magazine field test (Apr 2000) and Sound On Sound review (Jan 2001). [published]
Audient **ASP800 (8-channel)** *INFORM — partial — some fields estimated · performance estimated*	**Key parameters:** Gain 0–70 dB · EIN -127 dBu · Max out +18 dBu · Transformerless P: EIN (<−127.0 dBu, 150Ω, 20 Hz–20 kHz), gain range (0–70 dB), THD+N (<0.003% at 0 dBu/1 kHz = −90.5 dBr, predominantly 3rd harmonic), and supply rails (±15V) from Audient ASP800 published specification (audient.com/products/mic-pres/asp800/tech-specs/) and corroborated by authorized dealer listing (proaudiobrands.com reproducing full spec block). maxOut +18 dBu estimated from ±15V supply rails and SOS review (Hugh Robjohns, SOS Oct 2015): 'slightly less headroom' than ASP880 (which runs at ±18V); stored as +18 dBu. HMX/IRON coloration circuit topology (MOSFET asymmetric distortion, transformer saturation emulation) from SOS review and Audient product page description. [published — primary source: Audient tech specs page; maxOut from supply rail analysis and SOS review characterization]
Audio Upgrades **High-Speed Mic Preamp** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 15–60 dB · EIN -132 dBu · Max out +30 dBu · Transformerless D: Gain range (15–60 dB) and topology (transformerless, Class A, current-feedback) from audioupgrades.com product page and Mix magazine top-preamps round-up (Apr 2000). EIN and maxOut not published by manufacturer; those fields remain estimated from comparable high-speed transformerless designs and are documented in notes. [derived — gain/topology from manufacturer site and Mix magazine; EIN/maxOut estimated]
Avalon **VT-737sp (Tube)** *NONE — Clean published data*	**Key parameters:** Gain 0–58 dB · EIN -116 dBu · Max out +30 dBu · Transformer I/O / tube P: Avalon Design VT-737SP manufacturer specification sheet as reproduced by AVLGEAR, Athens Pro Audio, and Professional Audio Design (all reproduce identical Avalon factory spec block). gainMax corrected from 60 to 58 dB, eiaNoise corrected from -126 to -116 dBu, maxOut corrected from 26 to +30 dBu, thdFloor corrected from -75 to -46 dBr (0.5% THD+IMD). [published]
BAE **1073MPF** *WARN — EIN estimated*	**Key parameters:** Gain 0–71 dB · EIN -125 dBu · Max out +27 dBu · Transformer I/O D: Gain range (0–71 dB), transformer topology (Carnhill I/O, BA283 card), maxOut (+27.4 dBu at 600Ω) from BAE 1073MPF product specification as listed by Sonic Circus, Long & McQuade, and BAE product page (baeaudio.com). eiaNoise -125 dBu derived from AMS Neve 1073 published specification (same BA283/Carnhill circuit) — the BAE published EIN of '-110 dBu unweighted, 300kHz bandwidth' is explicitly excluded as a non-standard bandwidth measurement not comparable to the 20 Hz–20 kHz standard used throughout this database. SOS BAE 1073 DMP review (Paul White, SOS Apr 2010) bench measurements confirm comparable THD+N and frequency response. [derived — gain/topology/maxOut from BAE spec; EIN derived from Neve 1073 primary spec with documented reason for rejecting BAE published figure]

Buzz Audio **MA-2 (Dual Mic Amp)** *NONE — Clean published data*	**Key parameters:** Gain 14–66 dB · EIN -134 dBu · Max out +24 dBu · Transformerless P: Buzz Audio MA-2.2B/BTX manufacturer specification sheet from buzzaudio.com/products/ma2.2.htm and corroborated by FrontEndAudio.com, Sound On Sound review (Dec 2002, Hugh Robjohns), and multiple dealer listings. All key fields corrected: transformer=false (transformerless standard config), gainMin 14, gainMax 66, eiaNoise -133.5 (rounded -134), maxOut +24 dBu, thdFloor from <0.008% THD. [published]
Chandler Limited **TG2 (Dual)** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 5–75 dB · EIN -123 dBu · Max out +26 dBu · Transformer I/O D: Gain range (5–75 dB), transformer topology (Carnhill input, Altran output), topology (all-discrete, complementary pairs) from Chandler Limited TG2 product page (chandlerlimited.com) and SOS TG2-500 review (Hugh Robjohns, SOS Dec 2014). EIN not published by Chandler anywhere; estimated at -123 dBu from SOS reviewer description and topology class (Carnhill step-up transformer, similar to but slightly noisier than Neve 1073 family). thdFloor estimated from SOS description of predominantly odd-harmonic character at drive levels. maxOut estimated from external power supply rails (±28V per Chandler spec) and transformer headroom. [derived — gain/topology from manufacturer/SOS; EIN/thdFloor/maxOut estimated]
Cranesong **Flamingo** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 6–66 dB · EIN -130 dBu · Max out +28 dBu · Transformerless D: Gain range and transformer/tube topology from Crane Song official product page (cranesong.com/flamingo.html), corroborated by FrontEndAudio, Sonic Circus, and Vintage King dealer listings. EIN and maxOut not published by manufacturer; remain estimated from comparable discrete Class A transformerless designs. [derived — gain/topology from official product page and dealer corroboration; EIN/maxOut estimated]
D.W. Fearn **VT-2 (Tube)** *WARN — EIN estimated · performance estimated · unit-to-unit variation*	**Key parameters:** Gain 10–70 dB · EIN -127 dBu · Max out +26 dBu · Transformer I/O / tube E: Topology confirmed from D.W. Fearn VT-1/VT-2 owner's manual (dwfearn.com). All numeric performance fields estimated — manufacturer does not publish EIN, maxOut, or THD. [estimated — topology confirmed, all performance fields estimated]
Daking **52270** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 20–70 dB · EIN -128 dBu · Max out +26 dBu · Transformer I/O D: Topology (Jensen transformers, Trident A-Range discrete Class A) confirmed from Daking product pages and Sound On Sound Mic Pre II review (Nov 2018). Gain range 20–70 dB from Daking Mic Pre II/IV product pages (same preamp section as 52270). EIN and maxOut not published by Daking; estimated from comparable transformer-coupled discrete Class A designs and documented in notes. [derived — topology/gain from official pages and SOS review; EIN/maxOut estimated]
Earthworks **LAB 102** *INFORM — non-standard measurement conditions*	**Key parameters:** Gain 6–66 dB · EIN -134 dBu · Max out +22 dBu · Transformerless P: EIN and max output from Sound On Sound review (Hugh Robjohns, SOS Jun 1998), corroborated by Gearspace spec listing (both cite manufacturer spec). gainMin corrected from 10 to 6 dB (6 dB steps confirmed), gainMax confirmed 66 dB (not 70), maxOut corrected from +30 to +22 dBu (10 V RMS), eiaNoise corrected from -133 to -134 dBu, thdFloor corrected from -110 to -74 dBr (0.02% THD). Note: EIN measured at 50Ω, somewhat more favorable than standard 150Ω condition. [published]
Focusrite **430 Producer Pack** *WARN — EIN estimated · performance estimated*	**Key parameters:** Gain 0–60 dB · EIN -127 dBu · Max out +24 dBu · Transformer I/O E: Topology (Lundahl transformer, ISA preamp circuit) confirmed from Focusrite product documentation. EIN estimated from ISA family range (-123 to -129 dBu across generations); no ISA 430-specific EIN published separately. Other fields estimated from ISA family. [estimated from family]

Focusrite **ISA 110** *INFORM — non-standard measurement conditions*	**Key parameters:** Gain 0–70 dB · EIN -123 dBu · Max out +26 dBu · Transformer I/O P: EIN -123 dBu from Sound On Sound review bench measurement (Hugh Robjohns, May 2000) of the ISA 110 rack-mount reissue. This is an independent reviewer measurement, not a Focusrite factory spec sheet for the original module — noted accordingly. gainMax 70 dB reflects 60 dB stepped + 10 dB trim. [independent review measurement — primary Focusrite factory spec for original ISA 110 module not located]
Focusrite **ISA 428** *NONE — Clean published data*	**Key parameters:** Gain 0–70 dB · EIN -126 dBu · Max out +25 dBu · Transformer I/O P: ISA 428 MkII EIN -126 dBu and max output +25 dBu from Focusrite published specification on focusrite.com, confirmed by multiple authorized dealer listings. eiaNoise corrected from -129 to -126 dBu, maxOut corrected from 24 to 25 dBu. [published — Focusrite ISA 428 MkII spec sheet]
Focusrite **Red 1 (Quad)** *NONE — Clean published data*	**Key parameters:** Gain -6–60 dB · EIN -127 dBu · Max out +26 dBu · Transformer I/O P: Focusrite Red 1 published specification as reproduced by zZounds and Artsound (EIN -127 dBu, gain -6 to +60 dB, output +24/+26 dBu). transformer corrected from false to true (Red 1 has both input and output transformers). gainMin corrected from 10 to -6 dB. maxOut set to 26 dBu (into 10kΩ). eiaNoise confirmed -127 dBu. [published]
Focusrite **Scarlett OctoPre** *WARN — EIN estimated · performance estimated*	**Key parameters:** Gain 0–56 dB · EIN -128 dBu · Max out +24 dBu · Transformerless E: Gain range and topology (transformerless) from Focusrite Scarlett OctoPre product page. EIN not published by Focusrite for this model; estimated from comparable Focusrite interface-class preamps. [estimated]
GML **8300 (Quad)** *INFORM — non-standard measurement conditions*	**Key parameters:** Gain 10–65 dB · EIN -127 dBu · Max out +27 dBu · Transformerless P: GML Model 8300 specification sheet from massenburg.com (retrieved directly). Gain 10–65 dB, EIN <-126.5 dBv (150Ω, 400Hz–30kHz bandpass), output clipping +27.4 dBv, THD 0.007% at 70 dB gain. Previous entry had EIN -132 dBu (from Mix magazine round-up, not primary source) and gainMax 70 — both corrected. eiaNoise adjusted to -127 dBu to account for the narrow-band measurement condition. maxOut corrected from 30 to 27 dBu. [published — primary source massenburg.com]
Grace Design **Model 201 (Dual)** *INFORM — non-standard measurement conditions*	**Key parameters:** Gain 18–64 dB · EIN -130 dBu · Max out +28 dBu · Transformerless P: Grace Design Model 201 owner's manual (gracedesign.com/support/201_manual_c.pdf) — gain 18–64 dB, EIN -130 dBu (50Ω), THD+N <0.0015%. Max output +28 dBu from Gearspace product page and Sweetwater listing. gainMin corrected from 10 to 18 dB, gainMax corrected from 66 to 64 dB, maxOut corrected from 30 to 28 dBu, eiaNoise corrected from -131 to -130 dBu. [published]
Great River **MP-2MH (Dual)** *NONE — Clean published data*	**Key parameters:** Gain 7–66 dB · EIN -129 dBu · Max out +24 dBu · Transformer I/O P: Great River MP-2MH specification sheet as reproduced in Reverb listing and WorthPoint (both reproduce official Great River spec). EIN -129 dBu unweighted confirmed, gainMin corrected from 10 to ~7 dB (lowest step on 24-position switch), gainMax corrected from 70 to 66 dB, maxOut corrected from 28 to 24 dBu. [published]
Hardy **Jensen Twin Servo 990** *NONE — Clean published data*	**Key parameters:** Gain 16–60 dB · EIN -129 dBu · Max out +24 dBu · Transformer I/O P: John Hardy Jensen Twin Servo 990 specification sheet from johnhardyco.com (retrieved directly at johnhardyco.com/JTS990Details.html and confirmed against johnhardyco.com/pdf/TSMP2015-03-01.pdf). All key fields from primary source: EIN -128.7 dBu (stored as -129), gainMin 16 dB, gainMax 60 dB, maxOut +24 dBu into 75Ω, THD 0.001% typical. [published — primary source johnhardyco.com]

Hardy **M-1 (Single)** *NONE — Clean published data*	**Key parameters:** Gain 10–70 dB · EIN -129 dBu · Max out +24 dBu · Transformer I/O P: John Hardy M-1 specification sheet as reproduced in Reverb listing (reproducing official Hardy spec: EIN -129 dBu, max output +24 dBu). maxOut corrected from 28 to 24 dBu, eiaNoise confirmed -129 dBu. [published]
Harrison **32C / 32Classic (console channel)** *INFORM — EIN estimated · performance estimated · console section*	**Key parameters:** Gain 20–70 dB · EIN -124 dBu · Max out +24 dBu · Transformer I/O D: Jensen JT-MB-CPCA transformer topology and gain range confirmed from Harrison 32Cpre+ product page (harrisonaudio.com/products/32cpre), Harrison 32Cpre+ user manual (manuals.plus), and Tape Op 32cs review (#113). EIN not published by Harrison for either console or 32Cpre+; estimated at -124 dBu from Jensen JT-MB-C transformer topology (1:1 ratio, lower ratio than Neve) and NE5534 op-amp noise class. maxOut estimated from console signal path constraints. thdFloor estimated from topology (NE5534 IC, 1:1 Jensen transformer) — inherently lower saturation than high-ratio iron designs. [derived — topology/gain from manufacturer documentation; EIN/maxOut/thdFloor estimated from transformer and op-amp specifications]
Harrison **32Cpre+ (500-series)** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 20–70 dB · EIN -124 dBu · Max out +24 dBu · Transformer I/O D: Jensen JT-MB-CPCA transformer, gain range 20–70 dB, HPF/LPF specification from Harrison Audio 32Cpre+ product page (harrisonaudio.com/products/32cpre), Sweetwater listing, Tape Op #163 review, and Vintage King editorial. EIN not published by Harrison; estimated at -124 dBu from Jensen JT-MB-C transformer topology and NE5534 op-amp class (same basis as 32C console estimate). TEC 2026 finalist (32Classic MS Mix Strip) confirmed from tecawards.org. [derived — topology/gain from manufacturer page and Tape Op review; EIN estimated from transformer/op-amp topology]
Mackie **1604 VLZ Pro (Console mic section)** *INFORM — partial — some fields estimated · performance estimated · console section*	**Key parameters:** Gain 10–60 dB · EIN -128 dBu · Max out +22 dBu · Transformerless P: Mackie 1604 VLZ Pro / XDR published spec. EIN -128 dBu A-weighted from Mackie product documentation and corroborated by multiple professional reviews of the VLZ Pro series. Other fields remain topology-estimated for the console bus context. [partial — EIN published, maxOut estimated from console topology]
Millennia **HV-32P (Portable Stereo)** *NONE — Clean published data*	**Key parameters:** Gain 14.5–60 dB · EIN -131 dBu · Max out +28 dBu · Transformerless P: gainMin (14.5 dB / 1 dB with pad), gainMax (60 dB / 70 dB ribbon), inputImpedance (2,210 Ω, phantom, 1 kHz), maxInputLevel (+12 dBu without pad / +18 dBu with pad, both at 0.02% THD+N), padFlag (−14.5 dB hardware pad), THD+N (<0.003% max / typ <0.001% at +24 dBu, 35 dB gain), IMD (<0.0006% at +12 dBu), phase (<2°), CMRR (>65 dB typ >85 dB), slew rate (>25 V/μs), output impedance (24.3Ω), supply (12–15 VDC / internal boost) from primary source: mil-media.com/product/hv-32p/ (April 2026). eiaNoise: published −130 dBu at 0Ω source, 10 Hz–30 kHz (non-standard condition — inputs shorted, identical to HV-3C/D measurement convention); stored −131 dBu for family consistency with SOS bench baseline; standard unweighted 150Ω 20 Hz–20 kHz estimate ~−128 dBu. W code applies. maxOut +28 dBu: derived from published THD+N curve (endpoint at +28 dBu where THD+N reaches <0.05%) rather than stated clip level; D code. [primary source: mil-media.com/product/hv-32p/]
Millennia **HV-3B (Dual)** *INFORM — EIN estimated*	**Key parameters:** Gain 8–69 dB · EIN -131 dBu · Max out +32 dBu · Transformerless D: Max output +32 dBu and THD <5 ppm derived from Millennia HV-3D published specification (mil-media.com); the HV-3D uses the identical circuit to the HV-3B and is the current production equivalent. EIN not explicitly published for the HV-3B; estimated at -131 dBu from topology class and independent reviews describing near-theoretical-minimum noise performance. [derived — maxOut/THD from published spec of identical-circuit HV-3D; EIN estimated] gainMin/gainMax/inputImpedance/maxInputLevel confirmed from Millennia HV-3C/D manual 041722js page 7. [primary source: 041722js]

Millennia **HV-3C (Stereo)** *NONE — Clean published data*	**Key parameters:** Gain 8–69 dB · EIN -131 dBu · Max out +32 dBu · Transformerless P: All performance specifications from primary source — Millennia HV-3C/D owner's manual 041722js (September 2025), page 7 'HV-3 Series Preamp General Specifications': gainMin (8 dB), gainMax (69 dB, 1 dB/step, 61 steps), maxOut (+32 dBu, 20 Hz–40 kHz), maxInputLevel (+23 dBu, 20 Hz–40 kHz), inputImpedance (6,750Ω, phantom, 1 kHz), THD+N (<0.002% max / typ <0.0007% at +27 dBu, 35 dB gain, 10 Hz–20 kHz), IMD (<0.0009%), phase (<2°), slew rate (>25 V/μs), CMRR (>65 dB typ >85 dB). eiaNoise: manual states −130 dBu at 0Ω source (non-standard); stored −131 dBu from SOS bench (likely A-weighted, 150Ω); standard unweighted 150Ω 20 Hz–20 kHz estimate ~−128 dBu. eiaNoise = W: real but non-standard in both published and bench-sourced forms. [primary source: Millennia HV-3C/D manual 041722js, page 7]
Millennia **HV-3D (4 or 8-channel)** *NONE — Clean published data*	**Key parameters:** Gain 8–69 dB · EIN -131 dBu · Max out +32 dBu · Transformerless P: All performance specifications from primary source — Millennia HV-3C/D owner's manual 041722js (September 2025), page 7 'HV-3 Series Preamp General Specifications': gainMin (8 dB), gainMax (69 dB, 1 dB/step, 61 steps), maxOut (+32 dBu, 20 Hz–40 kHz), maxInputLevel (+23 dBu, 20 Hz–40 kHz), inputImpedance (6,750Ω, phantom, 1 kHz), THD+N (<0.002% max / typ <0.0007% at +27 dBu, 35 dB gain, 10 Hz–20 kHz), IMD (<0.0009%), phase (<2°), slew rate (>25 V/μs), CMRR (>65 dB typ >85 dB). eiaNoise: manual states −130 dBu at 0Ω source (non-standard); stored −131 dBu from SOS bench (likely A-weighted, 150Ω); standard unweighted 150Ω 20 Hz–20 kHz estimate ~−128 dBu. eiaNoise = W: real but non-standard in both published and bench-sourced forms. [primary source: Millennia HV-3C/D manual 041722js, page 7]
Neve **1073 (Single)** *NONE — Clean published data*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +26 dBu · Transformer I/O P: AMS Neve 1073 published specification from ams-neve.com and confirmed by multiple authorized dealer listings (Pro Audio Design, Studiocare). EIN corrected from -128 to -125 dBu (published 'better than -125 dBu @ 60 dB gain'). maxOut confirmed >+26 dBu. thdFloor from 0.07% THD figure. [published]
Neve **1081 (Single)** *WARN — EIN estimated*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +26 dBu · Transformer I/O E: AMS Neve 1081 shares the same mic preamp circuit as the 1073. Specs inferred from 1073 published spec (ams-neve.com). A dedicated 1081-specific spec sheet was not located. [estimated from 1073 family — no independent spec confirmed]
Neve **8078 (console channel / 31105)** *WARN — EIN estimated · console section*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +26 dBu · Transformer I/O E: 31105 module topology (same BA283 Class A / Marinair transformer circuit as 1081, modified for inline NAD console use) confirmed from Wikipedia Neve 80-series article, Sweetwater Neve history article, and Gearspace 8068/8078 thread (including input from former Neve engineer). Gain range confirmed from 31105 module documentation (Neve 1081 reference: 20–80 dB). EIN, maxOut, thdFloor estimated from AMS Neve 1073/1081 published specifications — no independent 31105 spec sheet found. [estimated — topology confirmed, performance inferred from 1073/1081 family; no 31105-specific spec published]

Neve **VR (console channel)** *WARN — EIN estimated · console section · performance estimated*	**Key parameters:** Gain 15–75 dB · EIN -127 dBu · Max out +26 dBu · Transformer I/O E: VR topology (NE5534-based IC op-amp, not discrete Class A; transformer I/O, not Marinair) from Gearspace owner discussions including direct input from what appears to be a former Neve engineer. EIN estimated at -127 dBu from Audio Precision test results posted on Gearspace by owner of 96-channel VSP Legend (VR variant): -90 dBu noise at full signal path; full-path noise converted to EIN estimate. thdFloor from same owner's AP tests: 0.0055% THD full path ≈ -85 dBr; stored as -90 dBr to represent preamp section alone. Gain range estimated from Funky Junk FJ V-series (same VR modules in rack housing). No published AMS Neve VR channel spec sheet located. [estimated — topology from owner/engineer discussions; EIN/thdFloor from independent AP measurements posted by console owner; gain estimated from racked VR modules]
RME **Quadmic II (Quad)** *WARN — EIN estimated · performance estimated*	**Key parameters:** Gain 0–75 dB · EIN -128 dBu · Max out +26 dBu · Transformerless E: Gain range (0–75 dB) from RME Quadmic II product page. EIN estimated from RME preamp class; RME does not prominently publish this figure. Other fields estimated from topology. [partial — gain range published, EIN estimated]
Rupert Neve Designs **Portico 511 (500-series)** *INFORM — non-standard measurement conditions*	**Key parameters:** Gain 0–66 dB · EIN -123 dBu · Max out +20 dBu · Transformer I/O P: RND Portico 511 published specification from rupertneve.com/products/511. EIN 'better than -125 dB' (RND dBV convention = approx -123 dBu; stored as -123 dBu to reflect standard 150Ω unweighted condition). THD+N <0.0025% at +20 dBu / 1 kHz (Silk off); 0.015–2% Silk engaged from same spec page. gainMax 66 dB, gain steps 6 dB. Silk saturation range documented on product page. [published — EIN converted from RND dBV convention to dBu]
Rupert Neve Designs **Shelford Channel** *NONE — Clean published data*	**Key parameters:** Gain 6–72 dB · EIN -127 dBu · Max out +26 dBu · Transformer I/O P: Shelford Dual Mic Pre published specification from rupertneve.com/products/5025 (same preamp circuit as Shelford Channel; confirmed by RND FAQ). EIN -127 dBu at main output, +66 dB gain, 150Ω source; THD+N <0.0025% at 0 dBu / 1 kHz. Silk saturation range (0–4-5% THD, predominantly 2nd order) from Shelford Channel product page and Parsons Audio dealer documentation. gainMin 6 dB, gainMax 72 dB from RND product documentation. [published]
SCA **A12 (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 14.5–69.7 dB · EIN -126.3 dBu · Max out +32.6 dBu · Transformer I/O P: All optimizer-critical fields from SCA Preamp Test Revision 1.05, Module A12, Serial Number 0388, dated 10/13/2015 (SCA_A12_SN0388.pdf, retrieved directly). eiaNoise -129 dBu: plateau of -128.6 to -129.3 dBu at steps 7–12 (stored as -129). maxOut +30 dBu: 1% THD level of +30.3–30.4 dBu across steps (stored as +30). thdFloor -89 dBr: 0.0036% THD+N at step 6 (37.5 dB gain, +4 dBu output). Supply ±24V confirmed from test sheet (B+ 24VDC, B- 24VDC). Gain range from SCA A12B product page (seventhcircleaudio.com), confirmed by test sheet step sequence. [published — primary source: SCA acceptance test document SN0388] All performance fields confirmed P from SCA factory test (SN Sebastian 1, 2026-03-13, SCA test rev 1.05, ±4 dBu standard output level, 150Ω source). [primary source: A12_Factory_test.xls]

SCA **C84 (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 14.5–68.4 dB · EIN -131.1 dBu · Max out +30.1 dBu · Transformerless P: Gain range (15–70 dB) and maxOut (+32 dBu) from SCA C84 product page (seventhcircleaudio.com). EIN derived systematically from Millennia HV-3 reference design (same Graham Cohen Double Balanced topology) with allowance for OPA2604 op-amp substitution. thdFloor estimated from OPA2604 datasheet characteristics vs. Millennia reference. [derived — gain/maxOut from SCA product page; EIN/thdFloor derived from Millennia HV-3 published spec with documented adjustment] All performance fields confirmed P from SCA factory test (SN C1040, 2025-09-26, SCA test rev 1.05, ±4 dBu standard output level, 150Ω source). [primary source: C84_Factory_test.xls; unit-variation flag removed after component defect traced to specific build]
SCA **J99-990C+ (PC01 Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 15–70 dB · EIN -131 dBu · Max out +26 dBu · Transformer I/O P: Measured April 2026. Same Jensen Twin Servo / 990C+ module and Lundahl + CineMag transformers as SCA J99 (990C+) chassis entry, installed in SCA PC01 dedicated PSU chassis. All performance figures from direct measurement (Akitika/UFX session).
SCA **J99-990C+ (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 15–69.8 dB · EIN -122.0 dBu · Max out +26.1 dBu · Transformer I/O P: eiaNoise (-124.5 to -124.6 dBu plateau, stored as -125 dBu) and maxOut (+26.0 dBu) from SCA Preamp Test Revision 1.05, Module J99, Serial Number 0113, dated 3/21/2017 (SCA_J99_SN0113.pdf, retrieved directly). thdFloor (-85 dBr) from same test sheet, step 6: 0.0055% THD+N at 40.2 dB gain, +4 dBu output. Supply voltage ±24V confirmed from test sheet (B+ 23.9VDC, B- 23.7VDC), consistent with Hardy 990C+ design operating voltage. Gain range 15–70 dB from SCA J99 product page and confirmed by test sheet step sequence. [published — primary source SCA acceptance test document SN0113] All performance fields confirmed P from SCA factory test (SN Second J99 Steve Repaired, 2026-04-29, SCA test rev 1.05, ±4 dBu standard output level, 150Ω source). [primary source: J99_Factory_test.xls]
SCA **J99-AD797 (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 15–70 dB · EIN -132 dBu · Max out +22 dBu · Transformer I/O P: eiaNoise (-122.7 to -122.8 dBu plateau, stored as -123 dBu) and maxOut (+22.2–22.6 dBu) from SCA Preamp Test Revision 1.05, Module J99, Serial Number 0105, dated 11/30/2015 (SCA_J99_SN0105.pdf, retrieved directly). thdFloor (-82 dBr) from same test sheet, step 6: 0.0076% THD+N at 39.2 dB gain, +4 dBu output. Supply voltage ±18V confirmed from test sheet (B+ 18VDC, B- 18VDC). 3dB bandwidth ~76 kHz corroborated by SCA J99 datasheet (SCA_J99_AD797_Datasheet_2004.pdf): '<10Hz and 75kHz -3dB,' AD797 op-amp at ±15VDC. Gain range 15–70 dB from SCA product page and test sheet. [published — primary sources: SCA acceptance test SN0105 and SCA 2004 datasheet]
SCA **N72 (PC01 Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 21–70 dB · EIN -140 dBu · Max out +28 dBu · Transformer I/O P: Measured April 2026. Same Neve BA183 module and Carnhill transformers as SCA N72 chassis entry, installed in SCA PC01 dedicated PSU chassis. All performance figures from direct measurement (Akitika/UFX session). EIN and THD both substantially better than chassis N72 due to dedicated linear PSU architecture.

SCA **N72 full-fader (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 18.7–72.2 dB · EIN -123.9 dBu · Max out +29.2 dBu · Transformer I/O P: eiaNoise (-124.5 to -125.3 dBu plateau, stored as -125 dBu) and maxOut (+28.2 dBu, stored as +28 dBu) from SCA Preamp Test Revision 1.05, Module N72, Serial Number 0398, dated 11/30/2015 (SCA_N72_SN0398.pdf, retrieved directly). thdFloor (-78 dBr) from same test sheet, step 6: 0.0129% THD+N at 42.1 dB gain, +4 dBu output. Supply ±24V confirmed from test sheet (B+ 24.0VDC). N72 datasheet (SCA_N72_Datasheet_2004.pdf, retrieved directly) corroborates: gain 15–70 dB, max output +27 dBu at clipping (600 Ohm), THD+N 0.009% at 1kHz, freq response 15Hz–40kHz. Gain range from SCA N72 product page (seventhcircleaudio.com) and confirmed by test sheet step sequence. [published — primary sources: SCA acceptance test SN0398 and SCA 2004 N72 datasheet] All performance fields confirmed P from SCA factory test (SN From Ebay, 2026-04-28, SCA test rev 1.05, ±4 dBu standard output level, 150Ω source). [primary source: N72_Factory_test.xls]
SCA **S90 (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 16–65.6 dB · EIN -126.3 dBu · Max out +29.2 dBu · Transformerless P: Circuit topology, component values, and supply voltage from SCA S90 schematic (S90_Rev_1_2_SCH.pdf, Rev 1.2, retrieved directly). Supply ±18V confirmed from page 1 power supply. Signal path components confirmed from pages 2–3 (SSM2212 input pair, NE5534 gain stages, THAT 1646 output). Transformer=False confirmed from full schematic review (no transformer symbol at any stage). eiaNoise −126 dBu: calculated from SSM2212 datasheet parameters (en=1.4 nV/√Hz, in=0.9 pA/√Hz) with 150Ω source, 20 Hz–20 kHz BW, accounting for R109=54.9Ω emitter resistor and R117/R110=300Ω base resistors partially bypassed by C115/C105=330pF; uncertainty ±1 dB. SSL 9000 XLogic EIN −127 dBu (SOS bench measurement, same SuperAnalogue circuit) provides independent plausibility check — S90 calculated EIN is 1 dB above this, consistent with SSM2212 vs SSL proprietary input transistor noise difference. gainMin=10, gainMax=65: estimated from SSL 9000 console gain range and R211=10kΩ continuous feedback pot visible in schematic. maxOut +24 dBu: derived from THAT 1646 at ±18V (same calculation as SCA T15). thdFloor −97 dBr: derived from NE5534 datasheet THD extrapolated to +4 dBu operating level. SCA does not publish specifications for the S90. [derived — all fields from schematic analysis and component datasheet calculation; no manufacturer-published performance figures available] All performance fields confirmed P from SCA factory test (SN S90 C1008, 2021-09-17, SCA test rev 1.05, ±4 dBu standard output level, 150Ω source). [primary source: S90_Factory_test.xls]
SCA **T15 (SCA Chassis, factory tested)** *NONE — Clean published data*	**Key parameters:** Gain 14–68.2 dB · EIN -127.7 dBu · Max out +29.2 dBu · Transformerless P: Gain range (10–51 dB) derived from SCA T15 BOM (t15_bom-R1_5.pdf, retrieved directly): gain resistors R10=17.8Ω through R17=1100Ω, THAT 1512P formula G = 1 + 6000/Rg, 12-position Grayhill rotary switch, 10kΩ trim pot R26 giving ±6 dB trim. IC topology (THAT 1512P → OPA134PA → THAT 1646) confirmed from BOM line items U1, U4, U3 respectively. Supply voltage (±15–18V regulated) inferred from IC maximum ratings (all three ICs rated ±18V maximum) and LM317/LM337 regulators in BOM. eiaNoise -129 dBu: calculated from THAT 1512P datasheet noise specs (1.0 nV/√Hz voltage noise, 0.9 pA/√Hz current noise) with 150Ω source, 20Hz–20kHz bandwidth, confirmed against THAT 1512P published EIN of -131.5 dBu A-weighted. maxOut +24 dBu: derived from THAT 1646 datasheet output swing at ±18V supply (±16.5V → +23.6 dBu, stored as +24 dBu). SCA product description '+29 dBu headroom' excluded as non-physically-achievable at ±18V with these ICs; treated as gamed-spec-excluded for maxOut. thdFloor -97 dBr: derived from THAT 1512P datasheet THD+N <0.001% at G=40 dB extrapolated to +4 dBu output. [derived — gain/topology from BOM primary source; EIN/maxOut/thdFloor from IC datasheets] All performance fields confirmed P from SCA factory test (SN T15 1.3 to JR, 2026-03-27, SCA test rev 1.05, ±4 dBu standard output level, 150Ω source). [primary source: T15_Factory_test.xls]

SSL **4000 G (console channel)** *INFORM — console section*	**Key parameters:** Gain 10–65 dB · EIN -127 dBu · Max out +26 dBu · Output xfmr D: Transformer topology (Jensen JT-115K-E), preamp topology (discrete Class A, transformer-coupled), and gain range from SSL channel strip guide (solidstatelogic.com/channel-strip-guide) and SSL 4K G plug-in documentation. EIN -127 dBu from SOS XLogic SuperAnalogue Channel review (Paul White, SOS Feb 2004: 'Equivalent input noise (with a 150Ω source) is -127dBu at maximum gain') — the XLogic unit uses the same SuperAnalogue preamp design as the 4000 G family. maxOut +26.5 dBu from Gearspace user citing console technical documentation. THD <0.003% from SSL documentation for the 4000 series family. [derived — topology from SSL primary sources; EIN from SOS bench measurement of identical-circuit XLogic unit; maxOut from owner documentation]
SSL **9000 J SuperAnalogue (console channel)** *INFORM — console section*	**Key parameters:** Gain 15–75 dB · EIN -127 dBu · Max out +26 dBu · Transformerless D: SuperAnalogue topology (DC-coupled, transformerless, no caps in signal path), gain range, and transformer=false from SSL XLogic SuperAnalogue Channel product documentation and SOS review (Paul White, SOS Feb 2004). EIN -127 dBu from SOS bench measurement of XLogic unit (same SuperAnalogue circuit). Audio Precision measurement (-90 dBu channel noise floor ≈ -127 dBu EIN) from Gearspace owner thread corroborates this figure. THD <0.003% from SSL XLogic published spec. [derived — topology/EIN from SOS XLogic review bench measurement of same SuperAnalogue circuit; corroborated by owner AP measurements]
SSL **Super 9000 (SuperAnalogue channel strip)** *INFORM — partial — some fields estimated · performance estimated*	**Key parameters:** Gain 20–70 dB · EIN -127 dBu · Max out +26 dBu · Transformerless P: SSL Super 9000 product page (solidstatelogic.com/products/super-9000) and SOS review (Oct 2025). SuperAnalogue preamp confirmed as same circuit as 9000 J/K. Gain range +20–+70 dB from SOS review. EIN, maxOut, and thdFloor derived from SSL XLogic SuperAnalogue Channel published specification (same SuperAnalogue circuit; SOS measured -127 dBu EIN) and SSL XLogic documentation (THD <0.003%, maxOut +26 dBu). VHD mode excluded from performance fields as it is a deliberate saturation circuit. [published for topology/gain; performance derived from SSL primary spec for same SuperAnalogue circuit]
Telefunken **V-76 (Single)** *WARN — EIN estimated · performance estimated · vintage DIN spec · unit-to-unit variation*	**Key parameters:** Gain 20–80 dB · EIN -128 dBu · Max out +24 dBu · Transformer I/O / tube E: Historical Telefunken V-76 topology (tube, transformer I/O) confirmed from broadcast engineering archives and collector documentation. Numeric EIN/maxOut values estimated from comparable vintage tube transformer designs; original specs in DIN broadcast format. [estimated — vintage unit, original specs not in standard EIN format]
Universal Audio **6176 (Channel Strip)** *WARN — EIN estimated · performance estimated*	**Key parameters:** Gain 10–65 dB · EIN -128 dBu · Max out +21 dBu · Transformer I/O / tube E: UA 6176 topology (610 tube pre + 1176 limiter, transformer I/O, 6072 tube) confirmed from UA product documentation. UA publishes S/N >82 dB but no EIN. maxOut revised downward from +26 to +21 dBu based on SOS SOLO/610 bench measurements (+18 dBu into 100kΩ). [estimated — topology confirmed; all performance fields estimated]
Universal Audio **710 Twin-Finity** *WARN — EIN estimated · performance estimated*	**Key parameters:** Gain 0–65 dB · EIN -127 dBu · Max out +24 dBu · Transformer I/O / tube E: UA 710 Twin-Finity topology confirmed from UA product page. UA does not publish EIN or maxOut numerically. All performance fields estimated. [estimated — topology confirmed; all performance fields estimated]

Universal Audio **LA-610 MkII (Tube)** *WARN — EIN estimated · performance estimated*	**Key parameters:** Gain 10–65 dB · EIN -125 dBu · Max out +18 dBu · Transformer I/O / tube E: Topology confirmed from UA LA-610 MkII product documentation. maxOut revised from +24 to +18 dBu per SOS SOLO/610 measured output (+18 dBu into 100kΩ). EIN not published by UA. [estimated — topology confirmed; all performance fields estimated]
Universal Audio **SOLO/610 (Tube)** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 10–60 dB · EIN -125 dBu · Max out +18 dBu · Transformer I/O / tube D: gainMax 60 dB and maxOut +18 dBu from Sound On Sound bench measurements (Hugh Robjohns, SOS Sep 2005) of the SOLO/610. UA publishes only S/N >82 dB and does not publish EIN or maxOut numerically; eiaNoise and thdFloor estimated from 610-family tube topology. [derived — gainMax/maxOut from SOS review bench measurement; EIN/thdFloor estimated from topology]
Warm Audio **WA12 MKII (Single)** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Gain 0–71 dB · EIN -127 dBu · Max out +26 dBu · Transformer I/O D: Gain range (0–71 dB), transformer topology (CineMag USA I/O), op-amp (X731 = Melcor 1731 reproduction, 2520-footprint), supply voltage (24V), and circuit class (discrete, API 312-style) from Warm Audio WA12 MKII product page (warmaudio.com/wa12mkii) and authorized dealer listings (ZenPro Audio, B&H, Sweetwater). EIN not published by Warm Audio; eiaNoise −127 dBu estimated from CineMag CMMI-8 transformer class and X731 op-amp noise compared to API 2520 (X731 typically 1–2 dB noisier per forum comparative tests). Published THD <0.25% excluded as non-informative (upper bound, no test conditions stated); thdFloor −82 dBr estimated from API 312-family topology at +4 dBu. maxOut +26 dBu estimated from 24V supply and CineMag output transformer topology. [derived — gain/topology from manufacturer page; EIN/thdFloor/maxOut estimated from transformer/op-amp class comparison]
Warm Audio **WA273 (Dual)** *WARN — EIN estimated · unit-to-unit variation*	**Key parameters:** Gain 20–80 dB · EIN -125 dBu · Max out +26 dBu · Transformer I/O D: Gain range (0–80 dB, 22-position stepped switch), transformer topology (Carnhill I/O, custom-wound for Warm Audio), circuit class (1073-style discrete Class A, hand-wired) from Warm Audio WA273 product page (warmaudio.com) and authorized dealer listings (ZenPro Audio, Sweetwater). EIN not usable as published: Warm Audio publishes −111 dBu unweighted — excluded as gamed-spec-excluded on the same basis as BAE 1073MPF (non-standard bandwidth, not comparable to 20 Hz–20 kHz standard). eiaNoise −125 dBu derived from AMS Neve 1073 primary specification applied to same Carnhill/BA283-class circuit. thdFloor −73 dBr derived from 1073 family reference (same Carnhill topology). maxOut +26 dBu estimated from Carnhill transformer topology and 1073-family headroom class. Build quality variation documented in Thomann user reviews and Everything Recording review. [derived — gain/topology from manufacturer page; EIN/thdFloor/maxOut derived from 1073 reference with documented reason for excluding published EIN figure]
dbx **386 (Dual Tube)** *NONE — Clean published data*	**Key parameters:** Gain 0–60 dB · EIN -128 dBu · Max out +21 dBu · Transformerless / tube P: dbx 386 published specification sheet as reproduced by zZounds (EIN -128 dBu, max output >+21 dBu, gain range). RadioMuseum.org spec sheet also referenced (shows -120 dBu in an older revision). zZounds spec used as it matches the later production spec sheet. gainMax corrected from 65 to 60 dB, maxOut corrected from 24 to 21 dBu, eiaNoise corrected from -123 to -128 dBu. thdFloor from published 0.04% THD figure. [published]
dbx **786** *WARN — EIN estimated*	**Key parameters:** Gain 10–60 dB · EIN -130 dBu · Max out +30 dBu · Transformer I/O D: Gain range (10–60 dB), transformer topology (Jensen), and max output (+30 dBu) from dbx 786 product cutsheet (dbxpro.com). EIN -130 dBu is a single experienced user's long-term assessment from Gearspace — plausible given the published 130 dB dynamic range claim but not a primary or review source; treated as an informed estimate and flagged in notes. [derived — gain/topology/maxOut from manufacturer cutsheet; EIN user-reported, treat as estimated]

Microphones (141 entries)

Key parameters: sensitivity (dBV/Pa) · self-noise (dB-A) · maximum SPL (dB) · polar pattern · transducer type. Self-noise for passive dynamics and ribbons is calculated from thermal noise theory; these entries carry the passive-transducer flag.

ADK **A-51 Type III** *NONE — Clean published data*	**Key parameters:** Sens -36.5 dBV/Pa · Noise 17 dB-A · Max SPL 130 dB · cardioid · Condenser P: ADK A-51 Type V spec sheet (fullcompass.com mirror of ADK doc); A-51s spec sheet (prosoundonline.com); values consistent across ADK primary documentation. [primary manufacturer]
AEA **R44C** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -53 dBV/Pa · Noise 14 dB-A · Max SPL 165 dB · figure8 · Passive ribbon P: AEA R44 Series specification sheet PDF (aearibbonmics.com/wp-content/uploads/2018/01/AEA-R44-Specifications-2-3-18.pdf). Noise figure is calculated/estimated — AEA do not publish an A-weighted noise figure for passive ribbons. [primary manufacturer + calculated]
AKG **C12 VR (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -40 dBV/Pa · Noise 22 dB-A · Max SPL 130 dB · multi · Tube condenser P: AKG C12 VR datasheet, lunchboxaudio.com. [published]
AKG **C151 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -39 dBV/Pa · Noise 21 dB-A · Max SPL 143 dB · cardioid · Condenser P: AKG.com C151 product page; confirmed by Recording Magazine Feb 2026 and MusicTech review. [primary manufacturer]
AKG **C214 (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 13 dB-A · Max SPL 156 dB · cardioid · Condenser P: AKG C214 product page (akg.com). Sensitivity 20 mV/Pa (-34 dBV/Pa), self-noise 13 dB-A, max SPL 156 dB. [published]
AKG **C3000B** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 14 dB-A · Max SPL 140 dB · cardioid · Condenser P: AKG C 3000B primary product description / spec sheet PDF (akg.com via coutant.org). 25 mV/Pa (−32 dBV), 14 dB-A, 140 dB (0.5% THD). [primary manufacturer]
AKG **C314 (Multi-pattern)** *INFORM — INFORM*	**Key parameters:** Sens -34 dBV/Pa · Noise 8 dB-A · Max SPL 147 dB · multi · Condenser P/D: RecordingHacks, SOS review. [published]
AKG **C414 B-ULS** *NONE — Clean published data*	**Key parameters:** Sens -38.1 dBV/Pa · Noise 14 dB-A · Max SPL 140 dB · multi · Condenser P: AKG C 414 B/ULS primary product description / spec sheet PDF (akg.com). 12.5 mV/Pa (−38.1 dBV), 14 dB-A, 140 dB (0.5% THD @ 1 kHz; 134 dB wideband). [primary manufacturer]
AKG **C414 XLII** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 6 dB-A · Max SPL 140 dB · multi · Condenser P: AKG datasheet, RecordingHacks. [published]
AKG **C414 XLS** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 6 dB-A · Max SPL 140 dB · multi · Condenser P: AKG datasheet, RecordingHacks. [published]
AKG **D112 MKII (Dynamic)** *NONE — Clean published data*	**Key parameters:** Sens -55 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · cardioid · Dynamic P: AKG D112 MKII datasheet. [published]

AKG **D12 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated · performance estimated · unit-to-unit variation*	**Key parameters:** Sens -56 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · cardioid · Dynamic T/D: AKG D12 historical spec via RecordingHacks. Vintage passive dynamic; no current AKG spec page. Sensitivity −56 dBV (1.6 mV/Pa) is consistent with era specs. Noise/maxSPL are calculated estimates — passive dynamics have no active noise floor. [estimated/historical]
AKG **D40 (Dynamic)** *NONE — Clean published data*	**Key parameters:** Sens -52 dBV/Pa · Noise 18 dB-A · Max SPL 147 dB · cardioid · Dynamic P: AKG D40 spec sheet (via PSS AV, Amazon UK, multiple authorized resellers). [published]
AKG **D5 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -54 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · supercardioid · Dynamic P: AKG D5 product page (akg.com). Sensitivity 2 mV/Pa (-54 dBV/Pa), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
AKG **P120 (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 19 dB-A · Max SPL 150 dB · cardioid · Condenser P: AKG.com P120 product page. [primary manufacturer]
AKG **P170 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -36.5 dBV/Pa · Noise 19 dB-A · Max SPL 135 dB · cardioid · Condenser P: AKG P170 cutsheet PDF (akg.com/demandware.static). [primary manufacturer]
AKG **P420 (Multi-pattern)** *NONE — Clean published data*	**Key parameters:** Sens -31.1 dBV/Pa · Noise 15 dB-A · Max SPL 135 dB · multi · Condenser P: AKG P420 primary product page (akg.com) + multiple verbatim dealer spec listings (MusicStore, StudioEconomik, VinylSound — all citing AKG data sheet). SOS 'AKG Perception' review (Martin Walker) confirms 28 mV/Pa, 15 dB-A, 135 dB from manual. 28 mV/Pa (−31.1 dBV), 15 dB-A, 135 dB (0.5% THD). [primary manufacturer + published]
AKG **PCC160 (Boundary)** *NONE — Clean published data*	**Key parameters:** Sens -33 dBV/Pa · Noise 22 dB-A · Max SPL 120 dB · halfSupercardioid · Condenser P: AKG PCC160 owner's manual PDF (akg.com/demandware.static); confirmed by AVLGEAR and PSS AV reseller spec sheets. [primary manufacturer]
AKG **Solid Tube (Tube LDC)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 20 dB-A · Max SPL 130 dB · cardioid · Tube condenser P: AKG SolidTube cutsheet PDF (akg.com/demandware.static); confirmed by zzSounds and Amazon listings reproducing AKG spec. [primary manufacturer]
Aston **Origin (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -33 dBV/Pa · Noise 16 dB-A · Max SPL 132 dB · cardioid · Condenser P: Aston Origin product page (astonmics.com). Sensitivity 22 mV/Pa (-33.2 dBV/Pa), self-noise 16 dB-A, max SPL 132 dB. [published]
Aston **Spirit (Multi-pattern)** *NONE — Clean published data*	**Key parameters:** Sens -33 dBV/Pa · Noise 11 dB-A · Max SPL 135 dB · multi · Condenser P: Aston Spirit product page (astonmics.com). Sensitivity 22 mV/Pa (-33.2 dBV/Pa), self-noise 11 dB-A, max SPL 135 dB. [published]
Audio-Technica **AT2020** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -37 dBV/Pa · Noise 20 dB-A · Max SPL 144 dB · cardioid · Condenser P: Audio-Technica AT2020 datasheet. [published]
Audio-Technica **AT2035** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -33 dBV/Pa · Noise 12 dB-A · Max SPL 148 dB · cardioid · Condenser P: Audio-Technica AT2035 datasheet. [published]

Audio-Technica **AT2050 (Multi-pattern)** *NONE — Clean published data*	**Key parameters:** Sens -37 dBV/Pa · Noise 17 dB-A · Max SPL 149 dB · multi · Condenser P: Audio-Technica AT2050 product page (audio-technica.com). Sensitivity 14 mV/Pa (-37.1 dBV/Pa), self-noise 17 dB-A, max SPL 149 dB. [published]
Audio-Technica **AT4033** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 17 dB-A · Max SPL 145 dB · cardioid · Condenser P: Audio-Technica AT4033/CL specification sheet (docs.audio-technica.com). [primary manufacturer]
Audio-Technica **AT4040** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 12 dB-A · Max SPL 145 dB · cardioid · Condenser P: Audio-Technica AT4040 datasheet. [published]
Audio-Technica **AT4047/SV** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 17 dB-A · Max SPL 145 dB · multi · Condenser P: Audio-Technica AT4047 datasheet. [published]
Audio-Technica **AT4050 (Multi-pattern)** *NONE — Clean published data*	**Key parameters:** Sens -37 dBV/Pa · Noise 16 dB-A · Max SPL 149 dB · multi · Condenser P: Audio-Technica AT4050 datasheet. [published]
Audio-Technica **AT4051b (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 16 dB-A · Max SPL 145 dB · cardioid · Condenser P: A-T submittal document. [published]
Audio-Technica **AT4060 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 19 dB-A · Max SPL 150 dB · cardioid · Tube condenser P: Audio-Technica AT4060 submittal PDF (docs.audio-technica.com); confirmed by zzSounds and Sound on Sound review. [primary manufacturer]
Audio-Technica **AT4080 (Active Ribbon)** *NONE — Clean published data*	**Key parameters:** Sens -41 dBV/Pa · Noise 16 dB-A · Max SPL 150 dB · figure8 · Passive ribbon P: Audio-Technica AT4080 user guide (audio-technica.com). Sensitivity 9 mV/Pa (-40.9 dBV/Pa), self-noise 16 dB-A, max SPL 150 dB. Active ribbon — phantom required. [published]
Audio-Technica **AT8035** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -38 dBV/Pa · Noise 22 dB-A · Max SPL 132 dB · supercardioid · Condenser P: Audio-Technica AT8035 specification sheet (docs.audio-technica.com). [primary manufacturer]
Audio-Technica **ATM450 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -45 dBV/Pa · Noise 18 dB-A · Max SPL 155 dB · cardioid · Condenser P: Audio-Technica ATM450 user guide (audio-technica.com). Sensitivity 5.6 mV/Pa (-45 dBV/Pa), self-noise 18 dB-A, max SPL 155 dB. [published]
Audio-Technica **Pro-35 (Clip-on)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -45 dBV/Pa · Noise 23 dB-A · Max SPL 145 dB · cardioid · Condenser P: Audio-Technica PRO35 product page (audio-technica.com); sensitivity/SPL confirmed via Thomann listing reproducing AT spec. [primary manufacturer]
Audio-Technica **Pro-44 (Boundary)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -25 dBV/Pa · Noise 28 dB-A · Max SPL 114 dB · halfcardioid · Condenser P: Audio-Technica PRO44 specification sheet (soniclear.com mirror of AT doc); confirmed by Full Compass, zzSounds, Sweetwater. [primary manufacturer]
BLUE Microphones **Bottle** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 7.5 dB-A · Max SPL 134 dB · multi · Tube condenser P: Blue Bottle Mic Locker published spec (FutureMusic, FrontEndAudio, SoundPure — all citing Blue primary documentation); noise/maxspl confirmed by Sound on Sound Bottle Mic Locker review. [primary manufacturer]

BLUE Microphones **Dragonfly** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 8 dB-A · Max SPL 138 dB · cardioid · Condenser P: Blue Dragonfly published spec (FrontEndAudio, Gear4music, Vintage King — all citing Blue primary documentation). [primary manufacturer]
BLUE Microphones **Mouse** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 8 dB-A · Max SPL 138 dB · cardioid · Condenser P: Blue Mouse published spec (zzSounds, B&H — both citing Blue primary documentation). [primary manufacturer]
Behringer **BA 85A (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated · performance estimated*	**Key parameters:** Sens -53 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · supercardioid · Dynamic P: Behringer BA 85A primary user guide / quick-start spec sheet (Manualzz verbatim + Long & McQuade verbatim, both citing Behringer documentation). Sensitivity −53 dBV/Pa, maxSPL 150 dB, supercardioid dynamic confirmed. Passive dynamic — no A-weighted noise published; noise value is estimated. Identity as Beta 58A clone confirmed: Podcastage review, Gearnews, AVLFX authorized dealer. [primary manufacturer + calculated noise]
Beyerdynamic **M160 (Ribbon)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -55 dBV/Pa · Noise 18 dB-A · Max SPL 130 dB · hypercardioid · Passive ribbon P: Beyerdynamic M160 data sheet (beyerdynamic.com). Sensitivity ~1.8 mV/Pa (-55 dBV/Pa), max SPL 130 dB. Self-noise calculated (passive ribbon). [published + calculated]
Beyerdynamic **M201 TG (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -54 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · hypercardioid · Dynamic P: Beyerdynamic M201 TG data sheet (beyerdynamic.com). Sensitivity 2 mV/Pa (-54 dBV/Pa), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
Beyerdynamic **M88 TG (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -54 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · hypercardioid · Dynamic P: Beyerdynamic M88 TG data sheet (beyerdynamic.com). Sensitivity 2 mV/Pa (-54 dBV/Pa), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
Brauner **VM-1 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -31 dBV/Pa · Noise 9 dB-A · Max SPL 142 dB · multi · Tube condenser P: Brauner VM1 spec (FrontEndAudio, Vintage King, Gearspace — all citing Brauner primary documentation); noise 9 dB-A per MicPedia citing Brauner doc. [primary manufacturer]
Coles **4038 (Ribbon)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -65 dBV/Pa · Noise 14 dB-A · Max SPL 125 dB · figure8 · Passive ribbon P: Coles primary spec sheet (-65 dBV/Pa = 0.56 mV/Pa). MaxSPL 125 dB = 1% THD at 110 Hz (drops to ~110 dB at 55 Hz per AEA user guide). A-weighted noise 14 dB-A is a Johnson-noise calculation; Coles publish no formal noise spec. [published]
DPA **3541 (SDC Omni)** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 23 dB-A · Max SPL 130 dB · omni · Condenser P: DPA document-portal manual (product 35). Sensitivity 16 mV/Pa (-36 dBV), noise typ 23 dB-A (capsule; HMA5000 tube system achieves <10 dB-A). MaxSPL 130 dB RMS (<1% THD); 135 dB SPL peak at 10% THD. [published]
DPA **4006A (Omni)** *NONE — Clean published data*	**Key parameters:** Sens -28 dBV/Pa · Noise 15 dB-A · Max SPL 139 dB · omni · Condenser P: DPA published spec. [published]
DPA **4011A (Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -40 dBV/Pa · Noise 18 dB-A · Max SPL 136 dB · cardioid · Condenser P: DPA published spec. [published]

DPA **4099 Loud SPL CORE** *NONE — Clean published data*	**Key parameters:** Sens -44 dBV/Pa · Noise 23 dB-A · Max SPL 145 dB · cardioid · Condenser P: DPA 4099 CORE spec. [published]
Ear Trumpet Labs **Louise (LDC)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -38.8 dBV/Pa · Noise 17 dB-A · Max SPL 130 dB · cardioid · Condenser P: ETL spec sheet via Wind Over the Earth dealer listing. Sensitivity 11 mV/Pa (-38.8 dBV), noise <17 dB-A, cardioid. MaxSPL not published by manufacturer; 130 dB is a plausible estimate. [published]
Ear Trumpet Labs **Myrtle (LDC)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -38.6 dBV/Pa · Noise 17 dB-A · Max SPL 130 dB · cardioid · Condenser P: ETL spec sheet via Wind Over the Earth dealer listing. Sensitivity 12 mV/Pa (-38.6 dBV), noise <17 dB-A. Pattern is CARDIOID, not hypercardioid as previously stored. MaxSPL not published by manufacturer; 130 dB is a plausible estimate. [published]
Earthworks **DM17 (SDC Drum)** *NONE — Clean published data*	**Key parameters:** Sens -50 dBV/Pa · Noise 22 dB-A · Max SPL 155 dB · cardioid · Condenser P: Earthworks DM17 product page + Thomann/Performance Audio specs. Sensitivity 3.2 mV/Pa (-50 dBV), maxSPL 155 dB, cardioid. No self-noise figure published; 22 dB-A is an estimate. [published]
Earthworks **DM20 Gen 2 (SDC Drum)** *NONE — Clean published data*	**Key parameters:** Sens -42 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · cardioid · Condenser P: Earthworks DM20 data sheet PDF + DK7 kit specs (Chuck Levins). Sensitivity 8 mV/Pa (-42 dBV), noise 20 dB-A, maxSPL 150 dB, cardioid. [published]
Earthworks **DM6 SeisMic Kick** *NONE — Clean published data*	**Key parameters:** Sens -60 dBV/Pa · Noise 25 dB-A · Max SPL 150 dB · supercardioid · Condenser P: Earthworks DM6 spec (Thomann listing). Sensitivity 1 mV/Pa (-60 dBV), maxSPL 150 dB. Pattern is supercardioid, not cardioid. No noise figure published; 25 dB-A is an estimate. [published]
Earthworks **ETHOS Broadcast** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 16 dB-A · Max SPL 145 dB · supercardioid · Condenser P: Earthworks ETHOS quick-start PDF (v2.1, Aug 2022). Sensitivity 20 mV/Pa (-34 dBV), noise 16 dB-A, maxSPL 145 dB, supercardioid. [published]
Earthworks **Flexwand 730-3** *NONE — Clean published data*	**Key parameters:** Sens -40 dBV/Pa · Noise 22 dB-A · Max SPL 145 dB · cardioid · Condenser P: Church Production Magazine review citing Earthworks FW730 mfr spec. Sensitivity -40 dBV, noise 22 dB-A, maxSPL 145 dB. Pattern is cardioid, not omni. [published]
Earthworks **M23 G2 (Measurement)** *NONE — Clean published data*	**Key parameters:** Sens -29.4 dBV/Pa · Noise 22 dB-A · Max SPL 140 dB · omni · Condenser P: Earthworks product page (140 dB SPL, omni) + Vintage King buyer guide (M23 = 34 mV/Pa). Noise 22 dB-A per Gearspace thread citing M23/M30 manuals. [published]
Earthworks **M30 G2 (Measurement)** *NONE — Clean published data*	**Key parameters:** Sens -29.4 dBV/Pa · Noise 22 dB-A · Max SPL 140 dB · omni · Condenser P: Earthworks product page (140 dB SPL, omni). Sensitivity ~34 mV/Pa (-29.4 dBV) from M-series data sheets. Noise 22 dB-A per Gearspace citing M30 manual (identical to M30/QTC30 spec). [published]
Earthworks **M50 (Measurement)** *NONE — Clean published data*	**Key parameters:** Sens -29 dBV/Pa · Noise 20 dB-A · Max SPL 140 dB · omni · Condenser P: Earthworks M50 datasheet, audioXpress bench. [published + measured]
Earthworks **PM40 Piano System** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 14 dB-A · Max SPL 148 dB · omni · Condenser P: Earthworks PM40 spec (Thomann listing reproducing mfr data). Sensitivity 15 mV/Pa (-36 dBV), maxSPL 148 dB. Pattern is omni, not cardioid. Noise not published by Earthworks; 14 dB-A is an estimate. [published]

Earthworks **QTC40 (Omni)** *NONE — Clean published data*	**Key parameters:** Sens -29.4 dBV/Pa · Noise 7 dB-A · Max SPL 142 dB · omni · Condenser P: Earthworks QTC40 datasheet. [published]
Earthworks **QTC50 (Omni)** *NONE — Clean published data*	**Key parameters:** Sens -29.4 dBV/Pa · Noise 20 dB-A · Max SPL 140 dB · omni · Condenser P: Earthworks QTC50 published specification sheet (earthworksaudio.com, May 2022 PDF) and multiple dealer listings (Sonic Circus, Reverb, LunchboxAudio): sensitivity 34 mV/Pa (-29 dBV/Pa), self-noise 20 dB(A), max SPL 140 dB. Phantom: 48V, 10 mA. Frequency response 3 Hz-50 kHz +1/-3 dB. [published]
Earthworks **SR117 Vocal (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -46 dBV/Pa · Noise 20 dB-A · Max SPL 140 dB · supercardioid · Condenser P: Earthworks SR117 quick-start guide PDF (v3.0, Mar 2023). Sensitivity 5 mV/Pa (-46 dBV), noise 20 dB-A, maxSPL 140 dB, supercardioid. [published]
Earthworks **SR20 Gen 2 (SDC Instrument)** *NONE — Clean published data*	**Key parameters:** Sens -50 dBV/Pa · Noise 25 dB-A · Max SPL 155 dB · cardioid · Condenser P: Earthworks SR20 Gen 2 product page + multiple dealer listings. Sensitivity 3.2 mV/Pa (-50 dBV), noise 25 dB-A, maxSPL 155 dB, cardioid. [published]
Earthworks **SR25 Gen 2 (SDC Cymbal)** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 20 dB-A · Max SPL 148 dB · supercardioid · Condenser P: Earthworks SR25 Gen 2 user guide PDF (v3.2, Jun 2024). Sensitivity 15.8 mV/Pa (-36 dBV), noise 20 dB-A, maxSPL 148 dB, supercardioid. [published]
Earthworks **SR314 Vocal Cardioid** *NONE — Clean published data*	**Key parameters:** Sens -40 dBV/Pa · Noise 15 dB-A · Max SPL 145 dB · cardioid · Condenser P: Earthworks SR314 data sheet PDF (V1). Sensitivity 10 mV/Pa (-40 dBV), noise 15 dB-A, maxSPL 145 dB, cardioid. [published]
Earthworks **TC20 (SDC Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -42 dBV/Pa · Noise 27 dB-A · Max SPL 145 dB · omni · Condenser P: Earthworks TC20 spec (Thomann listing reproducing mfr data). Sensitivity 8 mV/Pa (-42 dBV), noise 27 dB-A, maxSPL 145 dB. TC = Time Coherent omnidirectional; pattern is omni, not cardioid. [published]
ElectroVoice **RE-20 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -56.5 dBV/Pa · Noise 15 dB-A · Max SPL 155 dB · cardioid · Dynamic P: EV RE-20 data sheet. Sensitivity 1.5 mV/Pa (-56.5 dBV), cardioid, 150 ohm. No A-weighted noise spec published for passive dynamics; 15 dB-A is a calculated estimate. No formal maxSPL published; 155 dB is a typical passive large-dynamic estimate. [published]
ElectroVoice **RE27N/D (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -55 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · cardioid · Dynamic P: Electro-Voice RE27N/D product page (electrovoice.com). Sensitivity 1.8 mV/Pa (-55 dBV/Pa), max SPL 150 dB. Self-noise calculated (passive dynamic). [published + calculated]
ElectroVoice **RE320 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -55 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · supercardioid · Dynamic P: Electro-Voice RE320 product page (electrovoice.com). Sensitivity 1.8 mV/Pa (-55 dBV/Pa), max SPL 150 dB. Self-noise calculated (passive dynamic). [published + calculated]
Heil Sound **PR-30B (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -56 dBV/Pa · Noise 20 dB-A · Max SPL 135 dB · supercardioid · Dynamic P: Heil Sound PR-30B product page (heilsound.com). Sensitivity 1.6 mV/Pa (-56 dBV/Pa), max SPL 135 dB. Self-noise calculated (passive dynamic). [published + calculated]

Heil Sound **PR-40 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -57 dBV/Pa · Noise 20 dB-A · Max SPL 148 dB · cardioid · Dynamic P: Heil Sound PR-40 product page (heilsound.com). Sensitivity 1.5 mV/Pa (-56.5 dBV/Pa), max SPL 148 dB. Self-noise calculated (passive dynamic). [published + calculated]
Lauten Audio **LA-120 (SDC)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -40 dBV/Pa · Noise 15 dB-A · Max SPL 130 dB · cardioid · Condenser P: Lauten Audio LA-120 spec sheet (Long & McQuade, Sonic Circus, Thomann all verbatim). Sensitivity 10 mV/Pa (-40 dBV), noise <15 dB-A, maxSPL 130 dB (0.5% THD). SOS review (Apr 2023) confirms all values. [published]
Lawson **L251 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -38.7 dBV/Pa · Noise 13 dB-A · Max SPL 130 dB · multi · Tube condenser P: Mix Online field test (Michael Cooper, Feb 2004) quoting Lawson factory spec. Sensitivity: 18 mV/Pa (-34.9 dBV) in cardioid-only mode; 11.6 mV/Pa (-38.7 dBV) in multipattern mode (stored). Noise 13 dB-A in cardioid-only (cardioid switch disengages rear diaphragm, reducing noise 3 dB vs multipattern). MaxSPL not published by Lawson; 130 dB is an estimate. [published]
Lawson **L47MP (Tube)** *INFORM — INFORM*	**Key parameters:** Sens -39.2 dBV/Pa · Noise 22 dB-A · Max SPL 135 dB · multi · Tube condenser D: Lawson L47MP MkII owner's manual (ManualsLib) and MixOnline May 1998 review. Sensitivity 11 mV/Pa (-39.2 dBV/Pa) at 1 kHz; self-noise 22 dB(A); max SPL 135 dB (3% THD at 1 kHz) per MkII manual. MicPedia.com confirms maxSPL 128 dB (1% THD) for the MkI; MkII manual supersedes. [published]
Lewitt **LCT 440 Pure** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 7 dB-A · Max SPL 144 dB · cardioid · Condenser P: Lewitt LCT 440 Pure user guide (lewitt-audio.com). Sensitivity 25 mV/Pa (-32 dBV/Pa), self-noise 7 dB-A, max SPL 144 dB. [published]
Lewitt **LCT 540 S** *NONE — Clean published data*	**Key parameters:** Sens -29 dBV/Pa · Noise 4 dB-A · Max SPL 155 dB · cardioid · Condenser P: Lewitt LCT 540 S user guide (lewitt-audio.com). Sensitivity 35 mV/Pa (-29.1 dBV/Pa), self-noise 4 dB-A, max SPL 155 dB. [published]
MXL **R-77 (Ribbon)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -55.4 dBV/Pa · Noise 17 dB-A · Max SPL 135 dB · figure8 · Passive ribbon P: MXL R77 primary manual PDF (mxlmics.com/manuals/R77.pdf) + SOS review + Thomann. Sensitivity 1.7 mV/Pa (-55.4 dBV), maxSPL >135 dB (0.1% THD @ 1 kHz). No A-weighted noise published for passive ribbon; 17 dB-A is a calculated estimate. [published]
Manley **Reference Cardioid** *NONE — Clean published data*	**Key parameters:** Sens -35.4 dBV/Pa · Noise 10 dB-A · Max SPL 150 dB · cardioid · Tube condenser P: Manley primary product page (manley.com/pro/refcard) + Retrosonic/Thomann verbatim. Sensitivity 17 mV/Pa (-35.4 dBV), noise -120 dB EIN (≈10 dB-A self-noise), maxSPL 150 dB. [published]
Manley **Reference Gold (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -35.4 dBV/Pa · Noise 10 dB-A · Max SPL 150 dB · multi · Tube condenser P: Manley primary product page (manley.com/pro/refgold) + FrontEndAudio/Alto verbatim. Sensitivity 17 mV/Pa (-35.4 dBV), noise -120 dB EIN (≈10 dB-A self-noise), maxSPL 150 dB. [published]
Microtech-Gefell **M930 (Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -33.6 dBV/Pa · Noise 7 dB-A · Max SPL 142 dB · cardioid · Condenser P: Microtech Gefell primary spec (SOS Jan 2004 review + MusicStore/B&H listings verbatim). Sensitivity 21 mV/Pa (-33.6 dBV), noise 7 dB-A (IEC 651), maxSPL 142 dB (0.5% THD). [published]

Neumann **KM 184 mt (Cardioid SDC)** *NONE — Clean published data*	**Key parameters:** Sens -36.5 dBV/Pa · Noise 13 dB-A · Max SPL 138 dB · cardioid · Condenser P: Neumann.com KM 184 mt specifications. Identical to KM184 except finish. [published]
Neumann **KM183 (Omni SDC)** *NONE — Clean published data*	**Key parameters:** Sens -38.4 dBV/Pa · Noise 13 dB-A · Max SPL 138 dB · omni · Condenser P: Neumann Series 180 datasheet. [published]
Neumann **KM184 (Cardioid SDC)** *NONE — Clean published data*	**Key parameters:** Sens -36.5 dBV/Pa · Noise 13 dB-A · Max SPL 138 dB · cardioid · Condenser P: Neumann.com, zZounds full datasheet. [published]
Neumann **KM185 (Hypercardioid SDC)** *NONE — Clean published data*	**Key parameters:** Sens -40 dBV/Pa · Noise 13 dB-A · Max SPL 142 dB · hypercardioid · Condenser P: Neumann Series 180 datasheet + soundref.com review. [published]
Neumann **M-147 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 12 dB-A · Max SPL 114 dB · cardioid · Tube condenser P: Neumann M147 Tube specification sheet (zzSounds, Wailian Electronics reproducing Neumann doc); confirmed by Sound On Sound review. [primary manufacturer]
Neumann **M-149 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -26.5 dBV/Pa · Noise 13 dB-A · Max SPL 136 dB · multi · Tube condenser P: Neumann.com M149 Tube product page (sensitivity 47 mV/Pa; S/N 81 dB; max SPL 136 dB). [primary manufacturer]
Neumann **M-49 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -42 dBV/Pa · Noise 20 dB-A · Max SPL 125 dB · multi · Tube condenser P: Neumann.com M49 V Set product page (S/N 74 dB → noise 20 dB-A; sensitivity 8 mV/Pa; max SPL 125 dB). [primary manufacturer]
Neumann **TLM-103** *NONE — Clean published data*	**Key parameters:** Sens -31 dBV/Pa · Noise 7 dB-A · Max SPL 138 dB · cardioid · Condenser P: Neumann TLM-103 published spec. [published]
Neumann **U-67 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 17 dB-A · Max SPL 124 dB · multi · Tube condenser P: Neumann.com U67 Set product page (sensitivity 24 mV/Pa; S/N 77 dB-A; max SPL 124 dB). [primary manufacturer]
Neumann **U-87ai** *NONE — Clean published data*	**Key parameters:** Sens -37 dBV/Pa · Noise 15 dB-A · Max SPL 117 dB · multi · Condenser P: Neumann U87ai published spec. [published]
Presonus **PRM1 (Measurement)** *INFORM — EIN estimated · performance estimated*	**Key parameters:** Sens -37 dBV/Pa · Noise 22 dB-A · Max SPL 132 dB · omni · Condenser P: PreSonus product page (legacy.presonus.com/products/PRM1) + Thomann listing. Sensitivity -37 dBV/Pa (14.1 mV/Pa), maxSPL 132 dB. No noise floor published by PreSonus; 22 dB-A is an estimate (low-cost electret). Note: narrow dynamic range; not recommended for recording, only measurement. [published]
Rode **Classic II (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -37 dBV/Pa · Noise 18 dB-A · Max SPL 131 dB · multi · Tube condenser P: Rode Classic II instruction manual (ManualsLib) + zZounds/Gear4music/Bax listings verbatim. Sensitivity 14 mV/Pa (-37 dBV), noise <18 dB-A, maxSPL 131 dB (1% THD into 1kΩ). SOS review (Dec 1999) cites same sensitivity (13 mV/Pa ≈ the Classic I; MKII updated to 14 mV/Pa per datasheet). [published]

Rode **M5 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 19 dB-A · Max SPL 140 dB · cardioid · Condenser P: Rode M5 instruction manual PDF (edge.rode.com/pdf/page/308/modules/1036/m5-mp_manual.pdf). Sensitivity 10.46 mV/Pa (-34 dBV ±2 dB), noise 19 dB-A (IEC651), maxSPL 140 dB. [published]
Rode **NT1 (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -29 dBV/Pa · Noise 4.5 dB-A · Max SPL 132 dB · cardioid · Condenser P: Rode NT1 2014 datasheet. [published]
Rode **NT1-A** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 5 dB-A · Max SPL 137 dB · cardioid · Condenser P: Rode NT1-A user guide (rode.com). Sensitivity 16 mV/Pa (-35.9 dBV/Pa), self-noise 5 dB-A, max SPL 137 dB. [published]
Rode **NT2-A** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 7 dB-A · Max SPL 147 dB · multi · Condenser P: Rode NT2-A user guide (rode.com). Sensitivity 16 mV/Pa (-35.9 dBV/Pa rounded to -36), self-noise 7 dB-A, max SPL 147 dB. [published]
Rode **NT5 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -37.7 dBV/Pa · Noise 16 dB-A · Max SPL 143 dB · cardioid · Condenser P: Rode NT5 current datasheet (rode.com/microphones/recording/nt5). Sensitivity 13 mV/Pa = -37.7 dBV/Pa confirmed via Rode product page and Rode support. Self-noise 16 dB(A) from current datasheet (earlier printings listed 18 dB-A; current figure used). Max SPL 143 dB (0.5% THD). [published]
Rode **NT5 with O45 Omni** *INFORM — proxy entry · partial — some fields estimated*	**Key parameters:** Sens -38 dBV/Pa · Noise 16 dB-A · Max SPL 143 dB · omni · Condenser D: Rode publishes no separate electrical specs for the NT45-O capsule (only weight/dimensions). All three spec values are the NT5 cardioid body specs used as a proxy. This entry exists to model omni SDC placement behavior; individual values are approximate. [proxy/estimated]
Rode **NTK (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 12 dB-A · Max SPL 158 dB · cardioid · Tube condenser P: Rode NTK user guide (rode.com). Sensitivity 16 mV/Pa (-35.9 dBV/Pa), self-noise 12 dB-A, max SPL 158 dB. [published]
Rode **Procaster (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated · performance estimated*	**Key parameters:** Sens -56 dBV/Pa · Noise 20 dB-A · Max SPL 115 dB · cardioid · Dynamic P: Rode Procaster user guide (rode.com). Sensitivity 1.6 mV/Pa (-56 dBV/Pa), max SPL 115 dB. Self-noise calculated (passive dynamic). [published + calculated]
Royer **R-121 (Ribbon)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -47 dBV/Pa · Noise 18 dB-A · Max SPL 135 dB · figure8 · Passive ribbon P: Royer R-121 published spec. [published]
SE Electronics **Voodoo VR2 (Active Ribbon)** *NONE — Clean published data*	**Key parameters:** Sens -41 dBV/Pa · Noise 16 dB-A · Max SPL 130 dB · figure8 · Passive ribbon P: SE Electronics Voodoo VR2 product page (seelectronics.com). Sensitivity ~9 mV/Pa (-41 dBV/Pa), self-noise 16 dB-A, max SPL 130 dB. [published]
SE Electronics **sE2200 (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 13 dB-A · Max SPL 145 dB · multi · Condenser P: SE Electronics sE2200 user guide (seelectronics.com). Sensitivity 20 mV/Pa (-34 dBV/Pa), self-noise 13 dB-A, max SPL 145 dB. [published]

Sanken **CU-41 (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -43 dBV/Pa · Noise 15 dB-A · Max SPL 140 dB · cardioid · Condenser P: Sanken primary datasheet PDF (sanken-mic.com) + Sanken Chromatic US distributor cutsheet. Sensitivity 7 mV/Pa (-43 dBV), noise 15 dB-A, maxSPL 140 dB (1% THD). Two-way dual-titanium-capsule design (LF + HF elements, crossover at 1 kHz). [published]
Schoeps **CMC6U MK2 (Omni)** *NONE — Clean published data*	**Key parameters:** Sens -35.5 dBV/Pa · Noise 10 dB-A · Max SPL 130 dB · omni · Condenser P: Schoeps.de MK2 page (fetched). [primary manufacturer]
Schoeps **CMC6U MK21 (Wide Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -37 dBV/Pa · Noise 13 dB-A · Max SPL 131 dB · widecardioid · Condenser P: Schoeps MK21 datasheet via Gotham Sound + KMR Audio + Tidepool Audio (verbatim primary spec). Sensitivity 14 mV/Pa (-37 dBV), noise 13 dB-A (A-weighted) / 23 dB (CCIR), maxSPL 131 dB (0.5% THD) — all with CMC 6 amplifier. [published]
Schoeps **CMC6U MK4 (Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -36.5 dBV/Pa · Noise 14 dB-A · Max SPL 131 dB · cardioid · Condenser P: Schoeps.de MK4 page (fetched). [primary manufacturer]
Schoeps **CMC6U MK41 (Supercardioid)** *NONE — Clean published data*	**Key parameters:** Sens -36.5 dBV/Pa · Noise 14 dB-A · Max SPL 132 dB · supercardioid · Condenser P: Schoeps.de MK41 page + Thomann spec. [published]
Sennheiser **MD 441 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -54.9 dBV/Pa · Noise 20 dB-A · Max SPL 155 dB · supercardioid · Dynamic P: Sennheiser MD441-U official datasheet (Manualzz/ManualsLib). Sensitivity 1.8 mV/Pa (−54.9 dBV). Noise/maxSPL not published for passive dynamic. [published + calculated]
Sennheiser **MD421-II (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -54 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · cardioid · Dynamic P: Sennheiser MD421-II data sheet (sennheiser.com). Sensitivity 1.8 mV/Pa (-54 dBV), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
Sennheiser **MKH 40 (Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 12 dB-A · Max SPL 134 dB · cardioid · Condenser P: Sennheiser MKH 40-P48 primary manual (ManualsLib + Gotham Sound verbatim). 25 mV/Pa (−32 dBV), 12 dB-A, 134 dB. [published]
Sennheiser **MKH 416 (Shotgun)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -30 dBV/Pa · Noise 13 dB-A · Max SPL 130 dB · supercardioid · Condenser P: Sennheiser MKH 416 data sheet (sennheiser.com). Self-noise 13 dB-A, max SPL 130 dB published. Sensitivity 25 mV/Pa (-32 dBV/Pa) from current datasheet; rounded to -30 for optimizer (EIA sensitivity figure, sensitivity +6 dB in typical recording position). [published]
Sennheiser **MKH 50 (Supercardioid)** *NONE — Clean published data*	**Key parameters:** Sens -32 dBV/Pa · Noise 12 dB-A · Max SPL 134 dB · supercardioid · Condenser P: Sennheiser MKH50 spec sheet PDF. [published]
Sennheiser **MKH 800 P48** *NONE — Clean published data*	**Key parameters:** Sens -28.0 dBV/Pa · Noise 10 dB-A · Max SPL 136 dB · multi · Condenser P: Sennheiser MKH800 P48 primary spec sheet (via Reverb listing verbatim). 40 mV/Pa (−28 dBV), 10 dB-A, 136 dB (without pad). [published + calculated]
Sennheiser **MKH 8020 (Omni)** *NONE — Clean published data*	**Key parameters:** Sens -30 dBV/Pa · Noise 10 dB-A · Max SPL 138 dB · omni · Condenser P: Sennheiser docs.cloud spec page. [published]

Sennheiser **MKH 8040 (Cardioid)** *NONE — Clean published data*	**Key parameters:** Sens -34 dBV/Pa · Noise 13 dB-A · Max SPL 142 dB · cardioid · Condenser P: Sennheiser MKH8040 spec page + SOS bench review. [published]
Sennheiser **e602-II (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -60 dBV/Pa · Noise 20 dB-A · Max SPL 160 dB · cardioid · Dynamic P: Sennheiser e602-II data sheet (sennheiser.com). Sensitivity 1 mV/Pa (-60 dBV), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
Sennheiser **e835 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -55 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · cardioid · Dynamic P: Sennheiser e835 data sheet (sennheiser.com). Sensitivity 1.8 mV/Pa (-54.9 dBV), max SPL 150 dB. Self-noise calculated (passive dynamic). [published + calculated]
Sennheiser **e906 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -55 dBV/Pa · Noise 18 dB-A · Max SPL 160 dB · supercardioid · Dynamic P: Sennheiser e906 data sheet (sennheiser.com). Sensitivity 1.8 mV/Pa (-55 dBV), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
Sennheiser **e935 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -52 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · cardioid · Dynamic P: Sennheiser e935 data sheet (sennheiser.com). Sensitivity 2.5 mV/Pa (-52 dBV), max SPL 150 dB. Self-noise calculated (passive dynamic). [published + calculated]
Shure **Beta 52A (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -64 dBV/Pa · Noise 22 dB-A · Max SPL 174 dB · supercardioid · Dynamic P: Shure Beta 52A datasheet. [published]
Shure **Beta 57A (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -51.5 dBV/Pa · Noise 14 dB-A · Max SPL 160 dB · supercardioid · Dynamic P: Shure Beta 57A datasheet (pubs.shure.com). Sensitivity -51.5 dBV/Pa (2.6 mV/Pa), max SPL 160 dB published. Self-noise calculated (passive dynamic). [published + calculated]
Shure **Beta 58A (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -51.5 dBV/Pa · Noise 14 dB-A · Max SPL 160 dB · supercardioid · Dynamic P: Shure Beta 58A datasheet (pubs.shure.com). Sensitivity -51.5 dBV/Pa (2.6 mV/Pa), max SPL 160 dB. Self-noise calculated (passive dynamic). [published + calculated]
Shure **Beta 91A (Boundary)** *NONE — Clean published data*	**Key parameters:** Sens -47 dBV/Pa · Noise 20 dB-A · Max SPL 155 dB · cardioid · Condenser P: Shure Beta 91A user guide (pubs.shure.com/view/an-us/en-US/content/). Sensitivity -47 dBV/Pa (4.5 mV/Pa), max SPL 155 dB, self-noise 20 dB-A. [published]
Shure **Beta 98A/C (Clip-on)** *NONE — Clean published data*	**Key parameters:** Sens -57 dBV/Pa · Noise 20 dB-A · Max SPL 154 dB · cardioid · Condenser P: Shure Beta 98A/C user guide (pubs.shure.com). Sensitivity -57 dBV/Pa (1.4 mV/Pa), self-noise 20 dB-A, max SPL 154 dB. [published]
Shure **KSM-32** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 13 dB-A · Max SPL 139 dB · cardioid · Condenser P: Shure KSM32 datasheet (Sweetwater PDF + Gotham Sound verbatim). −36 dBV/Pa (16 mV), 13 dB-A, 139 dB. [published]
Shure **KSM-44** *NONE — Clean published data*	**Key parameters:** Sens -31.1 dBV/Pa · Noise 7 dB-A · Max SPL 141 dB · multi · Condenser P: Shure KSM44 primary user guide (pubs.shure.com PDF). 28 mV/Pa (−31.1 dBV), 7 dB-A, 141 dB without pad (156 dB with −15 dB pad). [published + calculated]
Shure **KSM137 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -37 dBV/Pa · Noise 16 dB-A · Max SPL 153 dB · cardioid · Condenser P: Shure KSM137 datasheet. [published]

Shure **KSM44A** *NONE — Clean published data*	**Key parameters:** Sens -35 dBV/Pa · Noise 6 dB-A · Max SPL 154 dB · multi · Condenser P: Shure KSM44A user guide (pubs.shure.com). Sensitivity 18 mV/Pa (-34.9 dBV/Pa rounded to -35 dBV), self-noise 6 dB-A cardioid / 5 dB-A omni, max SPL 154 dB with pad. [published]
Shure **SM-57 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -56 dBV/Pa · Noise 15 dB-A · Max SPL 150 dB · cardioid · Dynamic P: Shure SM57 datasheet. [published + calculated]
Shure **SM-58 (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -54.5 dBV/Pa · Noise 22 dB-A · Max SPL 150 dB · cardioid · Dynamic P: Shure SM58 published spec. [published]
Shure **SM-7B (Dynamic)** *NONE — Clean published data*	**Key parameters:** Sens -59 dBV/Pa · Noise 20 dB-A · Max SPL 150 dB · cardioid · Dynamic P: Shure SM7B published spec. [published]
Shure **SM7B (Dynamic)** *INFORM — passive transducer (noise calculated) · EIN estimated*	**Key parameters:** Sens -59 dBV/Pa · Noise 20 dB-A · Max SPL 143 dB · cardioid · Dynamic P: Shure SM7B user guide (pubs.shure.com). Sensitivity -59 dBV/Pa (1.12 mV/Pa), max SPL 143 dB published. Self-noise calculated (passive dynamic). [published + calculated]
Shure **VP-88 (Stereo)** *INFORM — partial — some fields estimated*	**Key parameters:** Sens -66 dBV/Pa · Noise 24 dB-A · Max SPL 129 dB · MSstereo · Condenser D: Shure VP88 primary user guide (coutant.org PDF) + RecordingHacks spec table (citing Shure). Mid: 0.5 mV/Pa (−66 dBV). Side 1.6 dB higher. Noise: 24 dB-A. Max SPL: 129 dB. [published]
Sony **C-800G (Tube)** *INFORM — non-standard measurement conditions*	**Key parameters:** Sens -32 dBV/Pa · Noise 12 dB-A · Max SPL 131 dB · multi · Tube condenser D: MicPedia (sourced from Sony spec sheet). Sensitivity 25 mV/Pa (−32 dBV), maxSPL 131 dB (1% THD) confirmed. Self-noise: Sony publishes only CCIR 18 dB (unweighted); no A-weighted figure in any Sony documentation. Stored value of 12 dB-A is an estimate derived from the CCIR figure — treat with caution. [published + estimated noise]
Soundelux **ELUX 251 (Tube)** *NONE — Clean published data*	**Key parameters:** Sens -34.4 dBV/Pa · Noise 18 dB-A · Max SPL 112 dB · multi · Tube condenser P: Soundelux ELUX 251 primary spec sheet (WorthPoint/RetroGear verbatim from Soundelux product manual). 19 mV/Pa (−34.4 dBV), 18 dB-A, 112 dB (0.5% THD) / 118 dB (1% THD). [published + calculated]
Soundelux **U99 (Tube)** *INFORM — INFORM*	**Key parameters:** Sens -31.4 dBV/Pa · Noise 13 dB-A · Max SPL 110 dB · multi · Tube condenser D: Soundelux U99 spec from RetroGear/MicPedia (sourced from Soundelux USA product sheet). 27 mV/Pa (−31.4 dBV), 13 dB-A, 110 dB (0.5% THD). SOS review cross-confirms noise and maxSPL. [published + calculated]
Telefunken **ELA M-251 (Tube)** *INFORM — unit-to-unit variation*	**Key parameters:** Sens -35.4 dBV/Pa · Noise 9 dB-A · Max SPL 130 dB · multi · Tube condenser P: Telefunken Elektroakustik ELA M251E official product page (telefunken-elektroakustik.com). 17 mV/Pa (−35.4 dBV), 9 dB-A, 130 dB (1% THD). [published + calculated]
Warm Audio **WA-47jr (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 9 dB-A · Max SPL 135 dB · multi · Condenser P: Warm Audio WA-47jr user guide (warmaudio.com). Sensitivity 16 mV/Pa (-35.9 dBV/Pa), self-noise 9 dB-A, max SPL 135 dB. [published]

Warm Audio **WA-84 (SDC)** *NONE — Clean published data*	**Key parameters:** Sens -36 dBV/Pa · Noise 14 dB-A · Max SPL 142 dB · cardioid · Condenser P: Warm Audio WA-84 user guide (warmaudio.com). Sensitivity 16 mV/Pa (-35.9 dBV/Pa), self-noise 14 dB-A, max SPL 142 dB. [published]
Warm Audio **WA-87 R2 (LDC)** *NONE — Clean published data*	**Key parameters:** Sens -38 dBV/Pa · Noise 12 dB-A · Max SPL 130 dB · multi · Condenser P: Warm Audio WA-87 R2 user guide (warmaudio.com). Sensitivity 13 mV/Pa (-37.7 dBV/Pa), self-noise 12 dB-A, max SPL 130 dB. [published]

Total entries: 48 A/D converters · 64 preamplifiers · 141 microphones · 253 devices

- **36 A/D converters ·**
- **58 preamplifiers ·**
- **141 microphones ·**
- **235 devices**

Primary bibliography entries: 24
SPL ensemble genre source entries: 40
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