The newest integrated amplifier from Pass Labs is the pure Class A INT-25.

This conservatively rated 25 wpc beast of an amp is filled with all kinds of high-quality parts that were specifically selected and assembled by one of the greatest amplifier design teams on the planet. This solid-state amp is really put together and ready to provide a lifetime of audio bliss.

The Pass Labs INT-25 blew me away with its audio performance. To begin with, it produced well over twice the rated power. Then I found it could drive speakers that had even moderate sensitivity. All that was nice but the real story is this amplifier, more than any amp I have reviewed in the last 15 years, let me get lost in the music the way we all strive for. I was able to put on a record, kick my feet up, and forget about the stressors of the day feeling like I was one with the music.

Highlights

Pass Labs INT-25 Integrated Amplifier

- Surprisingly massive amplifier with extreme build quality.
- Simple to set up and use.
- Handy little remote for the most basic functions.
- Realistic soundstaging and imagery that draws listeners in.
- Power beyond its rating to drive a variety of speakers.
- Wonderful rhythm, pace, and drive.
- Subterranean bass response.
- Immerses you into the music unlike any other amp I have tested.

Introduction

Pass Labs was founded by Nelson Pass in 1991 in his home in the Sierra Nevada foothills. He immediately

made waves in the audio industry by churning out highly regarded and seriously well-made amplifiers. In the ensuing 30 years, Mr. Pass has updated, evolved, and improved the circuit topologies of all his amplification components. I just counted a total of 24 different amplification products currently available on the Pass labs website. This count doesn't cover the myriad products available from Mr. Pass' sister company, First Watt. If you have an amplification need, you can find a Pass Labs amplifier that will fit the bill, no matter what!

The amplifiers that Pass Labs offers are all solid state. None are the newer classes like Class D or Class G. They are all either Class A or AB. So, these are tried and true technologies but Mr. Pass and his team are in a constant state of wonderment and are always trying new things in an effort to achieve audio greatness.

When it comes to the INT-25, it is Pass Labs' lowest rated integrated amp in terms of power output. It is fundamentally an amalgamation of a single-ended version of the preamp section from the INT-60 and INT-250. The amplifier section is modeled after the XA25 stereo power amp. The INT-25 under review here was completely designed by one of Nelson Pass' partners, Mr. Wayne Colburn. I will have more to say about Wayne further down in this review.

Design

I had some difficulty collecting my thoughts in writing this section of my review of the Pass Labs INT-25. When it comes to my puerile understanding of circuit design (I am a Civil Engineer for crying out loud), my ability to understand the technical discussion from Pass Labs was a bit of a challenge. It was reminiscent of a theologian explaining how a man cannot look at God and see God but can only know God in an abstract manner or through an oracle perhaps. This is how I felt trying to cipher Pass' team's attempts to educate me.

The two people who tried explaining all this to me were Mr. Pass himself along with one of his chief engineers, Wayne Colburn. Wayne originally went to work with Nelson Pass at Threshold in 1989. They have worked together sense and Wayne is one of four partners in Pass Labs. Wayne is something of a Renaissance Man and has savant-like skills when troubleshooting all manner of electronic and mechanical devices. He is now fully responsible for design of all preamplifiers, phono preamplifiers, and integrated amplifiers produced at Pass Labs. That means, the INT-25 is Wayne's baby!

PASS LABS INTEGRATED AMPLIFIER SPECIFICATIONS

Design:
Pure Class A Solid State Integrated Amplifier
Amplifier Section
Power Output:
25 W RMS, 8 Ω
50 W RMS, 4 Ω
Gain:
26dB
Damping Factor
500
Frequency Response:
DC – 100 kHz -2 dB
THD:
<0.1% at 1 kHz, 25 W, 8 Ω
Residual Noise:
< 150 uV output, unweighted 20 to 20 KHz
Inputs:
Three (3) RCA
Input Impedance:
48 kΩ
Speaker Outs:
1 Pair Multi-Way Binding Posts
Idle Power draw:
~2.25 Amps @ 120 VAC
Dimensions:
17" W x 17.13" D x 6" H
Weight:
51 Pounds
MSRP:
$7,250 USD
Website:
passlabs.com
Company:
Pass Labs
SECRETS Tags:
Pass, Pass Labs, Pass Labs INT-25, Class A, Integrated amplifier, Amplifier, Solid State , Amplifier Review 2021

The overarching theme of the INT-25's design relates to a design philosophy that I feel can be summarized as follows:

- Minimalist design
- Single-ended
- Fewer parts in the signal chain
- Linear topologies
- Class A

Let's begin with a brief overview of the INT-25's preamp section. The preamp section is a simplified single-ended version of the one used in the INT-60 and INT-250 with three line level inputs and no line level output. (I sometimes wish the INT-25 had a line level output.)

Wayne described the preamp section for me, "The preamp section is a self-biased complimentary pair of JFETs and a pair of bipolars all running class A. It is low open loop gain with minimal feedback. It is low distortion and very DC stable."

The volume control runs off the remote and/or a front panel optical encoder fed to a micro controller. This then feeds an off-the-shelf volume chip that is only precision resistors and switches. There is no gain or DC offset. Wayne says it is "pretty transparent"! This style of volume control (precision resistor-based) is key to a high-performance preamp design.

The power amp section is much more interesting to contemplate. The stated power rating of this amp is 25 wpc into an 8 Ω load. I measured the review unit and found it produces twice this amount of power at lower than the claimed distortion. This may be partially due to the fact that the output transistors are 700 watt / 40 amp-rated industrial FET devices. So even at double the expected power output, the transistors are essentially loafing along.

One signature feature of the INT-25 is that it does not use "degeneration" which Wayne equates to "that other negative feedback". What he means is that degeneration lowers the gain and measured distortion but increases the proportion of higher-order harmonics similar to the effects of negative feedback.

He overcomes this by way of a considered selection of the best internal components for the job. In a nutshell, Bipolar transistors exhibit a logarithmic transfer curve. Bipolar transistors, therefore, need degeneration to flatten the distortion while increasing the output impedance (not good). This phenomenon can be overcome by designing an amplifier with multiple gain stages to achieve the desired results. When you have multiple gain stages in series, the distortion not only increases along the way, but becomes more complex and audibly more annoying. Or this phenomenon can also be managed by inserting resistance in series with the Emitter or Source pins of the transistor which is basis of the term “degeneration”.

If you want to design a power amp with Bipolar output transistors, the best solution may well be to include massive banks of parallel Bipolar transistors. This design philosophy tends to become unwieldy and prohibitively expensive.

On the other hand, FETs have what is known as a square law character – the current through the device is a function of the square of the control voltage. Put another way, the current from Drain to Source depends on the voltage between the Gate and Source pins. This is not linear, per se, but much closer to linear than we see with a Bipolar transistor.

The main point of this discussion is that FETs perform better without degeneration because, as square law devices, FETs nicely cancel, delivering a constant low output impedance without distortion. This is simply the result of the square law math. So, the INT-25’s most salient design feature revolves around a single pair of industrial-grade FETs without degeneration.

Wayne has other tricks up his sleeve which I suspect he will divulge at some point at a future date. Other benefits of the INT-25’s design are:

- Constant-current bias
- No ballast resistors
- Direct-coupled amplifier section that requires no DC servos or frequency compensation.

My opinion is that Nelson and Wayne follow a minimalist approach utilizing the best parts available and this, in my opinion, is much better than any brute force design philosophy. At least it works this way in Civil Engineering too.

Setup

The Pass Labs INT-25 integrated amplifier was about as simple to set up as any modern- day amplifier on the market. It's something of a throw-back in that regard.

It doesn't have a built-in DAC or DSP or even balanced inputs. There are no subwoofer outputs and of course no high-pass filters. This amplifier is essentially a massively over designed and over built Class A stereo amp that has a nice resistor-ladder volume control and switches up to three unbalanced sources. That's all she wrote.

The hardest part of the set up was schlepping the 50+ pounds of American hardware onto my stand. Once there, I connected my Topping D90 DAC to Input 1 and a Parasound phono preamp to Input 2. Then I connected the speaker outs to my beloved VIVID Kaya 90 floor standing speakers.

The Pass Labs INT-25 comes with an aluminum IR remote that can handle the most basic functions only – power toggle, input selection, volume control, and display brightness.

I don't know about you, but I think this amp is excellent in this way. It is simple, straight forward and not at all fiddly. I may have hoped for a balance control or even a subwoofer line level out (or any line out for that matter). But since I am totally happy with the VIVID Kaya 90's the Pass Labs INT-25 was pretty much ideal for my two-channel needs. The VIVIDS are large-ish and reasonably sensitive and "25 watts" was more than enough power even in my large listening space.

In Use

I love that the INT-25 is about as rudimentary as they come! This product can be viewed as a high-end power amp with switching for three unbalanced sources and a properly designed and executed volume control. Oh wait, it does come with a nice remote and it includes a Mute function. That, in a nutshell is the essence of this amplifier and I love it.

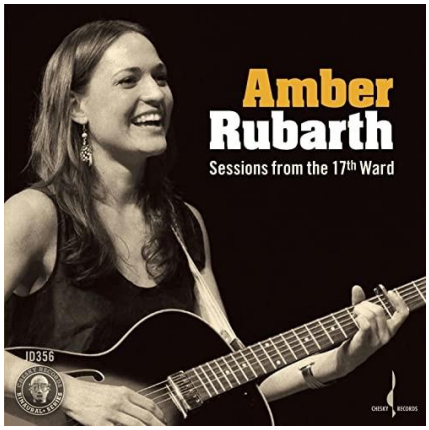
I have always had a fondness for audio products that eschew unnecessary features and just give you the best audio quality that they can provide. That is the overriding theory, but some products claim they delete features to up the quality of the key parts in their designs. This sounds good until you evaluate their products and discover they just cut the features and charged a premium, but they did not give you upgraded internals.

This is not the case with the Pass Labs INT-25. Wayne really did pack this amp with all-around high-quality parts. So, it has that going for it. Parts are great, right? But you need to know what you are doing to assemble them into a workable product. This is where the Pass Labs team really shine. The R&D they have done along with their fabrication and assembly practices leads to a fully realized product of great quality.

The set up of the INT-25 was as simple as could be. I connected my Topping D90 DAC to Input 1, my Parasound phono preamp to Input 2, and my LG OLED TV to input 3 (for casual TV watching). I then connected the power cord and my speakers. I tested the INT-25 with two different sets of speakers – the VIVID Kaya 90's and the Revel F226Be towers. The amp was able to drive both if these in a fairly large space without any issues though the VIVID's are subjectively more sensitive than the Revel and so that was a better, more synergistic match with the INT-25. (I said subjectively because both speakers have the same rated sensitivity but in practice, the VIVIDs were an easier load.)

I know I just went on a mini rave about how I love minimalist products, but I did miss two possible features that were omitted from the INT-25: I love having a channel balance control, especially one that can be remote-controlled, and I also like a polarity toggle to play with. So, I will add these to the "Would Like to See" section at the end of the review.

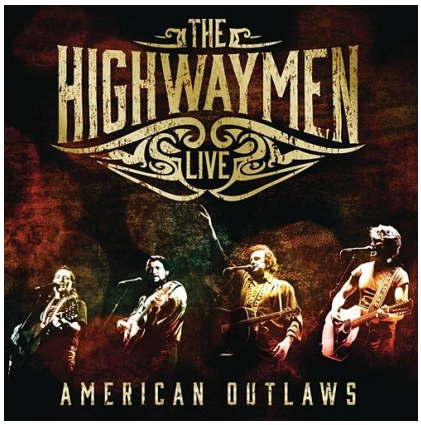
The INT-25 was the amplifier I used when reviewing a complete suite of Clarus Crimson MK II Cables. You can read the review here.



I linked it for you because all the great stuff I said about the cables applied to the entire system and most especially this amazing "little" amplifier. The first thing you notice during an audition is how powerful this amp is. When you see the power rating it is easy to feel that this amp would only work with the most sensitive speaker designs. Over the years, especially when I started to build a home theater, I reached the conclusion that you need 200 wpc anymore. But that opinion has been strangely upended first by a ~7 wpc 300B tube amp I've been playing with and, even more so, by way of the Pass Labs INT-25.

I never would have dreamed that 25 watts would sound this loud. And, well, I guess it doesn't actually. Looking at the bench tests, a "Nelson watt" is apparently 2 watts to everybody else. This amplifier could easily be rated as a 50 wpc amp and it would still fall within the FTC criteria for such a power rating. Never mind all that, this amplifier simply had ample power for anything we threw at it and I never even came close to causing it to clip or start compressing the waveform. 50 watts of Class A power sounds more like 150 watts of Class AB power

After my initial impression of how powerful the INT-25 actually was, I was then able to chill and really enjoy what this bad boy was capable of doing. This amp's Damping Factor is rated at 500. This was apparent during my listening sessions and was noted as a very tight bass presentation. This does not mean the bass was rolled-off or lean. Not at all. It just means the bass has a tighter presentation than amplifiers with a higher output impedance and/or lower current capability. The VIVID Kaya 90's start out with well-damped bass due to the tapered-tube loading and the INT-25 married up with that in a way that kept the pace of the music aligned throughout all the registers.



On the other end of the spectrum, the treble was decidedly lithe: low distortion and very extended. It was so good over the INT-25 that I was able to readily hear the difference between the Revel's beryllium tweeters and the VIVID's aluminum domes. Despite being many times lower in cost, the Revel tweeters were in fact audibly sweeter than the VIVID's. These are both very accomplished speakers, but the difference was easy to hear. I am not sure how many amps can highlight these very differences in the treble the way the INT-25 was capable of pulling off.

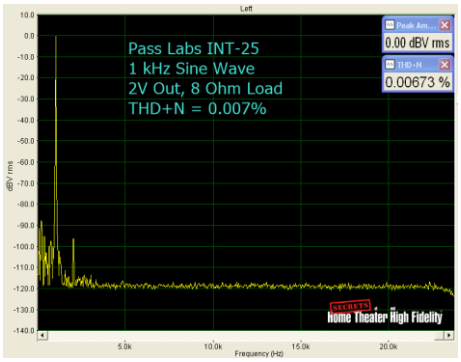
The INT-25 was proving to be among the best all-around amps I have evaluated, and I did not identify any glaring weaknesses. In fact, I was so enamored with what I heard, I had this to say in the Clarus review, "The system is like a pure singularity, a merging of man and music. It is so good that I fear even turning it on if I don't have several hours to spare listening because once I go down

the rabbit hole, I have a very hard time shutting it off." This is as true today as when I penned these words a few months ago.

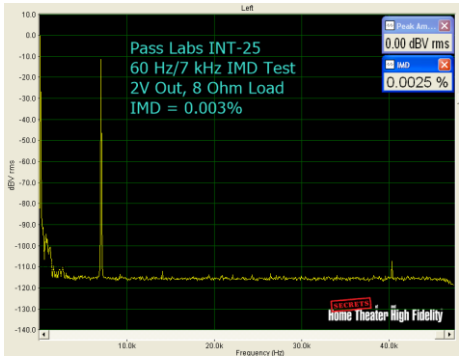
The INT-25 was able to accommodate anything I threw at it. It genuinely brought out the true nature of every recording, whether that was the recording's greatness or a recording's foibles. Either way, all was laid bare for you to inspect to your heart's content. But the amp was at its best when I just kicked back, shut off my conscious brain and let the music carry me away. I felt the INT-25's warm embrace and it was a good thing. My point is, this is the type of outcome we are all striving for whether we know it or not. We just want to enjoy the music as close to the source as we can without any conscious thought. Lesser amps will pull you out of this trance with peaky or harsh distortions while an amp like the INT-25 really does get out of the way and lets you just enjoy your music as fresh as it can possibly sound. I am enamored.

On The Bench

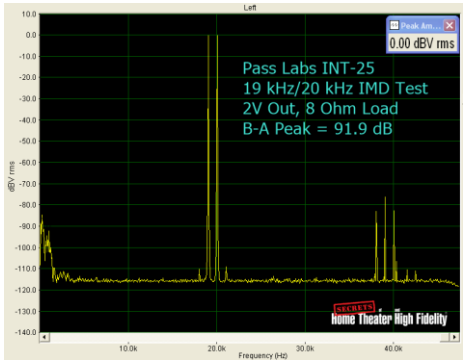
All below tests were run with one channel driven. The signal was fed through the left channel input to the left channel speaker out.



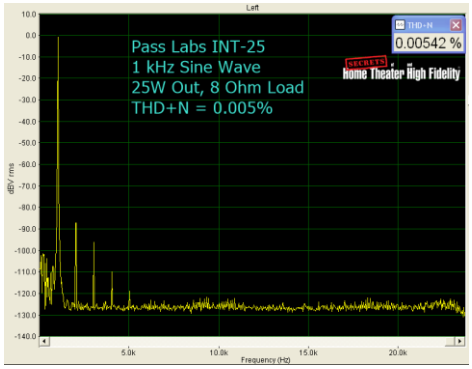
The first test I ran on the INT-25 was a 1 kHz sine wave at 2V RMS into a static 8 Ω load. THD+N measured just 0.007%. I can see the 2 kHz harmonic and can just barely make out the 3 kHz harmonic until all other harmonics disappear into the very low noise floor. This low contribution of higher-order harmonic distortion is a major design goal of Mr. Colburn and is demonstrated in the tests I performed.



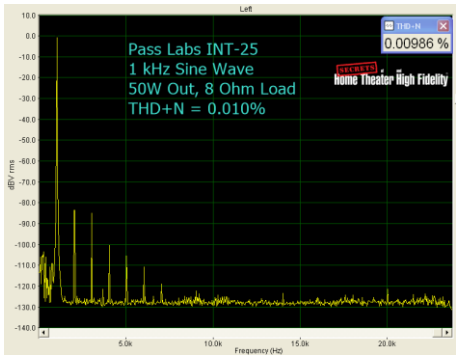
This next test is the Intermodulation Distortion Test with signals at 60 Hz and 7 kHz at a 4:1 ratio. The INT-25's measured IMD at 6 dBV (2 Volts) came to just 0.003%.



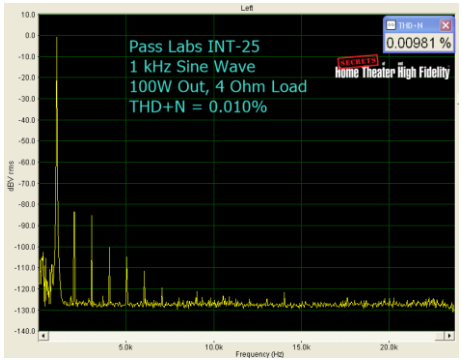
This is the other IMD Test we run with signals at 19 kHz and 20 kHz at equal gain. The B-A peak is the difference between the test signal and the level of the 1 kHz tone generated in sympathy to the two test tones. I measured this on-screen and got a B-A peak response of -91.9 dB at 2 Volts output.



The INT-25 tested at its rated power of 25 Watts into 8 Ω presents a very clean and orderly distortion profile. The calculated THD+N is just 0.005%.



Increasing the output to twice the rated power, or 50 Watts into 8 Ω, the THD+N remained well below the threshold of audibility at just 0.010%. Compare this reading to the manufacturers claim of 0.1% for the 25 Watt rated power into an 8 Ω load. The actual production amplifier I reviewed produces at least twice the power than the manufacturer's claim. I did not push it any further on this test.



The INT-25 is similarly rated to put out a clean 50 wpc into a 4 Ω load. Well, with the above test, I doubled that number and again the distortion was only 0.010%. Excellent!

I also tested the frequency response of the Pass Labs INT-25 at 2 Volts output into an 8 Ω load. The amplifier was essentially flat from DC to 20,000 Hz though I did measure an insignificant drop of ~1 dB at 20 kHz. The response gently attenuated above that and was approximately 6 dB down at 80 kHz.

Conclusions

PASS LABS' INT-25 runs in pure Class A, produces well over it rated power, is built like a tank, and sounds like a dream.

Likes

- Amazing build quality.
- Handy little remote control.
- Tightly controlled bass.
- Sweet treble.
- All-around musicality lets you get lost in the music.

Would Like To See

- Balance control.
- Polarity toggle.

The INT-25 is an incredible integrated amplifier. It is nice looking with a utilitarian aesthetic. To me, the visual beauty of the INT-25 is most expressed through its great build quality – it has a thick aluminum faceplate that is finely machined and clearly etched. The massive heatsinks weave their swooping webs, adding to the striking look of the amp. The rear panel features excellent-quality speaker binding posts and RCA jacks. The remote is a substantial piece machined from a block of aluminum. On the whole, the INT-25 doesn't have a super stylish look, but it gets the job done

while its beauty lies in the quality of the materials and quality of the execution. The whole package exudes quality and a sense of confidence the product will endure for many decades.

In terms of performance, the amp had no audible weaknesses. It also did not color the music. In fact, the music was as pristine and natural as any amplifier I have ever heard. Let's not forget the bass. You may laugh when I tell you this 25 watt per channel amp in fact has some of the best, tightest, and most extended bass I have heard. But it does.

The INT-25 was also transparent and extended to the point I could discern subtle differences in the tweeters between the speakers I used in this review.

Mr. Colburn and the Pass Labs team have a real winner on their hands. Just be sure you find a well-ventilated spot for thus hot-running Class A amp. And it runs even hotter by virtue of producing more than double the rated power! What's not to like?