

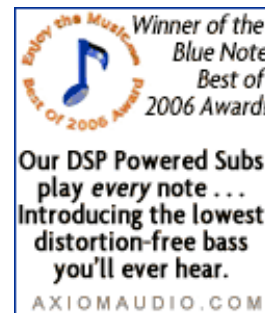
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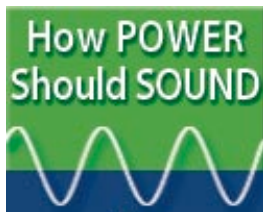
The Manley Labs Stingray Integrated Stereo Amplifier

By Dick Olsher

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Call me old-fashioned, or simply reactionary, but I miss the essence of classic tube sound. Marantz, McIntosh, Dynaco, and Fisher, to name just a few of the true giants of the golden age of tube audio, were instrumental in defining my notion of classic tube sound. This is sound so smooth, rich, and passionate that you'd swear that the music's harmonic tapestry was dripping with honey.



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The musical passion has been largely absent in modern tube designs. The pendulum, in my opinion, has swung too far from romanticism toward precision and clarity. Live music's harmonic warmth and lushness, its emotional fire in a bottle, have given way to analytic sterility. Enter the Stingray. At last here's an integrated amp that attempts to bridge the gap between old and new world tube sound. The Stingray's designer – EveAnna Manley – makes me feel oh so good when she says: *"I was also shooting for the same sound you are looking for. Our newer products had gotten away from this lush sweet thing I remember with David's older designs. I wanted to get back to the roots. I know for a fact, that I have done this with the Stingray with the new output transformer design, new input stage and way less feedback is giving me that sound I wanted so bad."*



Various pundits have dubbed her as "the Manley Tube Queen" and even "America's Goddess of Thermionic Emissions." EveAnna says she's too young to be a full-fledged queen or goddess, and humbly prefers the title of "the Tube Chick." All of this pubescent nonsense aside, it is important to note that in her roles of president and CEO of Manley Labs, she has broken



through the “glass ceiling” in a major way. It’s quite a happening for a fresh new voice to shake up a world that

had been heretofore dominated by iconoclastic old farts. The Stingray is the first significant high-end product that was designed and voiced from the ground up by a woman. For starters, the looks of the thing are guaranteed to please even the most artistic eye with its shape and form. Right off the bat, the Stingray earns a wife acceptance factor of 10, which means that no one should be able to resist the looks of its fabulous high polished stainless steel and gold facade. By the way, credit for the name is attributed to J. Gordon Holt, whose agile mind first made the visual connection between the six-sided chassis shape (drawn by EveAnna on a bar napkin no less!) and that of an ocean dwelling Stingray.

Technical Details

One of the excesses of high-end audio is the unnecessary compartmentalization of the amplification chain. Sometimes, as in the case of the Stingray, simpler is actually better. From a technical standpoint, it makes perfect sense to integrate the line-level voltage amplification with a power amplifier stage. The obvious benefits are less potential for power supply hum and noise, optimized gain matching between stages, and a shorter signal path without the additional connectors and cable mandated by an outboard preamp.

The Stingray is outfitted with excellent passive-attenuator volume and balance controls, and four selectable line-level inputs. If you’re still into vinyl, you’ll need to connect phono stage to one of the line inputs in order to complete the amplification chain. The input stage uses a 12AT7 dual triode for voltage amplification. A 6414 dual triode is used as a cathode-coupled phase splitter to drive two pairs of EL84 power pentodes (per channel) connected in push-pull. The EL84 output stage is connected in Ultra-Linear (UL) fashion to the output transformer; with the screen grids of the output tubes operating off transformer taps at a voltage somewhat below that of the plate. The UL connection gives a tube characteristic intermediate between that of a triode and tetrode.

Only one pair of output terminals is provided, as the amp is optimized for a load of 5 ohms. This means that power delivery should be near optimum for loudspeakers with

nominal impedances in the range of 6 to 8 ohms. Small amounts of global feedback are used to obtain excellent phase margins at high frequencies. All of Manley's audio transformers are wound in house. The power supply is all solid state and uses a beefy capacitive reservoir in the filter section.

The EL84 is a small power pentode with a distinguished history in the annals of musical instrument amplification as well as high fidelity. A fine account of its history, titled "EL84: The Baby with Bite," by Eric Barbour has been published in issue No. 8 of Vacuum Tube Valley (www.vacuumtube.com). According to Eric, guitar amplifier applications began in the late 50s at Vox. Then came the Beatles, and later other British invasions bands in the 60s, whose use of the Vox Top Boost AC30 made this amp into an industry standard. A quartet of E84s running near Class A push-pull operation was all the power needed by John Lennon, Paul McCartney, and George Harrison. During the golden years of tube sound, between 1955 and 1965, came an outpouring of hi-fi EL84-based amps, including best sellers like the Dynaco ST-35, the EICO HF81, the Scott 222 series, and the Fisher SA-100 and X-202A.

Individual bias pots are provided for adjusting the bias current of each EL84. You'll need a DC voltmeter to verify that the voltage at each test point is at the nominal 250 (+/- 5) mV. Note that the negative terminal of the voltmeter fits into the test point located in the tail of the Stingray logo - very cute. These voltages need not be checked very often; on the order of once every three months would be more than adequate, as I did not notice any significant drift in the bias over time. The benefit of individual bias pots is that you no longer have to worry about the additional expense of matched quad sets of replacement tubes.

The Sound

Let me say at the outset that my previous experience with several modern EL84 designs had been a bit of a mixed bag. In general, I've found the EL84 to be a sweet little thing with excellent midrange clarity, but its apparent lack of bass punch and dynamic power made it difficult for orchestral music to take off. Could EveAnna Manley have turned the corner with this tube? Our own Steven Rochlin seemed to think so. And then EveAnna's own words enticed me even further: "*We've been building EL84 amplifiers for 15 years*

and to my ears they always sounded wimpy." Now I got thinking, what's up with this? It ain't the tubes' fault. Tubes are linear and can go almost DC to daylight. So we got to work on this with the output trannies and that new input stage and boy we got bass swingin' now. At this past Stereophile HIFI '98 show, we put the Stingray up against the 807 monos we build which are 4 times the price and three times the power. The 807's got frikkin' murdered by the lil' Stingray." And so without the benefit of even a lifejacket, Toob Man took the plunge into uncharted waters in search of the Stingray.

Watch out - right out of the box, the Stingray stung my ears with two serious sonic objections. First, the amp's distortion signature appeared to emphasize the upper mids and presence region, so as to produce a pervasive brightness, which after a few minutes I found to be annoying. This is often referred to as tube glare, an assertive, somewhat in your face harmonic tapestry, that seems to afflict many push-pull pentode designs. Hey, that's no way to greet a triode fan. Second, dynamic contrasts were somewhat muted. Not only did the Stingray subdue the emotional inflections that reside in microdynamic detail, but it also strained on occasion as it was attempting to reproduce musical peaks (i.e., macrodynamics). And this was happening even with efficient speaker loads that are normally happy with only 10 watts.

The instant I started liking the Stingray was when I swapped out the stock 12AT7 input tubes. Every substitution for the stock Philips JAN 12AT7 removed much of the brightness and improved dynamics. I finally settled on the Serbian Ei brand. This tube features a large smooth plate ala the classic Telefunken design, and is probably the most musical sounding 12AT7 type of all time. I still have in my collection several Ei 12AT7s with the VTL logo – relics dating back to happier times in Yugoslavia when the Ei brand was widely available in the USA.

One of the joys of owning tube gear is the ability to tube roll. Voicing a particular product to suit one's musical taste buds, is not really a possibility with transistorized gear, but is literally a snap with tubes. It's easier than changing a light bulb! Tube rolling is part of the tube experience, and I firmly believe in the right of the consumer to enhance his musical experience. After all, let's not forget that our hobby's main reason for being is to enjoy the music. Keep in mind that our tube rolling recommendations are intended for the benefit of the end user. They are not meant to condemn a

manufacturer's particular choice or to suggest that production immediately be switched over to the alternative we recommend here. It is easy enough for the end user to locate and purchase a pair of Ei 12AT7 triodes. It's an entirely different problem to find commercial sources for the thousands of tubes required for inventory in one year of production. Boutique tubes or New Old Stock (NOS) are a reasonable proposition for the consumer who doesn't mind paying a premium for a tube as rare as di-lithium crystals, and for whom a pair of NOS tubes represents a lifetime supply. However, for a manufacturer, such supply channels are neither practical nor viable. While EveAnna shares my fondness for the sound of the Ei 12AT7, don't expect her to wave a magic wand and materialize these tubes overnight.

With the Ei 12AT7 in the circuit, I was now able to focus on the Stingray's strong suites, which are in fact considerable. The midrange clarity for which the EL84 is famous for was very much in evidence. Harmonic textures were retrieved with such startling purity and commendable smoothness that individual timbres were readily resolvable from within complex passages. Instrumental outlines were palpably focused in space. The soundstage was brightly illuminated, highlighting all of the recoding acoustic's inner recesses. Tube amps are all about harmonic integrity, microdynamics, and the reproduction of the spatial perspective. These virtues the Stingray has in spades. But it was also able to swim with the "big fish" in terms of bass reproduction. Bass lines had plenty of rhythmic drive and pitch precision. The midbass, in particular, was tightly defined with the sort of authoritative punch I would have expected from a much more powerful design.

The sound through the upper octaves was open and extended. Transients were well controlled and consistently natural in character. It was a pleasure not to be exposed to any gratuitous sibilance. Unlike many vintage amps, the stingray sounded fast and incisive in the treble. No tube softness or mush here; really a nice blend of old and modern tube attributes. With the stock Yugo EL84/6BQ5 output tubes, the tonal balance was a tad lean through the lower midrange. The tonal center of gravity was tilted toward the upper midrange so that, for example, the majestic richness of a cello was slightly subdued.

Enter the JJ Electronic EL84. I was fortunate to have on hand two quad sets of the JJ Electronic EL84 for evaluation. For your information, JJ Electronic represents a privatization (in 1993) of the well-known Tesla manufacturing plant located in the Slovak

Republic. JJ Electronic manufactures tubes on proven Tesla equipment modernized with the latest technology. With over 25 years of experience in development and manufacturing of vacuum tubes, JJ electronic knows tubes. Their tube portfolio is small but of high quality. Check out www.eurotubes.com for additional information and pricing, and tell Bob that I sent you. You'll be surprised at how cost effective the EL84 is: \$15 per matched pair is a great price. The end result was a definite Wow! The sound of the Stingray was transformed to a darker and richer sonic life form. A tropical rain forest sort of midrange may not be everyone's cup of tea, but it sure gets my juices flowing. Another consideration, of course, is the tonal character of the matching loudspeaker. If our speaker is a bit lightweight and/or bright sounding to begin with, you might prefer the sound of the JJ Electronic EL84. If, on the other hand, your speaker needs more life and air through the upper octaves, the stock Ei tubes will do just fine.

Conclusion

In summary, per our tube rolling recommendations, the Stingray represents a compelling blend of tube virtues that is guaranteed to delight music lovers in search of both form and substance. Don't let its size and looks fool you: this integrated amp rock n' rolls much like those higher-powered and very pricey monoblocks. It offers instant value, as there's no need to purchase a line preamp and additional connecting cable. Providing that the matching speaker sensitivity is at least in the medium range (86 dB minimum), headroom should be adequate in a typical domestic listening environment.

The Stingray has, as of now, ascended to the throne as my reference at its power and price points. The Stingray is much more than just "a catch of the day," I hereby nominate it as integrated amplifier of the year.

Tonality	85
Sub-bass (10 Hz - 60 Hz)	90
Mid-bass (80 Hz - 200 Hz)	90
Midrange (200 Hz - 3,000 Hz)	90
High-frequencies (3,000	90

Hz on up)	90
Attack	90
Decay	90
Inner Resolution	85
Soundscape width front	90
Soundscape width rear	90
Soundscape depth behind speakers	90
Soundscape extension into the room	85
Imaging	90
Fit and Finish	100
Self Noise	100
Value for the Money	95

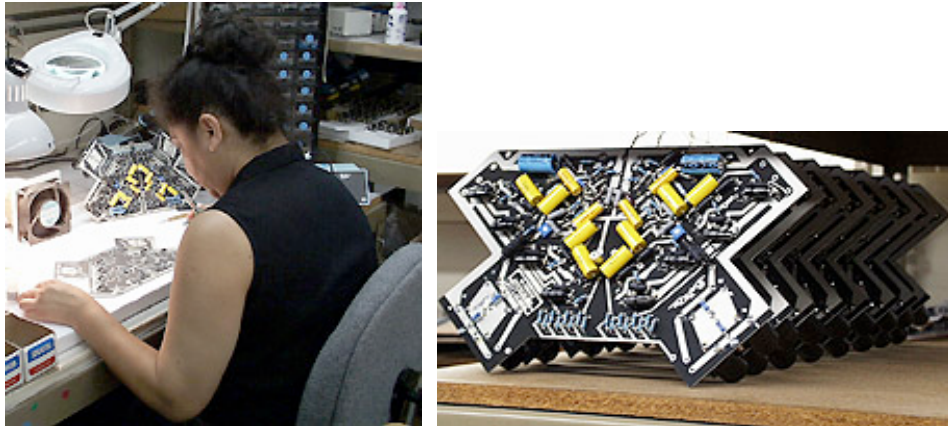
Manley Labs Stingray... the Making of Dick Olsher's "Integrated Amplifier of the Year".

Additions by Steven R. Rochlin
steve@enjoythemusic.com



Raw circuit boards

During a visit to Southern California I had the pleasure to see what it takes to make the magical Stingray. After finding a great sounding combination of parts through trial and error a final schematic was made. Subsequently, a circuit board layout was designed when the folks Manley knew they came upon a winner. Once a circuit board was designed for optimum parts placement for the shortest signal path, the boards are made and cut to shape followed by soldering in the necessary parts.



Soldering boards (left) and completed boards (right)

Every Stingray is hand-made right here in the USA! Seen here is a Manley employee soldering in the parts and using a "master board" as a guideline. Also seen here is a shelf filled with completed hand-wired Stingray circuit boards. I was truly humbled in seeing the care and skill it takes to make just one Stingray board! In fact Manley Labs even hand-winds the transformers in-house. Which brings up a story told to me by EveAnna herself.

To paraphrase what EveAnna told me, "Oh yeah, about transformers... so we were experimenting with different core material at one point in the development and ordered some good ol' pretty normal lamination samples for that size bobbin in the output transformers. They came in and we played with the stuff and we get liking these laminations plenty good. So we order up quantity to launch production. So the quantity comes in and we get winding. After testing them we noticed a difference. What happened to our inductance? So immediately we suspect the lams, but the packing slip, the box, and the invoice all tell us this is what we ordered and this is exactly what we had. Hmm. We get back to that first prototype and roll the lams into the newest bobbin. Yeah we have a problem here. So we send the lams back to the supplier and insist they test them 'cause obviously they were different than what the newest shipment was. So they measure the stuff and sure enough it is an exotic thing and no body knows how we got sent that in the first place! Now this stuff, it's gonna cost "x" per pound and take

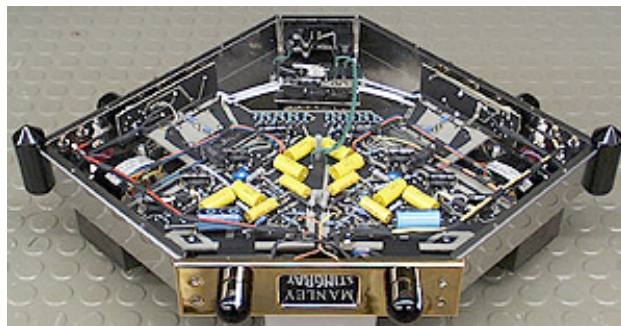
two months to arrive! I said we already have all these dudes pounding our fax machine into a pulp with orders and we're gonna delay production two months? Anyway, we had to have these odd strange laminations, so we just beat our suppliers and got it in 5 weeks. This is a normal tale of manufacture."

So basically what is in the Stingray are really expensive exotic laminations. As any tube-head will tell ya, the output transformer is a big part of giving an amplifier it's sound. Even today I still shake my head how they make the Stingray for such chump change all things considered. So once the boards are made, the parts all soldered in nice and happy-like, they get mounted into the chassis.



A Flock of Stingrays

Seen here is a Flock of Seagulls, umm, make that Stingray chassis with power supplies attached (darn 80's flashbacks! :-}). Once the circuit board, output transformers, feet, switches, knobs and other parts are attached, each and every Stingray is bench tested to insure its owner many years of carefree musical enjoyment.



Finished Stingray

Care was not just taken with the electrical parts layout, but if you look carefully, you'll notice how the top shapes of the right and left legs on the Stingray perfectly match the volume and balance knobs! As I said, a modern day legend! Just please remember that this is no fish story! We're talkin' Stingray territory here!

Manufacture's Reply

Hey, wow, Dick, thank you so much for your fabulous review of my

Stingray! Having known you for something like 12 years, I *know* you're a tough cookie to please. Especially without permitting the tube rolling thing. (big giggles) Years ago I remember everybody got into a heap of trouble on this subject of tube rolling. (Us with former owner and you with former magazine.) But now, you have framed the subject so well from your side and ours that who could possibly have a problem now? One thing we do stress to Average Joe or Josephine, is when considering trying other tubes, it is a good idea to check with us first. We do know of some tubes that really don't work well in a given design of ours and also do know certain brands that do work really well. It is case specific, and our attitude is if we can help the customer save some money and save some aggravation, a quick call or email is easy enough.

On the subject of the Ei 12AT7, indeed, indeed that is my fave input tube for the Stingray, and the one we designed and voiced it for as you could clearly hear. Originally we took the easy route and had AC on the input and driver tube heaters, which, with the Ei 12AT7's spirally wound heaters presented no problem. But then, the horrors, we ran out of the Ei's and had to switch over to the Phillips we had in stock just in case of such an emergency. Oh damn! Where did THAT hum come from? The un-clever Phillips non-spirally-wound heaters, that's where. So we had to quickly reconfigure the input/driver heaters for DC so anybody's tube would work.

Good news now, is we have just obtained a fresh batch of Ei 12AT7's again and the Stingrays are once again shipping with the tubes they were meant to. As you pointed out, I can't always just wave a magic wand and have them appear. Sometimes buying tubes seems like running drugs or something.... with over 100,000 tubes in stock of about 8 different types we use a lot of, we need to make a big investment in the future. We do the best we can with all kinds of factors outside of our control to consider. Dick, thank you for recognizing this.

Cheers,

EveAnna Manley, President
Manley Laboratories
emanley@manleylabs.com

Follow Up

Manley Labs Stingray Integrated Amp: Follow Up
Dick Olsher (6/17/00)

I recently participated in a listening session at a friend's house in Santa Fe. The essence of it all was to evaluate the performance of the Stingray with a newly acquired pair of ProAc Response 1.5 loudspeakers. The rest of the system consisted of the Wadia 836 CD player and TARA Labs cable. The competition on this occasion was the Audio Research CA-50 and the Cary 2A3 integrated amps.

Well, the Cary didn't work well at all into the moderately efficient load, while the much less expensive Stingray sonically embarrassed the CA-50. With the CA-50 in the chain, the presentation was pleasant but uninspired. Enter the Stingray, and wow! Rhythmic energy popped right out of the soundstage. Sweet, compelling, and cohesive, the ProAc/Stingray combo certainly forged a synergy made in heaven. Add the Stingray to your must hear list if you already own the ProAc Response 1.5.

Mea Culpa! Roger Stevens of Norristown, PA, wrote to correct an error that crept into my technical description of the Stingray's output stage. I described the Ultralinear connection's use of the screen taps as follows: "with the screen grids of the output tubes operating off transformer taps at a voltage somewhat below that of the plate." What I meant to say was that the screen grids operate off transformer taps at a lower impedance ratio relative to the plates.

As Mr. Stevens points out: "In truth, the screens of an Ultralinear design are operating at a voltage HIGHER than that of the plate. The B+ is connected to the center-tap of the primary. The screens are connected at a point (as I recall) that is 43% closer to the center-tap than are the plates, which are connected to the outermost ends of the primary winding. Thus, the screens see less voltage drop due to resistance in the winding, and are at a higher potential than are the plates. This is easily measured and verifiable."

Specifications

Output Power: 50 wpc (1.5% THD @ 1kHz)
Frequency Response: -1dB (15 Hz - 40 kHz)
Gain: 37 dB at max Volume
Input Sensitivity: 185 mV in = 50 watts out
S/N Ratio: typically 87 dB A WGT 20Hz-20KHz
Input Impedance: 50 Kohm nominal
Load Impedance: Optimized for 5 ohms
Power Consumption: 200W (idle); 370W (full power)
Dimensions: 19" x 14" x 5 1/2" (WxDxH)
Shipping Weight: 30 lbs.
Price: \$2,250

Manufacturer

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