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# Klipsch
## Palladium P-39F
### LOUDSPEAKER

WES PHILLIPS

**DESCRIPTION** Three-way, reflex-loaded, floorstanding, loudspeaker with horn-loaded midrange and tweeter. Drive-units: horn-loaded, 0.75" titanium-dome compression tweeter; horn-loaded, 4.5" inverted aluminum-dome compression midrange; three 9" aluminum-Rohacell-Kevlar woofers. Crossover: 500Hz, 3.2kHz, fourth-order electroacoustic. Frequency response: 39Hz–24kHz, ±3dB. Sensitivity: 95dB/2.83V/m, anechoic. Harmonic distortion (measured at 95dB/m): second harmonic, <0.5%, 50Hz–10kHz; third harmonic, <0.1%, 50Hz–6.6kHz. Impedance: 4 ohms (2.7 ohms at 130Hz). Power handling: 400W.
**DIMENSIONS** 56" (1422mm) H by 14.5" (368mm) W by 24.75" (629mm) D. Weight: 165 lbs (74.9kg).
**FINISHES** Zebra-grain Linia veneer in Natural, Merlot, or Espresso stain.
**SERIAL NUMBERS OF UNITS REVIEWED** 0842002 L/R.
**PRICE** $20,000/pair. Approximate number of dealers: 10. Warranty: 5 years parts & labor.
**MANUFACTURER** Klipsch Audio Technologies, 3502 Woodview Trace, Suite 200, Indianapolis, IN 46268. Tel: (800) 544-1482, (317) 860-8100. Fax: (317) 860-9170. Web: www.klipsch.com.

It ain't the stuff you don't know that trips you up, it's the stuff you *know* that ain't *so*. When, at the 2007 CEDIA Expo, I encountered Klipsch's startlingly new Palladium P-39F loudspeaker ($20,000/pair), I was impressed by its looks. Tall (56"), as beautifully contoured as the prow of a canoe, and clad in striking zebra-stripe plywood, the P-39F is possibly the best-looking speaker Klipsch has ever made.

The Klipsch rep, too, was enthusiastic: "This is a loudspeaker that PWK would have approved of!" (Yes, seven years after the death of Paul W. Klipsch, employees still refer to the founder of Klipsch Audio Technologies as PWK—and why not? Most of them have worked there for so long that they knew PWK or were hired by him.)

"How so?" asked WP.

"Obviously, the midrange and tweeter are horn-loaded, but the P-39Fs are efficient, have low distortion, and controlled directivity—all goals that Paul Klipsch sought in every loudspeaker he ever designed. We kept those goals forefront in designing the Palladium line, and we went to DesignworksUSA for the industrial design of the speaker itself, although we developed all of the drivers in-house."

I ran my hand along the curved flank of one P-39F, admiring its fit'n'finish. Sensing weakness, the rep moved in for the kill. "Maybe you'd like to review them."

"No offense, but I don't really like horn speakers," I said.

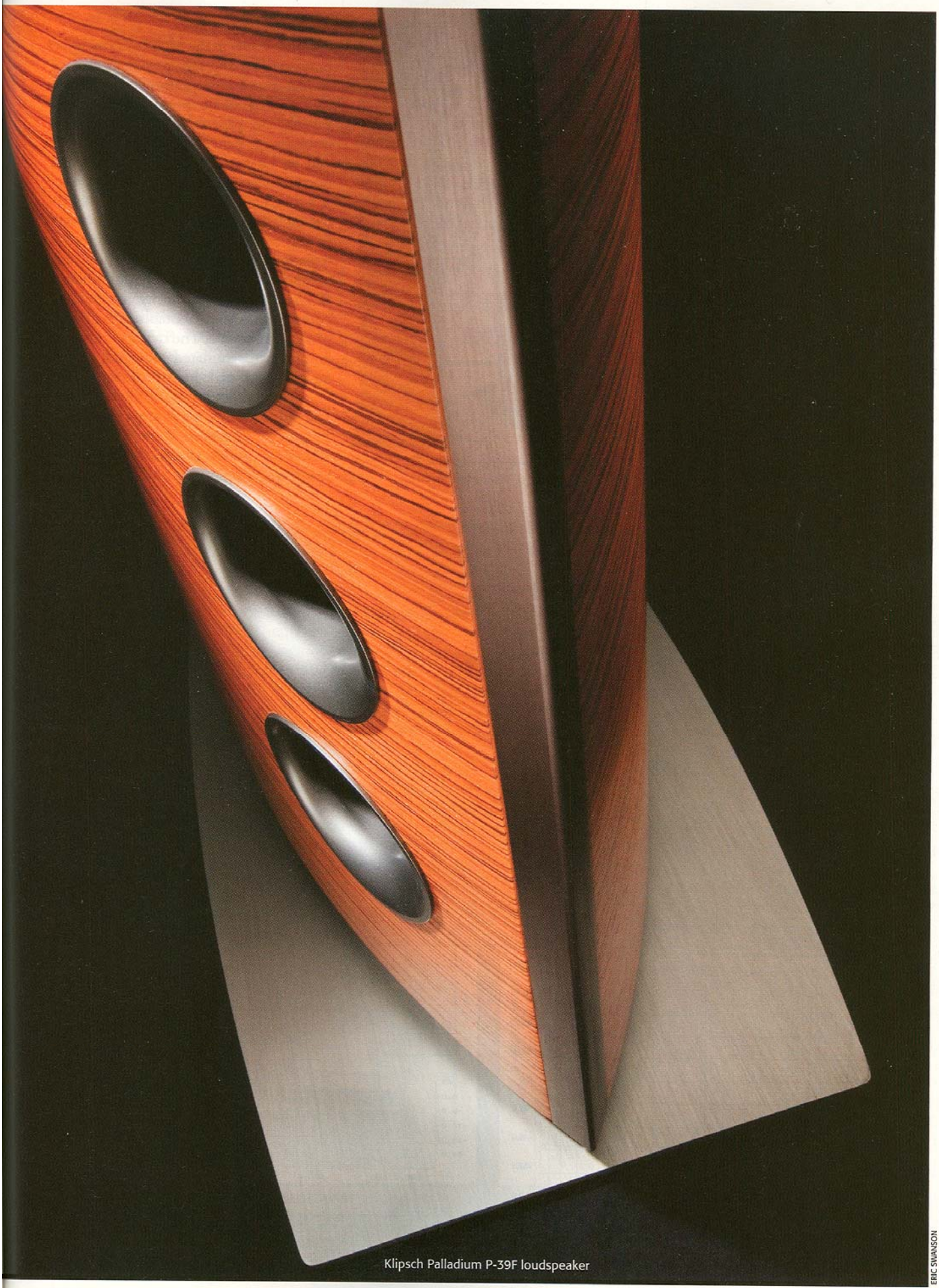
As if I'd ever actually *lived* with a pair. I'd sold Klipsch speakers back when I was an audio salesman, but mostly two-way monitors—they were my fallback model when customers wanted more bass. I'd never spent much time with the "heritage" trio of Cornwall, La Scala, and Klipschorn—my loss, I now suspect.

In the late 1990s and early 2000s, I listened to many large, "retro" horns designed to complement single-ended-triode amplifiers, and I just didn't cotton to 'em. The bass frequently seemed completely disconnected from the mids and highs—and, in at least one example I heard at a *Stereophile* Home Entertainment Show, the outputs of the individual drivers didn't cohere until I was sitting about 30' away. Granted, I also heard many contemporary dynamic and electrostatic loudspeakers that didn't do it for me during those years, but I didn't dismiss *those* types of speakers out of hand—just horns.

The machinations of time and tide—not to mention an enthusiastic phone call from CNET's audio blogger Steve Guttenberg, who was rendered almost speechless by the P-39F—conspired to put a pair in my listening room, where indeed I did review them.

## The horn, the horn, the lusty horn

The Palladium P-39F is a three-way loudspeaker with a fourth-order crossover. The cones of its three 9" woofers are constructed from an outer aluminum skin bonded to a Rohacell core, this in turn bonded to Kevlar. The result is a rigid but lightweight diaphragm. Each woofer's basket is cast aluminum, and its 1.5"-diameter voice-coil is wound from flat copper-clad aluminum wire. Three different neodymium magnets make up the drive system.



Klipsch Palladium P-39F loudspeaker

ERIC SWANSON

The mid-frequency driver is front-loaded with a modified Tractrix horn with a 4:1 high-compression phase plug in its center. The 4.5" inverted-dome driver is a first for Klipsch—although the company does credit PWK's famous dictum "The midrange is where we live." The midrange is claimed to have a raw sensitivity of 110dB. Like the woofers, the midrange driver uses three magnets (the primary magnet uses the other two to stabilize its output). The midrange driver is housed in its own tuned, sealed enclosure within the P-39F's shell.

The tweeter is also front-loaded with a Tractrix horn, this one with a 10:1 compression phase plug and a 0.75" dome diaphragm of titanium. The space behind the driver is a resistively damped tube. Klipsch says that the design of the phase plug "extends the upper frequency of the driver by 10kHz," which is said to have the salubrious effect of eliminating standing waves in the high-pressure layer between plug and driver.

Horn-loaded tweeter and midrange are matched to three reflex-loaded woofers.

The fourth-order crossover is built on two printed circuit boards mounted to the bottom plate of the speakers with isolation grommets. The parts quality is said to be superb: air-core conductors, polypropylene caps, ultra-low-inductance resistors, etc. The woofers cross over to the mids at 500Hz, the mids cruise from 500Hz to 3.2kHz, and Klipsch claims the tweeter goes from 3.2 to 30kHz!

Then there's that scrumptious cabinet. It has no parallel surfaces, and curves continuously from its tapered baffle to pointed rear spine. The cabinet—made of compressed laminated plywood, MDF, and particleboard—has an average thickness of 1", although the baffle is thicker and, where the woofers are mounted, is reinforced with steel. The cabinet's interior is extensively braced. Each speaker sits atop a high-mass machined metal

## MEASUREMENTS

Measuring a speaker as bulky and heavy as the Klipsch Palladium P-39F is always problematic: the speaker can't be raised high enough off the ground to eliminate the bounce of its sound off the floor between the speaker and the measuring microphone. I therefore had to use more aggressive time-windowing than usual to generate the frequency-response graphs, which in turn means that these graphs' resolution in the midrange is more limited than usual.

Looking first at the Palladium's voltage sensitivity, my estimate was 94.8dB(B)/2.83V/m, which is within experimental error of the specified 95dB. The P-39F is thus one of the most sensitive models I have encountered in 20 years of measuring loudspeakers—it will play very loud with very few watts. However, the speaker is not as efficient at low frequencies as you might expect; its impedance drops between 3 and 4 ohms in the lower midrange (fig.1), with a nasty combination of 4 ohms magnitude and –50° electrical phase angle at 80Hz. The three woofers do demand a significant amount of current to keep up with the horn-loaded midrange and treble drive-units. The impedance is significantly higher in the region covered by the latter two drivers, averaging 10 ohms, which means that the speaker will sound tilted-up at high frequencies when used with a tube amplifier having a high source impedance.

The traces in fig.1 are free from the small wrinkles in the midrange that would suggest the presence of cabinet resonances. Nevertheless, investigating the vibrational behavior of the curved panels with a simple plastic-tape accelerometer did uncover a strong resonant mode at 414Hz (fig.2) and another at 520Hz. I note that Wes Phillips mentioned no midrange congestion that might have resulted from this behavior; these resonances may indeed be high enough in frequency to mitigate the resonances' subjective effect.

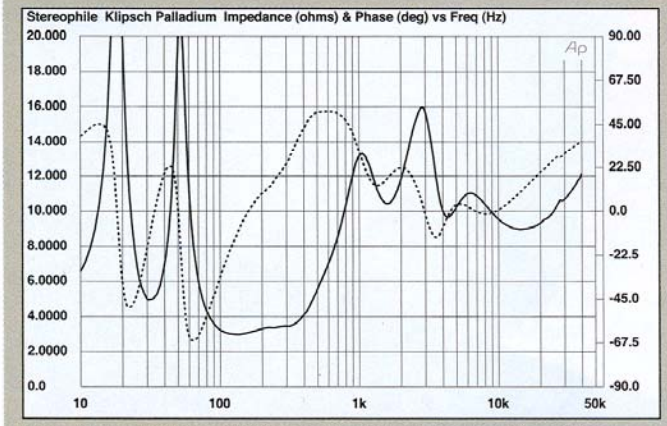



Fig.1 Klipsch Palladium P-39F, electrical impedance (solid) and phase (dashed). (2 ohms/vertical div.)

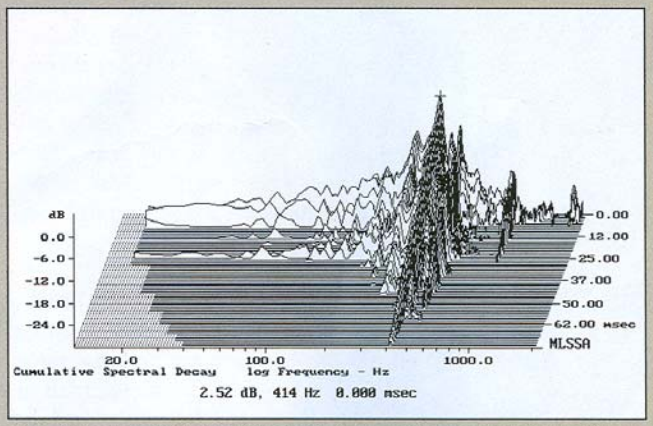



Fig.2 Klipsch Palladium P-39F, cumulative spectral-decay plot calculated from output of accelerometer fastened to center of side panel (MLS driving voltage to speaker, 7.55V; measurement bandwidth, 2kHz).

baseplate tapped for spiked feet. Mounted low on one side of the P-39F are three flared port tubes—the look is old-school Pontiac. Access to the triwired speaker terminals is from under the baseplate, a discovery that elicited much swearing on the part of John Atkinson.

## His tunes were frozen up in the horn

Other than the inconvenience of wiring the P-39Fs with audiophile-quality hawsers, setup was a snap. I could have used just about any amp in the house to drive the Palladiums' 95dB sensitivity, but the VTL MB-450 IIs were already on the amp stands. All I had to do was switch to the VTLs' triode mode—I sure didn't need all that pentode power.

I ended up placing the speakers 45" from the front wall and 32" from the sidewalls, toed in very slightly. Just an inch under 13' from my sweet spot, the P-39Fs "clicked" with my room as have very few loudspeakers, even far more expensive ones.

## Sugar in the gourd and honey in the horn

Whatever it was I was expecting from a pair of horn speakers, what I got from the Palladium P-39Fs was sound that was balanced, relaxed, and assured.

The uncharacteristically mellow moan of "Milano," from Stanley Clarke, Marcus Miller, and Victor Wooten's *S.M.V.* (CD, Dreyfus 369212), presented a huge soundstage and, in the B section of this ABA tune, dug deep, presenting all three bassists' thumb-popping prowess. The P-39F's specified response is 39Hz–24kHz, ±3dB, but it's only 10dB down at 28Hz—the way the Klipsches coupled to my room, that felt plenty deep.

WHATEVER I WAS EXPECTING FROM HORN SPEAKERS, WHAT I GOT FROM THE PALLADIUM P-39Fs WAS SOUND THAT WAS **BALANCED, RELAXED, AND ASSURED.**

"Don't You Evah," from Spoon's *Ga Ga Ga Ga Ga* (CD, Merge MRG295), was rhythmically complex, with an incisive guitar solo. The music was lively, focused, and alive.

With "Upstream," from k.d. lang's *Watershed* (CD, Nonesuch 406908), the P-39F presented the popping, bopping synth/bass underpinning to the song with

Turning to the P-39F's acoustical output, its three woofers behaved identically, as did its three ports. I show in fig.3, therefore, the summed outputs of each array as the blue and green traces, respectively. The ports' output peaks between 28 and 34Hz, as expected from the impedance graph, where the saddle between the two magnitude peaks in the bass occurred at 32Hz. The level of the ports' output is suppressed a little in absolute terms, implying a somewhat overdamped reflex alignment. This is always a good idea with large speakers, because it preserves midbass definition while letting the usual "room gain" at low frequencies give a flat response. There is a small peak in the ports' output at 130Hz, but otherwise the rolloff is smooth. Higher in frequency, the woofers hand off to the horn-loaded midrange unit at 450Hz with what appear to be symmetrical fourth-order filter slopes. The midrange unit looks well behaved in its passband before crossing over to the horn-loaded tweeter at 3.2kHz. Again, the filter slopes appear to be fourth-order or higher. The tweeter also appears well behaved in its passband, but is slightly hot in its top-octave response. The dome resonance occurs just below 30kHz, above which the output drops rapidly.

Fig.4 shows how these individual outputs sum in the farfield. Klipsch recommends that the listener sit 5° below the tweeter axis, which, at the microphone distance I use for my measurements, is close to the midrange axis. I therefore performed all of my farfield measurements on that axis for reasons of repeatability. The apparent rise in response in the upper bass is mainly due to the nearfield measurement technique—in anechoic conditions, the Palladium P-39F will actually be pretty flat in the bass region. The speaker doesn't go quite as low in the bass as its size might lead one to

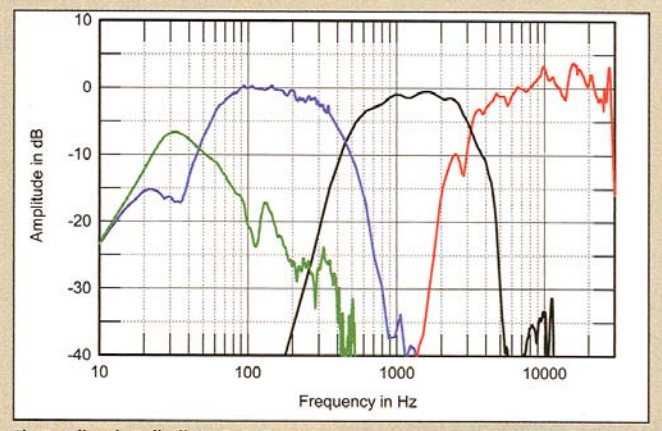



Fig.3 Klipsch Palladium P-39F, acoustic crossover on midrange axis at 50", corrected for microphone response, with summed nearfield responses of woofers (blue) and ports (green), scaled in the ratio of the square roots of their radiating areas.

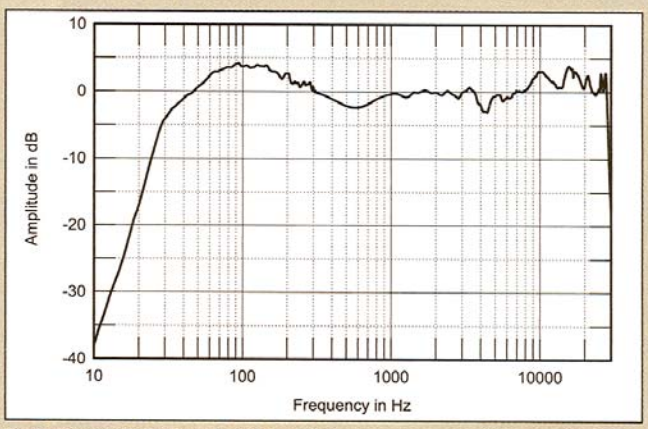



Fig.4 Klipsch Palladium P-39F, anechoic response on midrange axis at 50", averaged across 30° horizontal window and corrected for microphone response, with complex sum of nearfield woofers' and ports' responses plotted below 300Hz.

a vivid, living presence. Lang's breathy vocals were slightly larger than life, but also remarkably seductive. In fact, the P-39F really shone with vocals—I couldn't get enough of Shelby Lynne's *Just a Little Lovin'* (CD, Lost Highway 9789), either.

For sheer goose bumps, however, very little can beat k.d. lang's version of "Hallelujah," on *Watershed*'s bonus disc. Yes, it's probably time to call a moratorium on this Leonard Cohen chestnut, but talent will out—and lang's performance, recorded live, was a stunner through the P-39Fs. "Hallelujah" not only took my breath away, it reduced me to tears. Every. Damn. Time.

Nor do I mean that the Palladiums excelled at reproducing only female vocals. Playing Tom Russell's *The Man from God Knows Where* (CD, Hightone 8099), the way the Klipsches presented Russell's deep baritone was fairly magical—as was, for another example, Dave Van Ronk's hoarse, wheezy rant, "The Outcaste," also on this disc. (All Van Ronk fans owe it to themselves to hear not only this song, but also Russell's delightful salute to his old drinking buddy and mentor, "Van Ronk," from *Veteran's Day: The Tom Russell Anthology*.)

## FEED THE KLIPSCHES A HI-REZ SIGNAL AND THEY'LL REMIND YOU OF **WHY YOU CARE ABOUT HI-FI.**

Then there was the 24-bit/88.2kHz master of Cantus's *While You Are Alive* (CD, Cantus CTS-1208), which I played back from a DVD-A John At-

### measurements, *continued*

expect, but this must be balanced against its extremely high sensitivity and the overdamped alignment. In all but very large rooms, the P-39F should give almost the full measure of low frequencies. Other than a slightly elevated top octave, the Klipsch's midrange and treble are impressively flat.

Whether or not this flat on-axis response translates into a neutral tonal balance will depend on the speaker's dispersion. Fig.5 shows how the Klipsch's response on the midrange axis changes to its sides (only the differences in response are shown). The slight flare at the cursor position is actually due to the on-axis suckout at 4.3kHz filling in to the speaker's sides. The contour lines are otherwise evenly spaced in this graph, which is what matters, but close inspection reveals that the speaker is a little more directional than a typical direct-radiating model in the region covered by its horn-loaded drivers. The tweeter also becomes significantly more directional above 13kHz, which will ameliorate the slight boost in its on-axis output in the same region (for those whose hearing extends that high, of course). I note that Wes didn't toe the Palladiums all the way in to his listening seat, which suggests he gave a high priority to getting a smooth treble balance, while the speaker's well-controlled dispersion over the first 20° to its sides meant he could still get excellent imaging precision *and* a smooth transition between the drive-units.

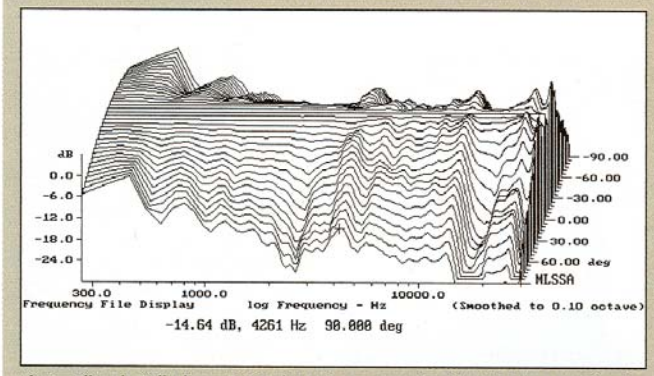



Fig.5 Klipsch Palladium P-39F, lateral response family at 50", normalized to response on midrange axis, from back to front: differences in response 90–5° off axis, reference response, differences in response 5–90° off axis.

In the vertical plane (fig.6), a suckout develops in the upper crossover region more than 10° below and 15° above the midrange axis, which is 45" from the floor. Fortunately, Klipsch supplies longer spikes for the rear of the baseplate to tilt the P-39F forward a little, to ensure that the ears of a seated listener are on the intended axis.

The Palladiums' spatially averaged in-room response (fig.7), calculated by taking 20 separate ⅓-octave response measurements for the left and right speakers individually in a vertical rectangular grid centered on the position of

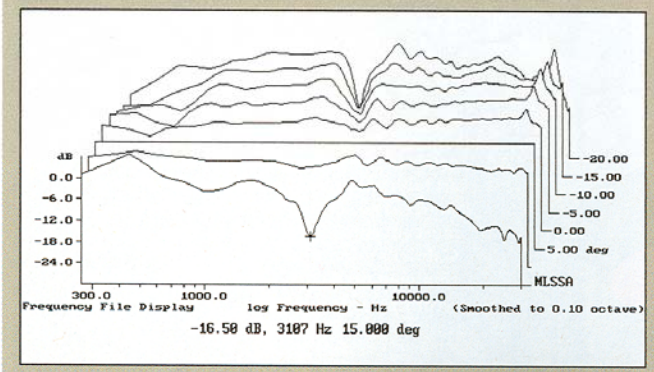



Fig.6 Klipsch Palladium P-39F, vertical response family at 50", normalized to response on midrange axis, from back to front: differences in response 20–5° above axis, reference response, differences in response 5–10° below axis.

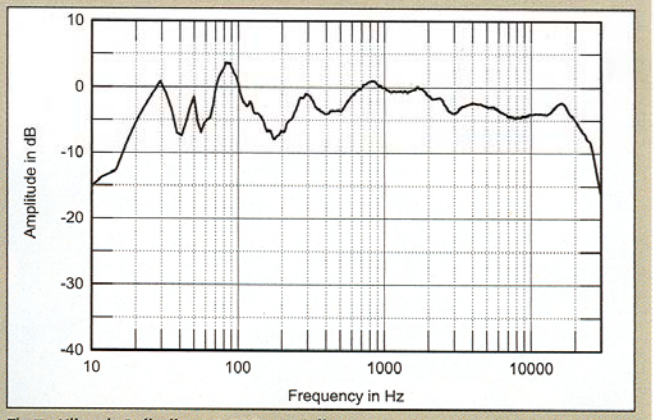



Fig.7 Klipsch Palladium P-39F, spatially averaged, ⅓-octave response in WP's listening room.

kinson had burned for me. Talk about goose-bump city—Eric Whitacre's *Lux Arumque* made my reaction to k.d. lang's "Hallelujah" seem mild. The P-39Fs glorified Cantus's extraordinary basses, and hung the tenors between the speakers in full-3D empalpification. Yes, feed the Klipsches a hi-rez signal and they'll definitely remind you of why you care about hi-fi. They take you there and get you closer.

## Hear old Triton blow his wreathed horn

After I'd reviewed the YGA Anat Reference II Pro without directly comparing it with another $100,000/pair reference loudspeaker (*Stereophile*, March 2009), YGA let me hang on to the Reference IIs with an ear toward making such a comparison in the near future. And as long as the YGAs were still around, I reckoned I'd compare the Klipsch Palladium P-39Fs to the high-priced spread.

The 4.5" inverted-dome midrange is loaded with a Tractrix-flare horn.

On several levels, such a comparison is unfair. Yes, the price difference of $80,000 is extreme, but also consider that the YGA has an active woofer, so you'd expect it to go lower than the Klipsch—and it does. On the other hand, the YGA

### measurements, *continued*

WP's head in his listening chair, indicates good integration of the speakers' output with the room acoustics, if not quite up to the standard set by the YG Anat Reference II Professional in March 2009 (www.stereophile.com/floorloudspeakers/yg_acoustics_anat_reference_ii_professional_loudspeaker/index4.html, fig.7) and the Thiel CS3.7 in December 2008 (www.stereophile.com/floorloudspeakers/1208thi/index4.html, fig.8). The Klipsch's middle and high trebles are slightly shelved down compared with the other two speakers (especially the Thiel), even though the Palladiums were being driven by the tubed VTL amplifiers, which will tilt up the treble region. The peaks and dips below 300Hz are due to room acoustics effects that have not been eliminated by the spatial averaging. Even so, the Palladiums maintain their in-room low-frequency output to 25Hz or so.

In the time domain, the Klipsch P-39F's step response on the midrange axis (fig.8) looks more complicated than the norm, due to the fact that the tweeter's output leads that of the midrange unit by 0.5 millisecond, due to the latter's setback to permit horn loading. Both tweeter and midrange unit appear to be connected in inverted acoustic polarity—the tweeter's step is the sharp negative-going spike just before the 4ms marker, followed by a lazier, negative-going spike from the midrange unit approximately 500µs later. The woofers are all connected in positive acoustic polarity, and their slow rise away from the timeline in this graph overlays the positive-going overshoot of the midrange unit's step. That each drive-unit's step smoothly blends into that of the next lower in frequency correlates with their good frequency-domain integration seen in fig.4. The Palladium P-39F's cumulative spectral-decay plot (fig.9) is basically clean, but with a slight amount of delayed energy apparent at the top of the midrange unit's passband. Peculiarly, this graph also suggests that the woofer/midrange integration is not as good as indicated in fig.4.

Overall, this is impressive measured performance, suggesting that Klipsch has some excellent speaker engineers on staff. However, Wes did mention the fact that the P-39F's three pairs of input terminals, positioned in a recess under the speaker's baseplate, elicited much swearing from me. Indeed they did, as this placement made hooking up and dressing speaker cables for the measurements far more difficult than it needed to be. Had Klipsch continued the terminal panel recess out to the rear of the baseplate so that cables could be routed straight back, that would have been a significant improvement in practicality. As it stands, dressing the thick speaker cables Wes likes to use was awkward: even with the P-39Fs sitting on their spikes, there was still not quite enough clearance between the bottom of the baseplate and the floor to avoid trapping the cables. **—John Atkinson**

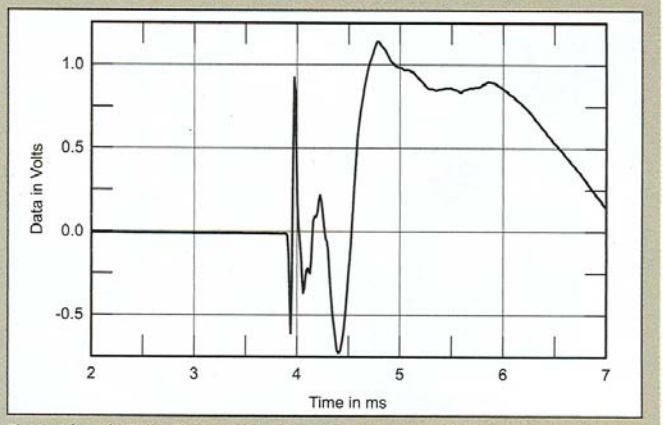



Fig.8 Klipsch Palladium P-39F, step response on midrange axis at 50" (5ms time window, 30kHz bandwidth).

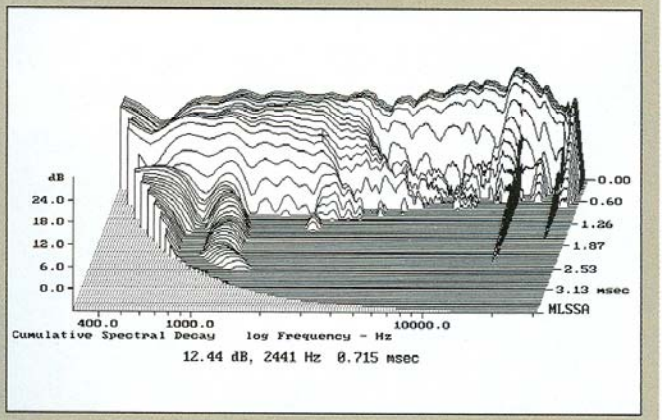



Fig.9 Klipsch Palladium P-39F, cumulative spectral-decay plot on midrange axis at 50" (0.15ms risetime).

is a pig to drive, and doesn't play well with tube amps—which means that the price of entry for the YGAs is considerably higher than $100,000. The Klipsches are easy to drive, so more of your budget can go for the speakers themselves.

Spoon dug deeper and rocked harder through the YGAs, but while the difference was audible, it wasn't overwhelming. Perhaps much of this was the result of how nicely the P-39Fs "fit" my room—or perhaps it was my awareness that the difference in price between the two loudspeakers would make an acceptable down payment on my brownstone.

With k.d. lang, Shelby Lynne, Tom Russell, and Cantus, I could hear more detail and ambience through the YGAs—though I don't think that translated into greater involvement with the music itself. More is better, of course, but there was something special about the way the P-39F handled the human voice that even a loudspeaker costing five times as much had a hard time trumping.

Everything else being equal, the Anat Reference II Pros unassailably performed better than the Klipsches in terms of frequency response, retrieval of detail, and holographic imaging. But everything else *wasn't* equal—the YGAs are all about extracting the last dollop of performance from an audio chain in which every component is operating a level of perfection. And while the Palladium P-39F, too, is extremely well engineered, it seems designed to function in the rather messier world that I live in—a world in which less-than-perfect rooms abound and where price matters. The fact that I felt an intense emotional connection to the music almost every time I played recordings through the Klipsches is no trivial detail.

## Out of the mouth of Plenty's horn

Are there better loudspeakers for $20,000/pair than the Klipsch Palladium P-39F? Possibly—I haven't heard every one of them yet. (Give me time and I'll certainly try.) What I can tell you is that the P-39F surprised me with its balance, lively sound, and ungimmicky naturalness. It's well built and, I think, really good-looking. If, like me, you think you know what a horn speaker sounds like, the P-39F just might astound you. It certainly astounded me. It's what you learn *after* you know it all that really counts.

## ASSOCIATED EQUIPMENT

**DIGITAL SOURCES** Ayre C-5xe universal player.
**PREAMPLIFIERS** Ayre K-1xe, VTL TL-6.5 Signature.
**INTEGRATED AMPLIFIER** Ayre AX-7e.
**POWER AMPLIFIERS** Moscode 402au, Musical Fidelity Nu-Vista 300, Parasound Halo JC 2, VTL MB-450 II.
**LOUDSPEAKERS** YGA Anat Reference II Professional.
**CABLES** Interconnect: AudioQuest William E. Low Signature, Shunyata Research Aeros (single-ended, RCA); Stealth Audio Metacarbon (balanced). Speaker: AudioQuest William E. Low Signature, Shunyata Research Aeros, Stealth Audio Dream. AC: Shunyata Research Python Helix Alpha.
**ACCESSORIES** Ayre Myrtle wood blocks & L-5xe line filter; Furutech eTP-609 distribution box & RDP panels, RealTraps Mini & Mondo Traps.

—Wes Phillips