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Infinity IRS Beta loudspeaker

By J. Gordon Holt & Larry Archibald • October, 1988

In 1966, two avid audiophile/music lovers—a nuclear physicist named Arnold Nudell and an airline pilot named Cary Christie—labored over weekends and evenings for 18 months in Nudell's garage to put together the world's first hybrid electrostatic/dynamic loudspeaker system. It cost them \$5000 for materials, launched a company (New Technology Enterprises), and helped contribute to the popular myth that all of the really *important* audiophile manufacturers got started in somebody's basement or garage (footnote 1). The system was marketed as the Servo-Statik I, for the princely sum of \$1795. (At the time, the most expensive loudspeaker listed in *Stereo Review's* "Stereo/Hi-Fi Directory" was JBL's "Metregon," at \$1230.)

It was in 1968, though, when this fledgling enterprise went "legit," with funding from outside investors, the rental of industrial space for a factory, and adoption of the name Infinity Systems, Inc. (If you're good at mental arithmetic, you may have reason to surmise that 1988 is Infinity's 20th anniversary). The first review of the SS-1 appeared in our Winter, 1968 issue, and it was an unqualified rave. But we had to return the system to Infinity shortly thereafter. We did so grudgingly.

Despite the subsequent release of two "affordable" hybrids, the models 2000 (\$239) and 1000 (\$119), Infinity Systems remained conspicuously inconspicuous in the audio field until 1970, when they were "discovered" by *High Fidelity* magazine, which gave the SS-1 an intemperately enthusiastic review.

Five years later, we got a revised version to test. By then, the SS-I had become the SS-IA. It was a three-way system consisting of a single 18" servo-controlled woofer in a cubic enclosure, plus two separate screens combining six largish electrostatic midrange panels with about the same number of electrostatic tweeters ranged in a single horizontal row and aimed in half a dozen different directions to "average" their HF beaminess. The tweeters were designed and built by the Jantszen company, which had had many years to debug the design, but the Infinity-designed midrange panels were far from bug-free. They had a tendency to arc-over at high listening levels, and when this happened, the spark would burn a hole in the diaphragm and the sharp edges around this from then on became a source of weakness, causing arc-over at much lower volume. Admittedly, our sample SS-IA was a "pre-production prototype," but the number of midrange-panel failures we experienced during the course of our tests did not augur well for the system's viability as a commercial product. Nonetheless, I was immensely impressed by the SS-IA's sound when it worked, describing it (in my review, Vol.III No.9) as one of the two "most accurate" speaker systems available. (The other, reviewed in the same issue, was the FMI J-Modular.)

Infinity apparently never did solve the problem of midrange-panel breakdown. Instead, they bypassed the issue by abandoning the electrostatic approach entirely. In 1976, after using the Strathearn planar driver for a while, they introduced their EMIT, the name being an acronym for "Electro-Magnetic Induction Tweeter." Essentially a push-pull

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ribbon transducer with an etched voice-coil, EMIT was later supplemented by a midrange version, called EMIM, and both became the basis of all subsequent loudspeakers from Infinity, other than their beer-budget models, from car-stereo speakers to the huge \$45,000 IRS V.

At a bit over \$10,000/pair, the IRS Beta should by all rights be a poor cousin to the "flagship" IRS V. After all, higher price buys higher quality, right? Particularly when the same manufacturer makes both models. But put that question to the people at Infinity, and you get a lot of hemming and hawing and scrabbling of toes in the dust. No, they won't come right out and tell you the IRS V is better than the Beta. (See, I resisted the urge to make a Terrible Pun.) But neither will they tell you the Beta is beta than the IRS. (I couldn't resist!) But the implication is clear; the folks at Infinity are *proud* of what they've pulled off in the Beta. And not without justification.

The IRS Beta is a five-way design, with the usual cone woofers (eight 12" in all) and a vertical array of five EMI drivers on each of two separate upper-range panels. These drivers have acronymic appellations of LEMIM (large midrange), EMIM (midrange), EMIT (tweeter), and SEMIT (supertweeter). All the crossover filters for the EMI drivers are contained in the bases of the free-standing panels, as are the level controls for the three uppermost drivers. (The two LEMIMs are the only drivers without level controls, which is okay because all the others have them.) An electronic crossover (supplied) contains an active low-pass section, with response-contouring controls for the woofer towers, and a passive (straight-through) signal path for the upper-range panels. The Beta system *must* be bi-amplified, although it is unusual in that it feeds the full audio range to the upper-range amplifiers.

On the electronic crossover are a woofer level control, a crossover control—labeled "low-pass filter"—which changes the woofer low-pass turnover, a "high-pass filter" that establishes the system's LF cutoff frequency, a bass contour control (for rising, falling, or flat response below 40Hz), and a woofer polarity switch. On the rear of the crossover is a toggle switch labeled Open Loop Gain Comp, which is essentially a gain-compensating switch for the bass amplifier.

I mentioned earlier that Infinity's original hybrid systems had a "servo-controlled" woofer. A second voice-coil was connected via a second pair of speaker wires to what amounted to a feedback circuit in the electronic crossover, which compared the cone's actual motion with the input signal, and automatically corrected for any discrepancy. The Beta uses a much more sophisticated form of servo control. One of the four woofers in each column has a high-quality accelerometer attached to its cone which measures the cone's changes in motional velocity. A second pair of (lightweight) wires carries the accelerometer output back to the crossover unit, and the signal is compared with the input signal, the difference being applied out-of-phase to the signal to correct for the discrepancy. (The woofers are said to be closely enough matched that the behavior of one will be typical of all.)

Because the servo control involves a large amount of negative feedback, signal polarity is crucially important. The servo connecting plugs are polarized, and can only be connected one way, but if the bass amplifier is polarity-inverting, or if the woofer cables are reversed, plus for minus, the negative feedback becomes positive and the system will go into violent full-power oscillation at around 35Hz, which is (I can assure you!) one of the most frightening (and potentially destructive) sounds you will have ever heard! This can also happen if everything is phased properly but the bass amplifier has very high gain, which explains the "Open Loop Gain Comp" switch. So, regardless of how absolutely certain you may be that your bass amp is noninverting and has the right gain and the speaker cables are properly polarized, you should *always* set the crossover's Woofer Level control all the way down before turning everything on the first time, and raise the level *slowly* to ascertain that everything is okay. If it isn't, a rising roar will warn you to turn the control down again before the woofer cones turn inside out, and to reverse the polarity of the speaker cables. Test one woofer channel at a time so that, if you get oscillation, you'll know for certain which channel is bass backwards.

Nota bene: The crossover's front-panel Polarity switch does not have the same effect as reversing the woofer connections. It reverses the woofer polarity *independent* of the feedback loop, so it does not change the negative feedback to positive feedback or vice versa. The Polarity switch is used only to achieve correct *absolute* system phase, in conjunction with the upper-range panel polarity, when (for example) the preamp/control unit is polarity-reversing. Infinity's instructions stress the importance of overall absolute phase, but I seem to be one of those people who are stone-deaf to absolute phase. My advice: Try to phase the system properly, just in case your ears *are* polarity-sensitive, but don't worry if you can't hear the difference. You're in good company.

Three Infinity staffers descended upon us prior to my tests of the Beta. First, chief design engineer John Miller arrived to modify our speakers—removing their overload protection circuitry—and to install and check them out. The protection mod on my Betas was done because the Infinity people felt they could trust us not to abuse them and because,

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apparently, the overload protection causes a slight degradation of the sound. (Considering *Stereophile* Santa Fe's record to date—six woofers and two tweeters trashed in a mere three years—I would say his confidence was misplaced.) But I had, and still have, some misgivings about reviewing a modified version of the Betas. If Infinity is not prepared to sell the unprotected version to consumers, I would have preferred to test a stock pair. As it is, I have no way of knowing how much the overload protection affects the sound, and, as a consequence, how much better my samples may have sounded than the average production speakers. (Perhaps Infinity can enlighten us about this, in a Manufacturer's Comment.)

After Mr. Miller left, Infinity president Arnie Nudell and senior veep Leon Kuby arrived, to re-tweak the loudspeakers and "make sure everything was working right." Having the manufacturer install his speakers for us is not exactly SOP at *Stereophile*, nor is it at all unusual. I usually undo most of what they've done after they leave, anyway, because my priorities for reproduced sound tend to be different from that of most manufacturers. But in this case, such undoing was minor.

Equipment used for these tests included the Ortofon MC-3000 cartridge in the Versa Dynamics arm and turntable, a Stax Quattro CD player, a Sony PCM-F1 digital tape system, Threshold's FET-10 preamp and line controller and SA-1 power amplifiers, an [Audio Research SP11](#) preamp, and pairs of [Audio Research M-300](#) and [VTL 300](#) mono amplifiers. Audio interconnects were Monster M-1000s, speaker cables were Monsters and AudioQuest Clears. Program material was some of my own and others' original tapes, and CDs and analog discs from Sheffield, Opus 3, Telarc, and Reference Recordings.

Footnote 1: This is consistent with the equally popular myth that people will beat a path to the door of anyone who invents a better mousetrap. They will, but only if the inventor spends half a million dollars on advertising and promotion.—**J. Gordon Holt**

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Infinity Systems

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J. Gordon Holt, January 1989

Larry Archibald, December 1989

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Prior to the visitations, LA and I had done some preliminary listening to the Betas with the FET-10 preamp, the SA-1s on the upper-range panels, and a Mark Levinson No.23 and a dbx BX1 (in turn) on the bass towers. The sound was excellent but not exactly what I would call superb. When Nudell arrived, he insisted that we try using tube electronics. He even brought along one of his own Audio Research SP11 preamps (the man owns *five* of them!), just in case we didn't have one gathering dust in the corner. We didn't, Arnie Balgalvis currently giving house-room to our Mk.II SP11. However, we did have a pair of ARC's M-300 amplifiers on hand, and these were pressed into service until, after about half an hour, one of them blew a screen fuse and died. (Evidently a tube let go, but with eight of them in each amplifier, we were not about to take the time to try and figure out which was the culprit.) Fortunately, we had just taken delivery of a pair of the new VTL 300W tube monoblocks.

With the solid-state electronics, the sound was rather dry—more so, in fact, than with the same electronics through the Sound Lab A-3s. With the SP11 and the VTLs, the sound was transformed, becoming much more liquid, open, and *musical*. Did this mean the tubed electronics were *better* than the solid-state ones, or just different? In fact, subsequent bypass tests confirmed that the FET-10 was slightly more *accurate* than the SP11, but there was no denying that, with the SP11, the Betas sounded more musically natural. Nudell confirmed that the Betas, like Infinity's other top systems, were designed in conjunction with Audio Research tube electronics, so it was hardly surprising that they sounded a little less decent with solid-state electronics, no matter how "accurate" these may have been. This report, then, applies only to the sound of the Betas with some of the best tubed electronics available. I think I can state with confidence that the system *must* be so used in order to fully exploit its performance capabilities.

It must also be said that the Betas need a lot of breathing space. Because the woofers are capable of moving a hell of a lot of air, they should be placed well away from the room corners, to avoid as much as possible the generation of standing-wave resonances. The upper-range panels, too, should be at least 4' out from the rear wall, to permit their fullest reproduction of depth. Even more distance is needed in front of them. Because the panels are so high, and the drive-units occupy quite a large chunk of vertical space, the listening seat should be at least 8' away from them, and preferably several feet more, in order to give the wavefronts sufficient distance to integrate properly. Like the IRS Vs, these are simply not small-room loudspeakers; using them in anything less than a *big* room is a waste of much of their purchase price.

Four driver-balancing adjustments may seem to pose a formidable setup challenge, but the job is a lot simpler than it may appear. To begin with, the EMI controls have rather limited range—only about ± 2 dB from center, and the system is designed to be close to "right" with all of them centered. Usually, little change in any of them will be required, and the final tweaking should be done over a period of some weeks, using a wide variety of recordings known to have been carefully engineered for realism. (That rules out all product from major record companies.)

Woofer adjustment is by far the most daunting aspect of Beta setup, because of the number of interacting controls provided. With a claimed lower limit of 25Hz, and (by my own measurements, footnote 2) flat response down to at least 20Hz, these are quite capable of revealing stuff on recordings that you didn't know was there and were better off not knowing. I have heard and read criticisms of Infinity's bass towers as being sodden and heavy in quality, and, indeed, when Nudell was here, he set up the woofers for what I felt privately to be too much of a good thing. The instructions for the Betas suggest that one should never operate the subsonic (high-pass) filter wide open when listening to LPs, and with the system setup Nudell left me, the unfiltered bottom revealed

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But after he left, I turned down the bass level, moved the woofer towers about 6" farther out from the room corner, and shoved my sofa around until the low end I was hearing was as smooth and extended as I could get it. Guess what? The LF filter was no longer necessary on discs. Yes, there were still many records from which you could hear very deep noises in the background, but the noises were under control. They were neither prominent nor annoying, and even added a measure of realism to the sound because the noises *were* present during the original performance. The moral of this is that the most bass is often not the best bass (footnote 3).

Shortly into my private listening tests, I noticed that I was consistently running the preamp's balance control to one side of center. I had also been starting to observe that the system's imaging wasn't as good as it might have been. Phantom images were broader than life, and were rather unspecific in lateral placement. Playing a mono disc confirmed what I suspected: Center bunching was rather loose, and seemed to wander ever so slightly with changes in the music. I tried rotating the balance control from extreme to extreme, so as to listen first to one channel only, then the other. There was a definite difference, all the more obvious when using pink noise as a signal source.

All the drivers in both panels were operating, and apparently at the proper sensitivity levels, but it was not possible to make the two channels sound alike by adjusting their balance controls. It sounded to me as though the crossover between one set of LEMIMs and the EMIM above them was out of whack: either the LEMIMs were going out too far or the EMIM was going down too low. (The difference was too great to be compensated for with the individual driver level controls.)

Reversing the speaker cables, left for right, confirmed that this was not due to a difference in input signal; the problem remained in the same speaker. Interchanging the speaker units caused the problem to switch sides. The panels were unquestionably different. No wonder the imaging was mediocre!

That nobody had picked this up during the two previous days of listening seems hard to believe, as it was not at all subtle once I started listening for it. (Though Arnie Nudell's listening seat was off to one side of the central listening seat.) But there's the point. It has been said that audiophiles tend to hear what they expect to hear, but less recognized is the fact that we are often amazingly oblivious to what we *don't* expect to hear (footnote 4). But was the problem I had found a result of poor quality control, or a defective crossover part, or something else? John Miller messed around in both crossovers with a soldering iron while he was here; could he have miswired something? I may never know what happened. What I do know is that Arnie Nudell was horrified at the news when I phoned him about it, and got another (also modified) panel to us almost overnight.

A New Panel

I assumed that, when the replacement panel arrived, it would be a simple enough matter to determine which of my samples was out of whack. Just listen to the new one against the other two, with pink noise, and throw out the one that didn't match the replacement. What I found instead was rather distressing, to say the least. The new panel did not match *either* of the originals!

Instead of two different sounds, I now had three. The fact that the new one sounded midway between the other two made it impossible for me to ascertain with any certainty which of the originals was "right" and which was wrong. So I gave Infinity the benefit of the doubt, and culled for rejection the one which, in my judgment, sounded the least agreeable. Whether it was more or less typical of average production, I have no way of knowing. But I must say I was shocked at the variability I found between three samples of the Beta's upper-range panels. There is no way this system will ever be able to provide tight, natural-width imaging with that kind of QC!

Not surprisingly, the Beta's imaging was now substantially better than it had been, but it still wasn't as stable or specific as I have heard from many other speakers. I cannot believe my Betas are imaging as well as they could. But—and here is the point to continuing with the review—I also find it hard to believe they could sound much *better* than they do.

Awesome

The word that most aptly describes the Infinity Betas is "awesome." These loudspeakers have a greater capability for standing one's hair on end than any system I have ever heard. I got goose bumps from recordings of solo accordion and harmonica, which is unprecedented, since I normally consider neither of them to be thrilling instruments to listen to. These speakers sounded as if they were *made* for big, dramatic musical works of the kind that inspired the high-fidelity movement from its very inception. (Why US audiophiles so often use their \$20,000 systems, with 200Wpc of amplifier power, to listen to "original baroque

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instruments," solo guitar, and vocal sextets, is beyond my comprehension. Are Americans the only people in the world who would not see anything ludicrous about using a Stinger missile to kill a fly on the wall? footnote 5) The Betas had tremendous dynamic range, an incredible feeling of power, and a remarkable effortlessness during the loudest passages. The overall impression they gave of real, live music was something that must be heard to be appreciated.

Yet, quite unlike other immensely "impressive" speakers I have heard, these were equally at home with small-scale, intimate musical works. The Wilson Audio Beethoven violin-and-piano sonata recording sounded almost as realistic as the time Dave played the original tape through his factory reference system. In fact, the fiddle sounded a bit more natural to me through the Betas, which is to say it almost *could* have been right in the same room with me.

In terms of harmonic structure—accuracy of timbre—the Betas are going to be hard to beat. When something is this close to the proper tonality, then it becomes hard to describe its "sound" as such. Heard through the Betas, every instrument seemed to have just the "right" combination of weight and texture. Cellos, piano bass, and large brass instruments—whose sounds are most slighted by the majority of audiophile speakers—were reproduced by the Betas with breathtaking authority and power, and the effect that had on the apparent dynamic range of orchestral (and piano) music was quite dramatic.

Bass was positively awesome, with the capability of producing a *huge* sound from large-scale kitchen-sink works like the Mahler 8th and Mozart *Requiem*. Properly balanced and contoured, the Beta's low end seems totally absent most of the time. Then an unbelievably deep sound comes from the system, and the floor shakes. As the floor of my listening room is concrete, I know this is impossible, but there were times when I would have sworn it was happening. (What was shaking was probably my sofa.) And the *quality* of that bass was just as impressive as its quantity. Only the Synthesis subwoofers have equalled the Beta's low-end detail and focus in my listening room, and nothing I have heard has surpassed either of those in that area.

Oh yes (ho hum), the matter of soundstaging. The only systems I have heard that can touch these for soundstage presentation are a few mini-monitors. With good recordings, the stage almost literally "floats" between and behind the speakers, and the awareness of side walls beyond the speakers and the rear wall behind them is more definite than I had believed possible. Only in imaging specificity is the Beta less than impressive, and we know now why that is. (At least, in the case of my samples.)

Summing Up

Is the Beta a winner in every respect? Almost, but not quite. It does not have quite the "snap" of such full-range electrostatics as the [Sound Lab A-3](#), which is capable of making sounds seem palpably, in-the-flesh alive. Without a direct comparison, this small deficiency is hardly noticeable; the Beta sounds very convincingly real. Under side-by-side conditions, the A-3s have the edge on realism. There is also a quality of brightness I hear from the Sound Labs which can verge on irritation under the wrong circumstances, but which contributes a great deal to the illusion of you-are-there reality when under control. This was one of the biggest differences I observed between the speakers. Whether the Sound Labs have too much of it or the Betas have too little is moot, but there is no doubt but that the Betas sounded more agreeable, and more *musical* under more conditions and with more program material than do the A-3s. The Betas have, if anything, a slight deficiency through this range (around 5kHz), which may conceivably account for the Sound Labs' superior aliveness.

In short, I *love* these speakers, and I cannot imagine anyone not being absolutely blown away by their performance. If you can afford them, and have the space, buy them. If I could, and had, I would. But if you do, be prepared to give up any smug preconceptions about the superiority of solid-state over tubes. A good transistor amp will work fine on the woofers, but only with the best tube preamps and upper-range power amps will these speakers deliver the remarkable musicality and realism of which they are capable. Also, make sure your panels are at least similar in sound. Perhaps my experience with three of them was unusual, but then again, it may not have been. Consider yourself warned!

The Infinity Betas' pricewise competition? Forget it. There isn't any that I know of.—**J. Gordon Holt**

Footnote 2: In fact, I could not tell what the Beta's lower limit was, because my oscillator does not range below 20Hz, and the system (in my room) produced as much output there as at 100Hz! The subjective effect of a very strong 20Hz is at once awesome and nauseating: awesome because of the impression of incredible power it gives, and nauseating because it apparently does nasty things to the ear's balance-sensing semicircular canals. I estimated that five minutes of exposure to it would

have cost me my lunch.—**J. Gordon Holt**

Footnote 3: To be fair to Arnie Nudell, he set the bass level in Gordon's system using master tapes and CDs as reference material. The absence of subsonic spurious with these sources, and the generally clean nature of their very low frequencies compared with LP, allows the subwoofers to be set higher without sounding unnatural.—**John Atkinson**

Footnote 4: I am reminded of a CES exhibitor some years ago who was proudly promoting a new noise-reduction system with a demo in which his decoder was *switched out of circuit*. For my part, I must confess that I have on occasion listened blissfully to several minutes of a stereo recording before realizing I had the preamp set to Mono.—**J. Gordon Holt**

Footnote 5: JGH! For shame! Thus to equate muscle with music is unworthy!—**John Atkinson**

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J. Gordon Holt, January 1989

[J. Gordon Holt returned to the IRS Beta in January 1989 \(Vol.12 No.1\):](#)

Rave or not, my report in Vol.11 No.9 (September 1988) on this Infinity flagship system ended on a note of uncertainty, concerning an audible difference between the sound of the two mid/high-frequency-range panels which was messing up the imaging and exacerbating program grunge in one channel.

When I phoned Infinity president Arnie Nudell and reported that my upper-range panels weren't matched, he didn't believe me. "Why," he asked, "didn't any of us notice it during our visit?" I explained it was probably because no one was listening for it, and besides, the brighter, more sizzly side had been at the right, out of reach of such things as massed violins, which were most affected. At the right, it only added additional guttiness to cellos and basses. So, on the (reasonable) assumption that one of my two upper-range panels was out of whack, Infinity sent a single replacement.

The idea was to compare the new one with the two originals, and toss out (as defective) the one that didn't match. But it wasn't that simple. (Things rarely are.) Instead of two different sounds, I now had *three*. The new panel sounded almost exactly halfway between the other two. Of those, I put aside the most sizzly-sounding one, and phoned Arnie again. This time, he sent John Miller to Santa Fe again, with two large boxes of test equipment.

First, we listened. Yes, John could clearly hear the difference I was talking about; no, it wasn't "normal," and no, he didn't know yet what was causing it. After a full day of measuring, during which I went off and tended to other matters, John felt he had the problem pinned down. He told me he had found a very small inaccuracy in the value of a crossover capacitor, resulting in a 1dB reduction in the level of the *rear-firing tweeter*, which spans the 5–12kHz range. He corrected it, and we listened to the result.

Now the speakers sounded virtually identical, and I expressed disbelief that such a small change could have had such a noticeable effect on the sound. But...the panel he claimed to have found the problem in was the one whose sound I had liked the most. Now I did not care for the system's sound at all.

After John left, I continued to work over the speakers, adjusting driver levels, changing room placements, trying other electronics, all the while becoming increasingly convinced that something was drastically wrong. I could not get them to sound nearly as good as they had originally. There was now a persistent coloration—best described as a steely sizzle—in *both* panels, which made any loud orchestral music sound so relentlessly strident as to set my teeth on edge. (Of course, that *had* to be the week of *Stereophile's* annual reviewer convention, and everyone wanted to hear my system. Only a few of them were polite enough—or embarrassed enough—not to tell me they thought it sounded dreadful!)

Meanwhile, a couple of other things developed that put the Betas in a less than favorable light. First one, then several, then all of the loudspeaker terminals came loose. They didn't actually fall off, but they became so wobbly that I started to wonder when their electrical connections would start to become intermittent. (None has, yet.) Then the crossover module's turnover control knob started to slip on its shaft and, with continued use, finally came completely off in my hand. The reason for this then became obvious: The knob had only one set screw to lock it to the shaft, the screw was very small, and the shaft had no flatted side for the screw to seat itself against. (Worse, the set screw is recessed behind the

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front panel when the knob is in place; it would have been necessary to dismantle the whole case to replace the knob. I just used pliers for future adjustments.)

Granted, these are minor mechanical problems which seem to have no effect on the sound, but to my way of mind they are inexcusable in a \$10,000 product. It's not as if we're dealing with frontiers of technology here; control knobs and 5-way binding posts have been around for longer than I have! I have a cheap Sears-Roebuck radio that has been in use for more than 25 years, and nothing has ever fallen off *that*.

I placed another call to Arnie, and learned that John hadn't just made a small crossover-part "correction," but had also replaced the EMIM and EMIT drivers on both panels, "just to be safe." Arnie declared he was sending another matched set for me to try.

The drivers were a cinch to replace, but did they solve the problem? Well, yes, no, and maybe. The speakers now sounded quite a bit more pleasant than they had, but they still lacked the gorgeous richness and ease that had attracted me so much to the sound of the original panels. (I should say, "to *one* of the original panels," because it was what that panel was doing to left-channel sounds that made the system so appealing.)

It seemed to me that most of the sizzle still remaining was coming from the EMITs, so, just on a hunch, I swapped out the latest pair for the previous pair. Sure enough, the problem was slightly worse.

Accordingly, we arranged for Infinity to send us yet another pair of upper-range panels. These, which I am assured are "right out of stock," are the best-sounding of any I have heard to date. The steeliness which afflicted some of the previous samples is completely absent, and nothing else of value has been lost. The system now sounds just as magnificently rich and powerful as did the first samples I reviewed, but with far better imaging than that first pair. However, the very fact that the latest pair are *different* from the previous pair, even if only slightly, has not helped to dispel the impression that there is some sort of quality control problem here.

The problem *sounds* very much like a simple frequency-response aberration, which should be easily measurable. In fact, we tried early on to find a frequency-response anomaly that would account for the perceived brightness difference between the two panels which had sounded the most dissimilar, and failed. The probe mike was not moved between comparative tests, the speaker locations were identical to within as small a fraction of an inch as we could get them, and the two people in the room during the tests were as far as possible from the soundfield and in identical poses for each response run. No consistent differences were measurable, and the *inconsistent* differences measured (on the order of $\pm 1-2$ dB) were of insufficient amplitude to account for the audible differences. Indeed, it took almost 3dB of EQ (downward, at 5kHz) on the Accuphase G-18 equalizer to make the two panels *sound* fairly similar, but they then *measured* almost 3dB different at that frequency.

The problem for a manufacturer, of course, is that it is impractical to do QC by ear. The challenge is to find an objective substitute.—**J. Gordon Holt**

Footnote 1: Don't laugh. No other recording medium comes close to digital's 0Hz low-frequency limit.—**J. Gordon Holt**

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Larry Archibald, December 1989

Larry Archibald wrote about the IRS Beta in December 1989 (Vol.12 No.12):

There I was in audiophile hog heaven, faced with the greatest collection of amplifier pulchritude I could imagine—plus four pieces of masking tape. Amplification was by Vacuum Tube Logic (VTL 500s), Krell (KSA-200), and Mark Levinson Audio Systems (No.20.5s); tape was by 3M. The amplifiers retail for over \$25,000, the tape for less than 5 cents—but each side of the equation was equally important.

Now, I already knew from JGH's experience with the Betas (Vol.11 No.9) that choice of amplification was crucial, particularly on the midrange-tweeter panels. And, prior to the measurements he carried out for his Vol.12 No.6 "Follow-up," JA confirmed this importance when he fired up the Betas in my living room using the exemplary Levinson 20.5s. No go! Unbearably bright sound—I listened for 30 minutes, then gave up. (In fact, that experience was daunting enough that it took me until late August to try again—see October's "As We See It.")

Fortunately, David Manley found a pair of VTL 500s to send out; their sister amps, the Reference 300s, had made the difference with JGH's original Betas, but are now with JGH in Colorado. (JA surmises that the interaction of a tube amplifier's higher-than-normal output impedance with the very low impedance of the Betas above 10kHz—which drops the absolute amplitude response above that frequency—is what makes the VTLs such a good match for the Betas. It's for sure that the Betas were designed by Arnie Nudell with strictly tube amps in mind.) Almost at the same time, our purchased Krell KSA-200 arrived, and we already had the Levinson 20.5s on hand for JA's review in the September issue (though I doubt I could have pried them away from him were it not for this follow-up). Such riches!

Let me define which pair of Betas I'm talking about here. If you remember JGH's review, he had just about decided the Betas were the best speaker in the world when he discovered that the two midrange-tweeter panels he had didn't sound very much the same (footnote 1). The area of difference was right in the range where a speaker sizzles, or doesn't. Critical to his up-till-now rave was the fact that the unsizzly (dull) speaker had been on the left (where the violins play), and the sizzly one had been on the right. JGH's most severe test of speaker tolerableness-under-stress is massed violins, virtually always found on the left of the orchestra. In other words, by accident JGH's Betas were "rigged" to sound good. JGH felt hoodwinked—though inadvertently, he was sure.

Infinity immediately supplied a third speaker, which unfortunately fell between the other two in tonal balance, making it even more difficult to determine what standard production sounded like. Then they sent out John Miller, their key speaker designer/technician, to make sure everything was all right, but the changes he made caused even more confusion. Finally, a completely new production pair of midrange-tweeter panels were sent, the sound of which JGH reported in his Vol.12 No.1 "Follow-up." Disappointingly, the replacements never quite attained the magic possessed by the first pair, with their one "dull" midrange-tweeter panel.

My job was to find just how good this new pair could sound, since JGH's efforts to do so were abbreviated by his move to Boulder, Colorado. (JGH's new listening room is, at present, too small to accommodate the Betas.)

By the time I got around to *this* "Follow-up," though, I had an advantage JGH didn't: the four pieces of masking tape. (You can use black

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electricians' tape for least noticeability, or sticky-backed foam tape for maximum effect.) This tape has provided the greatest return for the least investment since the first person used Mortite to keep a Shure stylus body tight to the cartridge body.

If you're a Beta owner (and it probably works to great effect on other Infinity models, most of which use EMIT and SEMIT drivers), here's what you do: vertically cover up half the tweeter and half the forward-firing supertweeter. I experimented with covering either inner or outer half of the tweeter. Which side you choose affects the overall soundstage presentation, but which will be better in your system depends on your speaker placement and room. I ended up with the tape on the inside half of the driver elements, effectively giving me a little extra separation. That's it! But do it *before* you spend \$25,000 on amplification, buy a new cartridge, replace your preamplifier, and exhaust your dealer's supply of exotic cables. This one move brings the Betas into the realm of listenability with a wide range of equipment.

The next step is to have the most skillful and well-equipped dealer in the country, or at least in your state. You'll need him (or her), because you will need to be able to audition a variety of amplification, CD players, cartridges, and cables—for all I know the first thing they'll tell you to do is remove the tape. (You *could* use black tape and leave the grilles on; no one will notice.) Beg their indulgence; you'll still get to buy lots of expensive gear from your dealer to make your Betas sound their best, but you'll enjoy the journey more, and your choice of associated equipment will be wider.

The tape tip came to me not from my native genius, which lies in the realm of Mercedes-Benz car repair, but from an electronics manufacturer who, almost alone among CES and Hi-Fi Show exhibitors, has coaxed an excellent sound from Betas in those environments. In fact, at one CES almost the entire staff of *Stereophile* remarked on his achievement—we just couldn't believe it!

So, here's my tale of the tape (footnote 2) With tape installed, I started out driving the Betas on top with the pair of VTL 500s, and on the bottom with the Carver Seven T-mods, using the Conrad-Johnson Premier Seven as preamplifier. (Other system elements consisted of the familiar CAL Tempest II, the Well-Tempered Turntable, the AudioQuest AQ7000 cartridge, AudioQuest Lapis interconnects, and AudioQuest Clear Hyperlitz and Kimber 4AG speaker cables.) The VTLs were magnificent on top. As much as I loved the 300s that Gordon used, I have to give the nod to the 500s in terms of sheer effortlessness—which is, after all, one of the main things a \$35,000 hi-fi system should be all about. With the system first turned on, the tape was essential: without it, there was just too much uncomfortable edge. As the system warmed up—which means, essentially, the VTL 500s, since the Premier Seven stayed on continuously—the tape became less and less necessary, until, finally, it got too dull. Off came the tape, and the natural bite and sheen of live instruments returned.

Through all this, though, the Carver Seven T-mods couldn't quite be made to work satisfactorily. In my room, the Beta bass towers proved hard to position; in fact, with the Carvers I couldn't find a combination of bass-control setting and tower positioning that yielded adequate bass without incipient bass heaviness. (In all fairness, Carver's attempt here is to imitate—he no longer claims identity—the sound of his tube Silver Sevens, which are unlikely to represent state-of-the-art control at the low end. Bob told me, during a recent visit, that he wouldn't expect the Sevens to sound good on the low end.)

Installing the Krell KSA-200 on the towers eliminated all problems, though still only with careful woofer positioning. I ended up with the woofers about 1-1½' behind the midrange-tweeter panels, and toed-in the way full-range speakers normally are: the midrange-tweeter panels faced straight ahead. The toeing-in of the woofers proved critical in limiting bass heaviness. Although a full review of the Krell awaits JA's soon-to-arrive ministrations, I have to say that it's unbelievable that this amp measures the same as other amps in the lower octaves: there seems to be at least an additional octave, and with almost unlimited supplies of power.

For curiosity's sake, I moved the Premier Seven out of the system and moved in the VTL Ultimate, which had arrived as a bonus with the 500s (give a camel an inch into the tent and he'll take a mile). What a change! I rushed for the tape. Along with a dramatic change in spaciousness (the Premier Seven is no slouch in this category) came a dramatic increase in mid- to upper treble. The tape, though, made this bearable—a superior presentation of spaciousness and ambient detail was rescued by the tape; without it, I'm afraid the virtues of the Ultimate would have gone unauditioned.

Further adventures in the tape wars came with the Levinson 20.5 amplifiers on the top end. As I mentioned earlier, the Levinsons, as originally set up back in April, simply made the Betas unbearable to listen to. Just too much treble. A combination of tape on the tweeters and better in-room setup make the 20.5 a suitable, if not ideal, amplifier with

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the Betas. Let me make it perfectly clear that I consider the 20.5s one of the truly great amplifiers of the late '80s. They have been both revealing and forgiving with all the other speakers with which I've tried them.

When first turned on with the Betas, my first move was to cover even more than half of the tweeter and supertweeter on each Beta—there was barely any radiating surface exposed! In addition, I used the double-sided foam tape, which is more absorbent than masking tape (as well as a pain in the neck to remove). After about two hours, it was necessary to move the tape back to the half-covering position; after six hours, I removed the tape from the supertweeter. Still, the sound was even better the following morning, so for the remainder of my listening I simply left the 20.5s on all the time. Truly, there is no better speaker on which to listen to the sound of the 20.5s warming up!

Completely warmed up, the 20.5s were most listenable, even enjoyable. In some respects the Levinsons were superior to the VTLs: they possessed a directness and clarity not there on the VTLs. (In fact, I found that excessive tape, such as I started out with, really screwed up this clarity; tape can be overdone.) Nevertheless, I felt that the virtues of both amplifier and speaker were not being heard to their maximum. The Betas were designed to be used with excellent tube amps, and they should be; the 20.5s sound best with speakers possessing a more neutral upper two octaves than the Betas. More specifically, the 20.5s don't provide the draw-you-in luscious liveliness I heard from the VTLs. I suspect other great tube amps, from Conrad-Johnson, Audio Research, or Counterpoint, can perform similarly well; I've heard the latter two sounding good with Betas. Complementarily, the 20.5s sound best in other situations—almost any other situation.

I guess your big question is, Are the Betas worth all this trouble and expense? In fact, my biggest incentive in writing this follow-up has been to allay the anxiety I experienced every time I saw the Betas in Class A of "Recommended Components." After all, I'd heard them sound quite poor in a number of situations, and good in only a few. (Our writers, after auditioning the Betas in JGH's basement at our second "Recommended Components" conference, couldn't for the life of them imagine how they made it into Class A at all.)

When everything's right—right amps on top and bottom, right preamplifier, right cables, right tape—the Betas are the best speakers I've ever heard in my home. They're one of the best speakers I've heard anywhere; only some choice auditions of the IRS Vs (by The Audible Difference at the Bay Area Hi-Fi Show) and the Wilson WAMMs have clearly bettered them. Voices and instruments achieve a kind of immediacy that's uncannily like what I imagine it would sound like to have my favorite singers and players right in my living room. Reproduction of the details of recording spaces, particularly on LP with the VTL Ultimate preamp, leaps way beyond anything I've heard at home, and not just a little. This ability is addictive: I suspect I'll be unhappy with how hard it will be to go back to Mirage M-1s, Thiel CS1.2s, or [Vandersteen 2C1's](#)—all excellent speakers.

At the same time, the Betas give you size—not the kind of size I've heard on IRS Vs, where modest voices sound overpowering, but the correct size of a guitar as well as (more or less, footnote 3) the size of an orchestra. There's enough visceral power to just about blow you out of the room, though I feel secure that a new generation of Infinity speakers will deliver tighter, better-controlled, and better-integrated (with the upper-range panels) bass. In fact, to reduce my anxiety about under-controlled bass, I ended up setting the bass-level control at a point where low bass seemed just a bit deficient. Over the next few weeks I will experiment with judicious and, I hope, unobtrusive distribution of Tube Traps to see if this corrects the problem.

There's one area where the Betas have a surprising limitation: right around 125Hz. Strong energy in this region, such as from organ, sets the lower midrange panels to rattling at little more than 100dB, a much lower limit than I would have suspected. (In this one sense, the Waveforms reviewed last month stand supreme.) The problem is much less severe when you adjust the Beta crossover so that the upper bass limit of the bass towers is set at 134 or 164Hz; for maximum coherence and least runaway bass, though, I generally had the LP Filter set for 60Hz.

I have a more difficult time deciding whether the Betas are worth all this trouble and expense. I find it annoying that Infinity insists on using drivers which have what look to me—if JA's impulse tests are any indication—like severe time-domain problems. Once they start moving, they have a hard time stopping. I assume that this is why they are so amplifier-sensitive, and why I needed the tape to block their sizzle. On the other hand, these same drivers, when driven placidly, offer as transparent a window on the music as I've heard.

When it comes down to it, I can't think of a less expensive way to get the kind of musical involvement offered by the Betas at their best. I have to say that, if you've got the money *and* the time *and* the patience *and* (especially) the right dealer, they're worth it. I look forward to a speaker which does as much with less trouble.—**Larry Archibald**

Footnote 1: Ever the stickler for thoroughness, JGH always checks how sharply focused a central mono image is (usually toward the end of the review process); with the Betas there was hardly any focus at all. Checking with pink noise, and alternating each speaker's position in the room—room anomalies are very commonly the cause of two speakers from a pair sounding different—JGH determined that the two speakers were markedly unlike in the mid- to upper treble.—**Larry Archibald**

Footnote 2: I read with interest reviews which imply that the true dimension and power of an orchestra has been captured by some hi-fi system. In my experience, reproduced sound has even *suggested* this only once, and a visit to a real orchestra quickly disabused me of that suggestion. Hi-fi systems can't yet capture the dimension and power of a piano or solo violin; they are equally, but more noticeably, far from doing it for an orchestra. How unutterably far we have to go!—**Larry Archibald**

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Infinity IRS Beta loudspeaker:

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Sidebar 1: Righting Wrongs

Before I listened at all, I decided to right the Infinity manufacturing wrongs uncovered by JGH. One of the knobs of his equalizer had come off, and it's not simply replaced. I had to remove the equalizer cover, with difficulty remove three screws holding on the milled-from-solid-aluminum front cover, and carefully reposition the knob so that, when tightened, it lined up with the appropriate numbers on the front panel (which was removed). For good measure, I filed a flat onto the switch shaft so the knob would not subsequently come loose, and I tightened all the other knobs' set screws (accessible only with the cover off)—several were quite loose. Total time: 35 minutes.

The other defect was speaker terminals on the woofer towers that became horribly loose with respect to their mounting plates, making it hard to attach speaker cables. This repair, requiring only a 4mm Allen wrench and two 10mm open-end wrenches, was simple, but permanent! After tightening down the 10mm nuts as much as I felt I could without breaking the hollow shaft they were on, and reinstalling the panel, I found the terminal was almost immediately loose again. I suspect the culprit is the ridiculous red and black plastic spacers between the shaft's shoulder and the plastic panel: the spacer compresses, defeating one's attempt to really tighten up the shaft. The colored spacers, supposedly there to indicate positive and negative, are ridiculous because they're so small you can't see the colors without a flashlight; the raised "+" and "-" symbols are similarly tiny, and almost impossible to discern. Of course, if you switch + and - on your cables, not much happens—the amp just goes into full-power low-frequency oscillation, scaring you to death during the moment before the crossover turns off.

Both these problems are disgraceful in a \$12,000 product; I trust that Infinity, in a fit of shame, has engineered solutions as unlikely to go wrong as most \$1000 speakers.—**Larry Archibald**

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Infinity IRS Beta loudspeaker:

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Manufacturer's Comment

Editor: Larry Archibald's review indicates that, when equipped with the right components and properly set up, the Betas are the best speakers he has heard in his home. This points to the potential of the system's musical and analytical ability.

There are a few areas that we would like to clarify:

The individual drivers have a mass approximately $\frac{1}{20}$ that of conventional dynamic drivers, and are driven over the entire radiating area. In their operating band, they are extremely detailed and well-controlled. The overall sonic transparency and neutrality of the Beta system demonstrates the accuracy of its time-domain performance.

Most of us in the audiophile community agree that there are differences in the sonics of amplifiers, wire, cartridges, etc., and any great analytical tool such as the Beta will clearly reveal these differences. Even the changes that occur as the equipment warms up will become evident with the Beta system.

What particularly concerns us about this, and prior reviews in *Stereophile*, is the continual rehashing of a few early quality issues which were addressed and corrected more than a year ago.

Yes, there is a long way to go before we, as an industry, are able to bring absolute musical realism into the home. We also agree that the Beta brings you close enough to invite this comparison.—*Cary Christie, President, Infinity Systems, Inc.*

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Sidebar 3: Measurements (from June 1989, Vol.12 No.6)

As I had dragged my motley collection of test equipment (footnote 1) over to Larry's listening room to carry out a set of measurements on the Mirage M1 loudspeaker he reviewed elsewhere in this issue, I thought it might be a good idea to quickly take a look at the measured performances of another of the high-end models that happened to be in Santa Fe, Infinity's \$12,000/pair IRS Beta, which J. Gordon Holt had discussed in the September 1988 and January 1989 issues of *Stereophile* (Vol.11 No.9 and Vol.12 No.1, respectively).

You may remember that JGH had an unfortunate series of consistency problems with his review samples of the Infinity IRS Beta. The final samples to arrive in Santa Fe, however, were both well matched and sounded as good as the high price promised. Before sitting down to some listening and response measurements, I looked at the speaker's impedance. Fig.1 shows the impedance modulus for both the woofer tower (without its servo drive connected) and the midrange/treble panel. With a fundamental 4 ohm characteristic, the woofer can be tuned to 49Hz, with its impedance rising above 400Hz due to the increasing voice-coil inductance. In use, one would expect the servo-drive system—one drive-unit of each tower's four is fitted with a high-precision accelerometer to send an error signal back to the LF crossover/equalizer—to extend the response significantly below the tower's bass-tuning frequency.

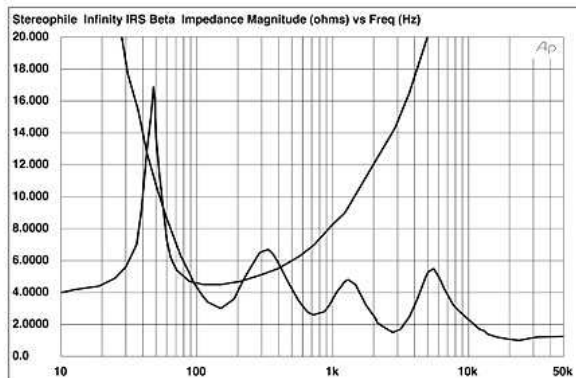


Fig.1 Infinity IRS Beta, impedance magnitude of woofer tower (top above 500Hz) and midrange/treble panel (2 ohms/vertical div.).

The impedance of the mid/treble panel drops significantly below 4 ohms for much of the time, reaching minima of 3 ohms at 150Hz, 2.6 ohms at 720Hz, 1.5 ohms at 2750Hz, and approximately 1 ohm at 23kHz. It will therefore present any driving amplifier with an extremely demanding task in terms of being able to deliver current, particularly in the lower midrange where the bulk of musical energy lies. On the positive side, the extremely low moving masses involved in Infinity's EMI drive-units and the well-damped nature of the fundamental resonance of each unit will not give the driving amplifier any problems with back EMFs, as is the case with some conventional dynamic drivers.

An important point that should be noted is that the overall low nature of the impedance means that the speaker's frequency balance will be much more amplifier-sensitive than normal. Certainly, a traditional tube amplifier with a rising output impedance with frequency will produce a

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sound that is much mellower in the treble than will a modern high-performance solid-state design. This was certainly the case in my experience, where [Mark Levinson No.20.5](#) amplifiers produced a sound from the Betas possessing considerably more HF energy than the [VTL 300](#) tube amplifiers.

At the opposite end of the frequency spectrum, fig.2 shows the nature of the crossover between the Beta's two systems. The response of the woofer tower with the servo drive connected and that of one of the Large-EMIM drivers on the main panel were measured in the nearfield, *ie*, with the microphone placed as near as possible to the center of the relevant diaphragm. The woofer low-pass filter was set to its maximum of 164Hz. The LF response can be seen to be extremely extended, being -3dB at an astonishingly low 16Hz (!), and is ostensibly flat through the three octaves above that frequency. This is true subwoofer performance. The woofer roll-off reaches 12dB/octave above crossover, but the midrange panel can be seen to roll out very steeply below 160Hz, with a 24dB/octave characteristic.

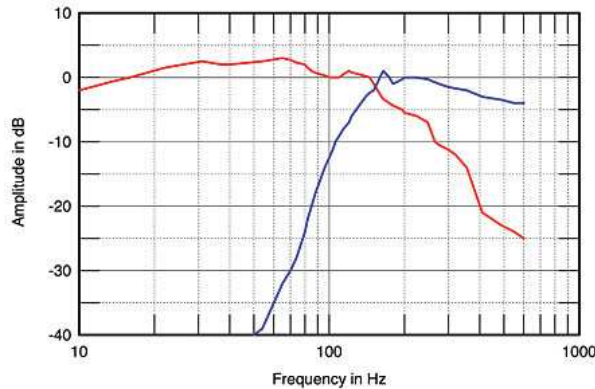


Fig.2 Infinity IRS Beta, nearfield woofer and midrange responses.

It might be thought that the result would be a seamless blend between the two drivers, but as shown in fig.3, which is the spatially averaged, 1/3-octave response of the Beta taken at the listening position with all its HF tone controls set to their mid positions, I couldn't eliminate a slight lack of energy in the region around crossover. I suspect that this is due to it being hard to match the essentially omnidirectional radiation pattern of the woofer tower with the dipole, steep-roll-out midrange pattern. The graph shows the best that I could achieve in Larry's room by adjusting the woofer positions, bass contour and level controls, and the woofer polarity.

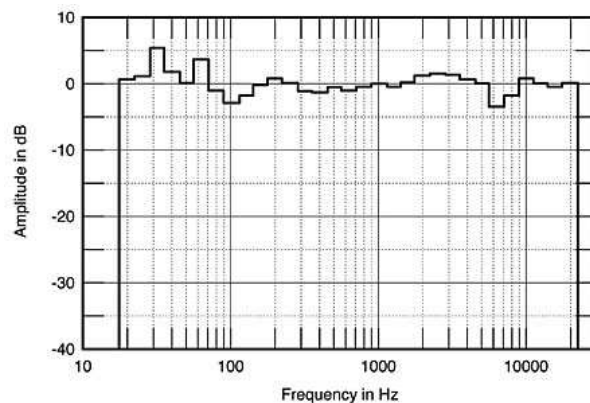


Fig.3 Infinity IRS Beta, spatially averaged, 1/3-octave response in LA's listening room.

Note that while the bass does feature true 20Hz extension, the two dominant LF modes in Larry's room, around 30Hz and 60Hz, are sufficiently excited that their effect is not eliminated by the spatial averaging used to derive the response curve. This gave problems in setting the optimum bass level in that when the upper bass was sufficiently full, the low bass was excessive. When the low-to-mid-bass balance was best, it then sounded a little separated from the main body of the music.

The exact match between the Beta's bass and midrange will also be a matter of personal preference. For example, though that shown in fig.3 was to my tastes, Larry found it a little bass-light. Above the bass/mid crossover region, the IRS Beta is flat from 160Hz to 2.5kHz, the averaged in-room response meeting superb ± 1 dB limits. The rise in the presence

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region is very dependent on the listening axis. With the Betas firing straight ahead, the flatness of response at a 39" listening height—a reasonably high chair, I admit—extended to above 4kHz, but at a higher listening height than that, the 3kHz region became a little too exaggerated. The broad depression between 4 and 8kHz lies in the exact region handled by the EMIT tweeter, and was present on all measuring axes. Resetting this driver's control to its maximum reduced the depth of the dip to around 2.5–3dB on-axis, but did not remove it entirely. I suspect that it is a crossover artifact.

In the high treble, the in-room response is flat, which, given the increase in sound absorption in-room at these frequencies, represents a significant amount of additional energy considering the fact that the microphone was 3m distant. The speaker has very wide dispersion in this frequency region, even in the vertical plane; as might be expected, the degree of extreme-HF boost increased with the microphone on-axis with the tweeter/supertweeter, but this is an unrealistically high listening position. In a relatively live room, however, it will lend the room's reverberant field a somewhat wispy, oversibilant nature. This measurement was taken with each panel driven by a Levinson No.20.5; as mentioned earlier, something like a VTL 300 monoblock would bring this region down in level to provide a better match to the low treble. Surprisingly, reducing the S-EMIT drive to its minimum with its level control made no significant difference in the measured exaggeration.

Though overall he was extremely impressed by the IRS Beta, the one criticism Gordon did have concerned a degree of HF "sizzle" to its sound, which was present to a greater or lesser degree in all the samples he auditioned. He felt, however, that this seemed to be a function of the EMIT, which covers the region below the one that measured as being too high in level. Certainly, I could hear the measured EHF lift as an added degree of "air" and sparkle, but despite being noticeable, it was not unpleasant. Gordon felt that the samples measured had the least amount of HF sizzle of any he had heard, but listening to music while carrying out these measurements, I was still aware that there was some added brightness in the mid-treble when compared, for example, with the [Quad US Monitor](#). I hoped, therefore, that looking at the speaker's impulse response might indicate the reason for this tonal characteristic, which doesn't seem to correlate with any broad-band amplitude-response problem.

And therein lies the same problem I had with the Quad: I was restricted to a microphone position unreasonably close to the speaker if early room reflections were not to cloud the issue. Fig.4 shows the time response of just the mid/treble panel to a unidirectional, rectangular 55µs pulse taken at a 1m microphone distance. (The window shown covers a 5ms period to reveal as much fine detail as possible.) Compared with the Quad US Monitor, the response is far more complicated, but it must be remembered that we are looking at a multiway design here compared with a single full-range diaphragm, and that the 1m mike distance will not allow the outputs from the individual drivers to integrate as well as they would at a 3m listening distance. The mike here was 39" high on a level with the bottom of the small EMIM unit, representing a typical listening height, directly in front of the panel. The tone controls were set with the EMIT at maximum, the S-EMIT at 9 o'clock and the EMIM at 11 o'clock.

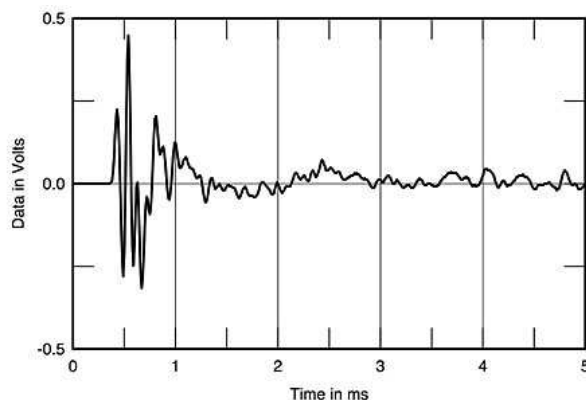


Fig.4 Infinity IRS Beta, impulse response of midrange/treble panel (5ms time window).

Interpretation of the raw pulse shape is difficult, but calculating the step response (fig.5) gives a clear picture. The initial spike of energy is due to the S-EMIT. The second, larger but 100µs later positive spike of energy will be due to the EMIT, which appears, therefore, to be connected in the same acoustic polarity. This has a significant negative-going overshoot, following which is superimposed the rise in energy from the small EMIM, which is not quite time-coincident. The later, slow-rising arrival represent the energy from the large EMIMs. The tail of the step is overlaid with a complex pattern of arrivals and ringing. Though these are well down in

level compared with the initial peaks, it is possible, though impossible to say probable, that the "sizzle" complained about by Gordon correlates with the presence of this ringing on transient signals.

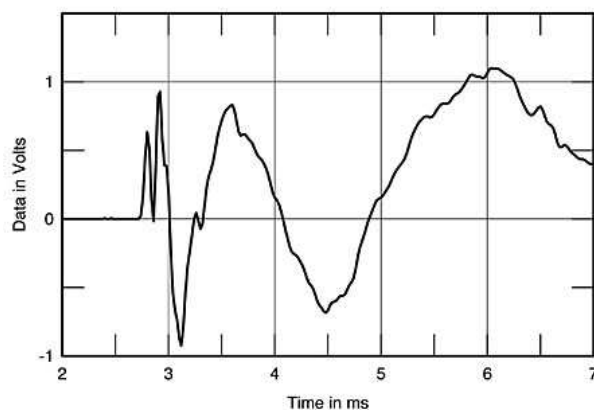


Fig.5 Infinity IRS Beta, step response of midrange/treble panel (5ms time window).

Compared with a typical, high-order-crossover, box loudspeaker, the time performance of the Beta is still good, with the bulk of the energy arriving within 1ms. At a more typical listening distance, where the sounds from the five drivers will have had a chance to better integrate, I would expect the Beta to have an excellent subjective transient characteristic, which indeed it does.

Fig.6 shows the Discrete Fourier Transform (plotted up to 10kHz) of the Beta midrange/treble panel's impulse response (taken under the same conditions as fig.4 but this time over a 10ms time window, which will give 100Hz resolution). Again, interpretation is hardly straightforward, but the overall shape is flat, broken up by what I would imagine are mainly interference phenomena from spaced drive-units carrying the same signal over a significant proportion of the frequency band. The slight lack of energy in the 5-7kHz region is noticeable, however, as is a resonant peak centered on 2950Hz. This latter might well correlate with Gordon's "sizzle."

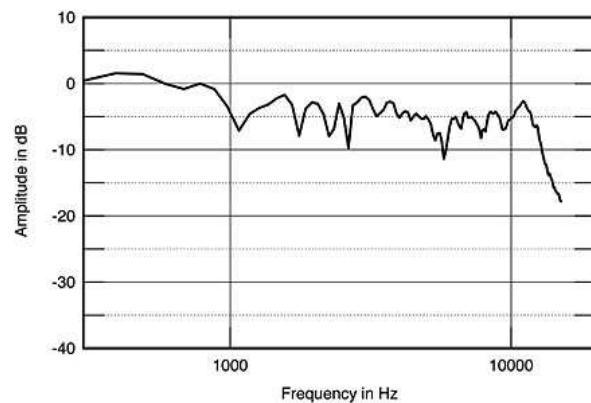


Fig.6 Infinity IRS Beta, quasi-anechoic response, midrange/treble panel.

Summing-up time: The IRS Beta has many strong points in its favor, including true large-signal 20Hz bass extension, a fundamentally flat tonal balance from the bass to the low treble, a neutral, uncolored midrange, tremendous dynamic range capability, and superb imaging (although, of course, these last two do not reveal themselves in the basic set of measurements carried out). Against these must first be set the difficulty in getting an optimum match between the woofer towers and both the room and the midrange/treble panels (though the excellent range of control options included in the IRS LF crossover unit should mean that any audiophile possessed of patience and hearing acuity should be able eventually to achieve both). Of more seriousness, I feel, are the bright nature to the mid-treble, which seems to be tied in with resonant problems, and the shelved-up nature of the top audio octave, both of which will render the speaker system very sensitive to HF problems elsewhere in the system. As mentioned earlier, the exaggerated top octave is purely a tonal balance problem, which will be considerably ameliorated by using tube amplification, but the former will persistently underlie the music to a greater or lesser degree.

To put this criticism into perspective, I have yet to hear a commercial loudspeaker system that can better the IRS Beta in being able to reproduce the sweep and scale of large-scale classical music with a full 20Hz–20kHz frequency balance. (I don't regard the IRS V and Wilson WAMM as *commercial* products in the sense that you can just go out on a Saturday afternoon and buy them.) It therefore rightfully claims its place in Class A of *Stereophile's* "Recommended Components" listing, but those prepared to cough up the five-figure admission to its sound quality should be prepared to spend both a lot of time and attention getting it to sound at its best, and a lot of money on optimizing the components and the listening room. One final point: All my experience with the Beta indicates that it *must* be listened to from a reasonable distance to enable the sounds from the widely spaced drive-units to properly integrate: at least 3m, 10', in my opinion. If your room does not allow you to sit that far away *and* allow sufficient space for the speakers to be positioned well away from room boundaries, then the IRS Betas are not for you.—**John Atkinson**

Footnote 1: Audio Control Industrial SA-3050A 1/3-octave spectrum analyzer with calibrated microphone and integral pink-noise source; Heath/Zenith PC-controlled 8-bit storage 'scope; Fluke 87 true-RMS multimeter; homebrewed computer-controlled sinewave, squarewave, and pulse generators.—**John Atkinson**

Footnote 2: Individual 1/3-octave response curves are taken for both left and right loudspeakers at 14 positions covering an approximately 8' by 3' spatial "window" centered on the listening position. The curve shown in the figure is the average of these responses, weighted toward the actual listening position. I have found it to give a benchmark response that eliminates the effects of LF room resonances to a large degree, and includes enough of the room sound with that heard direct from the loudspeaker for it to correlate very well with a loudspeaker's subjectively perceived tonal balance. It is not intended to be accurate in absolute terms, but as a consistent basis for comparison with other loudspeakers reviewed in *Stereophile*, it has proved very reliable.—**John Atkinson**

Article Continues: [Specifications](#) »

Company Info

Infinity Systems

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Floorstanding Loudspeakers

Infinity IRS Beta loudspeaker:

Specifications

Sidebar 2: Specifications

Description: Five-way, four-piece satellite/subwoofer dynamic loudspeaker system. Rated frequency response: 25Hz-44kHz \pm 2dB. Minimum recommended amplifier power: 75Wpc. Sensitivity: 87dB/W/m. Drivers (per side): 4 12" cone woofers, 1 large EMIM, 1 EMIM, 1 EMIT, 1 Super EMIT. Level controls for uppermost 3 drivers & woofers. Crossover frequencies: 70Hz, 700Hz, 4kHz, 8kHz. Nominal impedance: 4 ohms. Subwoofer crossover network: electronic (line-level), with hard-wired feed to fullrange amplifier.

Dimensions: woofer columns 65" H by 15" D by 16" W; upper-range panels (including base) 65" H by 17" W by 17" D. Weight: 1550 lbs, system.

Price: \$10,500/system (1988); \$12,000/system (1989); no longer available (2005). Approximate number of dealers: 30 (1988).

Manufacturer: Infinity Systems, Inc., Chatsworth, CA (1988). Infinity Systems, 250 Crossways Park Drive, Woodbury, NY 11797. Tel: (800) 553-3332. Web: www.infinitysystems.com (2005).

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



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