

Tomorrow's News Today

Hotline! 72

Loudspeakers

Osborn Epitome

Large, efficient speaker systems can provide a musical experience that no small or inefficient speakers can. They can have a dynamic punch that brings music to life in a visceral way, not to mention their greater loudness capability. But most such speakers have also had sonic limitations (due largely to their ruggedness), e.g. severe colorations, limited bandwidth, and limited transparency. If you want musical transparency and neutrality, you have had to turn to more delicate speaker systems that are less efficient, less dynamic, and cannot play as loud. You have had to trade off one set of desiderata against the other.

The Osborn speakers from Australia have changed this tradeoff. They provide amazing transparency from a very efficient system that can play very loud. They are also very neutral over most of the spectrum, and extend farther in bandwidth than other efficient systems. For lovers of loud, dynamic music, this is a sonic breakthrough that allows you to have most of your cake while eating it too. As a final bonus, the Osborn speakers are very attractively priced considering their capabilities.

It is especially shocking to hear such transparency from such an efficient, dynamic system. Many musical instruments have a very high crest factor in their natural waveform (e.g. brass, piano, and other percussion), but they also have subtle textural information right after the peak. Transparent speakers of limited dynamic capability squash the peak, so the musical instrument doesn't sound real, lacking its full dynamic bite. Conversely, efficient speakers of great dynamic capability have in the past not been transparent enough to reveal the subtle textural information after the waveform peak, so they too have not sounded real. The Osborn speakers, by providing a new level of open transparency from an efficient, dynamic system, opens both windows to musical reality, and so yields a kind of total musical reality that had not been available heretofore.

The Osborn speakers also sound very clean in handling music, whether played at low or loud listening levels. They are precise in revealing information, yet seem effortless and relaxed in delivering that information. Thus, you hear the music itself, clearly and cleanly, without the added obscuring layer of some speaker veiling, dirtying, or straining while delivering the music.

There are three basic models in the Osborn lineup. All use high quality components. They are very reasonably priced in their native Australia, considering the quality of components and the quality of sound they deliver. Their pricing in other countries will naturally vary widely, depending on importer markup, entry duty, and the not inconsiderable transportation from Australia for such heavy systems. We tested the top of the line Epitome model, which is large (4 feet tall) and very very heavy (250 pounds per channel for the dual version).

The Epitome is actually available in two formats, a tall single box and a dual box format which adds a second subwoofer. The single box employs three drivers, a Focal 1 inch inverted dome tweeter, a 6.5 inch bextrene cone woofer, and a 9 inch paper cone subwoofer. Interestingly, the 6.5 inch woofer, in its own vented enclosure, is allowed to run down in frequency as low as it can go. Thus, the Epitome is actually not a three way system, but rather is a two way system with a bonus subwoofer (in its own vented enclosure) within the same cabinet.

The dual version of the Epitome adds a second, identical subwoofer in its own separate box, whose volume and vent is the same as the subwoofer enclosure in the main cabinet. With two subwoofers working in the dual version, there is naturally more bass energy available, so more energy is also correspondingly needed from the two way speaker system (comprising the small woofer and tweeter) in the main cabinet. These two drivers are very efficient, indeed they are padded down in their crossover network to work with the single subwoofer. Thus, it is a simple matter to unpad these two drivers for them to match dual subwoofers. A handy switch on the rear of the main cabinet toggles between padded and unpadded signals to the small woofer and tweeter, to match either the single or dual subwoofer versions of the Epitome, respectively.

The small woofer and tweeter have a large dynamic loudness capability, so a single set can still match the output from two subwoofers. Keeping a single set of upper frequency drivers for the dual version, rather than going to dual sets of upper frequency drivers, makes for better signal integrity and better stereo imaging.

We prefer the dual version of the Epitome, for several reasons. Its low bass is stronger (even though both subwoofers are identical), due to the acoustic loading improvement from the larger radiating surface (the spacing between the two subwoofers per channel can also affect mutual reinforcement at certain desired frequencies, appropriate to your room's bass characteristics). The upper frequencies sound more transparent, with the rear switch in the unpadded position, probably thanks to the omission of the padding componentry. And the tonal balance sounds more neutral

through the midranges and lower treble with this rear switch in the unpadded position (though the mid treble gets too bright).

The Epitome sounds especially transparent and neutral throughout all three midranges and the lower treble, regions which by our convention span the frequencies from 700 to 10,000 Hz. This is where most of the music happens, and where the ear is most sensitive. This is also where other efficient, large speaker systems have in the past let you down.

Typically, they have been tonally colored here (e.g. with a midrange honk), or they have been opaque here (often due to a rugged driver's inability to render subtle detail). The Epitome is in its full glory here, playing music with an effortless dynamic ease, excellent transparency, very good clean purity, and very good tonal neutrality. The only coloration we could find here is a very slight rubbery plastic hollow coloration in the lower midrange, similar to that we have heard before from bextrene cones. Whether your musical taste runs to rock, big band jazz, or symphonic works, the Epitome provides a very rare treat through these regions, giving you musical reality and visceral excitement that other speakers systems don't.

The Epitome's mid and upper treble regions are still quite good, providing a lot of musical information, speed, and dynamics. There is just a bit of rough coarseness to the texture here. And the quantity of mid treble makes the sound too bright here, especially in the unpadded switch position. In spite of this excess brightness in the unpadded position, we still prefer it, because in the padded position a slight veiling is introduced over all the midranges and trebles, sacrificing the Epitome's glorious transparency.

The Epitome's stereo imaging is very good for a large speaker system with a big front panel area and no diffraction control. The image portrays a very good stage width, and an even spread beyond the speaker locations. Only at the speaker locations themselves is there too much of a hot spot, with too much music located in the speaker box, thereby giving away the speaker locations sonically.

The Epitome does an excellent job of portraying solid images, with believable tactile coherence, across the stage width. Depth and ambiance are also very good. The speakers might themselves disappear better if a simple thick wool pad were used to cover the front panel (with cutouts for the drivers), thus reducing secondary diffraction radiation; this might transform the Epitome's imaging from very good to excellent in all aspects.

As with most speakers, stereo imaging sounds best when the speakers are pointed straight into the room, and not toed in toward the listener. With the Epitome, this usual truism applies, with the added requirement that you should listen to them at least 30 degrees off axis (so that an angle of at least 60 degrees is subtended between the speakers, as viewed from the listening position). Listening to them at least 30 degrees off axis is especially helpful to the depth and ambiance aspects of imaging, and has a further benefit of ameliorating the excessively bright mid treble,

Which brings us to the lower frequencies. The main two way system (comprising the 6.5 inch woofer/midrange and the tweeter) has its own set of binding posts at the speaker input, and the 9 inch subwoofer driver has a second, separate set of binding posts. This allows considerable flexibility in the use of the subwoofer. The simplest setup is to biwire the subwoofer and main system from a single power amp, running them in parallel. Another setup would be to use two power amps (perhaps a tube unit for the main two way system and a solid state unit for the subwoofer), with a separate volume control for the subwoofer amp. Both these setups would allow the subwoofer driver to produce output over its full range, which considerably overlaps the range of the 6.5 inch woofer in the main two way system. A third option would be to add an electronic crossover (or simple RC network) before the subwoofer amp, to limit the signal fed to the subwoofer to only the low bass frequencies.

We tried the simplest option first, simply paralleling the internal subwoofer with the main two way system from the same power amp. The upper bass and warmth regions were strong. Very strong. Too strong, in our opinion. There is such prodigious energy here that musical notes in this region sound bloated, and they tend to overwhelm and hide music's midrange and treble information, thereby undoing some of the Epitome's excellent transparency. We tried moving the switch to the unpadded position with a single subwoofer Epitome, thus raising the level of the main two way system relative to the subwoofer; this helped the unbalance a little, but not enough.

With this setup, the Epitome's lower bass is not excessively prominent, so it seems to be weak or subdued in the shadow of the immediately adjacent, overly strong upper bass and warmth regions. Adding the second subwoofer to make a dual version Epitome did not significantly worsen the upper bass and warmth excess, but it did strengthen the lower bass, thereby bringing the lower bass into better balance with the rest of the spectrum, so it no longer seemed so weak in the shadow of the upper bass and warmth. Thus, we prefer the bass of the dual Epitome version overall, and its lower bass is truly impressive in its reach and power.

We listened to the main two way system alone, without the subwoofer at all, to get a handle on what was going on. The sound of the two way system alone was tonally too lean, thin, and bright. Thus, the Epitome's subwoofer is clearly a necessary feature for a full spectrum, neutral tonal balance. Since the two way system alone was too lean and thin, the prodigiously excessive upper bass and warmth we heard with the subwoofer added was obviously the fault of the subwoofer. How could we utilize the subwoofer to add the necessary fullness and foundation at the bottom to the two way system, without overwhelming the two way system?

We tried option two, driving the subwoofer separately, but padding its level down with an adjustable volume control. This didn't work satisfactorily either. As soon as we increased the subwoofer level enough so we could hear the needed benefit of its bass contribution, it was already coloring the sound of the main two way system by adding too much warmth, and obscuring some of that precious transparency.

So we tried option three, using the adjustable Symmetry electronic crossover by John Curl. After much experimentation with crossover frequency and level, we hit paydirt. On a variety of music, we kept adjusting the low pass cutoff frequency for the subwoofer up and down, listening for the changes to the Epitome's characteristics. We wanted to get the most bass energy we could out of the subwoofer (to give the two way the best bass foundation possible) - but without overwhelming the two way with excessive warmth and upper bass. We finally found a setting that gave wonderful bass support (and stunning lower bass with the dual subwoofer version), yet did not adversely and unnaturally color the warmth and upper bass regions.

We then looked at the Symmetry crossover's dial, to see what frequency we had aurally selected as a rolloff point for the subwoofer. It turned out to be 55 Hz. that's a surprisingly low frequency. Since the subwoofer operating full range had been swamping the upper bass and warmth region, it must have been putting out energy all the way up to roughly 700 Hz, and to get it to sound right we had to cut it all the way back to merely 55 Hz as an upper limit. No wonder it sounded so colored and bloated when operating full range.

Obviously, we strongly recommend using this third tactic for the Epitome. The signal to the subwoofer must be bandwidth limited, to below 55 Hz, and therefore should be driven by its own power amp. Only the signal for the subwoofer needs to be bandwidth limited; the main two way system should get a full range signal via the purest path possible, to preserve its transparency. If you don't feel like investing in an electronic crossover, a simple 55 Hz RC voltage divider filter at the input of your subwoofer power amp will do (insert a series R, no greater than one tenth the input resistance of your power amp, followed by a shunt C of value $2900/R$, in microfarads).

With its subwoofer limited to operating below 55 Hz, the Epitome is a stunningly capable full range system. With the dual subwoofer version operating below 55 Hz, the low bass is thrilling in its strength, yet the upper bass and warmth is properly proportioned to give a full support to the main two way system, without coloring it. Set up in this manner, the Epitome's superb transparency is complemented by very good neutrality throughout the spectrum. Save for two minor colorations noted (the excess mid treble brightness for the preferred unpadded switch position, and the slight hollow rubbery coloration in the lower midrange), the Epitome (especially in the dual subwoofer version) comes close to being that mythical perfect speaker system that has it all: open transparency, exciting dynamics, great loudness capability, clean purity, wide frequency range, and very good stereo imaging.

The USA price for the Epitome is just \$6000 per pair for the single tower version, which is a downright steal for a monster speaker of such awesome performance and diverse capability. The added subwoofer boxes to make a dual version Epitome are \$2000 per pair.

Measurements

Graph I shows the system frequency response at 1.5 meters of the single Epitome, and graph 2 shows the dual version, from 250 Hz to 50,000 Hz. Graph I already shows the excellent neutrality we heard from the lower midrange up through the lower treble; the system is flat within 2 db from 600 Hz through 13,000 Hz. Graph 2 shows the dual version (with the switch feeding the main two way system in the unpadded position). This unpadded switch position is even flatter and more neutral through all three midranges, as we heard; it stays within an astounding 1 db from 600 Hz through 7000 Hz. Both versions show the coarse resonant peak of the tweeter, peaking at 16,000 Hz and dying above that. The dual version, with the crossover switch set to unpadded, is naturally somewhat brighter, with the tweeter peak being given broader skirts in the 7000-13,000 Hz low and mid treble regions. As noted, we heard the tweeter's excess brightness getting even worse in this unpadded switch position, just as this measurement shows, but we still prefer this switch position because the padded position introduces too much veiling.

Graphs I and 2 show the Epitome set up with the subwoofer simply connected in parallel with the main two way system. These graphs already show that this setup has a large hump in the warmth region, from 600 Hz downward, reaching +7 db relative to the midrange just within these graphs. Graph 3 shows that this excess energy problem gets even worse as we go lower in frequency, down toward the upper bass. Graph 3 shows the system frequency response at 1.5 meters, from 30 Hz to 470 Hz. Visualize this graph 3 spliced onto the left side of graph 2; the 300-470 Hz plateau in graph 3 is the same as the plateau at the left extreme of graph 2. This plateau is in the warmth region, and is already at +7 db relative to the midrange. Graph 3 shows that the Epitome's upper bass rises even beyond this level, peaking at 60 Hz at a level about + 12 db relative to the midrange. Graph 3 looks similar for both the single and dual subwoofer versions. Thus, graphs 2 and 3 confirm what we heard, that the Epitome setup with the subwoofer in parallel has too much energy in the warmth and upper bass regions, from 600 Hz down. Graph 4 shows the nearfield frequency response of the subwoofer, from 10 Hz to 2000 Hz. This driver's upper frequency breakup modes are very well controlled; there is a smooth rolloff with no aberrant response. Thus, this driver does not introduce colorations at

frequencies higher than its intended passband. Most other woofers and midrange drivers do have aberrant responses at their top end, which color the tonal balance, smear the music, obscure transparency, sound distorted, and introduce foreign material colorations. This is one example of Osborn employing high quality components, which in turn make this speaker more transparent, cleaner, and less colored.

Notice though that this subwoofers region of greatest energy extends from about 50 Hz to 600 Hz, with a downward tilt emphasizing the upper bass most. If this driver, good as it might be, is simply brought in full range, and at too high an amplitude level, it would be primarily responsible for the excess warmth and upper bass energy seen in graphs 2 and 3.

This suspicion is borne out by graph 5, which shows the nearfield frequency response of the small woofer, from 30 Hz to 5000 Hz. This too is an excellent driver, with smooth, nearly flat response from 60 Hz through 2000 Hz. This flatness, with no excess energy in the upper bass and warmth regions, suggests that this driver is not contributing to the excess upper bass and warmth problem seen above. It also shows again that Osborn is employing very high quality drivers. This driver in particular is chiefly responsible for the excellent transparency, neutrality, clean purity, and wide dynamics heard through the lower midrange and midrange proper from the system.

It's rare to find a high efficiency, high power driver that has such smooth and flat response - not to mention such well controlled breakup (note the single cancellation mode at 3700 Hz, after which the response resumes a smooth rolloff from 4000 to 5000 Hz). High efficiency drivers usually have messy response and breakup regions, because their lightweight cones usually flex in messy ways. High power drivers are often not linear in response or transparent in sound, because their heavy or stiff parts interfere with these desiderata. The smooth, flat response seen in graph 5 would not be unusual in a modern driver of low efficiency and/or limited power handling ability, but it is rare and praiseworthy in a driver of high efficiency and high power handling ability. This 6.5 inch driver is the key to the Epitome's unique sonic abilities, and it would also be a key to similar prowess in the smaller Osborn speaker systems if, as likely, it is also employed there.

The driver in the Epitome is capable not only as a midrange, but also as a woofer, with a flat response down to its resonance and a gentle roll off below that in its vented enclosure (indicating bass with a good transient quality). Thus, this driver can carry on its shoulders most of the virtues of the Epitome, including bass down to 55 Hz, so Osborn is wise to let this driver run its full range down to its lower limit (though this design choice does portend to more modulation distortion of the midrange due to cone excursion).

Note that the subwoofer itself extends down to only 45 Hz, nearly 10 Hz lower. The subwoofer's chief role here is merely to add acoustic power capabilities to the bass, and also to drive its own vent, which produces bass down to below 20 Hz. But the subwoofer should not be allowed to overlap the small woofer's already flat range so extensively (from 55 Hz to above 600 Hz), and it should not overlap it at such a higher amplitude. The small woofer/midrange running full range down to its upper limit and the subwoofer running full range up to its upper limit, produces this great overlap region, and makes the Epitome a two way system with an added Subwoofer, not a three way system where all three drivers are mutually rolled off as they mutually interface. The subwoofer needs to be rolled off so it properly interfaces with the small woofer/midrange, instead of overlapping and overwhelming it. What frequency should the subwoofer be rolled off at, in order to dovetail with the small woofer/midrange instead of overwhelming it? Since the small woofer/midrange extends down to 55 Hz, the answer from our measurements is 55 Hz. This corresponds exactly to the 55 Hz rolloff frequency we found sonically best by listening, experimenting with the adjustable electronic crossover.

We noted hearing a very slight rubbery plastic coloration in the lower midrange, as the only nit we could pick with this excellent bass/midrange driver. We hear a similar coloration when just tapping the cone, which suggests that this is a coloration from the cone material itself, heard because it is part of the material's characteristic ringing pattern after it's excited by a transient. Graph 6 shows a time windowed measurement of the cone's response in its decaying ringing pattern after a transient (this is similar to looking at a frequency response curve partway down a 3D waterfall display, but it's easier to read and interpret). There's some rough response from 200 to 900 Hz, with a general valley centered about 350 Hz (a valley which

even imposes its effect upon the time averaged overall frequency response, as seen in graph 5). This rough region might indicate cone material breakup and a characteristic ringing pattern of the material itself (note the almost harmonically related peaks at 200, 400, 600, 900 Hz). This same after-transient ringing response was measured both at the cone apex (near the phase plug) and at the cone edge (near the surround), so it appears to be a property of the cone itself (rather than the surround or the dust cap, as it often is in other drivers). We haven't yet found the perfect driver, nor has any usually flex in messy ways. High power drivers are often not speaker system manufacturer, so this slight audible and linear in response or transparent in sound, because their heavy measurable flaw should be taken with a grain of salt. This 6.5 or stiff parts interfere with these desiderata. The smooth, flat inch driver remains an excellent choice for this speaker response seen in graph 5 would not be unusual in a modern system, and is the key to the Osborn's unique sonic prowess.

The tweeter continues this sonic prowess for the lower but it is rare and praiseworthy in a driver of high efficiency portion of its range. Among fabric dome tweeters, it is very and high power handling ability. This 6.5 inch driver is

the key efficient and can handle substantial power. In the Epitome, it is to the Epitome's unique sonic abilities, and it would also be a crossed over to the woofer/midrange at 3000 Hz, where the key to similar prowess in the smaller Osborn speaker systems woofer/midrange is naturally dying on its own. Incidentally since the excellent woofer/midrange is effectively run full range in the Epitome, it should be possible to feed it directly from the amplifier, without any reactive crossover components at all interceding; if this is actually done in the Osborn speakers, it would further explain the startling transparency and dynamic directness we hear from these speaker systems.

Although 3000 Hz is a low crossover frequency for a 1 inch dome tweeter in a high power system, imposing stress from greater excursion and higher power, if the tweeter can handle it there are sonic benefits. The small diameter tweeter is more pistonic (accurate) and can radiate with better dispersion at this frequency than a larger diameter midrange could. Thus in the Osborn speakers the upper midrange (3000-7000 Hz) comes from the tweeter instead of the midrange driver. Once again, Osborn has made an unusual design choice, which yields sonic benefits in the upper midrange, contributing to the unique sonic transparency of this efficient system, as well as to its stereo imaging (thanks to better dispersion in this critical region, where the ear is so sensitive and where there are abundant imaging cues).

Graph 7 shows the frequency response of the tweeter, measured near field, with the graph running from 100 to 20,000 Hz. The steep crossover slope brings on the tweeter between 2000 and 4000 Hz, at which point it is at -3 db. The tweeter then continues flat until 8000 Hz. Thus, this tweeter does an exemplary job of covering the upper midrange, better than any larger diameter midrange driver could. The Osborn crossover blends this tweeter well with the 6.5 inch bass/midrange; the blending sounds seamless, and graph 2 confirms the smooth transition.

Above 8000 Hz the tweeter dome becomes non-pistonic, and goes into its first breakup mode, which is seen to be the usual oilcan flexing mode for dome tweeters. The response falls to -10 db at 12,000 Hz, due to the self cancellation of the oilcan mode flexing, and then rises 10 db to the resonant peak at 16,000 Hz. This steep falling and rising portends some ringing and consequent roughness to the texture of treble information above 10,000 Hz, and we noted hearing some rough coarseness (as well as tonal anomalies) in the mid and upper treble (which covers 10,000 to 20,000 Hz). There are tweeters which perform better in the mid and upper treble, but they are more fragile, and cannot handle the power and dynamics required for the Osborn as a full tweeter. It could be possible, though, to add a faster, more delicate driver as a supertweeter.

Below 10,000 Hz the Epitome tweeter does an excellent job, so it covers both the upper midrange and lower treble in exemplary fashion, just as we reported hearing from the system. Between the excellent performance of the woofer/midrange and the excellent performance of the tweeter for the upper midrange and lower treble, the graphs show why we heard the Osborn system sounding so superb through all the midranges and the lower treble.

To complete the frequency response picture, graph 8 shows the subwoofer port measured near field. Though the response of the subwoofer itself merely extends down to 45 Hz, the port is tuned far lower, with a peak around 23 Hz and useful output below 20 Hz. This tuning of the port enables the efficient, hence light (but therefore high resonant frequency) 9 inch driver to furnish prodigious low bass output, far below its resonant frequency. As noted, this subwoofer system puts out very strong energy in the upper bass and warmth regions, and when two are combined per channel in the dual Epitome version, the lower bass becomes truly impressive. This port measurement shows why the lower bass becomes sonically impressive (the measurement of the driver itself in graph 4 didn't give a clue). Incidentally, the resonant peaks seen in graph 8 at 210 and 390 Hz are probably due to internal dimensions of the subwoofer enclosure, since they are not seen in the graph 4 measurement of the subwoofer driver itself.

Graph 9 shows the time domain step response of the Epitome, at 1.5 meters, with a 4 millisecond time window, showing the system's midrange and treble behavior. This graph shows, as expected, that the Epitome design makes no attempt at temporal alignment or phase coherence. A spike from the tweeter is seen first, before any output from the woofer/midrange. The notch that follows is probably simply due to the phase rotation from the steep crossover slope feeding and protecting the tweeter. When the woofer/midrange does come in, it is seen to be in the same polarity as the tweeter is for most of its operating range. The step response is well behaved thereafter, within the confines of this 4 millisecond time window. The ringing seen on the waveform is simply the 16,000 Hz peak of the tweeter.

Graph 10 shows the same time domain step response as graph 9, but with a 10 times wider time window, so as to include the system's low frequency performance. The step response seen in graph 9 occupies merely 1 division of graph 10. In graph 10, all the upper frequency information reproduced by the Epitome from the step input is over within 1 time division (it lasts from about .7 to 1.7 division marks on the time scale). The amplitude of all this information put together in aggregate reaches about the 60% level (discounting the tweeter's resonant spike).

Graph 10 shows the Epitome setup with the subwoofer simply in parallel, from which we noted hearing too much upper bass energy. What follows the 1.7 division mark (the first zero crossing) in graph 10 is predominantly a full cycle of a very large monotonic ringing pattern. This monotonic ring pattern has a peak to peak amplitude of 100% (-50% to +50%), greater than the amplitude of the rest of the frequency range (the rest of the music), which resides in the short initial step of 65% amplitude. This monotonic ring also has greater energy (area under the curve) than the rest of the music. And it lasts a much longer time than the rest of the music, so it will be psychoacoustically

dominant, sticking out like a sore thumb to be heard after the rest of a musical transient has passed (and also obscuring succeeding musical information). From the time scale, we can derive the frequency of this monotonic ringing. It is about 70 Hz. Now look at graph 4, the nearfield frequency response of the subwoofer driver. Its hump peaks around 70 Hz. Thus, graph 10 confirms that this driver's output is much too strong if simply used in parallel with the main two way system, outbalancing and overwhelming the rest of the system's output, just as we reported hearing for the upper bass and warmth regions covered by this driver's output. This confirms that the subwoofer's intrinsic response capability, extending up to 1300 Hz, needs to be rolled off above 55 Hz, in order to properly support and blend with the rest of the system output.

Australia and New Zealand have a rich high end audio community, featuring a wealth of innovative design talent. The Osborn speakers are an outstanding example. Their efficiency and dynamics make music viscerally exciting. Their transparency and clean purity over most of the spectrum are remarkable among efficient, loud playing speakers, and make the Osborn's something you must hear. They are obviously ideal candidates for single ended tube power amps. The Epitome, with its subwoofer properly fed, is a stunning full range system of awesome capabilities, and a steal at \$6000 (USA price). And, if you love deep bass, you'll also want the extra outboard subwoofer.

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1995 J. Peter Moncrieff

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Manufacturers Comment.

The recommendations made by J. Peter Moncrieff was incorporated in the mark 111 Epitome and Bass Unit. The changes to the crossover have been done passively, which is superior to the active method used in this review. This results in the use of massive inductors weighing 6 Kg each, resulting in an even more spectacular performance. The main speaker's crossover point was dropped from 400 Hz to 125 Hz, thus substantially improving the sound of the Epitome by itself. The crossover point of the optional bass unit was lowered from 400 Hz to 60 Hz.

The Mark IV version was improved further by a vastly improved bass driver, which gives a superior and noticeably deeper and better controlled bass.

The Mark V has a further improved bass driver with a magnet assembly 50% bigger than the Mark 111. A new Audiom midrange is also used. This is coated with Polyglass instead of the previously used acrylic. The basket assembly is also markedly superior and a 35% larger magnet is used. The mid range is now gently rolled off below 125 Hz further improving power handling. The resulting midrange is even smoother and more natural then before.