



Avalon Tesseract，蓮花座托觀音

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(English Translation Follows)

還記得2014年TAA圓山飯店音響展嗎？當時歐美國際在一樓金梅齋大房間中展出Avalon的旗艦喇叭Tesseract，結果反應二極，有人認為非常好聽，有人則認為不好聽。認為不好聽的人意見大多集中在低頻的駐波太強了，導致只要有某些低頻出現時，低頻量感就多到嚇人。而認為好聽的人是因為去聽時剛好沒有出現低頻駐波，所以充分聽到Tesseract厲害之處。的確，這對Avalon目前的旗艦絕對可以在非常大的空間中展現它的雄姿。有哪對二件式喇叭一聲道擁有四支15吋低音（二支外露，二支藏在裡面）單體、以及三千多瓦的內建擴大機呢？

還沒聽熱就被拿走了

在音響展期間，大概有去參觀音響展的人都去聽過Avalon Tesseract，這其中有一個人也聽了，他不僅在音響展時去聽，甚至在音響展還沒開始時，就已經先去代理商處聽過。只不過代理商當時把Tesseract放在小房間中，根本無法聽出它磅礴的音樂規模感，所以他才會在音響展時又特別去聽。聽過之後，他覺得很滿意，於是在音響展後一直催促代理商把喇叭送到他家。這位音響迷就是這次我去採訪的買主林先生。其實，在音響展之後，Tesseract就曾送到我家來，可惜我還沒有真正調整好，代理商就急著取走，或許就是這位林先生急著要吧？

因為這樣，所以我只在普洛影音網上簡單po文，Avalon Tesseract的試聽報告就無疾而終了，一直到現在。

其實這次來的目的主要並不是採訪林先生，而是要來聽Avalon Tesseract，因為在音響展時並沒有聽到它全面的表現，我家又還沒調整好，所以這次透過代理商歐美國際黃先生，以及經銷商佳盈音響張先生的安排，我來到林先生家，終於聽到Avalon Tesseract在一般人家裡的聲音表現。老實說，我在林先生家裡聽到的聲音跟在音響大展中所聽到者，可說是一對喇叭二種表現。為何會這樣呢？空間與器材搭配是關鍵。



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01. 這是在聆聽空間中拍的，由於客廳寬度也相當夠，所以龐大的Tesseract並不顯得擁擠。
02. 林先生家裡的客廳屬於開放式設計，這是從後端的桌子往內拍攝的，桌子後面還有空間，空間的長度非常夠。
03. 從這個角度，可以看到喇叭後面是厚厚的窗簾，左側牆面特別做了吸音裝置，地上鋪了厚地毯，天花板則沒有特別處理。
04. 左側牆的吸音處理做得很居家，但是有效。此外客廳的大沙發是皮的，也能夠起一定的吸音效果。
05. 這是右側牆面，上面有電視，有AV擴大機設備，這一面就沒有做吸音處理，不過有放幾個活動吸音板。

頂級器材服侍

林先生家相當大，尤其客廳是開放式設計，後端開放連著其他空間，因此「容積」很大。這麼長的空間中，Avalon Tesseract的低沈低頻可以盡顯，不會受到空間太小的限制。不過，由於Avalon Tesseract的低頻能量真的是「世間少有」，所以林先生是把低頻量感放在-1dB的位置，這樣聽起來可以盡顯低沈又不會有太多的低頻。

林先生以YBA六件式（沒錯，是六件式，二件主機、四件電源）Signature前級以及Signature單聲道後級來搭配Tesseract，事實上這套後級只是驅動它的上半截而已，因為底下的四個15吋低音單體有內建擴大機。數位訊源

一看就知道是dCS旗艦Vivaldi，至於黑膠系統，大家一看就知道是Clearaudio旗艦，不必我多說了。

為何林先生會買入Avalon Tesseract呢？據他說，在買入Avalon Tesseract之前就已經透過佳盈張先生安排，聽過許多頂級組合，最後還是中意Avalon Tesseract，不僅是因為它的體積大小與外觀設計放在家裡很搭，林先生也喜歡它的聲音特質。老實說，外觀跟聲音特質都是主觀的，當很多套音響器材的聲音同樣都表現很好時，最後決定收貨的原因當然就是主觀的愛好啦！其他沒做到生意的業者一定感到扼腕，其實也沒關係啦！每個人對聲音與外觀的愛好都不同，總是會遇上知音的。

隱形喇叭

Tesseract的造型非常獨特，打破以往Avalon喇叭的作法，全身上下由諸多斜面構成，肯定全世界只有這一對。它並不是有人戲稱的大竹筍，也不是星戰迷的星際大戰黑武士，而是隱形戰機與戰艦。如果是比較有慧根的老中，甚至為把它看成蓮花座托觀音，這是後話。為何一個喇叭箱體上要設計成幾十個斜面呢？隱形戰機或戰艦的多斜面是要漫射雷達波，使得雷達波無法集束傳回雷達接收器，達到匿蹤的目的。而Tesseract也一樣，這麼大體積立方體如果擺在房間中，從空間六個邊界（牆）傳來的反射音勢必會反射在龐然大物的箱體上（設計者Neil Patel估計

大約有70%)，造成更複雜不可控制的聲波反射，而對Sound Stage的營造形成傷害。為了解決這個問題，Avalon採用電腦計算模擬，設計出最適當的斜面切割，如此一來可以把聲波投射到喇叭箱體的反射影響降到最低。很多人不明白頂端為何設計成尖的？那不是作怪，也不是美觀，而是功能，從天花板來的反射音經過尖頂以及銜接的斜面，可以充分化解不當的聲波反射。

驚人的規格

由於體積龐大，為了便於搬運，也為了把高中低音與底下四個15吋低音徹底分開，不要相互干擾，所

以Tesseract分為上下二截箱體，這二個箱體是獨立的，上面那截箱體的底部有三個金屬錐，與超低音箱體的頂部銜接，安裝時要出動好幾個人來幫忙。根據原廠說明書資料，Tesseract頻寬16Hz-50kHz，平均阻抗5歐姆，最低4.6歐姆，靈敏度92.5dB，性能很優。最驚人的是說明書說16-32Hz沒有相位失真，200Hz-50kHz相位偏差也在4.2度與10度之間，而且群體延遲錯誤在16Hz時少於1.5 Milliseconds，這真是太驚人的數據了。當然，這麼驚人的規格成就來自幾十年來Avalon研發成果的累積。

Tesseract箱體材料並非複合材料，

而是Avalon所慣用的MDF，不過因為漆工漂亮，散發出金屬質感，所以會讓人誤以為是特殊材料製成，台灣這第一對遠看是黑色的，不過如果日光充足，您就會看出其實是深藍色的，就跟許多高級汽車的漆一樣。箱體的上半截採用三個單體，包括20mm鑽石高音、4.5吋陶瓷中音，以及11.5吋蜂巢式三明治式陶瓷低音。鑽石高音單體在中，4.5吋單體在上、11.5吋單體在下，形成很精確的時間相位排列，可以獲得很精準的定位感。這三個單體背後都有由大漸小的管道銜接，利用這樣的管道讓背波自然衰減，就像是鸚鵡螺單體背管的設計。而底下那四個15吋低音單體



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06. 從這個角度可以看到聆聽位置後面是開放式的，不過左右二側還有分隔牆面，那二處的分隔牆面也是做了吸音處理。
07. 這就是MIT訂價八萬美元的Articulation console喇叭線，上面有四個旋鈕，第一個是2C3D的開關，其餘三個分別是高、中、低音的開關，喇叭線能夠調整高中低音的量感，這還是第一次見到。
08. 數位訊源是四件式dCS Vivaldi，前級是六件式YBA Signature，後級則是單聲道Signature。
09. Tesseract的低音調整裝置，100Hz以下的低頻可以調整量感，範圍是-2.0dB-+dB。此外還可調整往下延伸或暫態反應快速。



10. Tesseract的上半截，包括一個20mm鑽石高音單體，一個4.5吋陶瓷中音單體，一個11.5吋陶瓷蜂巢振膜中低音單體。
 11. 從側面可以看出這三個單體的安裝位置煞費苦心，這是為了求得最佳聲焦點與正確相位。
 12. 這是Tesseract的下半部，外面只看到二個15吋低音單體，另有二個隱藏在箱體裡面，做Isobaric式輔助。
 13. 只要內建擴大機啟動，喇叭下方這個Avalon標誌就會亮起。
 14. Avalon Tesseract真是壯觀啊！

更利害，採用Isobarik與傳輸線式的混合設計，二個外露，二個內藏。老實說我不懂這二種設計為何能夠混合？因為Isobarik需要的是密閉的箱體，如此才能達到等壓效應，讓背後二個單體對前面外露的二個單體產生控制作用。而傳輸線式卻必須是喇叭背後密封，管道由大漸小，內部還要有阻尼吸音材料來控制聲波的阻尼，最後還要有開口。這麼罕見的混合設計我以前沒見過。對了，Tesseract的傳輸線式開口設在前面低音單體底下，半隱藏著。總之，這種低音箱體的設計也是Avalon所研發的。

低頻量感可調

Tesseract內建3,200瓦AB類後級，說

明書說是2,500瓦，但此間代理商說應該以本刊海外主筆李陵採訪的數字為準，所以是3,200瓦。這3,200瓦後級以JFET做輸入級，MOSFET做為功率晶體。4個15吋的分頻點設在100Hz，採用電子分音，上面那截高中低音則採用傳統被動式分頻網路，而這種主動與被動混血的分頻方式也不多見。到底高中低音的分頻點設在哪裡？Avalon一向不公布分頻點，就讓我們自己猜吧。

在喇叭後面，有一個負2dB到+1.0dB的100Hz以下音量調整，分成24段連續可調，用家可以依照自家聆聽空間情況而做適度調整。此外還有Extend與Fast Transcient的調整，可以讓用家選擇是要低頻更延伸，或速度更

快，這也是適應空間的調整。喇叭背面上端還有一個光感應小窗，只要手掌在那個感應窗上揮一下，驅動四個低音單體的擴大機就會關掉。如果要再度開啟，只要再揮一下手掌就可以了。要注意的是，這個感應開關要有1公尺的淨空，如果1公尺內背後有東西，可能就會干擾它開關。

把四件式融成二件式

如果您仔細觀察Tesseract的各項設計，推想它的設計初衷，就會發現其實設計者Neil Patel是想把四件式喇叭融為二件式。這話怎麼說呢？先從四件式分頻點來說，一般四件式喇叭的低音柱分頻點大約在100Hz左右，甚至

80Hz，而Tesseract的分頻就在100Hz。再者，一般四件式喇叭的低音柱大多採用主動式設計，內建大功率擴大機，而且電子分音，而Tesseract也正是這樣的設計。還有，一般四件式的低音柱如果不是以多個8吋或10吋低音單體構成，就是採用幾個12吋或15吋單體，而Tesseract選擇採用4個15吋單體，只不過二個外露二個內藏。上述這些設計可已窺知設計者Neil Patel的企圖是想要讓Tesseract發出如四件式喇叭的龐大氣勢。

既然如此，為何不乾脆設計成四件式呢？您一定會這樣問。四件式喇叭有一個問題必須克服，那就是低音柱與中高音柱的相位問題。由於分為四個箱體，各置不同之處，會讓低音與中高音產生相位差，一般四件式的低音柱為了解決相位差問題，都設有一個相位調整，讓用家憑耳朵去找出最正確的低音相位。而Avalon的設計者則更進一步，把中高音柱放在低音柱上方，並設計出一個獨特的造型，就像是以一個「蓮花座」（低音箱體）托住「觀音」（中高音箱體），完成了四件式喇叭融為二件式的完美設計，這真是煞費苦心啊！我甚至一度懷疑，Neil Patel在設計這對喇叭時，是否看過老中的水晶蓮花座？而從中獲得靈感。您看Tesseract的箱體斜切面多像水晶切面啊！其實，如果把中高音柱的低音分頻點解除，光是上面那段箱體的三個單體就已經可以發出完整的頻域了。不要忘了，那個中低音單體是11.5吋，一般落地式喇叭的低音單體也不過就是這個尺寸。

低頻能量有如颱風

在圓山音響展期間，早上還未開始之前，我曾試過Tesseract播放大鼓，那鼓聲真的可以用驚天動地來形容，龐大的低頻能量以非常快的速度彈出

來，簡直就像是強烈氣流掃過身體，渾身汗毛豎立，老實說就算是四件式喇叭也不一定有這麼強勁的彈性與能量。從大鼓的表現中，我完全臣服於Tesseract的低頻彈性與控制力。為何我會聽到那麼強勁的大鼓震波呢？我猜除了原本每支喇叭四個15吋低音單體的威力之外，還加上了空間的低頻峰值混入鼓聲，使得大鼓的能量增強數倍，正常狀態下鼓聲應該沒有那麼強的震撼力才對。

除了大鼓驚人的震波之外，我在圓山音響展時還聽到Tesseract另三項特異功能，那就是音場寬深超級龐大、整體音樂規模感超級磅礴、承受功率的能力超級硬挺，這些「特異」表現都是我關起門來測試的，旁人無法享受到。如果撇開空間低頻駐波所造成的危害，Avalon Tesseract所發出的聲音簡直就如巨人般，這是以往Avalon喇叭所不曾聽過的。

精確透明細緻的美

而這次來林先生家呢？老實說我聽到的是Tesseract的另外一面，那是精確、透明、甜美、細緻、活生、反應快速、細節超多的表現，也是細緻的一面，跟在圓山飯店音響展時的孔武有力形成對比。從聆聽諸多軟體中，我發現林先生家裡聽到的中低頻、低頻駐波並不強烈，也不常出現，這應該是空間長度夠深的關係。此外，林先生把100Hz以下的低音設定在大約-1dB之處，這也是正確的作法，如果低頻不衰減，低頻駐波的峰值會浮得更高，此時就會破壞音樂的整體平衡感。

在Y B A全套擴大機的搭配下，Tesseract展現的高頻段非常甜美，充分顯出鑽石高音單體與陶瓷中音單體的特色，那是華麗又純淨的高音。而中頻段的樂器與人聲形體並沒有特別龐大，也沒有特別粗獷，反而是形

體大小適中、輪廓線條浮凸的表現。如此的高頻段與中頻段表現，我認為跟我對YBA擴大機的聲音特質能夠吻合。不要忘了，Tesseract 100Hz以上都是由上半截那三個單體所負責的，與下半截那四個15吋低音單體無涉。所以，如果用家要改變100Hz以上的聽感，除了線材調配之外，更換擴大機是立竿見影的作法。

全世界最獨特的喇叭線

對了，我去的那天，剛好進音坊也把這次圓山音響展初次展出的MIT Articulation console旗艦喇叭線拿到林先生家試聽。這對頂級喇叭線擁有一個非常重的調整盒，上面有四個旋鈕，可以分別調整高、中、低頻量感，而且宣稱可以產生2C3D效果（二聲道三度空間）。這對超級喇叭線訂價8萬美元，在北美已經可以買一部高級歐洲轎車，大部分喇叭都還沒有它貴，真是超級豪華，我那天聽到的聲音就是透過這對喇叭線所發出者。

而在低頻段的表現方面，我所聽到的並非如圓山飯店音響展的那種颱風級低頻量感摧枯拉朽的威力，而是正常天氣下的晚風。我的意思是，Tesseract所表現出來的鋼琴、大提琴、Bass、腳踩大鼓等形體與量感跟一般落地式大喇叭無異，鋼琴低音鍵弦振清晰，腳踩大鼓撲撲聲收束快尾音短，Bass音粒凝聚彈跳，大提琴的琴腔振動細節與嗯嗯鼻音都很迷人，低頻暫態反應乾淨俐落，完全沒有15吋低音給人那種笨重的感覺。事實上，Tesseract體積740×2,210×820mm，一支淨重375公斤，這個龐然大物的低頻表現竟然會那麼的靈動，而且解析力那麼高，真的出乎意料之外。可惜當天我沒帶大鼓的軟體，不然也可以測試一下Tesseract所發出的鼓聲會不會把天花板上的嵌燈震下來。

音場開闊，層次分明

Tesseract還有幾項優點貫穿所有當天聆聽的軟體，那就是音質很美，解析力超高，定位精準、透明感極高，音場開闊，音場內的樂器散佈得很寬廣，不會擠在一起，層次拉得很開，整體聽起來有一種清爽純淨的美。

除了聆聽CD之外，我也隨手挑了幾張擺在旁邊的黑膠唱片，這些黑膠都是1950-1970年之間的錄音，而且是原版本，並非複製版。林先生使用的唱放是

FM Acoustics 223唱頭放大器，唱頭是Clearaudio Goldfinger Statement。這套黑膠系統所發出的聲音高頻內斂，弦樂擁有黏滯感，樂器線條刻畫清晰浮凸，音像凝聚，味道相當特別。

前所未有的喇叭

Avalon Tesseract是一對前所未有的喇叭，它的分音器分為主動與被動分音；它的低音與中高音也分為內建擴大機與外接擴大機驅動；它的低音

反射架構也是傳輸線式與Isobaric的混血；它的100Hz以下頻域由四個15吋低音單體負責；它的整體設計哲學等於把四件式融為二件式，消除四件式喇叭的相位問題。這樣一對設計傑出的喇叭，用家所需要的就是找出適合搭配中高音的擴大機，以及馴服低頻量感，讓中高音與低音達到水乳交融的地步。▲

參考軟體



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朱思馬即「Destiny」
(MCD3908AQ, 風行)



Shostakovich「Sonata For Violin、Percussion And String Orchestra」
(DG0289 477 6196 9, 環球)



Vanessa Fernandez「Use Me」
(GRV 150-1, Joy Audio)



Tacet「25 Years of Tacet」
(TACETS975, 響韻)



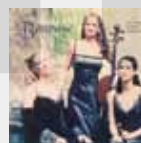
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「喇叭的28道試煉」
(DG 482 348-1, 普洛文化)

Avalon Tesseract – A Bodhisattva in a Lotus Throne

by Jack Liu, Editor in Chief, Audio Art magazine

Do you still remember the 2014 Taiwan Audio Association International Hi-end Show (“Hi-end Show”) in the Grand Hotel Taipei? It was that time when the Avalon Taiwan distributor Omega Audio first demonstrated the new Avalon flagship Tesseract to the public in the lobby Golden Plum Room. The results were mixed. Some audiophiles liked the sound, and some others didn’t. The criticisms were mostly about the standing waves in the low frequencies. There was simply too much bass when certain types of music were played. On the other hand, some other audiophiles listened to music that did not cause the standing waves and enjoyed the greatness of the Tesseract. Indeed, the latest Avalon flagship Tesseract can fill up a huge space with powerful sound. There is simply no other single column design hi-end speakers that are equipped with four 15” woofers (two showing, two hiding) per channel, and with built-in amplifiers over 3,000 watts.

Sold before even broken-in

Almost every audiophile who attended the Hi-end Show listened to the Avalon Tesseract, including one very particular audiophile. Even before the Hi-end Show, this audiophile went to the Taiwan Avalon distributor and listened to the Tesseract. However, the Taiwan Avalon distributor only had a small listening room for Tesseract which could not do justice to the mighty speakers. That’s why this particular audiophile decided to go the Hi-end Show and listened to the Avalon Tesseract again. The particular audiophile was very pleased with what he heard at the Hi-end Show, and demanded the Taiwan Avalon distributor to deliver the Tesseract to his home right after the Hi-end Show. This particular audiophile is Mr. Lin, the owner of the first ever pair of Avalon Tesseract in Taiwan. Actually, the Taiwan Avalon distributor delivered the pair of Tesseract to my listening room immediately after the Hi-end Show, but then took the speakers away before I had time to fine tune the sound of the Tesseract. Maybe it was due to Mr. Lin who was eager to own the Tesseract? As a result, I could only post simple photos on the Audio Art magazine website, but had no formal article of the Avalon Tesseract until now.

The purpose of visiting Mr. Lin at his home was really not for an interview, but to seriously listen to the Avalon Tesseract. The Tesseract could not show its full strength at the Hi-end Show due to the room constraints. I also had no time to make the Tesseract sound right in my listening room. So at my request, thanks to the Avalon distributor and dealer in Taiwan, I finally have a chance to listen to the Tesseract in an ordinary room and set-up. To tell the truth, the Tesseract sounded very differently at Mr. Lin’s home and at the Hi-end Show, almost like two different pair of speakers. I suspect the room acoustics and matching components made all the differences.

The Best Source, Amplification, and Cables

The Tesseract is placed in Mr. Lin’s living room. Mr. Lin owns a big house, and albeit a big living room. The living room is also connected to the dining area at the rear end, making the whole “breathing” area even more spacious for the Tesseract. The Tesseract can finally show its full power in terms of bass and deep bass without the limitation of the room. However, the Avalon Tesseract truly has one of the most power bass and deep bass in the world, Mr. Lin had to set the bass amplifier volume to -1 dB to get the best result.

For amplification, Mr. Lin uses the YBA Signature pre-amp in 6 pieces (Yes. 6 pieces. 2 main chassis and 4 power supply) and the YBA Signature mono power amps. Note that the YBA Signature power amps only drive the top half of the Tesseract since the four 15" woofers in the bottom half are driven by the built-in amplifiers. The digital source is obviously Vivaldi, the flagship of dCS of UK. The analogue source is also the flagship of the Clearaudio from Germany which requires no more comment.

What caused Mr. Lin to decide to own the Avalon Tesseract? Mr. Lin said that he auditioned many top systems via the dealer before deciding on the Avalon Tesseract. Eventually Mr. Lin chose the Avalon Tesseract not only because its size and design fits his living room, but also for the great sound of the Avalon Tesseract. Frankly speaking, we all know that it is a personal choice when it comes to the looks and sound. When there are so many systems sounding great, a buyer has to fall back to his/her personal preferences to make the decision. Obviously other dealers would be disappointed not being able to secure the business. Relax! Eventually someone else will buy from those dealers since everybody has a different personal taste.

Speakers in Stealth

Tesseract employs a unique shape which is different to all other Avalon speakers ever introduced to the audio world. Tesseract has to be the only speaker on Earth that utilizes so many bevel faces in the design. No. Tesseract is not a huge bamboo shoot as some audiophile nicknamed it, nor is it a gigantic Darth Vader. Tesseract is actually a stealth fighter or a stealth destroyer. If you are a Buddhist, you may view the Tesseract as the Bodhisattva standing in a lotus throne.

Why design a speaker enclosure with so many bevel faces? The bevel faces on a stealth fighter or a stealth destroyer are meant to diffuse the radar waves to achieve stealth. It's the same for Tesseract. For a speaker the size of Tesseract, most of the reflected soundwaves from the ceiling, the floor and all the walls will hit the speaker enclosure (designer Neil Patel estimates to be 70%) then reflect out again in a complex, uncontrollable manner, which would cause the sound stage to be distorted. To solve this problem, Avalon designed many bevel faces on the Tesseract speaker enclosure with the help of computer simulation and calculation to reduce and control the soundwave reflection onto/from the speaker enclosure. The spear shaped top section of the speaker enclosure is not for the look or just to be "different". It's designed to diffuse and control the soundwaves reflected from the ceiling.

Incredible Specification

Due to its large size, the Tesseract is designed into two enclosures for the best separation between the four 15" woofers and the rest of the drivers, and also for easier transportation. The two enclosures are totally independent to each other. There are three metal spikes at the bottom of the top enclosure which are to be connected to the bottom subwoofer enclosure. It takes more than a couple of men to properly assemble the Tesseract. According to the owner's manual, the frequency response range of Tesseract is 16Hz-50KHz. The average impedance is 5 ohms with the minimum at 4.6 ohms. The sensitivity is 92.5dB. Very impressive specifications indeed. Most amazingly, there are no phase errors between 16-32Hz, the phase shift in the 200Hz-50KHz is limited to between 4.2-10 degrees, and the group delay errors are less than 1.5 milliseconds at 16Hz. These numbers are truly incredible. Of course, the spectacular specifications can only be achieved through the years of continuous R&D by Avalon.

The enclosure of the Tesseract is not made of complex materials, but of MDF familiar to Avalon. Although the beautiful finishing that shines in metal like texture on the Tesseract may suggest some high-tech materials are employed in the enclosure. The first pair of Tesseract in Taiwan looks like in black color from a distance. If you look closely, it is actually in a very deep blue color, similar to the finishing of the luxury cars.

The top enclosure houses three drivers: a 20mm diamond underhung voice-coil tweeter, a 4.5" ceramic underhung voice-coil midrange driver, and an 11.5" ceramic/honeycomb underhung voice-coil mid-bass woofer. The diamond tweeter is placed in the center of the enclosure, with the 4.5" midrange driver over it, and the 11.5" woofer below it. The drivers are lined up in a precise time array to achieve an accurate sound stage reproduction. Similar to the design of the original B&W Nautilus speakers, each driver in the top enclosure has a tapering tube behind it to make the back soundwaves naturally disappear.

The bottom enclosure which houses four 15" woofers is of a more complex design. It is a combination of an isobarik structure and a transmission line. Only 2 woofers are exposed, the other 2 woofers are hiding inside the enclosure. Honestly I could not understand how those two designs can be integrated into one enclosure. The isobarik design requires a sealed box to ensure the constant pressure inside the enclosure, so that the back woofers can control the movement of the front ones. On the other hand, a transmission line design requires a tapered tunnel behind the woofers with an opening at the end. It also requires damping materials in the tunnel to control the soundwaves. I had never seen such a rare combination. By the way, the transmission line opening is just hiding below the woofers. Never the less, this enclosure design for woofers are also the results of the many years of R&D by Avalon.

Adjustable Bass

Two class AB 3,200 watts amplifiers are built into the Tesseract. According to the owner's manual, the output of the amplifiers is 2,500 watts, but the Taiwan Avalon distributor states the correct number of amplifier output should be 3,200 watts, as per the previous Tesseract report by Audio Art's senior reviewer Linn Lee. The 3,200 watts amplifier has a JFET input stage, and a MOSFET output section. The crossover point for the four 15" woofers is 100Hz with an active electronic crossover. The other drivers for mid-bass and up have a traditional passive crossover. It is also a rare design to combine passive and active crossovers into a single speaker. What are the crossover points for the other drivers? You can take a guess since Avalon never discloses that kind of information of its speakers.

There is a 24 steps knob for the adjustment of volume below 100Hz behind the Tesseract which goes from -2 dB to +1 dB, the owner of the Tesseract can adjust the volume of the bass to match the listening room. In addition, there is also a switch between "Extend" and "Fast Transient" which allows the owner to choose between a more extended deep bass or a faster tighter bass. This is also to better match the listening room. The small sensor behind the speaker is to turn on/off the amplifier. Waive your hand at the sensor, the amplifier will turn off. Waive again, the amplifier will be back on. Note that the sensor requires an 1 meter clearance. If there is anything within that distance, the sensor may not work properly as intended.

Morphing Four Columns into Two

If you look at all the design details of the Tesseract, and think about its design concept, it becomes obvious that the designer Neil Patel was trying to morph a four columns speaker into a two columns one. Why do I say so? Let's start from the crossover point. Most 4 columns speakers have a crossover point at around 100Hz or even 80Hz for the bass columns. In addition, most 4 columns speakers have active bass columns with built-in monster amplifiers and electronic crossover, which is exactly the design of the Tesseract. What's more? Most 4 columns speakers utilize multiple woofers sized from 8" to 15" in the bass column. The Tesseract has four 15" woofers per channel, with two woofers hiding behind the other two. One can tell, from the above, what the designer Neil Patel tried to achieve was to make the Tesseract sound as authoritative as a 4 columns speaker.

Well, one may ask, why not just design a 4 columns speaker? There is a core issue with any 4 columns speaker design: the integration of phase between the different columns. Since the mid/high drivers and the woofers are on different columns and at different heights, naturally there will be phase coherence issues between them. Most 4 columns speakers offer a phase adjustment knob on the active bass columns so that the audiophiles can adjust the phase of the bass columns to match that of the mid/high columns. The Tesseract takes it one step further by placing the mid/high column (enclosure) over the bass column which also forms a unique shape that is good for both the eyes and the ears. For a Chinese, the Tesseract is like a lotus throne (the bass enclosure) hosting the Bodhisattva (the mid/high enclosure). By such a design, Neil Patel successfully morphed a 4 column speaker into a perfect 2 column design. What a great effort I must say. I even wonder if Neil Patel borrowed some ideas from the crystal lotus thrones designed by Chinese artists since the bevel faces of the Tesseract resemble that of a crystal sculpture. In fact, even without the bass enclosures, the mid/high enclosures of the Tesseract can still reproduce the full frequency range required for most music. Note the Tesseract has two 11" mid-bass woofers, which are equal to or larger than the woofers of most floor standing speakers.

Bass Mighty as Typhoon

During the Hi-end Show, I played a CD with the big concert bass drum via the Tesseract in a morning before the show opened its door to the general public. It was incredible as I would describe the sound as "earth shattering". The bass energy was enormous in terms of quantity, and with tremendous speed, just like been blown by a jet air flow, causing goose bumps all over the body. You may not get such powerful bass with great energy and elasticity even from the 4 columns speakers. I was totally surrendered to the elastic and well controlled bass of the Tesseract when the big concert bass drum was played. How could I hear such powerful sound waves from the big concert bass drum? My guess is that in addition to the eight 15" woofers of the Tesseract, the standing waves of the listening room also contributed to the sound which resulted in a much more powerful drum beat than normal. A regular concert bass drum does not sound that shockingly impactful.

In addition to the super powerful bass drum, I also heard three other outstanding audio aspects of the Tesseract, which include a humongous sized sound stage, a breathtakingly majestic music scale, and an ability to handle unlimited power. I was the only one who heard these outstanding performances of the Tesseract since I played my CDs with the door closed to the public. Set

aside the negatives done by the poor acoustics of the room, I had never heard such a titanic sound from any Avalon speakers other than the Tesseract in my reviewing career.

The Beauty of being Accurate, Transparent and Delicate

How does the Tesseract sound in Mr. Lin's place? Honestly I heard the other side of the Tesseract that is accurate, transparent, sweet, delicate, lively, responsive, and extremely detailed. Such a sound is totally the opposite to the mighty Tesseract I heard during the Hi-end Show. From the various LPs and CDs I played, I did not find there to be much standing waves from mid to deep bass in the listening room of Mr. Lin, possibly due to the great size and length of the room. Besides, Mr. Lin did the right thing to set the bass below 100Hz at -1dB. There could have been stronger standing waves to ruin the tonal balance of the Tesseract in the room if Mr. Lin did not do that.

The Tesseract had a sweet sounding high frequency range, with the help from the YBA amplifiers, which shows the true quality of the diamond tweeter and the ceramic mid-range driver. That was a treble with elegance and purity. The body of the music instruments and vocals in the mid-range were not particularly large in size, or more rustic, but were properly sized with clear 3D imaging. Such a treble and mid-range performance matched the impression I had about the YBA amplifiers. Don't forget that the frequency range over 100Hz is covered by the three drivers in the upper enclosure and has nothing to do with the four 15" woofers in the bottom enclosure. So if the owner of the Tesseract wishes to alter the sound over 100Hz, changing the amplifier would be the most straightforward way.

Most Unique Speaker Cable in the World

Oh, on the day I auditioned the Tesseract, the Taiwan MIT distributor also sent the new MIT Articulation Console flagship speaker cable, which was premiered in the Hi-end Show, to Mr. Lin for auditioning. The new MIT top-of-the-line speaker cable has a heavy box with 4 knobs for the adjustments of high/mid-range/bass which can generate the 2C3D (2 Channel 3 Dimensional) effect as per MIT.

This pair of super speaker cable comes with a hefty price tag of USD80,000, which is about the same price of a luxury European sedan in North America and is more expensive than most hi-end speakers. What a luxury! My Avalon Tesseract audition was done with this MIT speaker cable.

Regarding the bass, I did not hear the super mighty typhoon like strong bass as was the case in the Hi-end show. What I heard was a light evening breeze in any ordinary night. The piano, cello, bass guitar, and kick drum reproduced by the Tesseract in Mr. Lin's room had the same size of body and same volume of bass reproduced by any other good quality floor standing speakers. The vibration of the piano low note strings was clear. The kick drum was fast and in control without a tail of excess slow bass. The cello had a clean vibration from its chamber and a very charming nasal timber. The overall bass was fast and clean and did not sound slow or delayed like a typical heavy 15" woofer. In fact, I was surprised that, with a dimension of 740 x 2,210 x 820mm and a weight of 375 kg per channel, a monster like Tesseract could have such a nimble bass with great resolution. Too bad I did not bring a CD with big concert bass drum played in it, otherwise I wonder if the Tesseract can knock down some ceiling lights with the big concert bass drum it reproduced.

Open and Layered Sound Stage

There are other achievements worth mentioning about the Tesseract. Regardless which CD I played, the Tesseract always demonstrated great timber, high resolution, pin-point imaging, see through transparency, and a wide open sound stage. The music instruments are spread widely in a huge sound stage with space between each other. The front to back of the sound stage was also in well-defined layers. The sound was simple, clean, pure, and beautiful to enjoy.

Besides CDs, I also played some LPs that were just there on site. Those LPs were all the originals from the 1950-1970's era, not re-issues. Mr. Lin uses an FM Acoustics 223 phono stage and a Clearaudio Goldfinger Statement cartridge. The LP system sounded a little laid back in the highs. The mass strings had good viscosity. The music instruments had clear 3 dimensional bodies and coherent imaging. The sound from that LP system was indeed something special.

A Speaker Never Heard Before

The Avalon Tesseract is a pair of unprecedented speakers. It has both passive and active crossovers; it has built-in amplifiers while still requires an external amplifier; it has a hybrid bass enclosure which combines the transmission line and the isobarik design; it has four 15" woofers to take care of the low frequencies below 100Hz; it has a design philosophy to eliminate the phase integration problem of the 4 columns speakers by morphing the 4 columns into 2. For speakers with so much engineering and design greatness, an audiophile only need to find the best amplifier for the mid-to-high range, and tune the bass properly, to achieve the perfect reproduction of recorded music.

Photos:

01. Mr. Lin's listening room. It is spacious enough to accommodate the big Tesseract.
02. The living room has an open concept design and is connect to the dining area. The photo was taken at the end of the dining area. It is very spacious.
03. From this angle, you can see the thick curtains behind the Tesseract. There are sound absorbing devices installed on the left hand side wall. The floor is covered in thick carpet. The ceiling has no acoustic treatment.
04. The sound absorbing devices on the left hand side wall look just like another piece of furniture. The big leather sofa should also provide some absorption.
05. There is a flat screen TV and A/V equipment on the right hand side wall. No sound absorbing devices are installed there except some acoustic panels.
06. From this angle, you can see it's wide open behind the listening position. The two small divider walls behind the listening position also have sound absorbing devices installed on them.
07. The USD\$80,000 MIT Articulation Console speaker cable. There are 4 knobs on it, one is the 2C3D switch, the other three are for the High/Mid/Low adjustment. It is the first time I see a speaker cable with such adjustments.

08. The 4 pieces dCS Vivaldi digital system. The 6 pieces YBA Signature pre-amp. The YBA Signature mono amplifiers.
09. You can adjust the bass output of the Tesseract here. The bass below 100Hz can be adjusted between -2dB to +1dB. You can also choose between “Extend” and “Fast Transient” for the bass.
10. The upper enclosure of the Tesseract houses a 20mm diamond underhung voice-coil tweeter, a 4.5” ceramic underhung voice-coil midrange driver, and an 11.5” ceramic/honeycomb underhung voice-coil mid-bass woofer.
11. The three drivers are placed with extreme care for the best focus and accurate phase integration.
12. The bottom enclosure of the Tesseract shows only two 15” woofers. There are two more 15” woofers inside the enclosure for the isobarik design.
13. The Avalon logo will light up when the built-in amplifier is turned on.
14. A splendid view of the great Tesseract!