

Sealed Vs. Ported

An Expanded Explanation of Sealed Vs Ported/Bass Reflex & Passive Radiator Designs

Ported systems (including designs with passive radiators) are 4th order hi-pass systems. They use an acoustic resonator (either a port or a passive radiator) to increase system efficiency, reduce driver excursion and extend the low frequency response of a given speaker. All this is well and good except they also have the following problems. Because they use a high Q (typically around 7) acoustic resonator, they have much worse transient response than the low Q (.707) sealed box design that Blue Sky uses. You can also get a lot of noise out of the port due to turbulent airflow. Ported and passive radiator designs can have very impressive output on sine waves and other steady state signals, which is great if you listen to organ tones all day long. But they fall short on other real world transient signals; such as drums, bass slaps, face punches, body slam etc. For those signals, low Q sealed box designs are a much better choice for faithful reproduction. Also if signals are fed into a ported system, which are below the system cutoff frequency, the port no longer works as designed and the driver excursion is no longer constrained by the action of the port. This can cause the drivers to bottom out. Sealed box designs do not suffer from this problem.

Since Blue Sky's design goal was accurate reproduction of the source material and not raw output per se; Blue Sky choose a sealed box design for the subwoofer and the satellite.