

## Studio Monitor Evolution and Use

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JBL's reputation in loudspeakers has always been greatly influenced by their studio monitors. At the beginning of JBL's professional endeavors, the consumer speakers and monitors shared components and system designs. Eventually, these lines would diverge into distinct products with different design parameters. However, questions commonly arise on this forum as to the appropriateness of various monitors for home use. This post doesn't address that issue directly. However, it does provide a history and context that will allow for a greater understanding of the purpose and application of these products.

One of the most common misconceptions about the origins of studio monitors is that they were initially designed for absolute accuracy. While accuracy is a critical issue, it is not the only one and historically it has not even been the most important issue. In its simplest terms, it is arguably more important that a monitor be predictable than neutral. To this day, the most common nearfield monitor is the Yamaha NS10. Just about every studio engineer hates them and realizes they are not neutral. However, they are all familiar with them so that they are a reference that everyone knows how to work with. This is important since engineers generally work in numerous studios. It is not easy to predict how a recording will sound if every monitor in every control room sounds different.

In North America, the standardization on specific monitors goes back to the Altec 604 in the mid 40's. This was the first relatively compact speaker with high output and reasonable bandwidth. Since it was a coaxial, it gave excellent imaging both midfield and farfield. For the next 20 years, it was the de facto standard in virtually all recording studios. However, the 604 was anything but neutral. It had a significantly rolled off high end and a noticeable midrange peak. This peak was considered useful by many engineers since it accentuated the critical vocal range.

The next industry standard was the JBL 4310/11. Not surprisingly, this speaker was purposely designed to mimic the sound of a 604, but in a bookshelf sized speaker. This system offered the flexibility of mounting nearfield on top of a console bridge, something that could not be done with the 604.

JBL came to dominate the studio monitor market in the 1970's. It was entirely due to the rise of rock music. This genre pushed the demands for high level output. JBL met this demand with three and four-way monitors (4333, 4343, 4350). By using multiple drivers, it was possible to increase the power handling since each driver handled a narrower frequency band. They were also considerably flatter than the previous 604/ 4311 since the individual drivers were flatter over a narrow range and could be equalized

more easily in the cross-over network.

The late 70's and early 80' saw the rise of the small nearfield monitors such as the Yamaha NS10. Nearfields have the great advantage of removing the room as a variable in sound quality. Every room colors a speaker's output due to reflections from the walls, floor and ceiling artificially reinforcing certain frequencies and canceling others. Nearfields have very controlled dispersion. The listener is usually within 3' to 4' of the speaker with no boundaries except for the console face. This means that the listener has a high proportion of direct versus reflected sound with minimal room distortion. This makes the standardization of monitors even more effective, since the speaker itself is the main variable responsible for sonic differences.

The NS10 started out as a monitor to check out mixes in "real world" applications. In other words, it mimicked the inexpensive speakers found in most homes and car stereos. After recording, engineers checked the mix on these speakers to ensure they would sound reasonable on the lowest common denominator. However, the advantages of using these speakers as nearfield monitors during recording resulted in the NS10 becoming a standard session monitor.

By the 80's, most large studios had two sets of monitors – the large soffit mounted main monitors such as the previously mentioned JBL's, and nearfield monitors mounted on the consoles. Most monitoring was done on the nearfields, for the reasons cited above. The main monitors were relegated to a secondary role. They were only fired up to do bass checks (since the nearfields are bass restricted) and to "impress the clients". Nothing matches the high level, dynamic output of the mains to impress the artists on how their session went. However, they played a minimal role in actually monitoring and mixing the recording

Even relegated to their secondary role, main monitors evolved considerably in the 80's. That time period saw the development of direct radiator midrange drivers that had similar output to the compression drivers and horns of previous main monitors. These drivers were considered more neutral sounding than horns. This led to the rise of such companies as ATC, Quested and Genelec as main monitor suppliers. However, horn based systems have not been entirely displaced. Main monitors based on Pioneer TAD horn and bass drivers are very common in some the top studios. They are very refined sounding compared to the horn systems of previous decades.

Absolute accuracy does have a role in one particular phase of the recording process. That is during final mastering. Here, subtle (and sometimes major) changes are made to finalize the mix. Critical monitoring is required to distinguish minor variations in mix levels,

imaging and processing. The most common mastering monitor is the B&W 801 and it dominates the classical recording field. Other mastering monitor names should be familiar to high end audio hobbyists. Dunlavy, Wilson, and ATC all have their followings in some of the world's most prestigious studios.

Nearfield monitors have progressed to the point that their sonic differences are not nearly so great. Therefore, the importance of standardized nearfields is beginning to disappear. In addition, the rise of the home "project" studio means that many involved in recording only work in one facility so that a standardized sound is not important to them.

Studios now sport a wide range of nearfields that are slowly replacing ubiquitous Yamaha NS10. Genelec nearfields seem to have garnered the greatest respect amongst engineers for accuracy and they are quite common. Other respected brands include Tannoy, JBL, Mackie, Alesis and many others. There are literally dozens of nearfield monitor manufacturers.

These nearfields still have attributes that differentiate them from home speakers. The most important are controlled dispersion and high output. Controlled dispersion is at cross-purposes to the design of many home speakers which are designed for a wide stereo sweet spot. Monitors only have to concern themselves with presenting an accurate stereo image at the engineer's listening position. Any wider, and you introduce the room problems mentioned earlier. High output remains in demand for popular music. This music tends to be recorded and played back at higher levels than other genres. Further, higher volumes make it easier to distinguish errors and defects in the recording process. Fortunately, the industry is finally recognizing the correlation between sustained high volumes and hearing loss so that high playback levels are becoming more the exception and less the norm (hip hop music excepted).

The other main distinction between home speakers and professional monitors is that the latter tend to be powered with built in amplifiers and electronic cross-overs. This is because it is easier to design a small, accurate monitor through bi or tri amping and internal amplification makes integrating them into the complex electronics of a studio easier and more flexible

And there you have a brief history course in the evolution and use of studio monitors.

(Don McRitchie – JBL)