For speech, *SPL*'s of 65-70 *dB* are usually adequate, provided this is at least 25 *dB* above the room noise level.

For music, which spans a wide range of genre's and dynamic range, typically peak levels of 90-100 *dB* (or more) may be required. However, *e.g.* for rock music, 110-120 *dB* peaks are not uncommon…

Example:

The acoustical power, P_{ac} needed to achieve a ***reverberant-field*** sound pressure level of $SPL = L_p^{rvb\,only} = 100\,dB$ in a room with total absorption $A = 500\ m^2$ can be determined using the above graph (and/or the use of the formula $SPL_{\substack{rvb \\ only}} = L_p^{rvb\,only} = L_{Pwr} + 10\log_{10}\left(\frac{4}{A}\right)\ (dB)$).

When $r/\sqrt{Q} > 10\,m$ (*i.e.* the ***reverberant-field*** region, for $A = 500\ m^2$), we see from the above graph/formula that: $L_p^{rvb\,only} - L_{pwr} = 10\log_{10}\left(\frac{4}{A}\right) = 10\log_{10}\left(\frac{4}{500}\right) = 10\log_{10}(0.008) \simeq -21\,dB$

or: $L_{pwr} = L_p^{rvb\,only} + 21\,dB = 100 + 21 = 121\,dB$.

Since $L_{Pwr} = 10\log_{10}(P_{ac}/P_o) = 121\,dB$, then $10\log_{10}(P_{ac}/P_o) = 121 \Rightarrow \log_{10}(P_{ac}/P_o) = 12.1$
$\Rightarrow 10^{\log_{10}(P_{ac}/P_o)} = 10^{12.1} \Rightarrow$ Thus: $P_{ac} = 10^{12.1} P_o = 10^{12.1} \cdot 10^{-12.0} = 10^{0.1} = 1.26\ Acoustic\ Watts\,(RMS)$.

If the loudspeaker(s) that are to be used for sound reinforcement in this room each have an efficiency of *e.g.* $\varepsilon_{spkr} = 1.26\%$ for conversion of electrical energy into acoustical energy, then since $P_{ac} = \varepsilon_{spkr} P_{el}$, the electrical power P_{el} required for the amplifier used in the electronic sound reinforcement system for this room needs to be $P_{el} = P_{ac}/\varepsilon_{spkr} = 1.26/1.26\% = 100.0\,Watts\,(RMS)$.

Placement/Location of Loudspeakers In a Listening Room:

In designing a sound system for a listening room, the placement/location of the loudspeakers in the room is one of the most important factors to take into consideration in order to achieve the best coverage, clarity and intelligibility over the listening area. Sound reinforcement systems often use a large single sound source, or a number of small sound sources judiciously distributed throughout the listening room.

In most auditoriums (*i.e.* large listening rooms), single sound sources are preferred, because they preserve the best spatial pattern of the sound field. A single sound source generally consists of an array, or cluster of loudspeakers, each with directivity factor *Q* selected (and spatially oriented) to give the best overall sound coverage for the audience. From direct experience with installation and the use of such sound reinforcement systems in auditoriums/large rooms, the {strongly!} preferred solution is the use of a single sound source, located along the centerline of the room, near the front, placed over/above the speaker's head, as shown in the figure below: