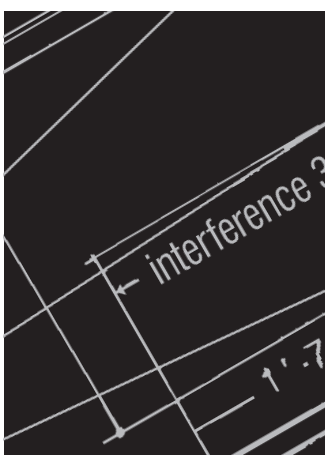
SECTION

2 SCREEN SIZE VERSUS CEILING HEIGHT

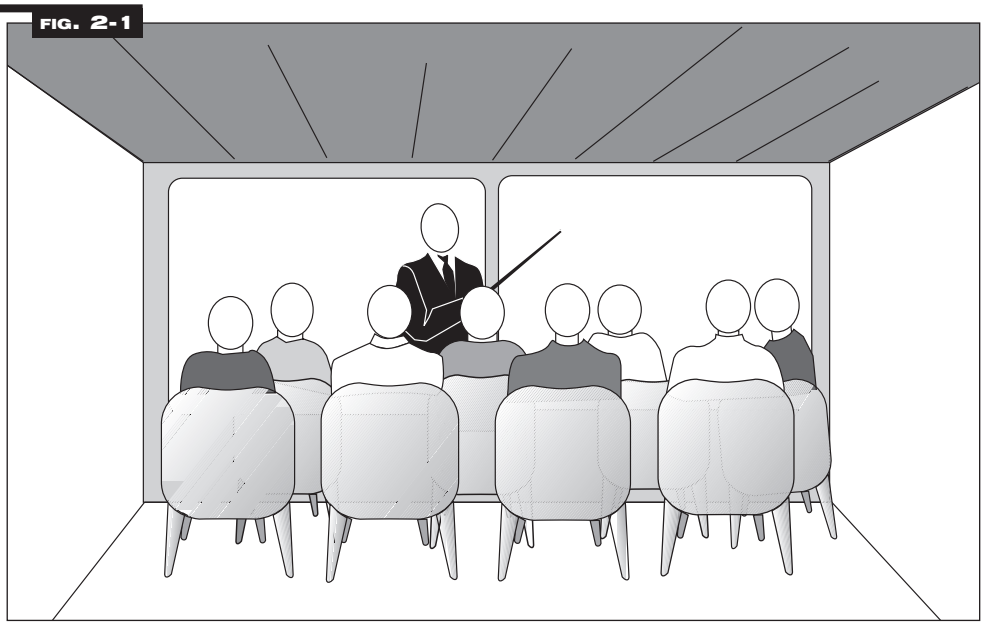
edited by **M.K. MILLIKEN**

Kim Milliken, of Da-Lite Screen Company and founder of Optixx Screen Systems, spent more than 25 years in the audiovisual industry. He is best known for his commitment to educating the industry with a level of intelligence and sophistication that remains unparalleled.



Inadequate ceiling height

FIG. 2-1



Once we have become convinced of the importance of size as a prerequisite of effective imagery, we almost certainly are going to bump our heads against the mechanical limitation of ceiling height. Neither architects nor builders, professionals whose top priorities quite understandably are economic, normally are sensitive to issues regarding adequate image height. Instead, the height of the room in which an AV display system is to be installed ranges from 8’ to 9.5’ in a typical commercial construction.

Taking the more generous of those two numbers, let’s see what might be the maximum length of a room that can be served by a projected image displayed below a 9.5’ ceiling.

Bottom of image should be at least 4’0” above floor to prevent excessive head interference

FIG. 2-2

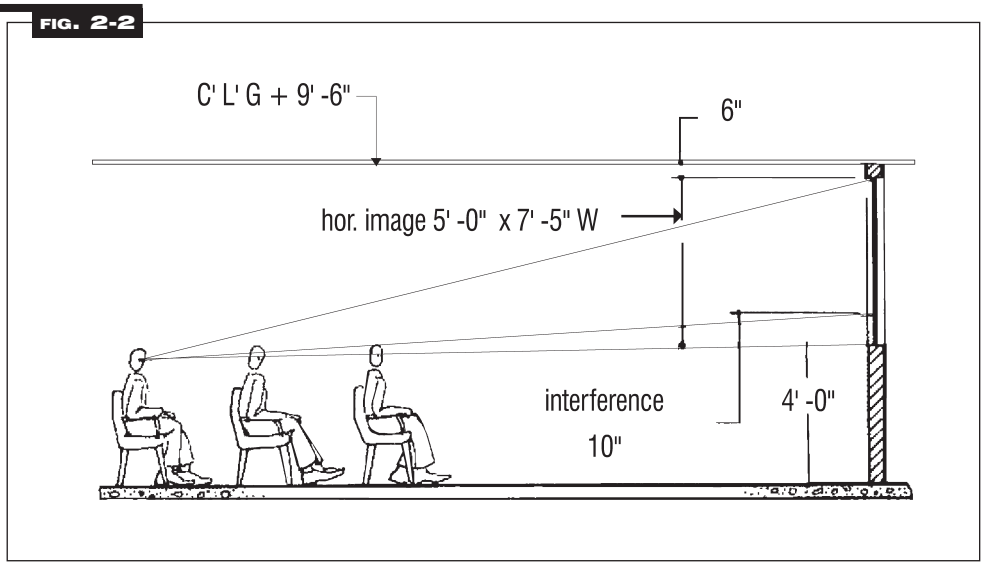


Figure 2-2 shows that a viewer will experience about 10” of head interference when seated on a flat floor under the following conditions:

- rows have staggered seats, so that the head of the person two rows in front of the viewer interferes;
- rows are no closer than 36”, chairback to chairback;
- the bottom edge of the image is 48” above the finished floor.

Figure 2-3 shows that the height of the image cannot be more than 60” (allowing for 6” above the top of the image for proper aesthetics).

FIG. 2-3

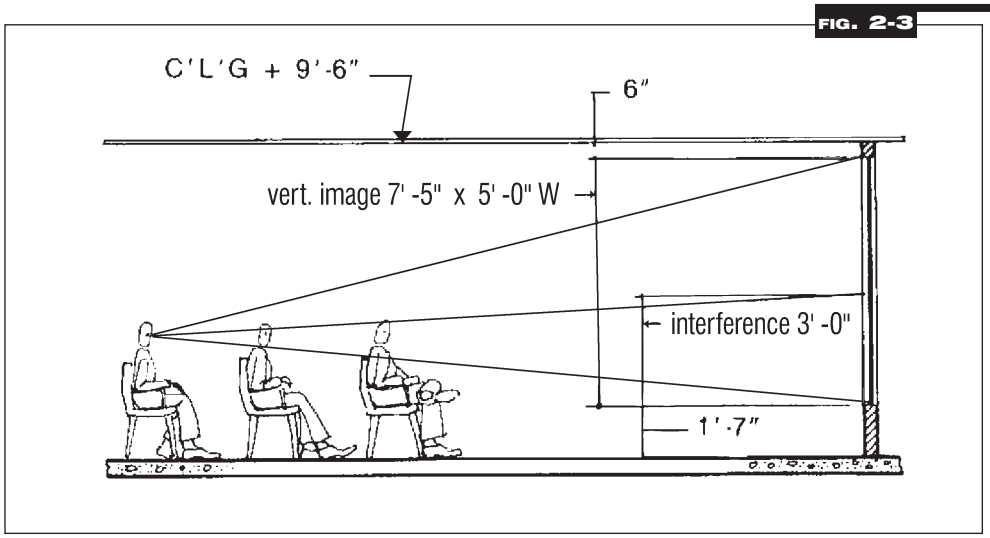


Image the size of that used horizontally in Figure 2-2 cannot be used vertically without excessive head interference

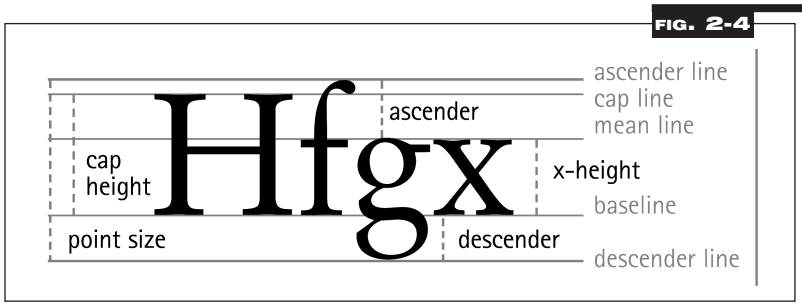
Following the formulas given at the end of Section 1, we find that the room can be 40’ deep if the only thing to be watched is video, 30’ deep if there is a data display, and a meager 20’ deep if the display is graphical.

Since these dimensions are so restrictive, there seem to be only two effective ways to ease them: Get the architect and builder to raise the ceiling, or develop some workaround utilizing the software. Although this section can offer no guidance as to the accomplishment of the first option, it can provide some data useful in the second.

In the easiest and therefore simplest case, with respect to video nothing need be done. After all, watching video is primarily a recognition task. Therefore it is no great test of our visual acuity to be asked, even from great distance, whether the subject being imaged is a man or a woman.

With regard to data, however, more rigid standards exist. They rightfully concentrate on the smallest coherent element within the presented material. This, of course, is a single character, which becomes even more usefully defined as a lower case x.

FIG. 2-4



Concept of x-height

Figure 2-4 illustrates this concept of x-height. Using it we can establish ways to calculate its minimum dimensions so that it can be “read” reliably from any given viewing distance. Notice that we now are abandoning as useless any consideration of overall screen height and instead are concentrating on character height. This should give us considerably greater flexibility, even if the resultant mathematics are marginally more rigorous.