Q: Will you please expand on and give us your description-example of what makes a horn a constant directivity horn and why it will not always give a constant coverage horn?

Roy: DI = 10 log(4 / {tan(a1/2) tan(a2/2)}) is the basic equation for calculating directivity index. a1 and a2 are the half angle coverage of an acoustic device. The coverage angle is determined to be when the level drops by -6 db from on axis. So you basically plug in the values and you get a number in db. What constant directivity means is that the directivity index remains the same value over a bandwidth thus the directivity remains constant over a bandwidth. My gripe has been two fold with this process.

(1) you can have the coverage angles change dramatically and still get the same DI. for example, (and just rough guesses here), look at this table:

freq	coverage angle in horizontal	coverage angle in vertical	DI
1k	90	60	7.5
2k	60	90	7.5
4k	90	60	7.5
8k	60	90	7.5

If you now look at the DI column, I can say that this acoustic device has constant directivity but I cannot say that it has constant coverage.

Now look at this one:

freq	coverage angle in horizontal	coverage angle in vertical	DI
1k	90	60	7.5
2k	90	60	7.5
4k	90	60	7.5
8k	90	60	7.5

Now this horn has constant directivity and constant coverage. That is why I say, constant directivity does not guarantees constant coverage but constant coverage guarantees constant directivity.