NOTES ON PORTING:

Overly large vent areas (or diameters) may be divided into smaller ports as long as the overall vent area and length remain unchanged. An example of this is the case where one 8" diameter tube is replaced by four 4" diameter tubes of the same length. The four smaller tubes have the same area, but also have twice the wall surface area. In cases such as this it is often necessary to trim the tube length by perhaps 10% to 20% to maintain the same helmholtz frequency that the single tube would have provided, since multiple tubes (more wall area) tend to tune a bit lower because of the added air friction on the greater wall surface area.

You can determine actual tuned frequency under large-signal conditions by measuring the A.C. current maximum near the target helmholtz frequency with an A.C. ammeter hooked in series between the power amplifier and the loudspeaker; the maximum current reading will coincide with tuning. Once actual helmholtz frequency is known, you can trim excess length (equally from each tube) to achieve the desired frequency increase.

PORT PLACEMENT ON THE ENCLOSURE:

It is generally not critical where ports are placed on an enclosure as far as low frequency operation is concerned, except that the port and woofer form a "system" which should not be disturbed or limited by near-by obstacles. It is perfectly acceptable to put a port on the back of an enclosure as long as the enclosure will not then be located too close to a wall so that the air flow at the vent opening is restricted. The same rule applies to the outside of the vent as to the inside-the-box end: the end of the vent should be kept away from obstacles if possible, as a rule by about twice the port dimension. The fiberglass or other insulating material inside the box should be fastened so as not to be drawn toward the port by the air flow. If necesary, insulation should be forgone in the immediate vicinity of the port end. Port material can be anything rigid, e.g. cardboard carpet tube. More expensive PVC or plastic tube is not necessary unless some odd size is called for where cardboard is not available. Port ducting can be square or rectangular using wooden sides as long as extreme length-to-width ratios are avoided. For example, a 9" tube and an 8" X 8" square duct have approximately the same area. One or two sides of the box may be used as sides of such a port, but this will cause an alteration in the expected tuning. Common wall ducts should therefore be designed to allow for some length adjustment after the box is completed. -Drew Daniels, July 28,1985.

JBL MODEL	INSIDE DIA.	TOTAL LENGTH	JBL MODEL	INSIDE DIA.	TOTAL LENGTH	JBL MODEL	INSIDE DIA.	TOTAL LENGTH
B380	4-1/8	9	4344	4-1/8	8-1/4	4509	2	5-1/4
B460	4-1/8	14-7/8	4345	4-1/8	8-1/4	4515	2-3/4	2-1/2
EN-5	5	8	4401	2	4-3/4	4518	4-1/8	8-3/4
EN-8	4-1/8	4-1/4	4411	3	6	4623	4-1/8	5-1/4
112	3	6	4425	2-1/2	6	4628	6	5-1/4
18Ti	2	4	4430	4-1/8	8-1/4	4680	2-3/4	3-1/4
216	2	3-1/4	4504	3	12-1/4	4691	3	5-3/4
320	2	4-3/4	4507	3	6	4695	4-1/8	7-1/2
4311	2-3/4	9	4508	5-5/16	4-1/4	8216	2	3-1/4

VOLUME CU FT	TUNED Hz	PORT DIMENSIONS			
		DIAMETER	AREA	LENGTH	VOLUME
0.5	50	2.5 in	4.9 in^2	8.7 in	.02 ft^3
0.5	100	2.5 in	4.9 in^2	3/4 in	--
1.0	50	3 in	7 in^2	5.4 in	.02 ft^3
1.0	100	5 in	19.6 in^2	1.6 in	.02 ft^3
2.0	30	3 in	7 in^2	8.3 in	.03 ft^3
2.0	40	4 in	12.6 in^2	7.6 in	.06 ft^3

2.0	60	5 in	19.6 in^2	3.6 in	.04 ft^3
3.0	30	4 in	12.6 in^2	9.5 in	.07 ft^3
3.0	40	5 in	19.6 in^2	7.3 in	.08 ft^3
4.0	30	4 in	12.6 in^2	6.3 in	.05 ft^3
4.0	40	5 in	19.6 in^2	4.5 in	.05 ft^3
5.0	30	5 in	19.6 in^2	8 in	.09 ft^3
5.0	40	5 in	19.6 in^2	2.9 in	.03 ft^3
6.0	30	6 in	28.3 in^2	9.6 in	.16 ft^3
6.0	40	6 in	28.3 in^2	3.5 in	.06 ft^3
8.0	30	6 in	28.3 in^2	6.1 in	.10 ft^3
8.0	40	6 in	28.3 in^2	1.5 in	.02 ft^3
10.0	30	8 in	50.3 in^2	9 in	.26 ft^3
10.0	40	8 in	50.3 in^2	4.6 in	.13 ft^3
12.0	30	8 in	50.3 in^2	6.6 in	.19 ft^3
12.0	40	8 in	50.3 in^2	1.2 in	.03 ft^3
16.0	30	10 in	78.5 in^2	7.3 in	.33 ft^3
16.0	40	9.9 in	76.2 in^2	3/4 in	--
20.0	30	12 in	113 in^2	8 in	.52 ft^3
20.0	40	12 in	113 in^2	3/4 in	--

Use 30 Hz for monitors & PA, use 40 Hz for musical instrument amps.
Dashes indicate no duct; length is that of the baffle thickness (3/4").