Chapter 10

(2)

Center Freq	Background Noise Level
500	55
1000	63
2000	72

Find PSIL

$$\frac{(55+63+72)}{3} = \boxed{63.3\ dB}$$

A man may speak with a normal voice at 0.3 m in this environment.

A female would need a raised voice at 0.3m and very loud at 1m.

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(3) Find the PSIL for octave-band noise spectrum

Hz	63	125	250	500	1k	2k	4k	8k
dB	52	56	57	62	55	51	50	45

$$\frac{52+56+57+62+55+51+50+45}{8} = 53.5\ dB$$

In dB(A), add 7dB

$\therefore$ 60.5dB Male + Female can use a normal voice at 0.3m.

(7) Find the level one must speak to be understood in the presence of a 50dB white noise background. What is the detectability level?

Use Figure 10.7

The ~~Chart~~ figure is a little ambiguous on its labeling.

If you use the tick mark to the left of 50dB you have about 32 dB for intelligibility and 18 dB for detectability.

If you use the tick mark to the right of 50dB you have about 40dB for Intelligibility and 28 dB for detectability. (Rachael uses the later as his solution)

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(8) At 500Hz a 40dB tone sounds equally loud as a 5000 Hz tone. What is the dB level of the 5000Hz tone?

Use the PHON plot (Figure 10.6)

40dB at 500 Hz corresponds to ~ 42 PHON.

Going to 5000 Hz, 42 PHON corresponds to 38 dB or 39 dB