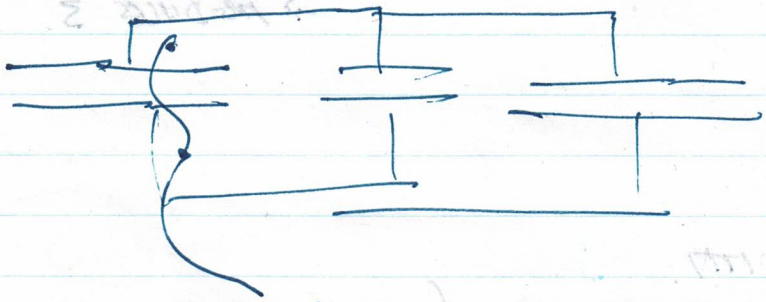
→ DOCUMENT (PROCESS). PAGE 1 OF C. MONDAY, FEBRUARY 3, 24 25.

→ NO CORRECT ANSWERS.



END CONDITIONS ARE IMPORTANT.

MODULE 2 - STARTING

ACOUSTIC ENCLOSURES
BIES CHAPTER 6 & 7 (INTERPOLATED).

1. OSHA ENFORCEMENT / REGULATION
2. NIOSH RESEARCH SCIENTIST
   → CDC

{ CANADIAN AGENCIES?
MATERIALS?
HANDOUTS.

85 dBA → "MAGIC" NUMBER/LEVEL
8 HOUR DAY.
W/ HEARING PROTECTION.

3 dBA EXCHANGE RATE.

SLIDE 3: PAGE 2 of 6.

→ FOCUS ON ENGINEERING CONTROLS.

VIBRATION ISOLATION.
→ MODULE 3.

SLIDE 7

ACOUSTIC RECIPROCITY.
INTERCHANGE SOURCE & RECEIVER
SAME RESULT
(LINEAR, DIFF. EQUATION)
↑ ACOUSTIC WAVE EQ.

SLIDE 8:

SLIDE 9:

SLIDE 10:

× now has boundary conditions as y & z.

n_x, n_y, n_z → mode numbers or orders;
CAN BE ZERO.

SLIDE 11:

MODE (ϕ, ϕ, ϕ) → ROOM PRESSURE INCREASES.
OVERALL

ORDER OF MODE FREQUENCIES DEPENDS ON MODE; NOT LOGICALLY SEQUENTIAL.

SLIDE 12:

WHITE REGIONS: NODE LINES
MODE GOES TO ZERO.

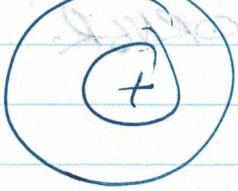
* (n_x, n_y, n_z) NUMBER OF TOTAL NODE LINES.

MODAL EXCITATION.

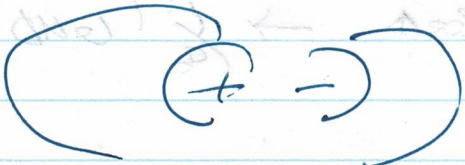
1. FREQUENCY MATCHING. (Q FACTOR). $= f/\Delta f_{-3dB}$.
2. SPATIAL MATCHING.

↓ SHAPE MATCHING

② MONOPOLES AT NODES DO NOT EXCITE THAT MODE.



MONOPOLE.



DIPOLE.

SOURCES.

MORE Q, MORE PEAK (SHARPER); LESS DAMPING.

CLOSE IN FREQ.

LOUD ON NODE LINES.

SLIDE 16

NODE LINES ARE IMPORTANT.

SLIDE 17

MODAL EXCITATION.

SLIDE 24.

SLIDE 25 ANIMATIONS.

"MODALLY DENSE"

PLANE WAVES
FACILITATES
DUCT TRANSFER
FUNCTIONS.

SLIDE 27

MODE LINES OR PLANES.

OR

MODES WITH N_x & N_y ODD, NOT EXCITED.

CENTER OF CEILING → 1/4 LOUD AS CORNER
CENTER OF ROOM → 1/8 LOUD AS CORNER.

CHECK.
1 HOUR MARK

SLIDE 28

(CORNER) LEFT - ALMOST RANDOM WAVE FRONTS

(CEILING) RIGHT - MORE MODE-LIKE BEHAVIOR

ANTI-NODE?

SLIDE 31

EIGENMODES SIMULATER.

APPLICATIONS?

1. SIMULATE KITCHEN CENTER

2. SOUND BOX.

HOMEWORK - SLIDE 32

LOWEST 10 RESONANT MODES.

DIFFERENT MODES ; NODE SEQUENTIAL.

OR ZERO ALWAYS ?