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21M.380 · MUSIC AND TECHNOLOGY
RECORDING TECHNIQUES & AUDIO PRODUCTION

SECOND QUIZ (QZ2)
EDITING, CABLES & PATCHBAYS, EQS, STEREO RECORD-
ING, DYNAMICS

MONDAY, OCTOBER 24, 2016
20 MINUTES, 5% OF TOTAL GRADE

1 Basic sound editing techniques

1.1 Sample rate and bit depth (12%)

Name two commonly used values for the following quantities in digital audio. List the numeric value (e.g., 32) on the left and the correct corresponding unit (e.g., Hz) on the right.

1. Bit rate:

- 192 kbits⁻¹
- 256 kbits⁻¹

2. Sample rate:

- 44100 Hz
- 96 kHz

3. Bit depth:

- 24 bit
- 16 bit

1.2 Audio file formats (9%)

Which form of data compression do the following digital audio file formats use?

1. A .ogg file using the *Vorbis* codec
 - Uncompressed
 - Lossless compression
 - Lossy compression
2. An .aiff file with *PCM*-encoded audio data
 - Uncompressed
 - Lossless compression
 - Lossy compression
3. An .m4a file using the *ALAC* codec
 - Uncompressed
 - Lossless compression
 - Lossy compression

2 Cables and patchbays

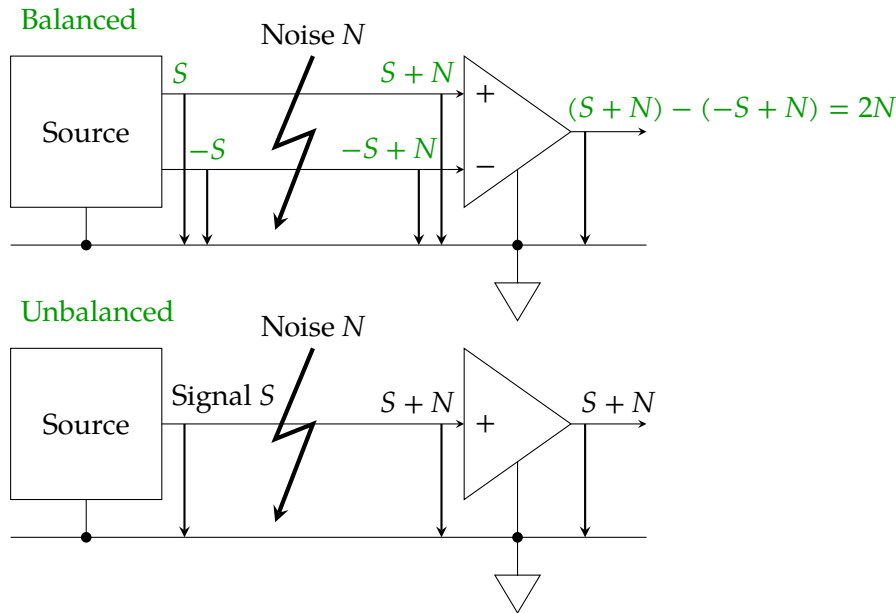
2.1 Connectors (7%)



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1. Which connector does the figure above show?
 - RCA
 - Ts
 - TRS
 - XLR
2. Could this connector carry a balanced mono signal?
 - Yes
 - No

2.2 Balanced lines (12%)



- Which half of the diagram shows the balanced connection?
 Top half Bottom half
- Label all five vertical arrows in the top half of the diagram (analogous to the bottom half), such that each indicates which signal the respective wire carries at that stage with respect to ground.

3 Filters and equalizers

3.1 EQ types (5%)

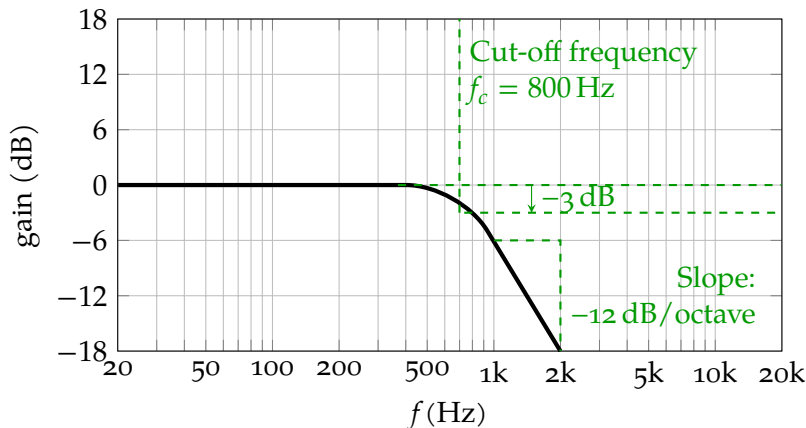


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Which kind of equalizer (EQ) does the above figure show?

- Parametric Graphic

3.2 Filter types and parameters (15%)



1. Which type of filter does the frequency response diagram above show?

Low-pass (or high-cut) filter

2. Quantify the filter's following parameters. Take note of the logarithmic x axis!

- Cut-off frequency: 800 Hz¹
- Slope: 12 dB/octave²

¹ Remember: How is the cut-off frequency defined?

² Remember that frequency doubles with each octave.

4 Stereo recording techniques

4.1 Which stereo recording technique? (10%)

1. Which of the four families of stereophonic recording techniques does the setup in the figure on the right belong to?

- Coincident
- Spaced
- Mixed
- Binaural

2. Since the microphones shown in the figure are both cardioids, which stereo recording technique does the figure show?

XY

3. Which stereo recording technique would the figure show if both microphones were figure-of-eights?

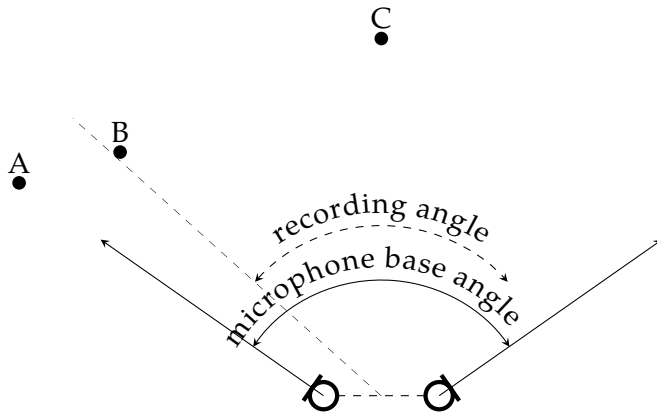
Blumlein pair



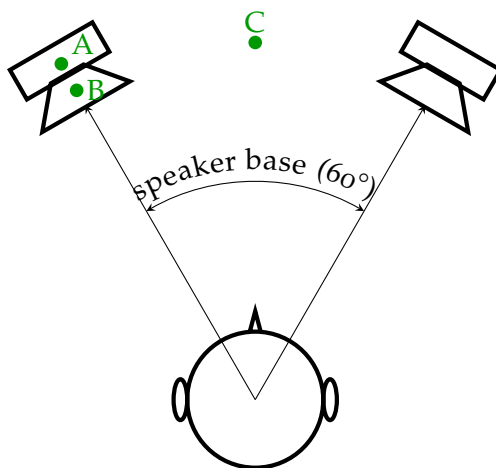
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4.2 Recording angle (10%)

Three sound sources A, B, and C are being recorded with an ORTF setup, whose visible microphone base angle and invisible recording angle are shown in the top figure below.

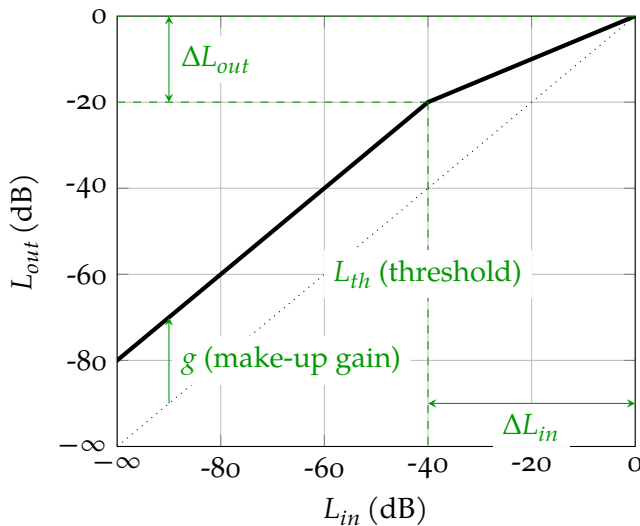


Which directions in the stereo image would you expect to hear these three sound sources from upon playback on a standard stereo loudspeaker setup? Mark the corresponding positions of all three phantom sources in the second figure below and identify each by name (A, B, C).



5 Dynamic range processing

5.1 Transfer function (20%)



1. Which dynamics processor does the above diagram show a transfer function of?

- Expander
- Limiter
- Compressor
- Gate

2. Quantify its following parameters (including the correct sign):

- Threshold: -40 dB
- Make-up gain: +20 dB

- Ratio: $R = \frac{\Delta L_{in}}{\Delta L_{out}} = \frac{40 \text{ dB}}{20 \text{ dB}} = \underline{2} : \underline{1}$

- Knee:
 - Soft
 - Hard

3. Clearly mark and label these quantities (or, if that's not possible, those quantities that they derive from) in the above diagram. Show in particular how you derived your answer for what the processor's *ratio* is.

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