Course: MSc in Environmental and Architectural Acoustics
Unit: Measurement and Behaviour of Sound
Subject: Filter characteristics.

Aim

- To investigate A, B, C, D frequency weightings.
- To investigate band pass filters
- To obtain experience in using swept sine waves signals and/ or random noise signals to measure frequency response.

Instrumentation

1. Random noise generator on SF04 or B&K 1402)
2. Sine wave signal generator (B&K 1024) swept sine
3. Frequency analyser (B&K 2112/3). For Part B only B&K 2131 digital filter analyser
4. Level recorder
5. Oscilloscope- optional
6. Frequency counter- optional

PART A: Measurement of frequency weighting using swept sine method

Swept sine generator generates sinusoidal signal of slowly varying frequency and constant amplitude. B&K 2112/3 frequency analysers have a built in A, B, C, D filter set. By feeding swept sine in to one of these analysers and plotting results one can effectively measure characteristics of A, B, C, D weighting networks.

The 1st aim is to measure these characteristics and compare them with the ideal ones.
The 2nd aim is to measure characteristics of 1.3 octave filters. The principle of these is the same as of A, B, C, D weightings but 1/3 octave filters reject most of the frequencies except comparatively narrow frequency range.

Procedure

1. Calibrate the frequency scale setting of the sine generator.
2. Connect output of the signal generator to direct input of B&K 2112/3 frequency analyser.
3. Set B&K 2112 as follows: Input o, Direct, r.m.s. slow, automatic off, meter range 120 multiplier 1=0 dB, function to 1/3 octave
   Or,

Set B&K 2113 as follows: Left hand dial to calib., top right to RMS SLOW, Push following buttons: "IN"- direct input – internal filter- range 1- ON. All other should be out.

Set input/output potentiometers so that indicator light is under 120 dB on 2113 or for 2112 set the meter range and multiplier to 120 dB.

4. Turn sine wave signal generator on; adjust output voltage control so that meter reads 2v on the 0-12 volt scale on the generator 1024
5. Set large dial on the 2112/3 to lin (linear frequency weighting)
6. Set the frequency on the BFO to the ref. Mark and switch to scanning on. Now manually move the level recorder pen so that it is in line with thew vertical scale line that is just to the left on the log graph paper. To start thew sweep press and hold down the button for 5 seconds ort twist it to the right.
7. Turn filter selection to A, B, C, D (2113 only) in turn and repeat 7).