Muting the noise - Responding to environmental noise

Hanan Ivry

Ariel University

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Intoduction

recent years, there has been a population increase, and with it, an increased density in our environment. The massive building in residential areas, various technologies which have become more available for individual use (cars, varied music players, TV sets). In this article, we will try to introduce a number of functions that eliminate noise.

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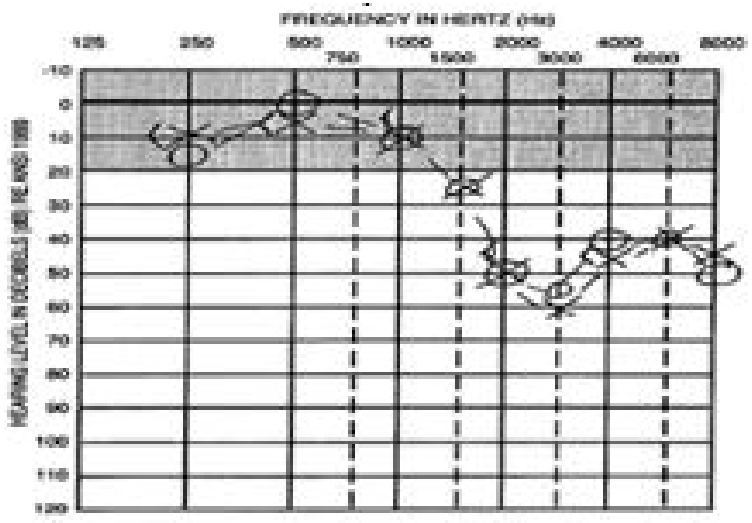
here are several ways of avoiding noise:

- Legal - setting specific hours of noise-making.
- Human - ear-plugs, distancing from noisy planned events (like parties).
- Mechanical - Sealing the source of the noise, creating a double window, thickening walls, etc.

Today the answer is individual and even depends on the environment. A more general and easily applied response is required. Strong level of noise (60 dB and above) may lead to a series of hazards. According to the Environmental Protection Ministry, in addition to hearing loss(A), temporary or permanent CheckNoise, noise may raise blood pressure and interfere with the heart rate (B). In addition to the physical injuries there is also the risk of emotional impairment, fear, and poor concentration. Therefore, there is an increased desire to prevent noise with the help of technological active elimination of noise , that is, producing a signal "anti-noise" which will cancel the disturbing noise.

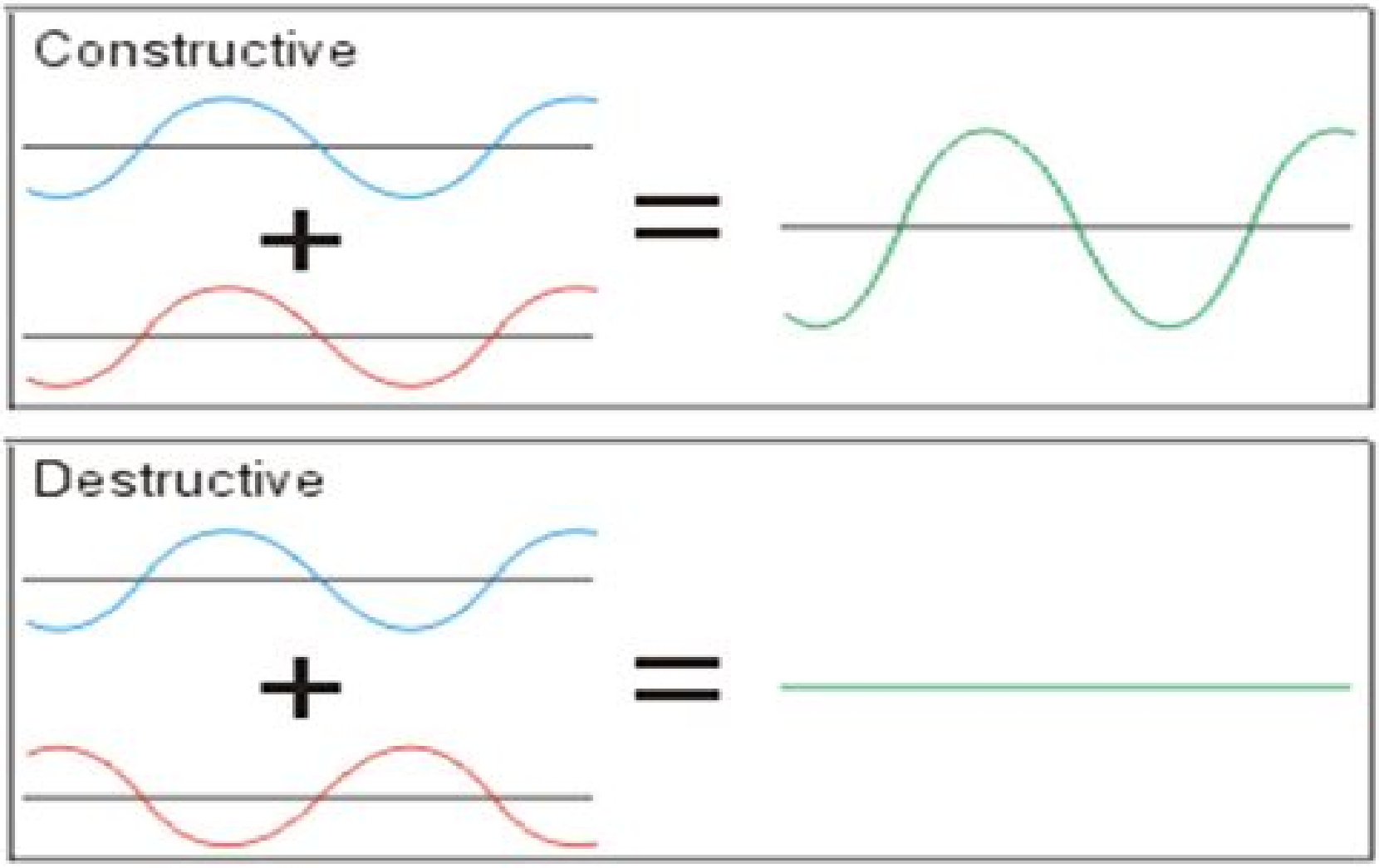
(A)


FREQUENCY IN HERTZ (Hz)
125
250
500
750
1000
1500
2000
3000
4000
6000
8000
-10
0
10
20
30
40
50
60
70
80
90
100
110
120

(B)

In order to produce the effect of cancellation, we may use as a base the physical phenomenon known as diffraction (Interference): a meeting of several waves (sound waves in our case) that creates a new template wave. The system will transmit waves at the same frequency and amplitude but in an opposite phase, thereby significantly canceling most of the noise. To eliminate the noise completely, the system should send the sound wave to cancel the noise, at the appropriate frequency and at the same time as the noisy sound wave. The effect can be realized in two ways:

- To include the technology by the manufacturer, which requires the development of a specific device which has specific characteristics.
- Quiet area / quiet space by the client, regardless of the source of noise in the workplace, making it suitable for everyone. Therefore the device must be able to recognize the movement of the noise, the pace and the frequency, and hence the device will know how to adapt itself to the variable source (C).



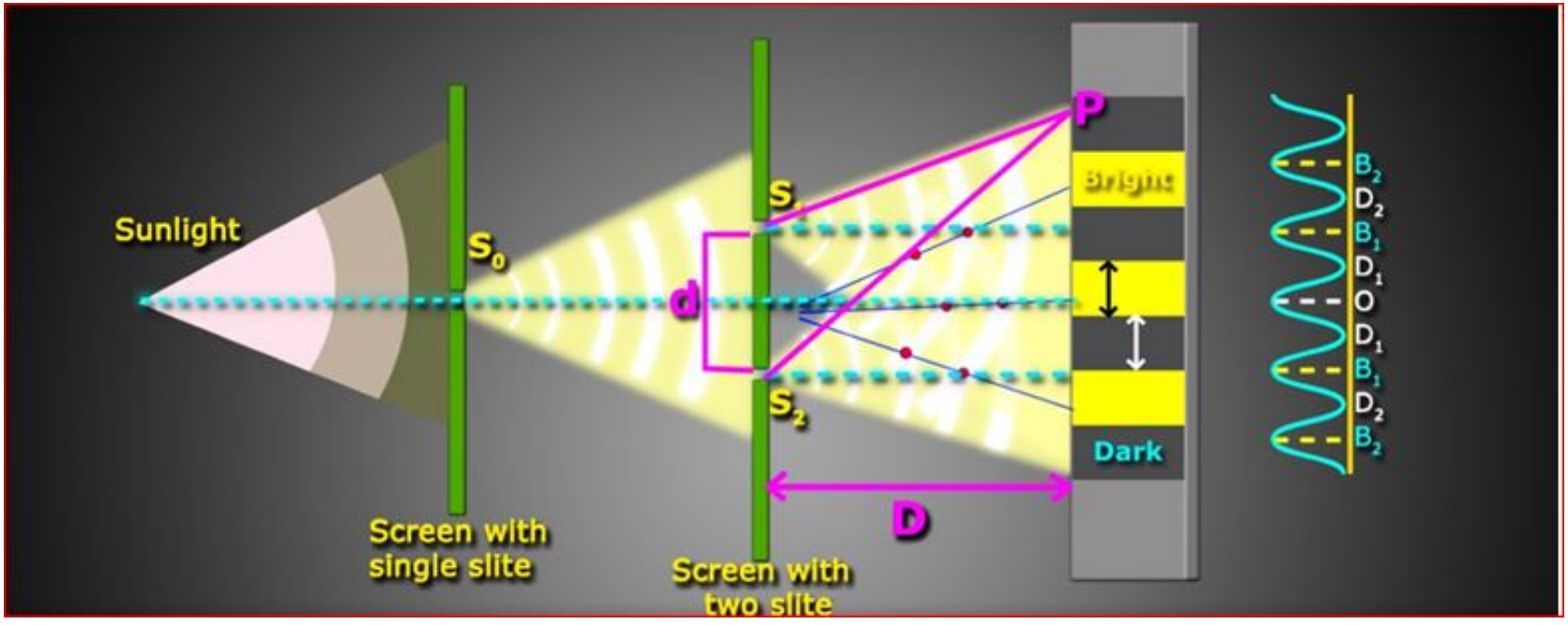
(C)

The first test of interference was made by Thomas Young in 1801, to determine whether light is a wave or a particle. In the experiment, the light wave behavior demonstrated - Interference (up until the Franck-Hertz experiment in the 1913 article on the photoelectric effect of Einstein's general assumption was that light is a wave). Course of the experiment:

- Source emits Fotonim-light waves(or other waves or particles at a rate that the experimenter can determine).
- A system of waves which is sensitive to the impact of photon / electron and records how many photon / electrons hit any point on the screen. In the case of light, one may use a simple screen. Visually, as a point on the screen is brighter, more particles have hit it.
- A partition with two fine cracks, each of which can open and close independently.

The result of the experiment (D):

- When opening a crack in one of the accepted pattern centered on the screen is clearest in front of the crack opened, and the brightness decreases as you move away from that point.
- When they opened the two-slits, the diffraction pattern received - light and dark stripes alternating along the length of the screen.
- These results fit the theory that light was a wave phenomenon.


Sunlight
S_0
Screen with single slite
S
d
S_2
Screen with two slite
D
P
Bright
Dark
B_2
D_2
B_1
D_1
O
D_1
B_1
D_2
B_2

(D)

We will try to throw the experiment of Thomas Young on sound waves. Also, consider a specific case and we will see if moving away and coming closer to the object we are changing the intensity and type of noise (the Doppler effect), I mean, is required to create a different calculation than the noise coming your sound has pulled away (like Sirina ambulance).We will try to apply the experiment of Thomas Young on sound waves as well. Also, consider a specific case and we will see if moving away and coming closer to the object change the intensity and type of noise (the Doppler effect). That is to say, is it required to create a different calculation than the noise approaching you, as opposed to noise distancing itself from you (like an ambulance siren).