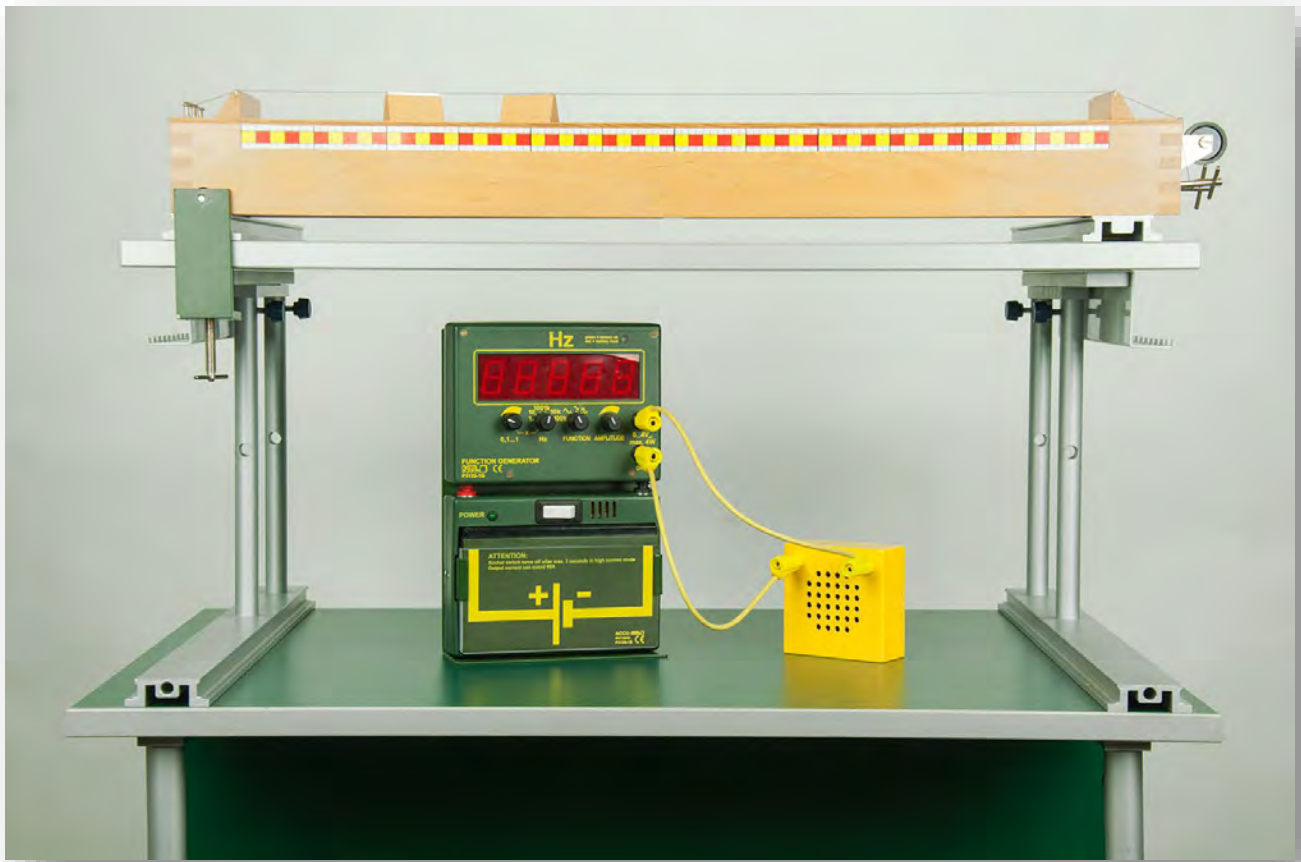


OVERTONES DETERMINE THE TIMBRE

AKD 03.05



Material:

Item Code	Qty	Description
DW250-1M	1	Monochord
DS500-1G	1	Screw clamp, jaw width approx. 50 mm
P3120-1G	1	Function generator with digital display "inno"
MB240-1LS	1	MBC Loudspeaker with nose
P3120-1B	1	Rechargeable battery, "inno", 6V/10 Ah
DW260-2S	1	String, e'
DW260-3S	1	String, g'

OVERTONES DETERMINE THE TIMBRE

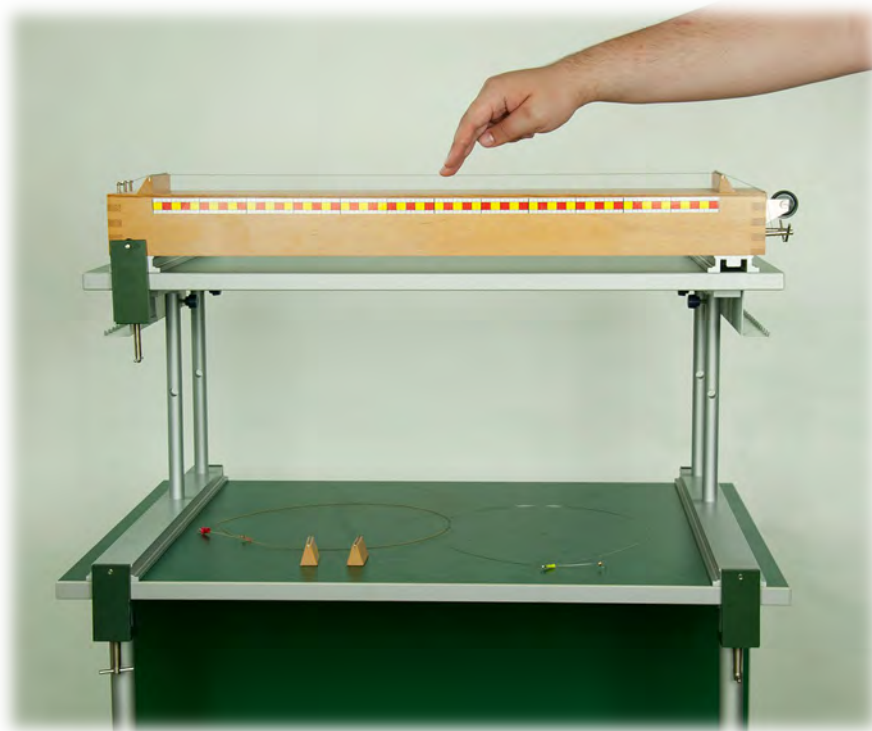
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Setup:

The monochord is placed at the edge of the table and fixed with the screw clamp. A guitar string is stretched over the bridges with a table clamp. The monochord is tuned to $c_1 = 261$ Hz. For this purpose, the function generator is connected to the loudspeaker and a battery. On the switched on function generator the frequency is adjusted. The amplitude changes the volume here.

Experiment 1:

The string is picked powerfully and shortly afterwards damped exactly in the middle by briefly tapping it with the finger.



Result:

A subtle tone, an octave higher, becomes audible - the 1st overtone

Experiment 2:

Same process, but damped at one third of the string length. The 2nd overtone becomes audible. At a quarter of the string length, the 3rd overtone becomes audible, etc..

Note:

Harmonics are integer multiples of the fundamental and make up the timbre of an instrument. The oscilloscope can be used to visualize the vibration patterns of various instruments.