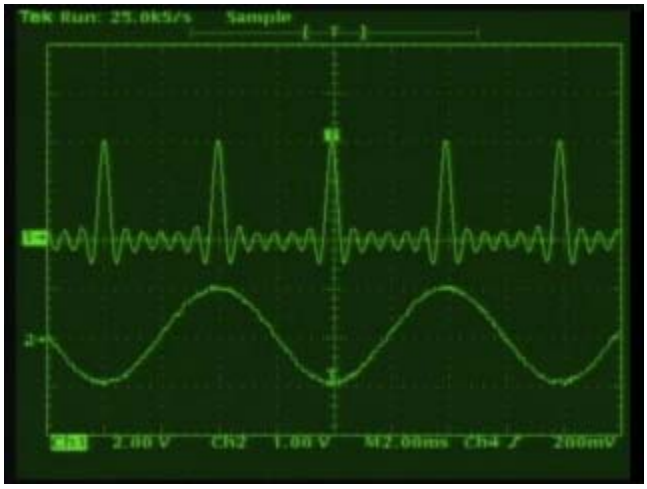
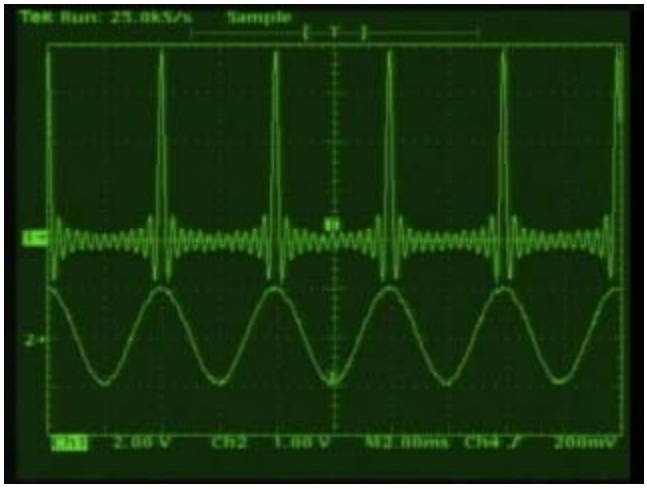
Answer #341

The answer is (a): the sound will go up one octave but remain the same timbre, as can be seen by clicking your mouse on the photograph below.



Note that if all of the *odd* harmonics are removed, the remaining harmonics are 2, 4, 6, 8, etc; this is just the same overtones as a note whose fundamental frequency is twice that of the original note, including all harmonics with the same amplitudes and the same phase relationship.

Thus the new wave is the same shape (timbre) as the original one but has twice the frequency, which makes it an octave higher. The photograph below shows the new wave synthesized using the Fourier synthesizer with its fundamental an octave higher than that of the original wave. Click on the photograph to hear its tone compared with the original one.



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For questions and comments regarding the *Question of the Week* contact Dr. Richard E. Berg by e-mail or using phone number or regular mail address given on the Lecture-Demonstration Home Page.