

## TAP 311- 8: Multimedia Sound: combining sounds

Here click means single-click with the left mouse button, and double-click means click the left mouse button twice in quick succession.

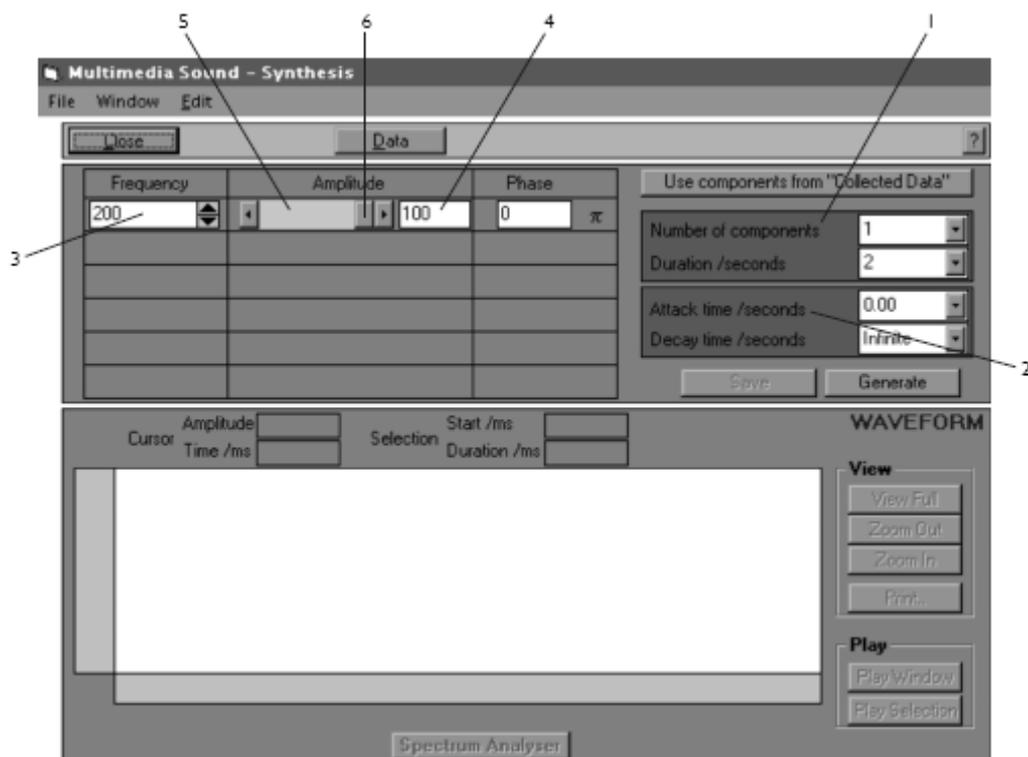
### Apparatus

A computer or system running Multimedia Sound

### Combining waveforms

- Load Multimedia Sound and click on the Synthesise Sound button.

The screen shown below will appear.



### Setting the characteristics

The boxes near the top right of the screen allow you to set the 'Number of components', the 'Duration' (the time for which the synthesised sound will last), the 'Attack time' (time for the sound to build up to maximum loudness), and the 'Decay time' (time for the sound to die away).

- Click on the down-pointing arrow next to the 'Number of components' box (labelled 1 above).
- In the drop-down list that appears, select the number of separate sounds you wish to synthesise. You can have a maximum of six.

The procedure for setting the 'Duration', 'Attack' and 'Decay' times in (2) is identical, once you have clicked on the appropriate box.

If you wish, you can delete the values in these boxes and type in your own from the keyboard.

- Click, or if necessary double-click, within the box until the contents of the box are highlighted in blue.
- Press 'Delete' or 'Backspace' on the keyboard to delete whatever is in the box.
- Type in your own value.

### **Setting the amplitudes, frequencies and phases**

To set the frequencies of the components:

- Delete the number in the 'Frequency' box (3) and type in your own.

You can also alter frequencies by clicking, or clicking and holding, on the arrows at the side of the 'Frequency' box.

Amplitudes are measured on a scale of 0 to 100 (4).

To set the amplitude of a component,

either

- type your own value in the 'Amplitude' box (5)

or

- click on the slider within the scroll bar (6) and keep the mouse button held down as you drag left or right.

Multimedia Sound uses radians to measure phase. Whatever number you type in to the 'Phase' box will be multiplied by  $\pi$  to get the phase in radians relative to other components. For example, if you want a phase difference of half a cycle, which is  $\pi$  radians, just type '1' into the box.

### **Combining the components**

- Click on the Generate button.

The combined sound will be created and played through once and its waveform will appear in the main waveform window.

- Click on 'Play Window' to play the whole sound again, or select just a part and click on 'Play Selection'.

### **Synthesising a sound using data from a spectrum analysis**

If you have performed a spectrum analysis on a sound and recorded the frequency and amplitude of up to six of its components in a table, you can recombine these components automatically.

Click on the 'Synthesise Sound' button to bring up the screen shown above.

- Click on the Use components from 'Collected Data' button.

This will put the frequencies and relative amplitudes of your first six components into the data rows and all you need to do now is to select duration, attack and decay times as described above, and click on 'Generate'.

- Click on 'Close' to get back to the main screen.

**External reference**

This activity is taken from Salters Horners Advanced Physics; section TSOM,  
additional sheet 5