signal and fade the other into the background – not always possible. However, we can assemble sounds that are in harmony, e.g. when the sounds form different instruments of a symphony orchestra arrive at a selected ear and the brain assembles the total sound.

Music to our Ears

3.17 Mobile phones and loud music in cars are a significant distraction. It is not just a matter of occupying hands or having a loud noise, the sound demands attention from the brain and the brain cannot be doing other processes.

When we are listening we are not seeing!

3.18 Also, high ambient sound levels reduce the level of detection of other signals – like the gain control in a radio or TV. We are rendered less sensitive to important audio cues.

3.19 Have you noticed how often you detect a car or motorcycle about to pass you from the change in sound rather than any visual cue. If the sound cue is masked then the passing vehicle is only detected when it enters the peripheral visual field. Surprise, surprise. Audio cues are equally important to a pilot. In early aircraft the pilot was exposed to the elements so that he could listen to the sound of the flying wires. Unfortunately we have lost these cues in many modern aircraft. Having said that, sound is still an important cue to power settings, braking, reverse thrust and take-off acceleration and speed.

Peripheral Hearing

3.20 We can hear something approaching from the rear, long before we can see it in out peripheral vision. We can see about 100 degrees from centre. We can hear something directly behind. Thus in our rear sector hearing is more important even than sight.

What Is Sound?

3.21 Sound is a pressure wave, and each sound is described by its:

- ***Frequency or pitch:*** the number of pressure waves per second (or hertz, Hz) that the sound source produces. Perfect human hearing is in the range of 20 Hz to 20,000 Hz, and voices use the frequency range 500 Hz to 3,000 Hz.
- ***Loudness or intensity:*** the strength or amplitude of the pressure waves, measured in decibels (dB), a logarithmic scale where an increase of 20 dB signifies an increase in intensity of 10 times (20 dB is 10 times as loud as 0 dB, which is the threshold of hearing; 40 dB is 10 times louder again, i.e. 100 times as loud as 0 dB; 60 dB is 1,000 times as loud as 0 dB and 100 times as loud as 20 dB; an increase from 80 dB to 100 dB is an increase in loudness by a factor of 10).
- ***Duration:*** how long the sound lasts.

The Speed of Sound

3.22 The speed of sound varies according to the medium through which it is travelling. The speed of sound in air varies with temperature but, at sea level, in ISA, it is specified as 340.3 metres per second or 661 knots (KTAS).