

## International Telecommunications Union H.870 Guidelines for Safe Listening Devices and Systems (08/2018) Recommends HearAngel approach to safeguard headphone users

The United Nation's (UN) World Health Organisation (WHO) identified three specific objectives in their "Make Listening Safe" initiative of 2015:

- 1) Regulate exposure to loud sounds through personal audio systems.
- 2) Change listening behaviours among the target population.
- 3) Limit sound exposure in recreational settings.

The International Telecommunications Union (ITU, UN special agency for ICT) is collaborating with WHO in this initiative and have recently published a set of recommendations (which are common to both ITU and WHO) for safe listening practice. Reference: **ITU-T H870 201808**

**HearAngel (HA)** is an app and an embedded feature in wireless headphones which meets the most important requirements of these recommendations as described below; it is being developed to cover all of them and more.

**Personal music players** of various kinds fall within the scope of the recommendations; these include mobile phone handsets. HA has focussed on the handset as the key platform for managing the user interaction with safe-hearing functionality. HA can operate either with a variety of headphones connected to the handset (wired or wireless), or can act as a hub to HA-functionality embedded in wireless headphones. In either case, information is provided to the user and suitable controls for safe hearing practice are made available. [Reference 3.1.14]

**All media is to be monitored** to ensure hearing protection, although voice calls are specifically excluded [7.1] and gaming has not yet been included being the subject of further research. HA has specifically included all media content other than voice as an Android app; iOS does not facilitate such widespread access and therefore HA is not currently available as an app for iOS. The embedded HA will operate seamlessly with both iOS and Android platforms.

**Protection for children** is ensured with lower thresholds than for adults, and 2 modes of operating are recommended. Adults (Mode 1) have a sound allowance of 40 hours at an average 80dBA in any 7-day period. Children (Mode 2) have a sound allowance of 40 hours at an average 75dBA in any 7-day period. Mode selection is recommended. HA features a Parental mode where adults determine limits of sound allowance, maximum levels and listening period per day. Note: HA is currently based on a 24 hour day as the most important monitoring and control reference, whilst the recommendations have moved to the week; HA shows all activity of the past 7-days and will include the week-based scheme as an option.

**Personal usage information** is believed to be a significant means to change behaviour. Such information includes average sound level over day or week, listening time over day or week, amount of sound allowance used in past week, and safe listening time left [11.2.1.1]. HA provides details of recent usage through its "radar" display as well as the other statistics. This currently is based on the 24 hour day. The "radar" gives a green/amber/red indication of levels of risk at the present operating level, helping the user to control their practice.

**Required response** on reaching the week's safe listening sound allowance is specified, giving the user options to accept the risk or take sensible action [11.2.1.2].

The options are:

- Automatic safe hearing level
- Direct access to volume setting for manual reduction
- Set volume limits.
- Remind later
- Ignore and continue

If no action is taken, volume is automatically reduced to the appropriate safe level (80dB or 75dB).

Additional hearing dose threshold transitions shall be messaged.

Messages should be multimodal where possible (visual, audible and vibratory).

HA app currently has options for automatic volume reduction at the prescribed limit, and always allows access to the volume controls. Under development is an anticipatory automated level control that allows short-term high levels but regulates to ensure long-term safe hearing. A future version of HA will include any residual requirements.