



TSUNADO
alert inform save

White Paper

Waking a Sleeper

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Introduction

IAD Technologies Ltd (aka DIWA) has developed a system for nationwide Public Alerting based on Broadcast Radio technologies.

Tsunado Alert Radios are devices intended for placement in homes, to alert the householders when a disaster is imminent. The alert is similar to a smoke alarm, however research was done to find an optimum alert sound that was unique and effective. The basis of this research is outlined in this White paper.



Executive Summary

1 Waking a Sleeper

Disasters can occur at any time of the day or night. In defining the function of the TSUNADO Alert Radios, the designers considered the nature of the sound required to wake even a deep sleeper during the night.

2 Learning from Smoke Alarms

Smoke alarms are almost universal in homes around New Zealand. The sound they make appears to be effective as there are few if any deaths from fire or smoke inhalation where they are fitted and operative.

3 Research to Change the Paradigm

In the course of development of the TSUNADO Alert Radios it was found that latest research indicated that there were more effective sounds to waken a deep sleeper.

The New Research

Who

Research funded by the Australian Fire Protection Research Foundation, and conducted by Dorothy Bruck and Ian Thomas of Victoria University in Melbourne, looked at the effectiveness of current smoke alarm signals, and what if any changes would make them more effective.

Their research paper can be found here:

<http://strategicfire.org/wp-content/uploads/2015/04/bruck-article.pdf>

What they found

“A summary of the evidence concerning the best and worst signal shows that the 520 Hz square wave signal is at least 4 to 12 times more effective than the current high pitched signal in the populations tested.

Research supporting lower frequency signals and mixed frequency signals as being the best alarms for people when awake is also discussed. It is argued that the 520 Hz square wave signal, which has been tested now in six different experimental studies, has a sufficient evidence base to warrant the recommendation for its widespread introduction as a new smoke alarm signal for the whole population.”

What we did

While trialling the first version of the TSUNADO Alert Radio, we became aware of the need to distinguish ourselves from smoke alarms, so as not to confuse householders as to what was happening.

We also had two of the triallists who did not wake during the night-time test.

This led to an investigation of alternate sounds, and based on the results of this research, we developed our own unique sound that is comprised of a square wave signal at alternating frequencies of 520Hz and 2200Hz.

In subsequent trials we had a 100% success rate for the test to wake persons from a deep sleep.