

PUBLIC EXPOSURE TO VERY HIGH FREQUENCY SOUND AND ULTRASOUND: DO WE KNOW THE RISKS?

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1 ABSTRACT

Literature has linked very high and ultrasonic frequency sound in air to tinnitus and other "subjective" effects, including headache and nausea, for over 40 years. Very little attention has been paid to the subject in the last 30 years, however the use of these frequencies is rapidly becoming more common, and increasing numbers of adults and children are exposed to these frequencies daily, often without their knowledge. Scientific study is emerging in the health effects of prolonged exposure to these frequencies, and the safety legislation that should surround them. National and international research currently being carried out to investigate the hearing abilities of different groups, and the potential impact of exposure, is described. Safety guidelines, especially for those with more sensitive hearing such as babies, children and those with hyperacusis, and also some people prone to migraine, are of particular importance.

This paper considers some of the equipment in regular daily use in the home and the workplace that produce constant tones at VHF / US frequencies. It summarises the current legislative position in the UK for very high and ultrasonic frequencies, looks at current work in safety around these frequencies of sound and looks at some of the major questions on the impact of these frequencies on the general public, and sensitive individuals in particular.

This paper details preliminary investigations into claims that data projectors found in school classrooms can inadvertently produce very high frequency tones and finds no evidence of this from the very limited sample tested. Measurements of very high frequency sound taken using a variety of measurement systems have revealed discrepancies in measured sound pressure level, which also varies significantly with angle to the source.

2 INTRODUCTION

Public exposure to ultrasonic (US) sound, usually defined as sound with a frequency above 20 kHz, and very high frequency (VHF) sound, generally taken to cover the 10-20 kHz range, has increased dramatically in recent years. Research conducted over the past 40 years has linked exposure to sound in the VHF / US range to various subjective health effects including annoyance, tinnitus, persistent headaches, fatigue, nausea, dizziness and migraine. Existing guidelines for exposure to VHF / US sound are inadequate for modern patterns of exposure and measurement methods are not standardised. This paper summarises past research into the subject and by investigating claims that VHF tones are inadvertently produced by equipment commonly used in schools, seeks to draw attention to some of the problems inherent in measuring VHF / US sound.