

## Add Salt to Taste

### Dear Editor,

Having installed an ion exchange domestic water softener about three years ago for my 4-bedroomed house and finding the rising cost of the bags of salt unwelcome, I installed one of the electronic gadgets four months ago, so I can now make some practical comment. Basically, the bulky ion exchange container requires £50 of salt per annum and has to be topped up weekly. Installation and maintenance costs are very high in comparison with the relatively cheap electronic type which is quickly fixed in position on the water supply pipe. I found that the conventional type requiring salt, exchanged the calcium salts for sodium, which in the family's opinion, made the water not so acceptable for drinking. It did remove scale from the system which was a real problem before, so the bath water felt really soft, using less soap and no scum. The 'computerised' electronic package which it replaced consisted of a small box with a mains input, which was reported to produce a signal "consisting of a modulated waveform within a calculated frequency bandwidth, with frequencies consisting of some 160 computer-calculated changes within a four-minute timeframe. The 2 to 4 micron crystals produced become repellent and will not coagulate or precipitate and form scale in the same way as untreated calcium carbonate would". In practice, there is a fine white powdery deposit in the electric kettle used for making the tea, which does not build up as the scale did. The old limescale is also being gradually removed over some weeks. The bath water does not feel as soft as before and there is some scum. On balance, the new gadgetry is preferred as the extra 'softness' with the old system was not considered to be worth the extra costs and trouble

of regular maintenance. I would support Mr Sawyer's request for more information on the practical circuitry involved and how the electronics operate. One other related topic engrosses me at the moment. I purchased two electronic woodworm repellers which emit ultrasonic sound waves at around 24kHz. Are they effective and do they work? Being ultrasonic, we cannot hear them operating. But wait, I found a way. By connecting up the pair close together, at first, nothing happened. Then, after about a week, I heard a high-pitched noise coming from them – obviously a beat frequency. This varied and disappeared, only to return a few days later. So, the circuitry used must produce a waveform that varies over time. As for the water softening gadget, could someone be found who could prepare an article for the magazine on the related circuitry and how ultrasonic frequencies may be measured or charted?

John Aston, Dorchester, Dorset.

**Ultrasonic devices claimed to scare off cats and dogs have been around now for several years, but we weren't aware of the woodworm repellers until now! An alternative method of 'listening in' on ultrasonic sound emitters is to place a sheet of polystyrene packing foam nearby the sound source; the (constructive) interference of the sound waves within the foam causes an audible frequency to be heard in many cases. A way of measuring the frequency of ultrasound is to connect an ultrasonic receiver transducer (e.g. HY12N) to the input of either a digital frequency meter (DFM) or an oscilloscope. Simply read off the frequency on the DFM display or calculate it from the 'scope trace, using the equation: Frequency = 1/Period (time for one complete cycle). A pre-amplifier may be required to boost the signal from the transducer, depending on how sensitive the measuring equipment's 'front end' is. See this month's Star Letter for a DIY electronic water de-scaler circuit.**

