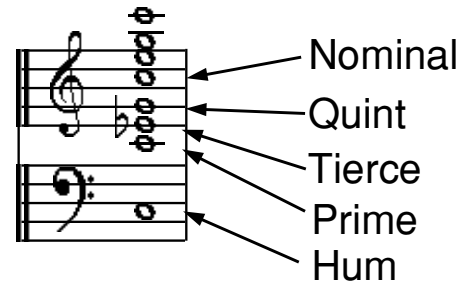


# Retuning All Saints bells

A bell vibrates in many different ways at once, and the sound contains many 'partial frequencies' (not harmonics). The shape and thickness of bells by trial and error over centuries to produce an acceptable sound but the result can be unpredictable – a bell might not quite have the intended note, and the partials might give a poor tone.

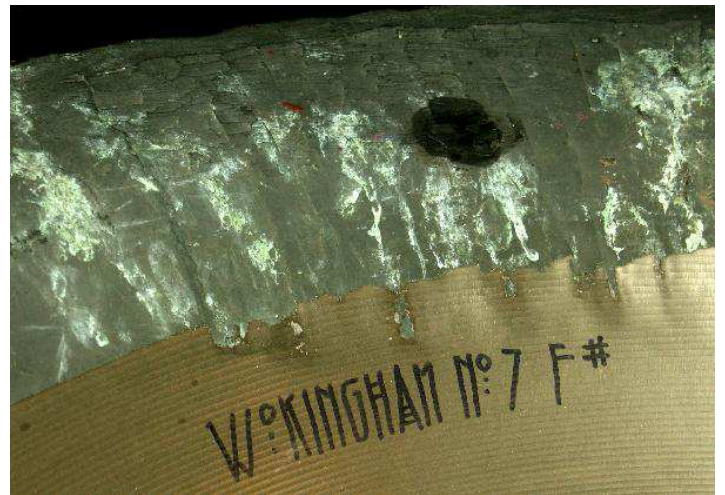


*Five key partials tuned by founders (for a bell in C)*

Early founders could alter the note a little by chipping bits off the edge. Modern founders use a tuning lathe to remove metal from different parts of the bell until the partials are properly aligned.

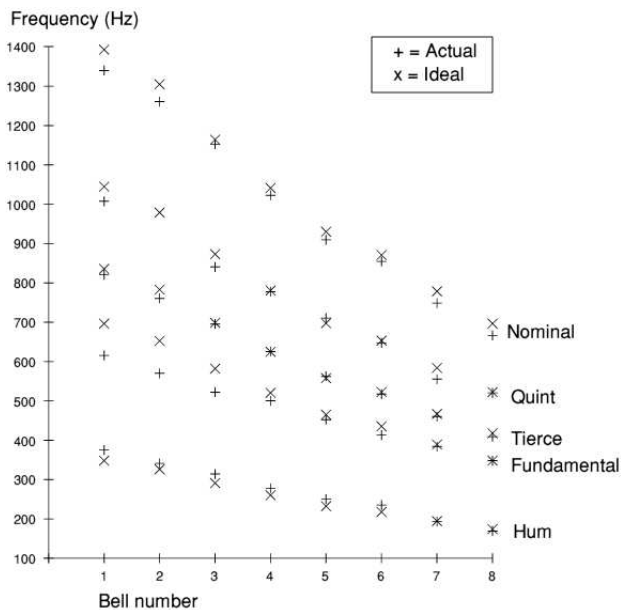


*Tuning by selective metal removal*

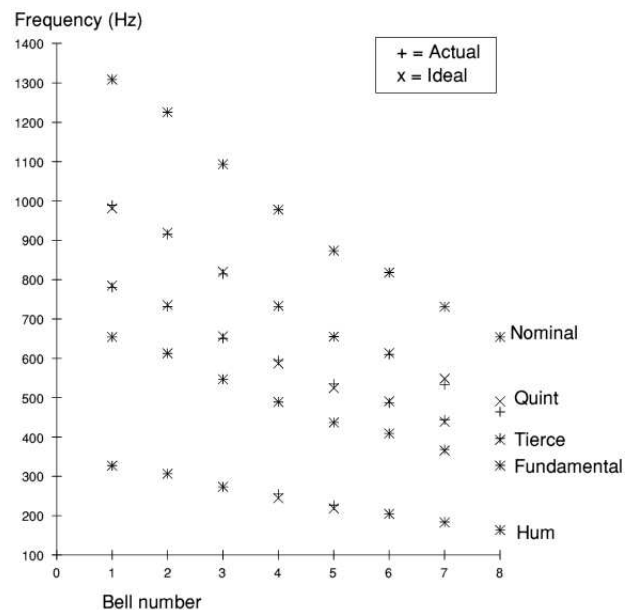


*Old chip tuning and modern tuning*

Before the 2004 restoration All Saints bells were not fully in tune with themselves or each other. Bells 1, 2, 3, 6 were replaced and all were tuned.



*Old bell frequencies*



*Frequencies after tuning*