# Preface to First Edition, May 2010

Some six years since I wrote the above, I still have not completed the intended project and so I have 'upgraded' this work to a 'published' edition. It remains unaltered from the original PhD thesis apart from the addition, below, of a corrigenda.

I still have plans to publish the additional material mentioned above. During the last six years, I have pursued some interesting and highly-relevant research topics during my employment as a research project manager in the research and consultancy division of the UK's Mines Rescue Service. This material is overdue for publication too.

*David Gibson, May 2010*

The remainder of this volume is a close copy of the text of my submitted PhD thesis.

# Corrigenda

| Page | Location | Correction |
|---|---|---|
| 35 | Caption to Figure 2-6 | For "a vacuum" read "a conducting medium" |
| 41 | Figure 2-9 | There are a number of confusing aspects to this figure and the associated text.<br>In the penultimate line on p40, replace "–3dB cutoff frequency" by "–3dB cutoff bandwidth".<br>In Figure 2-9, the x-axis should be labelled "T: normalised depth". This is related (indirectly) to frequency by $T = r / \delta$.<br>In Table 2-5, "–3dB b/w at" is better phrased as "–3dB b/w is".<br>The Q-factors shown in Table 2-9 have been calculated as $T / T_c$ but should, more accurately, have been calculated as $(T / T_c)^2$, and should therefore be 1.0 and 1.3 (to one decimal place). |
| 69 | After equation 3-20 | For "bandwidth is proportional" read "bandwidth is inversely proportional" |
| 72 | §3.4.1.2 | For "2.6 m" read "1.6 m" |
| 74 | After equation 3-40 | At the start of the second line, the text "0.001% so $R_e$, in this example, is" should be deleted |
| 94 | §4.4.2.2 | For "utilisation of the copper" read "utilisation of the ferrite" |
| 126 | After equation 5-17 | Note that, with a class D driver, the term ¼ $g\pi$ should be replaced by 1 (although this does not allow for the power in the harmonics) |
| 126 | After equation 5-18 | Note that, by substituting for $\Phi$, we can arrive at $m_d = \frac{r}{\omega K_Q N} \cdot \frac{U_p}{\sqrt{12}}$ |
| 259 | In §A7.3.2.1 | After "as shown in" insert "Figure A7-8" |
| 264 | line 1 | Replace "C1 + C2" by "C1 \\ C2" |
| | line 6 | Replace "R3/1R1" by "R4/R1" |
| | line 7 | replace "value give" with "value given" |
| | §7.3.2.2, line 4 | the minus sign belongs on the next line, i.e. "-72dB" |