Antenna Engineering Handbook, edited by John L. Volakis, New York, The McGraw-Hill Companies, 2007, 1800 pages.
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Chapter 14, "Horn Antennas," by Trevor S. Bird and Allan W. Love.

Summary
The three previous editions of the 'Antenna Engineering Handbook', the first edited by Henry Jasik in 1961, have proved an important design aid for several generations of engineers concerned with the design of antennas for all applications. The most recent edition, the fourth edited by John L. Volakis, is proving equally as popular. In all previous editions there has been a chapter devoted to electromagnetic horn antennas. In the fourth edition, the chapter on horn antennas is co-authored by Trevor Bird of CSIRO and Allan Love, who was author of a related chapter in the third edition.

The chapter in the fourth edition (Chapter 14) has been brought up to date and some additional and new topics have been included. The first section summarizes the most common type of horns and their uses. Their basic characteristics such as gain, phase center and polarization are defined and the effect of the horn flare on performance is described. The basic types of horns are then considered in turn, namely rectangular, pyramidal and circular conical horns. As well, other types of rectangular and cylindrical horns are covered such as dielectric-loaded, stepped, profiled and corrugated varieties. A new approach is given for the design of optimum gain pyramidal horns. Recent design approaches to multi-mode and profiled circular corrugated horns are detailed. Other horn geometries are discussed in the final section. These horn geometries include elliptical, ridged, lens corrected horns and horns with a protruding center conductor that are used as self-supporting feeds for reflectors.

Review
F.B. Gross, R.K. Arora, C.-C. Chen, C.D. Crews, I.J. Gupta, L.C. Kempel and E.E. Mack, "Review of Antenna Engineering Handbook" 4th Edition, IEEE Antennas & Propagation Magazine Vol. 50, No. 3, June 2008, pp. 119-126.
"Bird and Love first summarize the various types of horns, including the rectangular pyramidal family, horns with circular geometries, and elliptical and super-elliptical shapes. They specify a few typical applications for each type of horn. They then discuss the important characteristics of horns, including their bandwidth properties, radiation patterns, gain and efficiency, phase center, polarization, input match, fabrication, and cost. Bird and Love then present sections on rectangular horns, circular horns, corrugated horns, and then a few remaining miscellaneous horn structures. In each of these four sections, they present several types of horns within these families, and discuss their various characteristics."

Errata
Page 14-18, unnumbered equations at the top of page should be

$$\theta_{ebw} \approx 60 \arcsin(0.45\lambda/b) \text{ degrees;} \qquad \text{E-plane}$$

$$\theta_{hbw} \approx 60 \arcsin\left(0.63\lambda/a\right) \text{ degrees,} \qquad \text{H-plane}$$

Equation (14-26), second term should be

$$\ldots - \frac{\left(b_w c_o - \frac{a_w^3}{8}\right)}{4A_1} \ldots$$

Page 14-18 , under equation 14-26, at the end of item 1, below 'For a pyramidal horn…' add 'An even better design results if $g_1 = 1.992\lambda$, $\alpha = 3.10\lambda$, and $\beta = 2.07\lambda$.'

Page 14-19, line under equation (14-29), should be

"…reflection coefficient, where $\Phi_e(x) = \arctan\left(\frac{\mathrm{Re}\{Z_e(x)\}}{1+\mathrm{Im}\{Z_e(x)\}}\right)$, …."

Page 14-19, equation (14-31), upper limit on second pair of integrals should be

$$\ldots + \int_{\alpha_o}^{\pi/2} d\alpha \int_0^{b\csc\alpha} dx \ldots$$

Page 14-26, line above equation (14-39), the text should be '… thickness d is used' and equation (4-39) should be

$$d \approx \frac{\lambda}{4\sqrt{\varepsilon_{r1} - \varepsilon_{r2}}} .$$

Page 14-26, equation (14-40b) should be

$$E_\phi(r,\theta,\phi) = -A_{10} \frac{jk}{2\pi} \frac{e^{-jkr}}{r} \cos\theta \, N_x \, \sin\phi$$

Page 14-29, line above Figure 14-19, text should be '…should be $(p_{11}/\theta_o \arctan(\rho'/L))$ '

Page 14-33, Section headed 'Coaxial Horns', last two lines of first paragraph should be

"…by $k_c a = 2\pi f_c a / c \approx 2/(1+\tau)$, where f_C is the cut-off frequency, $c = a + b$ and $\tau = b/a$. The bandwidth for TE_{11} mode operation is $2/(1+\tau) < ka < \pi/(1-\tau)$.