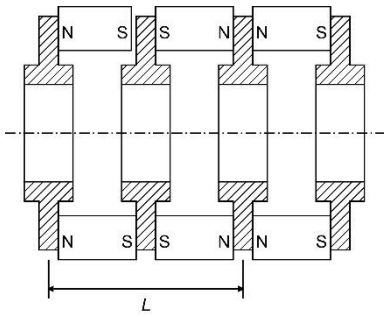
Microwave and RF Vacuum Electronic Power Sources

Additions and Corrections

23 May 2024

p.307	Revised the last sentence of para.1	"A comparison between the charge per unit length in the space-charge hub of a cylindrical diode shows that the charge in a first order hub is slightly less than that in a zero-order hub because the electric field on the surface of the cathode is not zero ~~they are the same to within ±5% in the range $1.2 \le r_a/r_c \le 2.0$~~ (see Figure 8.12 and Worksheet 8.3)."
p.402	Figure 11.16 caption	Add: "for a non-relativistic beam"
p.406	Equation 11.132	The top right-hand quadrant of the matrix should be $\begin{matrix} A\beta_+ & -A\beta_- \\ -A\beta_+ & A\beta_- \end{matrix}$
p.517	Equation 14.27	Change Z_0 to Z_c
p.520	After para.1	Add "The matches at the ends of a section are changed by the presence of the beam so that gain ripples are produced. Where the sections are separated by an internal attenuator this can be represented by setting the amplitude of the coupled backward-wave to zero (see Worksheet 14.1)."
p.548	Figure 14.26 caption	Change "single section" to "single-section tube".
p.589	Line after equation 15.80	"Hence the admittance presented to the cavity by N_s straps is"
p.589	Equation 15.81	Change jY_c to jN_sY_c
p.623	Line before equation 15.155	"… the power dissipated by the anode is given by"
p.755	Equation 19.39	Change c_1g to c_1d
p.756	Equation 19.40	Change c_1g to c_1d
p.761	Equation 19.51	Change r_3/r_5 to r_5/r_3
p. 272	Figure 7.11(b)	The text above the figure should read: α = 0.3, β = 0.224, K = 0.1, R_{max} = 1.107, R_{min} = 0.839, ripple = 13.8%
p.429	Para after (11.182)	Reference should be Figure 11.31(a)
p. 32	6 lines before the end of para.2	The figure reference should be 1.17(b)
p.7	Section 1.3.3, last line	The ratio should be I/I_0
p.220	Last para.	Clarification: "When there was a step change in the distance between the anode and the cathode opposite …"

p.246	Section 6.7.2	Clarification: "The potential of the anode in a conventional tetrode must always …." Pentodes and beam power tetrodes in which an additional electrode is used to prevent the collection of secondary electrons on the screen grid are not used at high power levels and have not been considered in this book.
p.426	p.426 before Table 11.2	Add: "Other idealised bunching waveforms can be obtained from (11.175) using non-integral values of n."
p.397	Section 11.3.6	Note: The derivation of (11.81) ignores the effects of space-charge because the azimuthal space-charge fields are small. When space-charge effects are included each cyclotron mode splits into a pair of space-charge modes carrying positive and negative power in the same manner as longitudinal space-charge waves. When the negative sign is taken in (11.81) the space-charge modes have phase velocities greater than the electron velocity. These modes are employed in gyrotrons (see p. 666).
p.202	Line above (5.53)	(5.53) follows from (5.24)
p.202	2 lines above (5.54)	The figure reference should be Figure 5.53.
p.199	Section 5.3.2.	Note: The definition of V_i in this section differs from that in section 5.3.1.
p.245	Section 6.6	There is a missing bracket at the end of the section
p.410	Line 7	The reference should be to Figure 11.19
p.227	Equation (6.11)	There should be a negative sign after the '='
p.230	Equation (6.32)	The left-hand side should be $E_x(0)$
p.232f		In equations (6.37), (6.40), (6.41), (6.43), (6.44) and (6.46) The subscript to E should be x
p.289	3 lines below (8.4)	The initial vector velocity should be $(-r\omega_c, 0)$
p.590	First para, last sentence	Delete the word 'lower'. The text should read "It is not suitable at the highest power levels .."
p. xxix	V_b	Also Backward-wave voltage
p. xxix	V_f	Also Forward-wave voltage
p.138	(4.16)	Bottom line should be $2\beta_0^2 P$
p.141	(4.29)	$\phi_{i+1} = \phi_i \exp\left(-j\left(\beta_0 p + 2m\pi\right)\right)$,
p.149	(4.54)	$V_1(l/2) = V_2(l/2)$
p.423	3 lines above (11.168)	The figure reference should be Figure 11.27(c)
p.334	(9.40)	Should be $r = r_0\left\{1 - \frac{1}{\pi}\left[\cot^{-1}\zeta - \frac{\zeta}{1+\zeta^2}\right]\right\}^{-\frac{1}{2}}$
p.334	(9.41)	Should be $z_a = \zeta\left\{a^2 - \frac{r^2}{1+\zeta^2}\right\}^{\frac{1}{2}}$

p.246	(9.65)	Left-hand side should be $E_x(0, y)$
p.xxviii	K	Is the square of the ratio of the flux linkages = $1 - \frac{1}{m^2}$
p.118	Penultimate line of para.2	z_3/z_2 should be h/g
Worksheet 7.1		Equations (7.57) and (7.51) are wrong. A revised worksheet has been issued.
p.271	Figure 7.10(a)	 The polarisation of the magnets is shown incorrectly in the figure in the book. (Compare Figure 19.24)