

References

- Ballato, A. (1970). Resonance in Piezoelectric Vibrators. *Proc. IEEE*, **58**, 149–51.
- Ballato, A. (1977). Doubly Rotated Thickness Mode Plate Vibrators. In *Physical Acoustics: Principles and Methods*, Vol XIII (W.P. Mason and R.N. Thurston, eds). Academic Press.
- Bechmann, R. (1955). Influence of the Order of Overtone on the Temperature Coefficient of Frequency of AT-Type Quartz Resonators. *Proc. IRE*, **43**, 1667–8.
- Bechmann, R. (1956). Frequency-Temperature-Angle Characteristics of AT-Type Resonators Made of Natural and Synthetic Quartz. *Proc. IRE*, **44**, 1600–7.
- Bechmann, R. (1960). Frequency-Temperature-Angle Characteristics of AT- and BT-Type Quartz Oscillators in an Extended Temperature Range. *Proc. IRE*, **48**, 1494.
- Bechmann, R. (1961). Thickness shear mode quartz cut with small second and third order temperature coefficients (RT cut). *Proc. IRE*, **49**, 1454.
- Bernstein, M. (1967). Increased Crystal Unit Resistance at Oscillator Noise Levels. *Proc. 21st Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 244–58.
- Besson, R. (1976). A New Piezoelectric Resonator Design. *Proc. 30th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 78–83.
- Bond, W.L. (1976). *Crystal Technology*. Wiley, New York.
- Bottom, V.E. (1982). *Introduction to Quartz Crystal Unit Design*. Van Nostrand Reinhold, New York.
- Bottom, V. and Ives, W.R. (1951). U.S. Patent No. 2,743,144.
- Brice, J.C. (1985). Crystals for quartz resonators. *Reviews of Modern Physics*, **57**, 105–146.
- Buchanan, J.P. (1956). *Handbook of Piezoelectric Crystals for Radio Equipment Designers*. WADC Technical Report 56–156. National Technical Information Service, U.S. Department of Commerce, Washington, D.C.
- Cady, W.G. (1964). *Piezoelectricity*. Dover, New York.
- EerNisse, E.P. (1975). Quartz Resonator Frequency Shifts Arising from Electrode Stress. *Proc. 29th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 1–4.
- Frerking, M.E. (1978). *Crystal Oscillator Design and Temperature Compensation*. Van Nostrand Reinhold, New York.
- Gagnepain, J.J. (1981). Nonlinear Properties of Quartz Crystal and Crystal Resonators. *Proc. 35th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 14–30.
- Gagnepain, J.J. and Besson, R. (1975). Nonlinear Effects in Piezoelectric Quartz Crystals. In *Physical Acoustics: Principles and Methods*, Vol XI (W.P. Mason and R.N. Thurston, eds). Academic Press, New York.
- Gerber, E.A. and Ballato, A. (1985). *Precision Frequency Control*. Academic Press, Orlando.
- Guttwein, G.K., Lukaszek, T.J. and Ballato, A.D. (1967). Practical Consequences of

- Modal Parameter Control in Crystal Resonators. *Proc. 21st Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 115-37.
- Heising, R.A. (1946). *Quartz Crystals for Electrical Circuits*. Van Nostrand, New York. Reprinted 1978 by Electronic Industries Association, Washington, D.C.
- Hight, S.C. and Willard, G.W. (1937). A simplified circuit for frequency sub-standards, employing a new type of low-frequency, zero-temperature-coefficient crystal. *Proc. IRE*, **25**, 549-63.
- Holland, R. (1974a). Nonuniformly Heated Anisotropic Plates. I. Mechanical Distortion and Relaxation [Quartz Resonator]. *IEEE Trans. Sonics & Ultrasonics*, **SU-21**, 171-8.
- Holland, R. (1974b). Nonuniformly Heated Anisotropic Plates. II. Frequency Transients in AT and BT Quartz Plates. *Proc. 1974 Ultrasonics Symposium*, 592-8.
- Holland, R. and EerNisse, E.P. (1969). *Design of Resonant Piezoelectric Devices*. Research Monograph No. 56, MIT Press, Cambridge, Massachusetts.
- Humpherys, D.S. (1970). *The Analysis, Design, and Synthesis of Electrical Filters*. Prentice-Hall, Englewood Cliffs, N.J.
- IEC (1973). *Basic method for the measurement of resonance frequency and equivalent series resistance of quartz crystal units by zero phase technique in a pi-network*. IEC Publication 444.
- IEC (1980). *Measurement of quartz crystal unit parameters by zero phase technique in a pi-network. Part 2: Phase offset method for measurement of motional capacitance of quartz crystal units*. IEC Publication 444-2.
- IEC (1981). *Quartz crystal controlled oscillators. Part 2: Guide to the use of quartz crystal controlled oscillators*. IEC Publication 679-2.
- IEEE (1978). *IEEE Standard on Piezoelectricity*. IEEE Std 176-1978.
- Kartaschoff, P. (1978). *Frequency and Time*. Academic Press, London.
- Kawashima, H., Sato, H. and Ochiai, O. (1980). New Frequency Temperature Characteristics of Miniaturized GT-cut Quartz Resonators. *Proc. 34th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 131-9.
- Lack, F.R., Willard, G.W. and Fair, I.E. (1934). Some Improvements in Quartz Crystal Circuit Elements. *Bell System Technical Journal*, **13**, 453-463.
- Lagasse, G., Ho, J. and Bloch, M. (1972). Research and Development of a New Type of Crystal — The FC Cut. *Proc. 26th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 148-151.
- Mason, W.P. (1940). A New Crystal Plate Designated the 'GT'. *Proc. IRE*, **28**, 220-3.
- Mason, W.P. (1950). *Piezoelectric Crystals and Their Application to Ultrasonics*. Van Nostrand Reinhold, New York.
- Matthys, R.J. (1983). *Crystal Oscillator Circuits*. Wiley-Interscience, New York.
- Meeker, T.R. (1985). Theory and Properties of Piezoelectric Resonators and Waves. In *Precision Frequency Control* (Gerber, E.A. and Ballato, A., eds). Academic Press, Orlando.
- Mindlin, R.D. and Spencer, W.J. (1967). Anharmonic, Thickness-Twist Overtones of Thickness-Shear and Flexural Vibrations of Rectangular, AT-Cut Quartz Plates. *J.A.S.A.*, **42**, 1268-77.
- Moore, S.C. (1983). Photolithographic Manufacture of Quartz Devices. *Proc. 5th Annual Quartz Crystal Conference*, Kansas. Electronic Industries Association, Washington, D.C., 115, 130.
- Neubig, B. (1979). Technical Information: Design of Crystal Oscillator Circuits. Special Issue of *VHF Communications*, **3**, 4, 1979.
- Nonaka, S., Yuuki, T. and Hara, K. (1971). The Current Dependency of Crystal Unit

- Resistance at Low Drive Level. *Proc. 25th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 139-47.
- Ochiai, O., Mashimo, Y. and Tamura, F. (1986). Miniaturized High-Accuracy Crystal Oscillator with Electrically Adjustable Frequency. *Journal of Electronic Engineering*, **24**, 32-7.
- Oita, T. (1986). Crystal Clock Oscillators Reduce Power Consumption and Size of Digital Equipment. *Journal of Electronic Engineering*, **24**, 28-31.
- Parzen, B. (1983). *Design of Crystal and other Harmonic Oscillators*. Wiley-Interscience, New York.
- Peters, R.D. (1976). Ceramic Flatpack Enclosures for Precision Quartz Crystal Units. *Proc. 30th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 224-31.
- Phillips, F.C. (1960). *An Introduction to Crystallography*. Longmans, London.
- Rayleigh, Lord (1889). On the Free Vibrations of an Infinite Plate of Homogeneous Isotropic Matter. *Proc. London Math. Soc.*, **20**, 225.
- Sheahan, D.F. and Johnson, R.A. (1977). *Modern Crystal and Mechanical Filters*, IEEE, New York.
- Smythe, R.C. (1974). Intermodulation in Thickness-Shear Resonators. *Proc. 28th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 5-7.
- Temes, G.C. and Mitra, S.K. (1973). *Modern Filter Theory and Design*. Wiley-Interscience, New York.
- Tiersten, H.F. (1969). *Linear Piezoelectric Plate Vibrations*. Plenum Press, New York.
- Tiersten, H.F. (1974). Analysis of Intermodulation in Rotated Y-cut Quartz Thickness-Shear Resonators. *Proc. 28th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 1-4.
- Tiersten, H.F. (1975). Analysis of Nonlinear Resonance in Rotated Y-cut Quartz Thickness-Shear Resonators. *Proc. 29th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 49-53.
- Tiersten, H.F. and Smythe, R.C. (1979). An analysis of contoured crystal resonators operating in overtones of coupled thickness shear and thickness twist. *J.A.S.A.*, **65**, 1455-60.
- Tyler, L.A. (1960). In *Quartz Resonator Handbook: Manufacturing Guide for AT Type Units* (ed. Bennett, R.E.). Union Thermoelectric Division, Niles, Illinois.
- Vig, J.R., Cook, C.F., Schwidtal, K., LeBus, J.W. and Hafner, E. (1974). Surface Studies for Quartz resonators. *Proc. 28th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 96-108.
- Vig, J.R. and LeBus, J.W. (1975). Further Results on UV cleaning and Ni Electro-bonding. *Proc. 29th Ann. Freq. Control Symposium*, US Army Electronics Command, Ft. Monmouth, N.J., 220-29.
- Vigoreux, P. and Booth, C.F. (1950). *Quartz Vibrators and their Applications*. H.M.S.O., London.
- Ward, R. (1983). Quartz Resonator Mounting and Packaging Requirements and Techniques. *Proc. 5th Annual Quartz Crystal Conference*, Kansas. Electronic Industries Association, Washington, D.C., 162-175.
- Weinberg, L. (1962). *Network Analysis and Synthesis*. McGraw-Hill, New York.
- Weyl, H. (1939). *The Classical Groups, their Invariants and Representations*. Princeton University Press.
- Zverev, A. (1967). *Handbook of Filter Synthesis*. John Wiley, New York.

FURTHER READING FOR APPENDIX 3

- Dixon, R.C. and Eringen, A.C. (1965). A Dynamical Theory of Polar Elastic Dielectrics. *Int. J. Engng. Sci.*, **3**, 359.
- Eringen, A.C. (1962). *Nonlinear Theory of Continuous Media*. McGraw-Hill, New York.
- Eringen, A.C. (1963). On the Foundations of Electroelastostatics. *Int. J. Engng. Sci.*, **1**, 127.
- Grindlay, J. (1966). The Elastic Dielectric. *Phys. Rev.*, **149**, 637.
- Tiersten, H.F. (1971). On the Nonlinear Equations of Thermoelectroelasticity. *Int. J. Engng. Sci.*, **9**, 587.
- Toupin, R.A. (1956). The Elastic Dielectric. *J. Rational Mech. Anal.*, **5**, 849.
- Toupin, R.A. (1960). Stress Tensors in Elastic Dielectrics. *Arch. Rational Mech. Anal.*, **5**, 440.
- Toupin, R.A. (1963). A Dynamical Theory of Elastic Dielectrics. *Int. J. Engng. Sci.*, **1**, 101.