



Electronic Communication Systems: Fundamentals through Advanced (4th Edition)

By Wayne Tomasi



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For sophomore/senior-level courses in Introduction to Electronic Communications and Digital and Data Communications. Comprehensive in scope and contemporary in coverage, this text introduces basic electronic and data communications fundamentals, and explores their application in modern digital and data communications systems. Students with previous knowledge in basic electronic principles and fundamental calculus concepts will gain a complete understanding of the topics presented here. Tomasi's Advanced Electronic Communication Systems 5/e is the last 10 chapters of this text.



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Editorial Review

From the Back Cover

Electronic Communications Systems: Fundamentals Through Advanced, Fourth Edition, provides comprehensive coverage of the field of electronic communications. It introduces the reader to the basic concepts of conventional analog electronic communications systems and expands the reader's knowledge to more modern digital, optical fiber, microwave, satellite, and cellular and PCS telephone communications systems.

All topics have been updated to present the latest information available in this fast-changing field, and completely new sections have been added to cover the following important topics:

- AM envelopes produced by complex nonsinusoidal signals
- Quadrature Amplitude Modulation
- Noise limiters and blankers
- Alternate signal-to-noise measurements
- Single-sideband suppressed carrier and frequency division multiplexing
- Double-sideband suppressed carrier and quadrature multiplexing
- Microstrip and stripline
- Light sources, optical power, optical sources, and link budget
- Trellis encoding
- CCIt modem recommendations
- PCM line speed
- Extended superframe format and wavelength division multiplexing
- Kepler's laws Clark orbits, and limits of visibility

In addition, an entirely new chapter has been added with coverage of:

- Mobile telephone systems (including AMPS, PSC, and PCSS)

This text is written for use in undergraduate level electronic communications courses in which students have prior knowledge of some of the basic electronic principles, as well as an understanding of mathematics through the fundamental concepts of calculus.

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Preface

The purpose of this book is to introduce the reader to the basic concepts of conventional analog electronic communications systems and to expand the reader's knowledge to more modern digital, optical fiber, microwave, satellite, and cellular and PCS telephone communications systems. The book was written so that a reader with previous knowledge in basic electronic principles and an understanding of mathematics through the fundamental concepts of calculus will have little trouble understanding the topics presented.

Within the text, there are numerous examples that emphasize the most important concepts. Questions and problems are included at the end of each chapter; answers to selected problems are provided at the end of the book.

Electronic Communications Systems: Fundamentals Through Advanced, Fourth Edition, provides a modern, comprehensive coverage of the field of electronic communications. The most important and extensive changes to this edition occur in the chapters that deal primarily with digital communications systems such as Chapters 12, 15, 16, 18, and 19. In addition, Chapter 20 is a new chapter, dedicated entirely to cellular and PCS telephone systems. The major new topics and enhancements incorporated into this edition, by chapter number, are as follows:

1. The introduction and several sections throughout this chapter, including the section on modulation and demodulation, have been rewritten and several figures have been modified. In addition, several new figures have been added along with sections on impulse noise and interference.
2. This chapter remains essentially the same as in the previous edition except for minor modifications to several figures.
3. This chapter remains essentially the same as in the previous edition except for the addition of new sections on AM envelopes produced by complex nonsinusoidal signals, quadrature amplitude modulation, and minor modifications to several figures.
4. The introduction and section on bandwidth improvement have been rewritten and several figures have been modified. In addition, new sections on noise limners and blankers and alternate signal-to-noise measurements have been added.
5. New sections on single-sideband suppressed carrier and frequency-division multiplexing and double-sideband suppressed carrier and quadrature multiplexing have been added.
6. The introduction and several sections throughout this chapter, including deviation sensitivity, modulation index, frequency deviation, frequency and phase modulators, frequency up-conversion, and advantages and disadvantages of angle modulation, have been rewritten with more examples. Also, several figures have been modified and several new figures have been added to the chapter.
7. The sections on FM receivers, FM demodulators, and FM capture effect have been rewritten and several figures have been modified. The section on cellular telephone has been moved from this chapter to Chapter 20.
8. This chapter remains essentially the same as in the previous edition except for the addition of sections on microstrip and stripline.
9. Except for a few minor modifications, this chapter remains essentially the same as in the previous edition.
10. The introduction and several sections throughout this chapter, including the sections on antenna reciprocity, effective isotropic radiated power, captured power density, capture area and capture power, and antenna beamwidth, have been rewritten and several figures have been modified.
11. Optical fiber communications has been moved from Chapter 20 to here. The introduction and several sections throughout this chapter have been rewritten and several new sections have been added, including sections on light sources, optical power, optical sources, and link budget.
12. The sections on digital amplitude modulation, frequency shift keying, continuous-phase frequency shift keying, and M-ary encoding have been rewritten and a new section on trellis encoding has been added.
13. This chapter is essentially the same as in the previous edition except for the addition of a new section on CCITT modem recommendations.
14. This chapter remains essentially the same as in the previous edition.
15. The introduction and several sections throughout this chapter, including the sections on advantages and disadvantages of digital transmission and pulse code modulation, have been rewritten and a new section on PCM line speed has been added. Also, several figures have been modified.
16. The introduction and several sections throughout this chapter, including the sections on time-division

multiplexing and T1 digital carrier systems, have been rewritten and new sections on extended superframe format and wavelength-division multiplexing have been added.

17. The introduction has been rewritten along with parts of several other sections, including the advantages and disadvantages of microwave communications, diversity, protection switching, fading, free-space path loss, and fade margin.
18. The introduction and several sections throughout this chapter have been rewritten, including the sections on history, satellite orbits, satellite elevation categories, satellite orbital patterns, geosynchronous satellites, antenna look angles, and footprints. New to this edition are sections on Kepler's laws, Clarke orbits, and limits of visibility.
19. Minor modifications have been made to the introduction and several other sections throughout this chapter. Significant changes and additions have occurred in the section on satellite radio navigation and Navstar GPS.
20. Sections from Chapter 7 of the previous edition have been rewritten and combined with several new sections to provide a comprehensive coverage of mobile telephone systems, including analog and digital cellular telephone (AMPS), the CDMA personal communications system (PCS), and the Iridium personal communications satellite system (PCSS).

Appendix A has remained essentially the same as in the previous edition.

Acknowledgments

I would like to thank the following reviews for their valuable feedback: Micha Hohenberger, Temple University; Martin Knutilla, McHenry County College; Steven Schwarz, Queens College; Walter Thain, Southern Polytechnic State University; and Martin Weiss, University of Pittsburgh.

Users Review

From reader reviews:

Lee Rutledge:

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