

Preface	7
Introduction	9
Chapter 1. An Outline of Colour and Colour Vision	11
1-1. Colour Defined	11
1-2. Colour Vision	12
1-3. Colour Vision Deficiencies	13
1-4. Psychological and Psychophysical Characteristics of Colour	14
1-5. Brightness Adaptation	16
1-6. Colour Adaptation	16
1-7. Subjective Effects of Colour Sensations	17
1-8. Two-Colour Reproduction	18
1-9. Colour of Small Objects	18
1-10. The Number of Colours Detected by the Eye	19
1-11. Tricolour (Tri-receptor) Theory of Colour Vision	19
1-12. Relative Luminosity Curve	20
1-13. Radiometric and Photometric Characteristics of Radiant Energy	21
Chapter 2. Basic Principles of Colorimetry	27
2-1. Additive Colour Mixing and Additive Primaries	27
2-2. Methods of Additive Colour Mixing	28
2-3. Colour Matching	28
2-4. Laws of Additive Colour Mixing	29
2-5. The Trichromatic System of Colour Specification	30
2-6. Unit Chromaticity Equation	32
2-7. Vector Representation of Colour	37
2-8. The Unit Plane in Colour Space	39
2-9. The Constant-Luminance Plane	41
2-10. Transformation of the Colour Triangle	43
2-11. Linear Transformation of Point (Vector) Coordinates in Conventional Geometric Space	44
2-12. Linear Transformation of Colour Coordinates in Colour Space	48
2-13. Projective Transformation of Chromaticity Coordinates in Colour Space	63
2-14. Representation of Chromaticity on a Plane	65
2-15. Coordinates of an Additive Mixture Colour	77
2-16. The CIE 1931 Standard Observer and <i>RGB</i> Coordinate System	79
2-17. General Outline of the CIE 1931 Standard Observer and <i>XYZ</i> Coordinate System	89

- 2-18. Properties of the XYZ System 93
- 2-19. Conversion between the RGB and XYZ Systems 96
- 2-20. The XYZ Chromaticity Diagrams 104
- 2-21. Colorimetric Calculations in the XYZ System 109
- 2-22. An Example of Colorimetric Calculations 112
- 2-23. The Shape of Colour-Mixture Curves 113
- 2-24. The Physiological System of Colour Specification 118
- 2-25. The Planckian Locus 118
- 2-26. Standard Illuminants 122
- 2-27. Uniform Chromaticity Scale Diagrams. The CIE 1960 System 124
- 2-28. Light Filters 131
- 2-29. Optimal Light Filters and Dyes 136
- 2-30. Colour Solid 140
- 2-31. Colour Atlases 141
- 2-32. Objective Colour Measurements 143
- 2-33. Subtractive Colour Mixing (Reproduction) 143
- 2-34. The CIE 1964 UCS Diagram 144

Chapter 3. Colour Reproduction in Colour Television 146

- 3-1. The Quality of Colour Reproduction 146
- 3-2. Perception of Colour Differences 149
- 3-3. Conditions for Colorimetrically Exact Colour Reproduction 156
- 3-4. Effect of Colour Adaptation on Colour Perception 167
- 3-5. Determination of the Primary Luminances Required to Match a Mixture Colour 167
- 3-6. Gamuts of Reproduced Colours 179
- 3-7. Linear and Projective Transformations in the $R_dG_dB_d$ System for Colour Television 186
- 3-8. Colour TV Camera Spectral ("Taking") Characteristic and Output Signal 205
- 3-9. Determination of Colour Fidelity in Colour Television 231
- 3-10. Construction of Coordinate Grids for Constant Values of Ratios of Colorimetric Quantities 240
- 3-11. Transmission of Colour Films in Colour Television 260
- 3-12. Modulation Characteristic of a Tricolour Kinescope. Gamma Correction. Colour Balance 282
- 3-13. Picture Luminance in a Colour TV Receiver 307
- 3-14. The Luminance Signals E'_Y and $E^{1/\gamma}_Y$ Chrominance Signals. Matrixing Networks 317
- 3-15. Colour Bar Test Signals for Colour Television 337
- 3-16. The Constant Luminance Principle in Colour Television 344
- 3-17. Colorimetric Quality Criteria for Video Signals in Colour TV 356
- 3-18. Use of a Separate Luminance Tube to Generate the $E^{1/\gamma}_Y$ Signal in Colour Television 377

- Bibliography 391
- Index 397