Holography Projects for the Evil Genius®

Gavin D. J. Harper
Acknowledgments xi

Introduction to Holography xiii

1 History of Holography 1
Project 1: Make a Camera Obscura 7

2 How We See in Three Dimensions 5
Project 2: Cutting Mirrors 12

3 Basic Practical Optics 11
Project 3: Develop Holographic Plates 43
Project 4: Develop Holographic Film 46

4 Light and Lasers 23

5 How Holography Works 31

6 Holographic Chemistry 41
Project 5: Construct a Sandbox 53
Project 6: Direct Beam Reflection Hologram 61
Project 7: Creating a Single-Beam Transmission Hologram 70
Project 8: Making a Single-Mirror Transmission Hologram 72
Project 9: Creating a Multiple-Channel Hologram 73

7 Your Holography Workshop 53

8 Simple Holography 61
Project 10: Working with Film 75
Project 11: Multiple-Beam Reflection Hologram 78
Project 12: Split-Beam Transmission Hologram (I) 78
Project 13: Split-Beam Transmission Hologram (II) 79

9 Intermediate Holography 75
Project 14: Transmission Hologram with Soft Lighting 80

10 Advanced Holographic Projects 81
Project 15: Making a Hologram with Diffuse Illumination 81
Project 16: Making a Hologram with Multiple Sources of Illumination 82
Project 17: Making a Copy of a Hologram 82
Project 18: Experimenting with 360° Holograms 83
Project 19: Making a Direct Beam 360° Cylindrical Hologram 84
Project 20: Making a Cylindrical Hologram with a Convex Mirror 86
Project 21: Making a Conical Hologram 89
Project 22: Make a Hologram Cube 90
Project 23: Rainbow Transfer Hologram 91

11 Advanced Holographic Chemistry 93
Project 24: Changing the Color of Your Holograms 96
Project 25: Chemical Blackening of Reflection Holograms 97

12 Computer-Generated Holography 99
Project 26: Make Your Own Digital Hologram 99

13 Useful Electronic Circuits for Holographers 105
Project 27: Darkroom Timer 105
Project 28: Electronic Shutter 107
Project 29: Automatic Electronic Shutter 109

14 Useful Electronic Circuits for Holographers 113