

Contents

	Page
Chapter 1. Introduction and Summary	1
suMMARY	1
Manufacturing	1
Communications Infrastructure	2
Services	4
INTRODUCTION	4
The Historical Development ofHDTV(Ch. 2)	7
CommunicationsT echnologies (Ch. 3)	8
Television Technology (Ch. 4)..	8
Technological Linkages (Ch. 5)	9
AdvancedTelevision Markets (Ch. 6)	9
U.S. Manufacturing ofHDTV	10
POLICY ISSUES	13
NATIONAL SECURITY	16
THECOMMUNICATIONSINFRASTRU CruRE	17
Recorded Media	18
Terrestrial Broadcasters	18
Cable Television	19
Direct Broadcast Satellites	19
Mobile Communications	19
Telephone Companies	20
Market Share	20
costs	21
THE STANDARDS-SETTING PROCESS	22
Standards Setting and Marketplace Participants	23
The Timetable for Establishing Standards	23
Providing Full Opportunities for All Serious Proponents	24
Hybrid Standards	25
Chapter 2. The Historical Development ofHDTV	27
INTRODUCTION	27
JAPAN	27
Research and Development	28
Financial Supports	30
Market Promotion	31
EUROPE	32
Market Protection	33
Eureka	34
UNITED STATES	34
Production Standards	35
Transmissions tandards	36
New Initiatives	36
Chapter 3. Communications Technologies	39
INTRODUCTION	39
TERRESTRIAL RADIO COMMUNICATIONS	40
SATELLITE COMMUNICATIONS	44
COAXIAL CABLES	45
COPPER TELEPHONELINES	46
OPTICAL FIBER CABLES	47
Chapter 4.TVand HRS Technologies	49
INTRODUCTION	49
CONVENTIONALTELEVISION: PRODUCTION, TRANSMISSION, AND RECEPTION	49
ADVANCED TELEVISION SYSTEMS: IDTV,EDTV, HDTV	52
VISUAL RESPONSE ANDHIGH DEFINITION TV	52
HDTV SYSTEMS: PRODUCTION, TRANSMISSION, RECEPTION	55
Production Standards	56
Transmissions systems	56

	<i>Page</i>
Receivers for HDTV	58
HIGH-RESOLUTION SYSTEMS AND TECHNOLOGIES	59
Chapter 5. Linkages Between HDTV, HRS , and Other Industries *.*	61
INTRODUCTION	61
SEMICONDUCTORS	63
Digital Signal Processing	63
DRAMs	65
Gallium Arsenide and Other Compound Semiconductors	66
Semiconductor Manufacturing ..1	67
DISPLAY TECHNOLOGY	68
STORAGE	72
COMMUNICATIONS	73
PACKAGING/INTERCONNECT	74
Chapter 6. Advanced TV Markets and Market Uncertainties	79
INTRODUCTION	79
SCENARIOS FOR MARKET DEVELOPMENT	79
Consumer Demand for HDTV	80
Consumer Demand for Interactive Video	81
Government Policies and Market Development	82
MARKET PROJECTIONS	83
MARKET PROJECTIONS AND THE RELATIVE IMPORTANCE OF HDTV	85
Extrapolating Current Growth Trends	85
Comparing the Semiconductor or Other Component Requirements for Assumed Market Sizes	86
Comparing Ultimate Market Penetration Rates and Corresponding Needs per user	87
TECHNOLOGY AND MARKET TRENDS	88
Appendix A. The Decline of the U.S. TV Industry: Manufacturing	91
Appendix B. The Decline of the U.S. TV Industry: Trade	93
Appendix C. The Decline of the U.S. DRAM Industry: Manufacturing	95
Appendix D. The Decline of the U.S. DRAM Industry: Trade	98
Appendix E. The Development of the Japanese Computer Industry	101
Appendix F. Research and Development Consortia	104
Appendix G. Acronyms and Glossary	106

Boxes

<i>Box</i>	<i>Page</i>
1-1. Digital Video Information and Telecommunications Services	5
3-1. Fundamentals	41
4-1. Inside Today's NTSC Analog Television	50
4-2. Inside Analog/Digital Television	53
4-3. Levels of Receiver Compatibility	57

Figures

<i>Figure</i>	<i>Page</i>
1-1. Erosion of U.S. Leadership in Semiconductor and Related Technologies	3
3-1. Amplitude and Frequency Modulation of a Carrier	41
3-2. A Digital Signal With Its Corresponding Numerical Equivalent	41
3-3. Techniques for Modulating an Analog Carrier in Order To Send Data in a Digital Format	42
3-4. Selected Allocations of the Radio Frequency Spectrum	43
3-5. Map of a Cellular Radio System	44
4-1. Analog to Digital Conversion Using Pulse Code Modulation	53
4-2. Comparison of the Field of View for an HDTV and T's NTSC TV To Have the Same Resolution for the Viewer	55
5-1. Selected Applications of Digital Signal processors v. the Speed of Operation	64
5-2. Projected Growth of the Digital Signal Processor Market , 1989-92	65
5-3. "Resor's Rule" for Active Matrix Liquid Crystal Displays	69

