

Internal Guide to Digital Organizations 1988-1989 Edition

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1988-89 INTERNAL GUIDE TO DIGITAL ORGANIZATIONS

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ABSTRACT: This guide presents general information about Digital and specific information about individual groups, programs, and committees. Included are descriptions of most engineering, manufacturing, marketing, sales, and service groups. Name and subject indexes are also included. This book was formerly titled the *Engineering Guide*, but was renamed because of its broadened scope.

APPLICABILITY: This guide is intended as a reference guide for any Digital employee requiring information or assistance from specific internal groups.

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Digital Equipment Corporation— Maynard, Massachusetts

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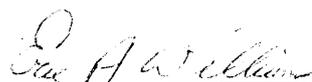
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TABLE OF CONTENTS

Preface	xix
Foreword	xxi
CHAPTER 1 CORPORATE OVERVIEW	1
1.1 SCOPE	1
1.2 FACTS ABOUT DIGITAL	1
1.3 DIGITAL PHILOSOPHY	3
1.4 DEC CULTURE	6
CHAPTER 2 PERSONNEL—ENGINEERING/MANUFACTURING/PRODUCT MARKETING	7
2.1 MANUFACTURING/ENGINEERING AND MARKETING CENTRAL QUALITY GROUP	8
2.1.1 Quality Development Program	9
2.1.2 Engineering Projects	9
2.2 GRADUATE ENGINEERING EDUCATION PROGRAM (GEEP)	9
2.3 TECHNICAL MANAGEMENT EDUCATION PROGRAM (TMEP)	10
CHAPTER 3 ENGINEERING PRODUCT OPERATIONS	11
3.1 ENGINEERING PRODUCT PLANNING	11
3.2 MEM SECURITY	12
3.3 INTERNATIONAL PRODUCTS OFFICE (IPO)	13
3.3.1 Corporate Product Safety and Regulations	14
3.3.2 Standards and Methods Control	15
3.3.3 Office of the Chief Engineer	16
CHAPTER 4 LEGAL SERVICES FOR ENGINEERING/MANUFACTURING	17
4.1 PROTECTING DIGITAL'S COMPETITIVE ADVANTAGE WITH INTELLECTUAL PROPERTY	17
4.1.1 Trade Secrets	17
4.1.2 Patents	18
4.1.3 Copyrights	19
4.1.4 Mask Works	20
4.1.5 Trademarks	21
4.2 TRADE REGULATION	22
4.3 PRODUCT LIABILITY	23
4.4 U.S. EXPORT CONTROL LAWS	23

4.5	GUIDELINES FOR HANDLING SOME COMMON LEGAL ISSUES	24
4.5.1	How To Get a Patent on Your Idea	24
4.5.2	Getting Your Publication Approved	26
4.5.3	When & How to Use Non-Disclosure Agreements	31
4.5.4	How to Avoid Legal Pitfalls When You Write	35
4.6	FINDING YOUR LAWYER	35
CHAPTER 5	MISCELLANEOUS INFORMATION SERVICES	37
5.1	DIGITAL LIBRARY NETWORK	37
5.1.1	Information Services	39
5.1.2	Books, Technical Reports, The DLN Catalog, and Interlibrary Loan	39
5.1.3	Circulation of Materials	39
5.1.4	Periodicals	39
5.1.5	Instructional Media Services	39
5.1.6	Digital Publications	39
5.1.7	Competitors' Publications	39
5.1.8	Purchasing Activities	40
5.1.9	Information Supply Base Management	40
5.1.10	Consulting Services/Library Start-Up	40
5.1.11	European Digital Library Network	40
5.2	MARKET INFORMATION SERVICES GROUP (MISG)	40
5.2.1	Competitive Information System	41
5.2.2	Customized Research Service	41
5.2.3	External Market Data System	42
5.2.4	Information Access Services	42
5.2.5	Market Information Resources Management	43
5.2.6	Market Research Centers	43
5.3	PUBLISHING AND CIRCULATION SERVICES	44
5.4	DIGITAL TELEPHONE DIRECTORY	44
5.5	PRODUCT FINANCIAL REPORTING INFORMATION CENTER	45
5.6	SYSTEMS MATERIALS ENGINEERING	46
5.7	CENTRAL MASSACHUSETTS ADMINISTRATIVE SERVICES (CMAS)	47
5.8	EASTERN MASSACHUSETTS ADMINISTRATIVE SERVICES (EMAS)	47
5.8.1	Eastern Massachusetts Administrative Services Information Services (EMAS-IS)	48

CHAPTER 6 DIS STRATEGY, TECHNOLOGY, AND ARCHITECTURE	51
6.1 INTERNAL EQUIPMENT GROUP	52
6.1.1 IEG Orders	52
6.1.2 DECdirect (DDD) Orders	52
6.1.3 Software Distribution Center (SDC) Orders	52
6.1.4 Account Management Services	52
6.1.5 IEG CAS Services	52
6.1.6 IEG Customer Center	53
6.2 DIS INFORMATION OPERATIONS AND SERVICES	53
6.2.1 Information Operations Program	53
6.2.2 Information Distribution and Access Program	53
6.2.3 Electronic Data and Information Interchange (EDI-EII) Program	53
6.2.4 Reference Information Systems Development (RISD)	54
6.2.5 DIS Purchasing	54
6.2.6 DNS Program Office	54
6.3 HUMAN RESOURCE MANAGEMENT GROUP	54
6.3.1 Digital Information Systems/Human Resource Management-End User Education	54
6.3.2 DIS/Executive Contact Program (DIS/ECP)	55
6.3.3 IDECUS (Internal Digital Equipment Corporation Users Society) Symposia and Seminars	55
6.3.4 Professional Resource Exchange Program (PREP)	55
6.3.5 DIS Training and Education	55
6.3.6 Network Training Program	55
6.3.7 Advanced Network Training Program	55
6.3.8 Operator Training Program	56
6.3.9 Internship Program	56
6.3.10 Management Development Program	56
6.4 DIGITAL TELECOMMUNICATIONS	56
CHAPTER 7 CORPORATE RESEARCH AND ARCHITECTURE	59
7.1 CAMBRIDGE RESEARCH CENTER	60
7.1.1 Computational Quality Group	60
7.2 PARIS RESEARCH LAB	60
7.3 SYSTEMS RESEARCH CENTER	60
7.4 WESTERN RESEARCH LABORATORY	61
7.5 ARTIFICIAL INTELLIGENCE RESEARCH GROUP	61
7.6 EXTERNAL RESEARCH PROGRAM	61
7.7 TECHNOLOGY DEVELOPMENT PROGRAMS	62
7.8 RESEARCH AND ADVANCED DEVELOPMENT COMMITTEE	62
7.9 MANAGEMENT SYSTEMS RESEARCH	63
7.10 TECHNOLOGY PLANNING AND DEVELOPMENT	64

7.10.1 Technology Strategy Council (TSC)	65
7.10.2 Technology Planning Group (TPG)	65
7.10.3 Technology Assessment Group	65
7.10.4 Engineering Interface Program	66
7.11 DIGITAL TECHNICAL JOURNAL	66
7.12 INTELLECTUAL PROPERTY PROTECTION PROGRAM	66
7.13 FINANCE AND ADMINISTRATION	66
7.14 PERSONNEL	66
CHAPTER 8 SEMICONDUCTOR OPERATIONS	67
8.1 SEMICONDUCTOR BUSINESS OPERATIONS	67
8.2 SEMICONDUCTOR MANUFACTURING AND TECHNOLOGY (SCMT)	67
8.2.1 U.S. Manufacturing	68
8.2.2 European VLSI	68
8.2.3 Advanced Semiconductor Development (ASD)	68
8.2.4 Physical Technology Group (PTG)	68
8.2.5 Computer Integrated Manufacturing (CIM)	68
8.2.6 Materials/Planning	68
8.3 SEMICONDUCTOR ENGINEERING GROUP (SEG)	69
8.4 SEMICONDUCTOR OPERATIONS GROUP QUALITY & RELIABILITY	69
8.5 SEMICONDUCTOR OPERATIONS STRATEGIC PROGRAM OFFICE	70
CHAPTER 9 LOW END SYSTEMS (LES)	71
9.1 MICRO SYSTEMS DEVELOPMENT (MSD)	71
9.1.1 Micro Systems Development Program Office	72
9.1.2 MSD Hardware Engineering	72
9.1.2.1 MSD Systems Integration Engineering	72
9.1.2.2 MSD Options Development	72
9.1.2.3 S-BOX Development	72
9.1.2.4 MSD Desktop Systems Development	73
9.1.2.5 Systems Engineering	73
9.1.3 Micro Systems Advanced Development	73
9.1.4 MSD Systems Quality	73
9.1.5 Micro Systems Software	74
9.1.6 General Business Engineering	74
9.2 DESIGN AND PROCESS ENGINEERING	74
9.2.1 Diagnostic Engineering	75
9.2.2 Engineering CAD	75
9.2.3 Low End Network Systems	76
9.2.4 Engineering Process and Technology (EP&T)	77
9.2.4.1 Project Oriented Groups	77
9.2.4.2 Support Groups	78

9.2.5 Low End Regulatory Engineering (LERE)	78
9.2.5.1 Electromagnetic Compatibility (EMC) Domain	79
9.3 VAX WORKSTATIONS PBU	80
9.4 PERSONAL COMPUTING SYSTEMS GROUP	81
9.4.1 Personal Computing Systems Software Engineering	81
9.4.2 Personal Computing Systems Program Office	81
9.4.3 Personal Computing Systems External Relations Program Office	81
9.4.4 Base Product Marketing Group - Integrated Personal Computing (IPC)	82
9.5 DESKTOP SYSTEMS GROUP	82
9.5.1 Font Engineering	82
9.5.2 Hardcopy CSSE	82
9.5.3 Video Engineering	82
9.5.4 Hardcopy and Input/Output Engineering Group	83
9.5.5 Architectural Systems	83
9.5.6 DSG Program Office	84
9.5.7 Video Advanced Development	84
9.6 ELECTRO/MECHANICAL DESIGN AND SUPPORT	84
9.6.1 Program Management	85
9.6.2 Corporate Design Group	85
9.6.2.1 Industrial Design	86
9.6.2.2 Graphic Design	86
9.6.2.3 Human Factors	86
9.6.3 Electro/Mechanical Design Engineering	87
9.6.4 LEPS Engineering and Corporate Power Conversion R&D	87
9.6.4.1 Power Conversion Product Development	87
9.6.4.2 Corporate Power Conversion Research and Development	88
9.6.5 Mechanical Technology Development	88
9.6.6 Industrial Package Engineering (IPE)	89
9.6.6.1 Low End Systems Industrial Packaging Engineering	89
9.6.6.2 High & Mid-Range Systems Industrial Packaging Engineering	89
9.6.6.3 Industrial Packaging Engineering Services	89
9.7 MICROVAX PROGRAM	90
9.8 BASE PRODUCT MARKETING AND PLANNING	90
CHAPTER 10 MID-RANGE SYSTEMS BUSINESS GROUP	93
10.1 DECWEST	94

CHAPTER 11 HIGH PERFORMANCE SYSTEMS (HPS)	95
11.1 LARGE VAX ENGINEERING	95
11.1.1 Aquarius Program	95
11.1.2 Technology Research and Engineering	95
11.1.3 CPU Engineering Group	96
11.1.4 CAD/CAM/Diagnostics	96
11.2 HPS OPERATIONS AND INFORMATION SYSTEMS	96
11.2.1 HPS Computer Services	96
11.2.1.1 HPS Computer Services Operation	96
11.2.1.2 HPS Computer Services Technical Support	97
11.2.1.3 HPS Computer Services Administration	97
11.2.2 HPS Facilities Management	97
11.2.3 HPS MIS	97
11.3 SYSTEMS RESEARCH AND ENGINEERING	98
11.4 PLANNING, QUALITY, AND STRATEGIC RELATIONS	98
11.4.1 Planning	98
11.4.2 Strategic Analysis	98
11.4.3 Quality	99
11.4.4 Strategic Relations	99
11.5 TRANSACTION PROCESSING SYSTEMS ENGINEERING	99
11.6 VAXCLUSTER SYSTEMS ENGINEERING AND MARKETING	100
11.7 SYSTEMS SOFTWARE ENGINEERING	100
11.7.1 OLTP Software Engineering	100
11.7.2 Processor Specific Software (PSS)	101
11.7.3 Systems Productivity Tools (SPT) Program	101
11.7.3.1 Information Environment (IE)	101
11.7.3.2 Project Management Facility (PMF)	101
11.8 VAX 8600 AND 8650 SYSTEMS	101
11.9 ADVANCED TECHNOLOGY ENGINEERING AND MANUFACTURING (ATEAM) ..	102
11.10 HIGH PERFORMANCE SYSTEMS MARKETING	102
11.10.1 VAXcluster Base System Marketing	102
11.10.2 High End VAX Marketing	102
11.10.3 OLTP Marketing	102
11.10.4 Systems Marketing/Competitive Expertise Center	103
11.11 MANUFACTURING BUSINESS UNIT	103

CHAPTER 12 STORAGE SYSTEMS ENGINEERING AND MANUFACTURING	105
12.1 TAPE AND OPTICAL PRODUCT DEVELOPMENT	105
12.1.1 Tape and Optical Product Management and Marketing	106
12.1.2 Industry-Compatible Tape Development	106
12.1.3 Cartridge Tape Development	106
12.1.4 Optical Disk Development	106
12.2 ADVANCED DEVELOPMENT STORAGE SYSTEMS	106
12.3 JAPAN RESEARCH AND DEVELOPMENT CENTER	107
12.3.1 Storage Systems Development	107
12.3.1.1 Storage Systems Advanced Development	107
12.3.1.2 Storage Systems Product Development	108
12.3.2 Semiconductor Engineering	108
12.3.3 Interconnect Technology	108
12.3.4 Asian Base Systems Software	108
12.3.4.1 ABS/JRD Product Planning and Administration	108
12.3.4.2 ABS/JRD Operating System Engineering	108
12.3.4.3 ABS/JRD System Software Engineering	109
12.3.5 Hardcopy Buyout Support	109
12.3.6 Japan Procurement Center	109
12.4 COLORADO STORAGE SYSTEMS ENGINEERING	109
12.4.1 Disk Drive Development	109
12.4.2 Subsystems Engineering	110
12.4.2.1 Small and Advanced Controllers	110
12.4.2.2 Mid-Range and High Performance Controllers	110
12.4.2.3 HSC Engineering	110
12.4.2.4 Diagnostics/SQA	110
12.4.2.5 Storage Subsystems Performance Engineering	110
12.4.3 Engineering Operations Group	110
12.4.3.1 VLSI Development Engineering	110
12.4.3.2 Power Systems Engineering	111
12.4.3.3 Mechanical Packaging Design Engineering Group	111
12.4.3.4 Computer-Aided-Design and Engineering Department	111
12.4.3.5 Printed Circuit Design Services	111
12.4.3.6 Engineering Information Services	111
12.4.3.7 Mechanical Design/Documentation Services/Model Shop	111
12.4.3.8 Regulatory and Component Engineering	112
12.4.3.9 Reliability and Design Assurance	112
12.4.4 MLDS PBU and Program Management Group	112
12.4.4.1 MLDS Product Management	112
12.4.5 Site Management	112
12.4.6 Customer Service Systems Engineering (MLDS)	113
12.5 ELECTRONIC STORAGE DEVELOPMENT (ESD)	113

12.5.1 Storage Systems East Technical Operations	114
12.5.1.1 Engineering Services	115
12.5.1.2 Information Resources	115
12.5.1.3 CAE/CAD/CAM	115
12.5.2 Organization Development Consulting	115
12.6 LOW END DISK SYSTEMS (LEDS)	115
12.7 FORGE ROAD MEDIA OPERATION	116
12.8 STORAGE SYSTEMS ENGINEERING (FOR ENGINEERING AND MANUFACTURING ENGINEERING)	116
12.8.1 Storage Systems Education and Training	116
12.8.2 Advanced Manufacturing Technology Organization	117
CHAPTER 13 DISTRIBUTED SYSTEMS	119
13.1 LOCAL AREA COMMUNICATIONS ENGINEERING	120
13.1.1 Local Area Systems Software	120
13.1.1.1 NAC Documentation and Publications	120
13.1.1.2 Distributed Systems Services	120
13.1.1.3 Network Engineering Technical Services	120
13.1.2 Communication Systems Engineering	121
13.1.2.1 Bridges & Terminal Server Hardware	121
13.1.2.2 NAC XI Program	121
13.1.2.3 Channel Products	121
13.1.2.4 NAC Ireland	121
13.1.2.5 NAC Engineering Design Support	121
13.2 WIDE AREA COMMUNICATIONS ENGINEERING	122
13.2.1 Wide Area Networks Program Office	122
13.2.1.1 Wide Area Networks Program	122
13.2.1.2 Enterprise Network Program	122
13.2.1.3 Network Standards Program	122
13.2.2 Wide Area Systems Engineering	122
13.2.2.1 Wide Area Communications (Reading)	122
13.2.2.2 WASE - IBM Interconnect Engineering	123
13.2.2.3 WASE - Computer Integrated Telephony	123
13.2.2.4 WASE - DECnet Software Engineering	124
13.2.2.5 WASE - Mail/Interchange Engineering	124
13.3 NETWORK MANAGEMENT AND SYSTEMS EVALUATION (NMSE)	124
13.3.1 MCC Base System Engineering	125
13.3.2 MCC Applications Engineering	125
13.3.3 Network Diagnostic Strategy	125
13.3.4 Third Party Transmission	125
13.3.5 DS Technical Evaluation	126
13.4 DISTRIBUTED SYSTEMS ARCHITECTURE AND ADVANCED DEVELOPMENT	126
13.4.1 Distributed Systems Architecture and Advanced Development	126

13.5 ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY GROUP	127
13.5.1 Product Management Group	127
13.5.2 Core Products Development Group	127
13.5.3 Problem Solving Systems Development Group	127
13.6 IMAGE SYSTEMS GROUP (ISG)	128
13.7 NETWORKS AND COMMUNICATIONS (NAC) PBU MANAGEMENT	128
13.7.1 NAC PBU Management	128
13.8 NETWORKS AND COMMUNICATIONS PRODUCT MANAGEMENT	128
13.8.1 Local Area Communications Product Management	129
13.8.2 Wide Area Communications Product Management	129
13.8.3 Network Management Product Management	129
13.8.4 NAC Europe Product Management	129
13.8.5 Operations	130
13.8.6 Strategic Planning	130
13.8.7 Customer Information Group	130
13.8.8 Network Ventures Group	130
13.9 NETWORKS AND COMMUNICATIONS (NAC) MARKETING	131
13.9.1 Product Marketing	131
13.9.2 Merchandising	131
13.9.3 Geographies	132
13.9.4 Strategic Planning & Feedback	132
13.9.5 Industries	132
13.9.6 Strategic Programs	132
13.9.7 Administration	132
13.10 DISTRIBUTED SYSTEMS MANUFACTURING (DSM)	133
13.11 INTERNATIONAL ENGINEERING	134
13.11.1 European External Research Program (EERP)	135
13.11.2 International Standards and Regulations	136
13.11.2.1 Product Safety Europe	137
13.11.2.2 International Standards and Systems Interconnection	138
13.11.2.3 Integrated Services Digital Networks Standardization	138
13.11.2.4 Post, Telephone, and Telegraph (PTT) Bureau	138
13.11.3 CIM International Engineering	139
13.11.3.1 CIMIE Shop Floor Integration (SFI)	139
13.11.3.2 CIMIE Manufacturing Data Integration (MDI)	139
13.11.4 International Advanced Product Development (IAPD)	140
13.11.5 International Engineering Development	140
13.11.5.1 Valbonne Engineering Support and International Engineering Development	141
13.11.5.2 Applications Engineering Group	144
13.11.5.3 International Engineering Consultancy Group	146
13.11.5.4 International Products Group	148
13.11.5.5 International Engineering Process and Quality	152
13.11.6 Telecom Application Engineering Center	154

CHAPTER 14 SYSTEMS SOFTWARE GROUP	155
14.1 SOFTWARE QUALITY MANAGEMENT	155
14.2 SPIT BROOK FACILITY MANAGEMENT	156
14.3 VAX/VMS DEVELOPMENT	156
14.3.1 VAX/VMS Product Management	157
14.4 SOFTWARE DEVELOPMENT TECHNOLOGY	157
14.4.1 Technical Languages and Environments	157
14.4.2 Commercial Languages and Tools	158
14.4.3 Core Applications Group	158
14.5 CORPORATE USER PUBLICATIONS	158
14.6 SSG MARKETING AND BASE PRODUCT MARKETING	159
14.6.1 VAX System Software Base Product Marketing	159
14.6.2 SSG Business Strategy and Planning Group	159
14.6.3 Central Engineering DECUS Administration	159
14.7 ZKO PERSONNEL	160
14.8 SOFTWARE MANUFACTURING BUSINESS UNIT	160
14.9 ASIAN BASE SYSTEMS	160
CHAPTER 15 PRODUCT STRATEGY AND ARCHITECTURE	161
15.1 SECURE SYSTEMS DEVELOPMENT	161
15.2 CORPORATE STANDARDS	162
CHAPTER 16 STRATEGIC RELATIONS GROUP	165
16.1 NEW COMPUTING STRUCTURES	166
16.2 TECHNICAL BUSINESS DEVELOPMENT	166
16.3 STRATEGIC RELATIONS	167
CHAPTER 17 MANUFACTURING OPERATIONS	169
17.1 COMPUTER SYSTEMS MANUFACTURING	169
17.2 NEW PRODUCTS OPERATIONS (NPO)	169
17.2.1 NPO - Program Office	170
17.2.2 NPO Engineering Model Shops (MLO5-3 and MLO1-1)	170
17.2.2.1 Prototype Module Assembly	170
17.2.2.2 Cable/Harness/Sub-Assembly/PROM Program Area	171
17.2.2.3 Sheet Metal/Machine Shops	171
17.2.2.4 NPO Engineering Stockroom 63	171
17.2.2.5 901 - 90 & 91 Class Materials	171

17.2.3	New Products Services (NPS)	171
17.2.3.1	New Products Materials	171
17.2.3.2	New Products Purchasing	171
17.2.3.3	Component Engineering	172
17.2.3.4	Design-Component Engineering (DCE)	172
17.2.3.5	Producibility	172
17.2.3.6	Test Technology and Applications	172
17.2.4	NPO Low Volume Manufacturing (MLO5-4)	172
17.2.4.1	Manufacture of Low End Systems	173
17.2.4.2	Manufacture of Modules and Subassemblies	173
17.2.5	Mechanical Component Engineering Support Services (MCESS)	173
17.2.5.1	Customer Service Center	173
17.2.5.2	Tooling Service Center	174
17.2.5.3	Machining Service Center	174
17.2.5.4	Sheet Metal Service Center	174
17.2.5.5	Plastic Service Center	174
17.2.5.6	Finishing Service Center	174
17.2.5.7	Computer Integrated Manufacturing (CIM) Services	175
17.2.5.8	Purchasing	175
17.2.5.9	Materials Research Laboratory	175
17.3	CORPORATE PRINTED-WIRING BOARDS	175
17.4	SMALL SYSTEMS MANUFACTURING (SSM)	176
17.5	MANUFACTURING CUSTOMER INTEGRATION GROUP	179
17.6	MANUFACTURING INFORMATION AND TECHNOLOGY	180
17.6.1	CAD/CAM Technology Center	180
17.6.1.1	CAD Systems Engineering (CADSE)	180
17.6.1.1.1	Vantage Development Group (VDG)	180
17.6.1.1.2	CAD Environment	180
17.6.1.1.3	CAD Support, Test, And Release (CADSTAR)	181
17.6.1.2	CTC Communications	182
17.6.1.3	Technical Information Engineering	182
17.6.1.4	CTC Technical Operations	182
17.6.1.4.1	Engineering Technical Training	182
17.6.1.4.2	Information Systems	183
17.6.1.4.3	GDS Facilities/Plant Layout CAD/CAM	183
17.6.1.5	CAD/CAM Applications and Data Management	183
17.6.1.6	Application of Integrated Manufacturing Technology (AIMT)	184
17.6.1.7	Program Management	184
17.6.1.8	CTC Technology Strategy	185

17.6.2	Application Systems Development	185
17.6.2.1	Application Systems Development (ASD) North	185
17.6.2.1.1	ASD Systems and Communications Software Group	185
17.6.2.1.2	ASD Documentation and Training Services	186
17.6.2.2	Information Systems Engineering	186
17.6.2.3	Internal Special Systems	187
17.6.2.3.1	Text and Information Management Engineering	187
17.6.2.4	Technical Systems Group	188
17.7	MANUFACTURING MATERIAL/EXTERNAL RESOURCES	189
17.8	STORAGE SYSTEMS MANUFACTURING	190
CHAPTER 18	GIA MANUFACTURING AND ENGINEERING	193
18.1	FAR EAST OPERATIONS	193
18.2	WESTERN HEMISPHERE OPERATIONS	193
18.3	GIA MANUFACTURING AND ENGINEERING SUPPORT	193
CHAPTER 19	PURCHASING	195
19.1	CORPORATE PURCHASING	195
19.2	EXTERNAL RESOURCE MANAGEMENT	195
19.3	CORPORATE ADMINISTRATIVE PURCHASING	196
19.4	STRATEGIC ACQUISITION RESOURCES AND SOFTWARE (STARS)	197
19.4.1	Software Acquisition	197
19.4.2	Consultant Acquisition & Programs	197
19.4.3	Software Supply Base Intelligence and Sourcing Strategies	198
19.4.4	Corporate Purchasing Information Management	198
19.4.5	Purchasing EDI Program Office	199
19.5	ENGINEERING/NEW PRODUCTS PURCHASING (ENPP)	199
19.6	ADVANCE PURCHASING	201
CHAPTER 20	CORPORATE QUALITY GROUP	203
CHAPTER 21	SALES, SERVICES, INDUSTRY/CHANNELS MARKETING, AND INTERNATIONAL	205
21.1	U.S. SALES	205
21.2	SSMI - CORPORATE COMMUNICATIONS	207
21.3	PERIPHERALS AND SUPPLIES GROUP	208
21.4	GOVERNMENT SYSTEMS GROUP (GSG)—PRODUCT DEVELOPMENT	209
21.4.1	Product Management	209

21.4.2	TEMPEST Product Development	210
21.4.2.1	Engineering Support Services	210
21.4.2.2	Interconnect Product Development Group	210
21.4.2.3	TEMPEST Product Design Group	210
21.4.2.4	Electrical Design Technology Group	210
21.4.3	TEMPEST/EMI/Encryption Technology Center - Advanced Development	210
21.4.4	System Integration Engineering	211
21.4.5	Secure Software Development	211
21.4.6	Operations	211
21.5	INDUSTRY MARKETING SERVICES	211
21.5.1	Consultant and Information Systems Marketing (CISM)	212
21.5.1.1	Consultant and Industry Marketing Group	212
21.5.1.2	Executive and Information Systems Marketing Group	213
21.5.1.3	U.S. IBM Competitive Sales	213
21.6	BASIC INDUSTRIES MARKETING GROUP	213
21.6.1	Education, State and Local Government	213
21.6.1.1	State and Local Government Marketing	214
21.6.2	Discrete Industry Marketing	215
21.6.2.1	Aerospace Marketing	215
21.6.2.2	Automotive Marketing	215
21.6.2.3	Electronics Marketing	215
21.6.3	Process Industry Marketing	216
21.6.3.1	Chemical Industry Marketing	216
21.6.3.2	Oil and Gas Industry Marketing	216
21.6.3.3	Food and Beverage Industry Marketing	216
21.6.3.4	Health Care Industry Marketing	217
21.6.3.5	Pharmaceutical Marketing	218
21.7	CHANNELS MARKETING GROUP (CMG)	218
21.8	SOFTWARE SERVICES/EDUCATIONAL SERVICES/CSS	220
21.8.1	Software Services	220
21.8.2	Educational Services	221
21.8.2.1	Corporate Marketing	222
21.8.2.2	Digital Press	223
21.8.2.3	Corporate Marketing—CSO Training	223
21.8.2.4	The Digital Business Fellowship Program	224
21.8.2.5	U.S. Area Customer Training	225
21.8.2.6	GIA Educational Services	225
21.8.2.7	Seminar Programs	225
21.8.2.8	Customer Support Programs (CSP)	226
21.8.2.9	Digital Management Education	226
21.8.2.10	Office Applications Training	227
21.8.2.11	Sales and Software Training	228
21.8.2.12	Field Service Training	228
21.8.2.13	Digital Information Systems Training	229
21.8.2.14	Development and Publishing	229

21.8.2.15 Media Communications Group (MCG)	232
21.8.2.16 Quality Assurance Group (QA)	234
21.8.3 Computer Special Systems (CSS)	235
21.9 FIELD SERVICE	236
21.9.1 Field Service Logistics	237
21.9.2 Field Service Business Development	237
21.9.3 Field Service Business Ventures Group	239
21.9.4 Customer Service Systems Engineering (CSSE)	239
21.9.4.1 CSSE Operations	239
21.9.4.2 Customer Satisfaction Group	240
21.9.4.3 Maintainability Engineering	241
21.9.4.4 Reliability and Maintainability Program Office (RAMP)	243
21.9.5 Advanced Service Delivery Systems (ASDS)	244
21.10 STRATEGY AND PLANNING	245
21.10.1 Management Sciences in Field Operations	245
CHAPTER 22 COMPUTER SYSTEMS MANUFACTURING ENGINEERING AND TECHNOLOGY GROUP (CSME&T)	247
22.1 SYSTEM AND SUPPORT ENGINEERING (SASE)	248
22.2 SYSTEM INTEGRATION ENGINEERING	250
22.2.1 System-Level Design Analysis Program - Systems Evaluation Engineering	251
22.2.2 Methods, Strategies, and Tools	251
22.2.3 Configuration Management Office (CMO)	252
22.3 Systems Reliability Engineering (SRE)	253
22.3.1 Reliability Programs Office, SRE	253
22.3.2 Advanced Development Group	253
22.3.3 Advanced Systems Engineering	253
22.3.4 Design Reliability Engineering	253
22.3.5 Reliability Assessment Engineering	253
22.3.6 Process Reliability Group	254
22.3.7 Reliability University	254
CHAPTER 23 PRODUCT MARKETING GROUP	255
23.1 CORPORATE SYSTEMS GROUP	258
23.1.1 Financial Industry Systems Group	259
23.1.2 Information Systems Product Marketing	259
23.1.3 Telecommunications Systems Group	259
23.1.4 Marketing Programs/Travel Applications	260
23.1.5 Marketing Communications	260
23.1.6 Finance and Planning	260
23.1.7 Personnel	260
23.1.8 Cullinet Strategic Alliance	260
23.2 ENGINEERING SYSTEMS, ULTRIX, PRISM	260

23.3 BUSINESS AND OFFICE INFORMATION SYSTEMS (BOIS)	262
23.3.1 Distribution, Marketing, Sales, and Service Business Systems (DMSS)	262
23.3.2 Finance and Administrative Business Systems (FABS)	262
23.3.3 Electronic Publishing Systems (EPS)	263
23.3.4 Office Information Systems (OIS)	263
23.3.5 Market Development and Programs (MD&P)	263
23.3.6 Systems Engineering	263
23.3.7 Finance and MIS	263
23.3.8 Strategic Planning	263
23.3.9 Personnel	264
23.3.10 Business and Office Systems Engineering (BOSE)	264
23.4 LABORATORY DATA PRODUCTS/SCIENCE GROUP	264
23.4.1 Laboratory Applications Marketing	264
23.4.2 Scientific Applications Marketing	264
23.4.3 Business Development Programs	265
23.4.4 Product Marketing and Planning	265
23.4.5 Systems Engineering	265
23.4.6 LDP Engineering	265
23.4.7 Finance and Administration/MIS	265
23.4.8 Personnel	265
23.5 CIM MARKETING AND PRODUCT DEVELOPMENT GROUP	266

NAME INDEX

SUBJECT INDEX

EXAMPLES

1	Publication Approval Request Form	30
2	Non-Disclosure Agreement Form	33

Preface

What is a manager's job?

I recently gave a talk at Marlboro on "DEC Culture". During that talk I discussed my expectations of all Digital employees, managers specifically. I have since thought that it would be a good idea if I wrote down my definition of a manager's job. This is also the definition of my job since I am a Digital manager. In this way, all Digital employees can understand what is expected of their manager, and evaluate how it impacts them individually.

A manager is first and foremost a leader and a doer. A manager should propose what should be done and then make sure that it gets done. No one at Digital should do things only because "I was told to do it". This applies especially to managers. Digital managers should believe in the value of the work they are directing. A manager bears a special responsibility with respect to doing the right thing for Digital. He or she directs the efforts of many people. Wasting people's working lives is very destructive.

Leaders are certain types of individuals, not titles. The real leader of a project is not necessarily the person at the top of the organization chart. Good managers do not worry about their titles, they see things to be done and get them done. They provide support to people in leadership roles.

A manager must develop trust. Digital is not a very formal company. Much of the real nature of an employee's duties have been defined over time. A manager and an employee must have a trusting relationship if this kind of working relationship is to function. I believe a manager should be very candid with his or her employees on a continuing basis. There should never be any surprises at performance review time.

A good manager is an informed risk taker. I say "informed" because being bold is not enough. Risks should be taken when the manager feels that there is a good chance of producing a quality product. Frequently a good manager "buys in" to someone else's high risk project. This is good as long as he or she believes in the other person's vision of what should be done.

Managers must listen to people, especially the people working for them. The people who do the day-to-day work of an organization are usually in close touch with what is possible and what is not.

A good manager convinces his or her people that what they are doing is worthwhile. There are no second-class citizens or organizations at Digital. If a group of people perceive themselves as being part of a second-class organization, it is part of the manager's job to find out why they feel this way. If there is a real problem, the manager fixes it. If the problem is psychological, the manager changes the way the group thinks about itself. Similarly, managers should not permit other groups to be viewed as second-class.

Managers are sensitive to the needs of their employees. Keeping people productive is a key management function; after all, they do the real work, not the management. A good manager always has time for his or her employees, especially those that truly need help. Since people are the first priority of the manager, there is, by definition, always enough time to attend to their problems and listen to their suggestions. Special attention should be paid to those situations where people are being nonproductive although they are doing their best. If the problem is the system in which these people function, a good manager changes the system.

Managers must recognize that only they can remove many of the roadblocks that prevent high productivity. This is an ongoing job; new roadblocks appear each day. This productivity should be used to produce high quality products. I expect Digital to be an industry leader in the production of quality products. Managers must help build and support a working environment that produces quality products.

Finally, a manager should be an example for his or her employees. A manager who does the job, never passes the buck, and treats other people with respect will find those traits appearing among employees. Every manager is a role model to some extent. A manager who is respected and who is a decent human being will experience problems sometimes, but will always be in a position to call on his or her employees for support when things become difficult.

Bill (BJ) Johnson
Vice President
Distributed Systems

Foreword

The following text is reprinted with permission from "The Unwritten Laws of Engineering" by W.J. King, originally appearing in the May, June, and July 1944 issues of *Mechanical Engineering*. That the article has been reprinted many times during its 40-plus year history should bear witness to its usefulness. It offers much wisdom to young engineers starting their careers, and to older engineers who know these things perfectly well but who all too often fail to apply them in practice.

In Relation To Your Work

However menial and trivial your early assignments may appear give them your best efforts. Many young engineers feel that the minor chores of a technical project are beneath their dignity and unworthy of their college training. They expect to prove their true worth in some major enterprise. Actually, the spirit and effectiveness with which you tackle your first humble tasks will very likely be carefully watched and may affect your entire career.

Occasionally you will worry unduly about where your job is going to get you—whether it is sufficiently strategic or significant. Of course these are pertinent considerations and you would do well to take stock of them, but by and large it is fundamentally true that if you take care of your present job well, the future will take care of itself. This is particularly so in the case of a large corporation, where executives are constantly searching for competent people to move up into more responsible positions. Success depends so largely upon personality, native ability, and vigorous, intelligent prosecution of any job that it is no exaggeration to say that your ultimate chances are much better if you do a good job on some minor detail than if you do a mediocre job as section head. Furthermore, it is also true that if you do not at first make a good showing on your present job you are not likely to be given the opportunity of trying something else more to your liking.

There is always a premium upon the ability to get things done. This is a quality which may be achieved by various means under different circumstances. Specific aspects will be elaborated in some of the succeeding items. It can probably be reduced, however, to a combination of three basic characteristics:

- a. Energy, which is expressed in initiative to start things and aggressiveness to keep them moving briskly.
- b. Resourcefulness or ingenuity, i.e., the faculty for finding ways to accomplish the desired result.
- c. Persistence (tenacity), which is the disposition to persevere in spite of difficulties, discouragement, or indifference.

This last quality is sometimes lacking in the make-up of brilliant engineers, to such an extent that their effectiveness is greatly reduced. Such dilettantes are known as "good starters but poor finishers." Or else it will be said of a man (or a woman): "You can't take him too seriously; he'll be all steamed up over an idea today but tomorrow he will have dropped it and started chasing some other rainbow." Bear in mind, therefore, that it may be worth while finishing a job, if it has any merit, just for the sake of finishing it.

In carrying out a project, do not wait for managers, vendors, and others to deliver the goods; go after them and keep after them. This is one of the first things a new engineer has to learn in entering a manufacturing organization. Many novices assume that it is sufficient to place the order and sit back and wait until the goods are delivered. The fact is that most jobs move in direct proportion to the amount of follow-up and expediting that is applied to them. Expediting means planning, investigating, promoting, and facilitating every step of the process. Cultivate the habit of looking immediately for some way around each obstacle encountered, some other recourse or expedient to keep the job rolling without losing momentum. There are ten-to-one differences between individuals in respect to what it takes to stop their drive when they set out to get something done.

On the other hand, the matter is occasionally overdone by overzealous individuals who make themselves obnoxious and antagonize everyone by their offensive browbeating tactics. Be careful about demanding action from another department. Too much insistence and agitation may result in more damage to your personal interests than could ever result from the miscarriage of the technical point involved.

Confirm your instructions and the other person's commitments in writing. Do not assume that the job will be done or bargain kept just because the other person agreed to it. Many people have poor memories, others are too busy, and almost everyone will take the matter a great deal more seriously if he or she sees it in writing. Of course there are exceptions, but at times it pays to mark a third party for a copy of the memo, as a witness.

When sent out on any complaint or other assignment stick with it and see it through to a successful finish. All too often a young engineer from the home office will leave a job half done or poorly done in order to catch a train or keep some other engagement. Wire the boss that you've got to stay over to clean up the job. Neither the boss nor the customer will like it if another person has to be sent out later to finish it up.

Avoid the very appearance of vacillation. One of the gravest indictments of an engineer is to say: "His or her opinion at any time depends merely upon the last person with whom he or she has talked." Refrain from stating an opinion or promoting an undertaking until you have had a reasonable opportunity to obtain and study the facts. Thereafter see it through if at all possible, until fresh evidence makes it folly to persist. Obviously the extremes of bullheadedness and dogmatism should be avoided, but remember that reversed decisions will be held against you.

Don't be timid—speak up—express yourself and promote your ideas. Every young engineer should read Emerson's essay on "Self Reliance." Too many new people seem to think that their job is simply to do what they're told to do, along the lines laid down by the boss. Of course there are times when it is very wise and prudent to keep your mouth shut, but, as a rule, it pays to express your point of view whenever you can contribute something. The quiet mousey individual who says nothing is usually credited with having nothing to say.

It frequently happens in any sort of undertaking that nobody is sure of just how the matter ought to be handled; it's a question of selecting some kind of program with a reasonable chance of success. This is commonly to be observed in engineering meetings. The first person to speak up with a definite and plausible proposal has better than an even chance of carrying the floor, provided only that the scheme is definite and plausible. (The "best" scheme usually cannot be recognized as such in advance.) It also happens that the person who talks most knowingly and confidently about the matter will very often end up with the assignment to carry out the project. If you do not want the job, keep your mouth shut and you'll be overlooked, but you'll also be overlooked when it comes time to assign larger responsibilities.

Before asking for approval of any major action, have a definite plan and program worked out to support it. Executives very generally and very properly will refuse to approve any proposed undertaking that is not well planned and thought through as regards the practical details of its execution. Quite often a young person will propose a project without having worked out the means of accomplishing it, or weighing the actual advantages against the difficulties and costs. This is the difference between a "well-considered" and a "half-baked" scheme.

Strive for conciseness and clarity in oral and written reports. If there is one bane of an executive's existence, it is the person who takes a half hour of rambling discourse to tell what could be said in a sentence of twenty words. There is a curious and widespread tendency among engineers to surround the answer to a simple question with so many preliminaries and commentaries that the answer itself can hardly be discerned. It is so difficult to get a direct answer out of some people that their usefulness is greatly diminished. The tendency is to explain the answer before answering the question. To be sure, very few questions admit of simple answers without qualifications, but the important thing is to state the crux of the matter as succinctly as possible first. On the other hand, there are times when it is very important to add the pertinent background or other relevant facts to illuminate a simple statement. The trick is to convey the maximum of significant information in the minimum time, a valuable asset to anyone.

An excellent guide in this respect may be found in the standard practice of newspapers in printing the news. The headlines give you 90% of the basic facts. If you have the time and interest to read further, the first paragraph will give you most of the important particulars. Succeeding paragraphs simply give details of progressively diminishing significance. To fit an article into available space, the editor simply lops off paragraphs at the rear end, knowing that relatively little of importance will be lost. You can hardly do better than to adopt this method in your own reports, presenting your facts in the order of importance, as if you might be cut off any minute.

Be extremely careful of the accuracy of your statements. This seems almost trite, and yet many engineers lose the confidence of their superiors and associates by habitually guessing when they do not know the answer to a direct question. It is certainly important to be able to answer questions concerning your responsibilities, but a wrong answer is worse than no answer. If you do not know, say so, but also say, "I'll find out right away." If you are not certain, indicate the exact degree of certainty or approximation upon which your answer is based. A reputation for dependability and reliability can be one of your most valuable assets.

This applies, of course, to written matter, calculations, etc., as well as to oral reports. It is definitely bad business to submit a report to the boss for approval without first carefully checking it yourself, and yet formal reports are sometimes turned in full of glaring errors and omissions.

In Relation to the Boss

Every manager must know what's going on in his or her bailiwick. This principle is so elementary and fundamental as to be axiomatic. It follows from the very obvious fact that a person cannot possibly manage his or her business successfully unless he or she knows what's going on in it. It applies to minor managers and other individuals charged with specific responsibilities as well as to department heads. No one in his or her right mind will deny the soundness of the principle and yet it is very commonly violated or overlooked. It is cited here because several of the rules which follow are concerned with specific violations of this cardinal requirement.

Do not overlook the fact that you're working for your boss. This sounds simple enough, but some engineers never get it. By all means, you're working for society, the company, the department, your family, and yourself, but primarily you should be working for and through your boss. And your boss is your immediate superior, to whom you report directly. It is not uncommon for young engineers, in their impatient zeal to get things done, to ignore the boss, or attempt to go over or around the boss. Sometimes they move a little faster that way, for a while, but sooner or later they find that such tactics cannot be tolerated in a large organization. Generally speaking, you cannot get by the boss; he or she determines your rating and rates you on your ability to cooperate, among other things. Besides, most of us get more satisfaction out of our jobs when we're able to give the boss our personal loyalty, with the feeling that we're helping him or her to get the main job done.

Be as particular as you can in the selection of your boss. In its effect upon your engineering career, this is second in importance only to the selection of proper parents. In most engineering organizations the influence of the senior engineer, or even the section head, is a major factor in molding the professional character of younger engineers. Long before the days of universities and textbooks, master craftsmen in all the arts absorbed their skills by apprenticeship to master craftsmen. It is very much as in the game of golf; a beginner who constantly plays in company with "duds" is very apt to remain a "dud," too, no matter how faithfully the rules are studied. Whereas even a few rounds with a "pro" will usually improve a novice's game.

But of course, it is not always possible to choose your boss advisedly. What if he or she turns out to be somewhat less than half the person he or she ought to be? There are only two proper alternatives open to you; (a) accept the boss as a representative of a higher authority and execute his or her policies and directives as effectively as possible, or (b) transfer to some other outfit at the first opportunity. A great deal of mischief can be done to the interests of all concerned (including the company) if some other alternative is elected, particularly in the case of younger persons. Consider the damage to the efficiency of a military unit when the privates, disliking the leader, ignore or modify orders to suit

their individual notions. To be sure, a business organization is not a military machine, but it is not a mob either.

One of the first things you owe your boss is to keep him or her informed of all significant developments. This is a corollary of the preceding rules: A manager must know what's going on. The main question is: How much must he or she know—how many of the details? This is always a difficult matter for the new engineer to get straight. Many novices hesitate to bother the boss with too many reports, and it is certainly true that it can be overdone in this direction, but in by far the majority of cases the executive's problem is to extract enough information to be kept adequately posted. For every time the boss has to say, "Don't bother me with so many details," there will be three times he or she will say, "Why doesn't someone tell me these things?" Bear in mind that the boss is constantly called upon to account for, defend, and explain your activities to the "higher-ups," as well as to coordinate these activities into a larger plan. In a nutshell, the rule is therefore to give him or her all the information needed for these two purposes.

Whatever the boss wants done takes top priority. You may think you have more important things to do first, but unless you obtain permission it is usually unwise to put any other project ahead of a specific assignment from your own boss. As a rule, he or she has good reasons for wanting his or her job done now, and it is apt to have a great deal more bearing upon your rating than less conspicuous projects which may appear more urgent.

Also, make note of this: If you are instructed to do something and you subsequently decide it isn't worth doing (in view of the data or events) do not just let it die, but inform the boss of your intentions and reasons. Neglect of this point has caused trouble on more than one occasion.

Do not be too anxious to follow the boss's lead. This is another side of the matter covered by the preceding rule. An undue subservience or deference to the department head's wishes is fairly common among young engineers. A person with this kind of psychology may:

1. Plague the boss incessantly for minute directions and approvals.
2. Surrender all initiative and depend upon the boss to do all of his or her basic thinking.
3. Persist in carrying through a design or a program even after new evidence has proved the original plan to be wrong.

This is where an engineering organization differs from an army. In general, the program laid down by the department or section head is tentative, rather than sacred, and is intended to serve only until a better program is proposed and approved.

The rule therefore is to tell your boss what you have done, at reasonable intervals, and ask for approval of any well-considered and properly planned deviations or new projects that you may have conceived.

Regarding Relations with Associates and Outsiders

In all transactions be careful to "deal in" everyone who has a right to be in. It is extremely easy, in a large organization, to overlook the interests of some division or individual who does not happen to be represented, or in mind, when a significant step is taken. Very often the result is that the step has to be retracted or else considerable damage is done. Even when it does no apparent harm, most people do not like to be left out when they have a stake in the matter, and the effect upon morale may be serious.

Of course there will be times when you cannot wait to stand on ceremony and you'll have to go ahead and "damn the torpedoes." But you cannot do it with impunity too often.

Note particularly that in this and the preceding item the chief offense lies in the invasion of the other person's territory without his or her knowledge and consent. You may find it expedient on occasions to do the other person's job in order to get your own work done, but you should first give the other person a fair chance to deliver the goods or else agree to have you take over. If you must offend in this respect, at least you should realize that you are being offensive.

Be careful about whom you mark for copies of letters, memos, etc., when the interests of other departments are involved. A lot of mischief has been caused by young people broadcasting memoranda containing damaging or embarrassing statements. Of course it is sometimes difficult for a novice to recognize the "dynamite" in such a document but, in general, it is apt to cause trouble if it steps too heavily upon someone's toes or reveals a serious shortcoming on anybody's part. If it has wide distribution or if it concerns manufacturing or customer difficulties, you'd better get the boss to approve it before it goes out unless you're very sure of your ground.

Promises, schedules, and estimates are necessary and important instruments in a well-ordered business. Many engineers fail to realize this, or habitually try to dodge the irksome responsibility for making commitments. You must make promises based upon your own estimates for the part of the job for which you are responsible, together with estimates obtained from contributing departments for their parts. No one should be allowed to avoid the issue by the old formula, "I can't give a promise because it depends upon so many uncertain factors." Consider the "uncertain factors" confronting a department head who must make up a budget for an entire engineering department for a year in advance! Even the most uncertain case can be narrowed down by first asking, "Will it be done in a matter of a few hours or a few months—a few days or a few weeks?" It usually turns out that it cannot be done in less than three weeks and surely will not require more than five, in which case you'd better say four weeks. This allows one week for contingencies and sets you a reasonable bogie under the comfortable figure of five weeks. Both extremes are bad; a good engineer will set schedules which can be met by energetic effort at a pace commensurate with the significance of the job.

As a corollary of the following, you have a right to insist upon having estimates from responsible representatives of other departments. But in accepting promises, or statements of facts, it is frequently important to make sure you are dealing with a qualified representative of the other section. Also bear in mind that when you ignore or discount another person's promises you impugn his or her responsibility and incur the extra liability yourself. Of course this is sometimes necessary, but be sure that you do it advisedly. Ideally, another person's promises should be negotiable instruments, like a personal check, in compiling estimates.

When you are dissatisfied with the services of another section, make your complaint to the individual most directly responsible for the function involved. Complaints made to a person's superiors, over the person's head, engender strong resentments and should be resorted to only when direct appeal fails. In many cases such complaints are made without giving the person a fair chance to correct the grievance, or even before he or she is aware of any dissatisfaction.

This applies particularly to individuals with whom you are accustomed to dealing directly or at close range, or in cases where you know the person to whom the function has been assigned. It is more formal and in some instances possibly more correct to file a complaint with the head of the section or department, and it will no doubt tend to secure prompt results. But there are more than a few individuals who would never forgive you for complaining to their boss without giving them a fair chance to take care of the matter.

In dealing with customers and outsiders remember that you represent the company, ostensibly with full responsibility and authority. You may be only a few months out of college but most outsiders will regard you as a legal, financial, and technical agent of your company in all transactions, so be careful of your commitments.

Purely Personal Considerations for Engineers

About 99% of the emphasis in the training of engineers is placed upon purely technical or formal education. In recent years, however, there has been a rapidly growing appreciation of the importance of "human engineering," not only in respect to relations between management and employees but also as regards the personal effectiveness of the individual worker, technical or otherwise. It should be obvious enough that a highly trained technological expert with a good character and personality is necessarily a better engineer and a great deal more valuable to his or her company than a sociological freak or misfit with the same technical training. This is largely a consequence of the elementary fact that in a normal organization no individual can get very far in accomplishing any worthwhile

objectives without the voluntary cooperation of his or her associates. And the quantity and quality of such cooperation is determined by the "personality factor" more than anything else.

This subject of personality and character is, of course, very broad and much has been written and preached about it from social, ethical, and religious points of view. The following "laws" are drawn from the purely practical point of view based upon well-established principles of good engineering practice, or upon consistently repeated experience. As in the preceding sections, the selections are limited to rules which are frequently violated, with unfortunate results, however obvious or bromidic they may appear.

"Laws" of Character and Personality

One of the most important personal traits is the ability to get along with all kinds of people. This is rather a comprehensive quality but it defines the prime requisite of personality in any type of industrial organization. No doubt this ability can be achieved by various formulas, although it is probably based mostly upon general, good-natured friendliness, together with fairly consistent observance of the "Golden Rule." The following "do's and don'ts" are more specific elements of such a formula.

1. Cultivate the tendency to appreciate the good qualities, rather than the shortcomings of each individual.
2. Do not give vent to impatience or annoyance on slight provocation. Some offensive individuals seem to develop a striking capacity for becoming annoyed, which they indulge with little or no restraint.
3. Do not harbor grudges after disagreements involving honest differences of opinion. Keep your arguments on an objective basis and leave personalities out as much as possible.
4. Form the habit of considering the feelings and habits of others.
5. Do not become unduly preoccupied with your own selfish interests. It may be natural enough to "look out for Number One first," but when you do your associates will leave the matter entirely in your hands, whereas they will be much readier to defend your interests for you if you characteristically neglect them for unselfish reasons.

This applies particularly to the matter of credit for accomplishments. It is much wiser to give your principal attention to the matter of getting the job done, or to building up your people, than to spend too much time pushing your personal interests ahead of everything else. You need have no fear of being overlooked; about the only way to lose credit for a creditable job is to grab for it too avidly.

6. Make it a rule to help the other fellow when the opportunity arises. Even if you're mean-spirited enough to derive no satisfaction from accommodating others it's a good investment. The business world demands and expects cooperation and teamwork among the members of an organization. It's smarter and pleasanter to give it freely and ungrudgingly, up to the point of unduly neglecting your responsibilities.
7. Be particularly careful to be fair on all occasions. This means a good deal more than just being fair, upon demand. All of us are frequently unfair, unintentionally, simply because we do not habitually view the matter from the other person's point of view, to be sure that his or her interests are fairly protected. For example, when a person fails to carry out an assignment, he or she is sometimes unjustly criticized when the real fault lies with the manager who failed to give him or her the tools to do the job. Whenever you enjoy some natural advantage, or whenever you are in a position to injure someone seriously, it is especially incumbent upon you to "lean over backwards" to be fair and square.

8. Do not take yourself or your work too seriously. A normal healthy sense of humor, under reasonable control, is much more becoming, even to an executive, than a chronically soured dead pan, a perpetually unrelieved air of deadly seriousness, or the pompous solemn dignity of a stuffed owl. It is much better for your blood pressure, and for the morale of the office, to laugh off an awkward situation now and then than to maintain a tense tragic atmosphere of stark disaster whenever matters take an embarrassing turn. To be sure, a serious matter should be taken seriously, and a person should maintain a quiet dignity as a rule, but it does more harm than good to preserve an oppressively heavy and funereal atmosphere around you.
9. Put yourself out just a little to be genuinely cordial in meeting people. True cordiality is, of course, spontaneous and should never be affected, but neither should it be inhibited. We all know people who invariably pass us in the hall or encounter us elsewhere without a shadow of recognition. Whether this be due to inhibition or preoccupation we cannot help feeling that such unsociable chumps would not be missed much if we never saw them again. On the other hand it is difficult to think of anyone who is too cordial, although it can doubtless be overdone like anything else. It appears that most people tend naturally to be sufficiently reserved or else overreserved in this respect.
10. Give other people the benefit of the doubt if you are inclined to suspect their motives, especially when you can afford to do so. Mutual distrust and suspicion breed a great deal of absolutely unnecessary friction and trouble, frequently of a very serious nature. This is a very common phenomenon that can be observed among all classes and types of people, in international as well as local affairs. It is derived chiefly from misunderstandings, pure ignorance, or from an ungenerous tendency to assume that a person is guilty until proved innocent. No doubt the latter assumption is the "safer" bet, but it is also true that if you treat others as depraved scoundrels, they will usually treat you likewise, and they will probably try to live down to what is expected of them.

Regard your personal integrity as one of your most important assets. In the long pull there is hardly anything more important to you than your own self-respect and this alone should provide ample incentive to maintain the highest standard of ethics of which you are capable. But, apart from all considerations of ethics and morals, there are perfectly sound hardheaded business reasons for conscientiously guarding the integrity of your character.

One of the most striking phenomena of an engineering office is the transparency of character among the members of any group who have been associated for any length of time. In a surprisingly short period each individual is recognized, appraised, and catalogued for exactly what he or she is, with far greater accuracy than that individual usually realizes. This is true to such a degree that it makes people appear downright ludicrous when they assume a pose or otherwise try to convince us that they are something better than they are. As Emerson puts it: "What you are speaks so loud I cannot hear what you say." In fact, it frequently happens that people are much better known and understood by their associates, collectively, than they know and understand themselves.

Therefore, it behooves you as an engineer to let your personal conduct, overtly and covertly, represent your conception of the very best practical standard of professional ethics, by which you are willing to let the world judge and rate you.

Moreover, it is morally healthy and tends to create a better atmosphere, if you will credit the other fellow with similar ethical standards, even though you may be imposed upon occasionally. The obsessing and overpowering fear of being cheated is the common characteristic of second- and third-rate personalities. This sort of psychology sometimes leads a person to assume an extremely "cagey" sophisticated attitude crediting him or herself with being impressively clever when he or she is simply taking advantage of his or her more considerate and fairminded associates. On the other hand a substantial majority of top-flight executives are scrupulously fair, square, and straightforward in their dealings with all parties. In fact most of them are where they are largely because of this characteristic, which is one of the prime requisites of first-rate leadership.

The priceless and inevitable reward for uncompromising integrity is confidence, the confidence of associates, subordinates, and "outsiders." Confidence is such an invaluable business asset that even a moderate amount of it will easily outweigh any temporary advantage that might be gained by sharp practices.

Integrity of character is closely associated with sincerity, which is another extremely important quality. Obvious and marked sincerity is frequently a source of exceptional strength and influence in certain individuals, particularly in the case of speakers. Abraham Lincoln is a classic example. In any individual, sincerity is always appreciated, and insincerity is quickly detected and discounted.

In order to avoid any misunderstanding, it should be granted here that the average person, and certainly the average engineer, is by no means a low dishonest scoundrel. In fact, the average person would violently protest any questioning of his or her essential honesty and decency, perhaps fairly enough. But there is no premium upon this kind of common garden variety of honesty, which is always ready to compromise in a pinch. The average person will go off the gold standard or compromise with any sort of expediency whenever it becomes moderately uncomfortable to live up to his or her obligations. This is hardly what is meant by "integrity," and it is certainly difficult to base even a moderate degree of confidence upon the guarantee that you will not be cheated unless the going gets rough.

Finally, it should be observed that the various principles which have been expounded, like those of the arts and sciences, must be assiduously applied and developed in practice if they are to become really effective assets. It is much easier to recognize the validity of these "laws" than it is to apply them consistently. The important thing here is to select, in so far as possible, a favorable atmosphere for the development of these professional skills. This is undoubtedly one of the major advantages of employment in a large engineering organization. Perhaps, even more important, as previously mentioned, is the selection of your boss, particularly during those first few years that constitute your engineering apprenticeship. No amount of precept is as effective as the proper kind of example. Unfortunately, there is not nearly enough of this kind of example to go around, and in any event it will behoove you to study the "rules of the game" to develop your own set of principles to guide you in your professional practice.

CHAPTER 1

CORPORATE OVERVIEW

1.1 SCOPE

Chapter 1 helps you become familiar with Digital Equipment Corporation in three ways. First, a short history of the company's achievements is provided. Next, "Digital Philosophy" provides you with positive, growth-producing values inherent to the operation of the company. Finally, a word about "DEC Culture" is included.

These topics in Chapter 1 provide you with a perspective with which you may meld your personal goals with those of the corporation to grow and prosper.

NOTE

All domestic telephone numbers in this guide are on the Digital Telephone Network (DTN), accessible only from inside a Digital facility. See your Digital Telephone Directory or contact your local operator for external exchange codes.

1.2 FACTS ABOUT DIGITAL

Digital Equipment Corporation, headquartered in Maynard, Massachusetts, is the world's leading manufacturer of networked computer systems and associated peripheral equipment. It is also the leader in systems integration with its networks, communications, services, and software products. Digital has about 1000 sales, service, manufacturing, administrative, and engineering sites in 64 countries and employs more than 119,000 people worldwide. Currently ranked 38th on the FORTUNE 100 list, Digital ended Fiscal 1987 with operating revenues of \$9.4 billion.

Digital's products are used worldwide in a variety of applications, including scientific research, computation, communications, education, data analysis, insurance, banking, financial services, industrial control, timesharing, commercial data processing, graphic arts, document processing, personal computing, health care, instrumentation, engineering, and simulation.

Beginning in 1957 with 8,500 square feet of rented space in the Mill and \$70,000 of venture capital, Ken Olsen quickly established Digital in the 1960s as the creator of the "minicomputer" industry. Digital's first computer, the PDP-1, which was the world's first small, interactive computer, broke the million-dollar barrier in 1960, providing interactive computing capability for about \$125,000. Digital's first minicomputer, the PDP-5, lowered the cost of interactive computing to about \$25,000.

Important milestones in Digital's history also include the following:

April, 1965	PDP-8, the world's first mass-produced minicomputer introduced
August, 1966	First public stock offering available
April, 1970	PDP-11/20. Digital's first 16-bit minicomputer available
May, 1974	Digital enters FORTUNE 500, ranked 475th in sales.
February, 1975	LSI-11 and PDP-11/70 computers introduced.
October, 1977	VAX-11/780 computer introduced.
June, 1980	Digital, Intel, and Xerox cooperate in Ethernet local network project.
April, 1983	VAXcluster technology announced. Digital entered FORTUNE 100, ranked 95th in sales.
October, 1983	MicroVAX I computer introduced.
October, 1984	VAX 8600 computer introduced.
May, 1985	MicroVAX II computer introduced.
January, 1985	VAX 8650 computer announced.
January, 1986	VAX 8200, VAX 8300, and VAX 8800 computer introduced.
January, 1987	VAX 8974 and VAX 8975 systems introduced.
February, 1987	MicroVAX 2000 and VAXstation 2000 systems introduced.
March, 1987	VAX 8250, VAX 8350, and VAX 8530 systems introduced.
April, 1987	First models of VT300 family of terminals announced.
September, 1987	Digital's 1,000,000th VT220 terminal announced.
January, 1988	Digital and Apple Computer, Inc., announce joint development program.

Digital's computer systems center on four central processor families:

- The PDP-8 12-bit computer family was first used in the laboratory. Today, the PDP-8 functions in machine control, real-time monitoring applications, process control, and a host of business and commercial applications, primarily in DECmate single-user computer systems.
- The PDP-11 16-bit computer family brought new technological advances to small computers. Processors from the LSI-11 to the PDP-11/84 are software compatible. It also uses the broadest range of peripherals and software ever offered. These systems are used for everything from running a lathe to running a railroad.
- The DECsystem-10, a 36-bit architecture system, was the first commercially available timesharing system designed for simultaneous timesharing, batch, remote job entry, and real-time tasks. DECsystem-10s are used by more data service companies to provide timesharing services than any other system. The DECSYSTEM-20, a modified version of our large computer, was designed to bridge the gap between the DECsystem-10 and the PDP-11.
- The VAX is a multiuser, multilanguage, multiprogramming, high performance computer system. It combines a 32-bit architecture, virtual memory operating system, and efficient memory management to provide essentially unlimited program space. Included in this family of computer systems are the VAX 8800, VAX 8250, VAX 8530, VAX 8650, VAX-11/780, and MicroVAX II.

To support its line of processors, Digital manufactures a full line of peripheral equipment, including disk and tape systems, input/output devices, hard copy and video terminals, and communication interfaces. This large selection of peripheral equipment allows Digital's customers to tailor systems to meet their specific needs, with the assurance of expansion capability for future requirements.

Complementing its hardware offering, Digital offers software products that include application packages, operating systems, higher level languages, and utilities. These products provide the full capability to meet a commitment of increased performance at a lower price.

2 CORPORATE OVERVIEW

Equally important, Digital provides resources and services to support all of its products.

- Software support services that range from getting a specialized system up and running to writing a customized application program.
- A worldwide customer support organization of more than 39,000 maintenance, software support, and training professionals deployed at more than 600 locations in 64 countries on five continents.
- Over 520 computer-related courses offered in 16 languages at 110 locations around the world.

Digital also supports Digital Equipment Users Society (DECUS), the largest such group in the world with over 110,000 members worldwide. DECUS sponsors symposia, publishes newsletters, and administers a program library for its members.

A major element in Digital's competitive advantage is its Manufacturing organization. Manufacturing currently consists of about 32,000 people in 34 plants in 11 countries. It is divided into product groups, as well as area groups and functions. The manufacturing product groups - Components, Computer Systems, and Storage - work closely with their counterparts in engineering and the field to orient the company's resources effectively on a world-wide basis.

Today, Digital is one company with one strategy, and all parts of the organization are working toward a common goal. Four parts of this strategy include the following: development of a single computer architecture; commitment to Ethernet; development of workstations and personal computers to serve as powerful terminals on these systems; and commitment to "clustering" to allow multiprocessing among large computers from a common data base.

The following messages clearly state Digital's worldwide strengths:

- *CUSTOMER'S COMPETITIVE ADVANTAGE*— When customers choose Digital computing solutions, they gain a clear advantage over their competition.
- *INTEGRATION OF WORK GROUPS, DEPARTMENTS, AND ORGANIZATIONS*—Integration of work groups, departments and organizations is the real benefit that computers can bring to business.
- *BEST NETWORKS*—Digital is leading the way in establishing multi-vendor networking solutions to allow customers maximum flexibility in network design and use.
- *BEST ARCHITECTURE*—A compatible architecture provides access to tomorrow's technology while protecting yesterday's investment.
- *BEST INTEGRATED APPLICATIONS*—A broad range of industry and applications expertise allows Digital to precisely match complete computing solutions to the specific needs of an industry.
- *BEST SERVICE*—A commitment to service is a commitment to the design, installation, and maintenance of a system over the life of an application.

1.3 DIGITAL PHILOSOPHY

The Strategy Committee feels that the following statement of PHILOSOPHY may be helpful for guidance in communicating the kind of company we would like to be to employees and people outside of Digital.

Honesty

We want to be not only technically honest, but also to make sure that the implication of what we say and the impressions we leave are correct. When we make a commitment to customers or to employees, we feel the obligation to see that it happens.

Profit

We are a public corporation. Stockholders invested in our corporation for profit. Success is measured by profit. With success comes the opportunity to grow, the ability to hire good people, and the satisfaction that comes with meeting your goals. We feel that profit is in no way inconsistent with social goals.

Quality

Growth is not our primary goal. Our goal is to be a quality organization and do a quality job, which means that we will be proud of our product and our work for years to come. As we achieve quality, we achieve growth.

The product we are selling includes the engineering, the software, the manufacturing, and the services. The services include field service, software support, sales, order processing, training, and manuals.

Responsibility

Plans are proposed by managers or teams. These plans may be rejected until they fit Corporate goals or until the Strategy Committee feels confidence in the plans. But when they are accepted, they are the responsibility of those who proposed them. The impetus for a plan may come from outside the group making the proposal, but once accepted, the proposal is the responsibility of the one who proposed it. Others who need to participate in plan implementation are expected to support approved plans.

Management

We particularly want to be sure that management jobs are clear and well-defined. Because so many people are dependent on the plans of managers, it is very important that their plans have regular automatic measurements built into them. Meeting financial results is only one measure of a plan; other measures are satisfied customers, development of people, meeting Digital's long range needs, development of new products, opening new markets, and meeting the commitments made to others in the company. We believe that our commitment to planning assures our freedom to act.

Society

We are committed as a corporation to taking affirmative action in providing equal opportunity for employment and promotion for all persons regardless of race, color, creed, age or sex. We encourage all employees to take responsibility in community, social, and government activities. We are always open for proposals as to what the corporation or an individual on corporation time may want to do in these areas. However, activities done on company time or with company funds should have a formal proposal including ways of regularly measuring success toward goals.

Environment

As good citizens we have a responsibility to keep our environment free of pollution and to set an example by these activities.

Customers

We must be honest and straightforward with our customers. Not only must they be told the facts, but we must be sure they understand the facts.

To the best of our knowledge and ability, we want to be sure that the products we sell answer the needs of the customer, even when the customer is inexperienced. We want our products and services to meet the customer's expectations. To do this, we must clarify in advance all of those expectations in a way that the customer will understand. When we sell a product to a customer, we want to be sure the corporation fulfills the obligations we took on with the sale. We sell our corporation, its products and its services, not a single individual. We must be sure all Digital commitments are met.

Suppliers

We wish to be viewed by suppliers as a desirable customer. Business transactions with suppliers will be conducted on an honest, fair, and open basis. Suppliers and potential suppliers will be treated courteously and given an opportunity to present their goods and services for consideration. Competition is encouraged. Our business ethics require that our employees not accept from suppliers any gifts, gratuities, or entertainment that exceed common courtesy or are of nominal value.

Competitors

We never criticize the competition publicly. We sell by presenting the positive features of our own products. We want to be respectful of all competition, and collect and analyze all public information about competitors. When we hire people from competitors, we should neither ask them for confidential, competitive information, nor should we use confidential literature they may have taken with them.

Simplicity and Clarity

We want all aspects of Digital to be clear and simple and we want simple products, proposals, organization, literature that is easy to read and understand, and advertisements that have a simple, obvious message. We have thousands of employees and many thousands of customers. We have to keep things simple to be sure that we all work together. Our decisions must always consider the impact on the people who will be affected by them.

Standard Products

Standard products are the base of our business. At times, in certain areas, we will invest in hardware and software specifically for special markets. But we should never lose sight that the base of our business is our standard products.

Original Equipment Manufacturers

Selling to OEMs is very important to us. There are more applications for our products than we could ever develop. When OEMs take risks and are very successful in a market, we should respect the risk they took.

However, we may compete with OEMs in very large markets or where the OEM covers only a small segment of the market. When we decide to enter a market, we make this decision independently on the basis of the facts.

Thereafter, we see if we have an OEM who focuses on that market so that we can openly communicate our future plans to that OEM. If we do compete with an OEM, we do it openly and fairly. Conversely, we will respect the right of our OEM to compete with us. When OEMs are in trouble with their customers, we tell them so they can improve.

Personnel Development

We encourage people to develop technical skills, breadth of knowledge, and expertise in a specific area. We also encourage people to develop supervisory and management skills. We believe that individual discipline should be self-generated.

Promotion

We promote people according to their performance, not only their technical ability but also their ability to get the job done and to take the responsibility that goes with the job. Ability is measured not only by past results, but also by attitude and desire to succeed. Performance results are also used to decide if a person should remain in his or her present job.

Hiring from Customers

We should be exceedingly careful when hiring employees from customers. Sometimes this is reasonable and desirable; but we should do it with all caution and by being sure that the employee first tells the customer.

First Rule

When dealing with a customer, a supplier, or an employee, do what is right in each situation.

1.4 DEC CULTURE

Honesty, hard work, moral and ethical conduct, a high level of professionalism, and teamwork are qualities that are an integral part of employment at Digital. Along with the other professional attributes that follow, these qualities are considered part of the DEC Culture.

A First-Name Company

Digital is a people-oriented company. The employee receives courteous, fair, and equitable treatment. Employees conduct themselves in an informal manner and are on first-name basis with everyone at all levels.

Self-Direction

The opportunity for self-direction and self-determination is always present at Digital. This allows employees to use their abilities and expertise to determine their career paths. Although Digital does stress self-improvement and professional growth, decisions concerning career paths are considered the responsibility of the employee. Digital gives encouragement and support in the form of tuition refunds. Job mobility does exist, and employees are free to seek new challenges as part of their professional growth.

Open-Door Policy

The open-door policy encourages employees with a complaint or a problem to talk it over with their supervisor or anyone else they feel can help them. This policy makes employees aware that the company is concerned with them as individuals and encourages them to voice their complaints.

Management Expectations

Management expects hard work and a high level of achievement from employees. A great deal of trust is placed in employees to give their best effort to a job. Generally speaking, management is by objective rather than by directive. Promotions are based on merit rather than by seniority.

Personal Ethics

Employees are expected to act in a mature manner at all times. They should not incur any negative opinions in public either upon themselves as employees of Digital or upon the company itself.

Matrix Organization

Digital is organized around a matrix structure. In a matrix structure, employees interact with other employees on all professional levels, crossing many areas of responsibility and cutting through many chains of command. In essence, everyone is accessible and helpful to you so that you can meet your goal. You go where you have to go, do what you have to do, talk with anyone to get the job done. The matrix organization is goal-oriented and depends upon trust, communications, and teamwork. As a result, most employees function as independent consultants on every level, interacting across many areas necessary to accomplish the task.

CHAPTER 2

PERSONNEL—ENGINEERING/MANUFACTURING/PRODUCT MARKETING

Manager: Dick Farrahar (MLO12-2/T8, 223-7738)

Personnel works with Engineering, Manufacturing and Product Marketing to enable all groups to meet the following objectives.

- Attract, develop, and retain a competent, innovative workforce.
- Link business and organizational requirements with individual employee needs.
- Understand and manage the impact of corporate decisions and conditions on organizational effectiveness and employee morale.
- Develop programs and processes to facilitate communication among employees.
- Ensure that employees are treated fairly, and in a manner consistent with Digital policies and legal requirements of countries/localities where Digital has facilities.
- Develop, support, and manage related administrative programs, systems and tools.
- Influence, participate in, and ensure the integration of group objectives and Corporate Personnel goals.

Personnel—Engineering, Manufacturing, and Product Marketing meet these goals through work in these and other areas of functional support.

- Employee Relations: Interpreting policy, solving problems and providing counseling.
- Compensation and Benefits: Salary planning and review administration, benefits configuration and administration.
- Staffing and Placement: Recruiting, interviewing and assimilating new employees.
- Human Resource Development and Education: Development planning, education and training including QDP, GEEP & TMEP.
- Human Resource Planning and Employment: Human resource planning, workforce analysis, strategic employment and college relations.
- Valuing Differences, Affirmative Action, Equal Employment Opportunity (EEO): Develop awareness strategies, plans and programs; set goals; evaluating; reporting.
- Administrative Systems: Maintaining personnel data base, employee profiles and records.
- Organizational Design and Work Effectiveness: Organizational diagnosis and consulting; organizational and workforce design; process management; business planning.

Each employee has the following individuals available for assistance with personnel issues.

Each group has a Personnel Manager, responsible for the overall management of the functions previously listed. Personnel Managers ensure a productive balance between individual and organizational needs. They consult with group management and other senior-level group members on all aspects of the business that affect people, and provide strategic and long-range perspective on workforce planning issues.

The Personnel Representative and Manager help employees in areas including career development and training, job performance, reclassification and transfers, and leaves of absence. Personnel Representatives work with management on issues of workforce planning, job descriptions, salary planning, Equal Employment Opportunity/Affirmative Action, and organization design and development. They sign personnel requisitions, salary reviews, relocation advances, vouchers, and exceptions, as well as training requests, tuition refund forms, and transfer and termination forms. They also conduct exit interviews.

Personnel Representatives make an effort to meet all new employees, either at an orientation or in an individual meeting, to answer any questions and address any concerns they may have.

The Personnel Services Administrator (PSA) processes paperwork for tuition refunds, disability benefits, U.S. savings bonds, leaves of absence, taxes, increase letters (notice of salary increase), and automatic deposit agreements. They handle employee transfers, orient new hires, and help with retirements. The PSA is the best source of information on benefits at Digital. They also keep employee records.

Your Personnel Services Administrator keeps your personnel file up to date. You can help by supplying your PSA with changes to your address, home phone number, emergency contact, and other essential information. Your department has your Employee Profile, which enables you to keep these records correct.

- Manufacturing/Engineering/Product Marketing
Manager: Dick Farrahar (MLO12-2/T8, 223-7738)
- Compensation/Benefits
Manager: Bob Mulkey (MLO1-5/A98, 223-1974)
- West Coast Engineering and Manufacturing Group
Manager: Hank Feir (UCT, 415-853-2229)
- Human Resource Development and Education
Manager: Larry Rossini (MLO3-6/B5, 223-3433)
- Human Resource Planning and Employment
Manager: Tony Picardi (MLO3-6/B5, 223-3432)
- Engineering Affirmative Action/Valuing Differences
Manager: Donna Taylor (MLO3-2/T98, 223-7034)
- Business Management and Information Systems
Manager: Maurice Vanderpot (MLO3-4/A11, 223-7113)

2.1 MANUFACTURING/ENGINEERING AND MARKETING CENTRAL QUALITY GROUP

Manager: Patricia Cox (ZKO1-2/D13, 381-1353)

The Central Quality Group works with the Corporate Quality Group and the Engineering Education Advisory Board (EEAB) to identify the issues facing the engineering community that are significant factors affecting quality and customer satisfaction during the design of our products. The group's major areas of concentration are as follows:

- To provide education in quality technology for engineers and engineering in cooperation with the Corporate Quality Group.

8 PERSONNEL—ENGINEERING/MANUFACTURING/PRODUCT MARKETING

- To identify, develop, and ensure the use of the quality technologies critical to the delivery of quality computing systems.

2.1.1 Quality Development Program

Manager: Patricia Cox (ZKO1-2/D13, 381-1353)

This group develops and sponsors the development of workshops to assist the engineer in producing quality products.

The following workshops are offered on a regular basis:

- Introduction to Digital for Engineering
- Quality
- Inspection Moderator's
- Introduction to Deming for Digital
- Human Factors in Design
- Exchanging Technical Information
- Statistics for Improving Quality/Productivity

This group also sponsors seminars and special workshops within engineering on topics related to product quality. These seminars may be conducted by external experts or by Digital experts.

This group can provide assistance to engineers and others in developing workshops or seminars within engineering.

2.1.2 Engineering Projects

Manager: Patricia Cox (ZKO1-2/D13, 381-1353)

This group identifies and promotes the use of quality technology within engineering by working on specific product development efforts.

The current projects in this function are as follows:

- Develop a reliability/availability model for estimating system characteristics.
- Provide user interface design consulting to Distributed Systems engineering groups.
- Identify new technologies for engineering quality systems and transfer the appropriate ones to engineering.
- Provide consulting to various engineering groups as requested.

2.2 GRADUATE ENGINEERING EDUCATION PROGRAM (GEEP)

Manager: Shirley Stahl (MLO1-3/U51, 223-9244)

The Graduate Engineering Education Program provides the opportunity for engineers to pursue technical graduate degrees full-time. Engineers who meet the entrance requirements may apply to the GEEP to pursue degrees (Master's and Ph.D's) in engineering (computer, electrical, industrial, mechanical, software) or computer science.

There is an application/selection procedure, and final selection of candidates is made by the Engineering Advisory Board (EEAB), whose members advise Jack Smith's staff on engineering education.

Once accepted into the GEEP and to a university where there is a strong degree program in the discipline the applicant has chosen to pursue, full salary and fringe benefits, university costs (tuition, books, fees), and the costs of relocating (if the university is at a distance) are paid by the GEEP cost center.

The Master's Program is a 12- to 18-month, full-time, graduate study program. The length of time granted to pursue the degree is determined by the university program requirements (thesis/non-thesis, research project).

To qualify for the Master's Program, an engineer must: have a desire to pursue a technical graduate degree on a full-time basis; be employed at Digital for at least 2 years; have made a contribution to the success of the company that can be demonstrated; and have an undergraduate degree.

The PH.D. Program is a two-year, full-time graduate study program for engineers who have completed the required course work. This program allows GEEP Ph.D. participants to meet the university residency requirements and to complete their doctoral research and theses.

Qualifications for the Ph.D. Program are similar to the Master's Program, except that one must be an engineer with at least four years at Digital, and must have completed the coursework toward the degree.

To be considered for the GEEP, an engineer gains his/her manager's support; submits an application for review by the GEEP advisory board, and to at least two recommended university programs in a degree area relevant to the technical priorities of the company.

The GEEP application deadline occurs in mid-February each year.

For additional information, application form, and guideline, contact the GEEP office, 223-9248 or HEIDI::GEEP.

2.3 TECHNICAL MANAGEMENT EDUCATION PROGRAM (TMEP)

Manager: Libby Finn (ACO/E48, 232-2313)

The Technical Management Education Program is sponsored by the Engineering, Manufacturing and Product Marketing organizations to meet the needs of technical managers across the Company. The TMEP is currently under development, with plans to begin piloting its programs in Q1, FY'89.

The objectives of the TMEP are to:

- Enhance managers' knowledge of changes in Digital's competition, marketplace, technology and workforce
- Strengthen management's ability to influence and manage these changes
- Provide a vehicle for the delivery of key Company messages

The TMEP will offer educational activities for senior, middle and first level managers who have technical responsibilities or who manage technical workforces. Areas of emphasis for senior managers will include: future technologies and markets; senior-level customer relations; cross-functional management; the management of technical innovation; and the management of organizational change.

Areas of emphasis for middle managers will include: Digital's marketing, technology and competitive strategies; managing change and innovation; customer relations; building cross-functional relationships; and managing the business.

Areas of emphasis for first-level managers will include: project management; managing a technical workforce; managing technical processes; and understanding Digital's markets, technologies, and competitors.

TMEP offerings will be communicated throughout the organization once they become available.

CHAPTER 3

ENGINEERING PRODUCT OPERATIONS

Group Manager: Jim Cudmore, V.P. (MLO12-2/U33, 223-6923)

The Engineering Product Operations Group provides Product Planning Management, Security Management, and Organizational Development for the Manufacturing, Engineering, and Product Marketing Organization (MEM).

The group's responsibilities include the following:

- Help in the definition and communication of MEM strategies, policies, processes, and procedures both within MEM and across the corporation.
- Provide a point of cross-MEM focus for the Field Operations Organization to ensure visibility to MEM's commitments, management systems, and processes.
- Provide a central security focus that supports the development of consistent protection programs across MEM business organizations.
- Provide management process and organization design consultation to MEM groups.

3.1 ENGINEERING PRODUCT PLANNING

Manager: Bill Koteff (MLO12-2/T39, 223-3123)

The Engineering Product Planning Group drives the planning process across Central Engineering. The group's responsibilities include the following:

- Provide leadership and stability in Product and Process planning across MEM. This activity is in process year-round, with particular focus on the major Q3 budget planning process. EPP maintains and publishes the following planning and process tools:
 - Engineering Long Range Plan Process, documented in the MEM Planning Sourcebook
 - Beige Book, annual Q1 statement of Engineering development commitments
 - Yellow Book, quarterly update to the Beige Book showing progress against plans
 - Top 100 Product Process, which provides for monthly review of critical projects under development
- Support the implementation of the Corporate Phase Review Policy and Process. The Phase Review Policy, published as DEC STD 028-0, applies to all Digital product development projects. The policy provides the following:
 - A consistent mechanism to review the quality and integration of product and system plans
 - A means to approve the level of investment at major decision points in the life cycle of products
 - Improvement in product and system predictability

The Phase Review Process, which supports this policy, provides a framework and an operational guideline that enables Engineering, Manufacturing, Finance, Customer Services, Marketing, and Sales to develop and communicate mutual commitments to product plans and execute those plans in accordance with agreed-upon objectives and schedules.

The Process defines the lifecycle of products over six phases and provides a set of measurable events for each phase. The Process is simple, dynamic, and flexible. It encourages and facilitates effective collaboration among functional groups and improves the discipline and predictability required for an effective development and delivery process.

DEC STD 028-0 *Phase Review Policy* and the *Phase Review Process Guide* are available from Standards and Methods Control (CTS1-2/D4, 287-3724, JOKUR::SMC).

The Engineering Product Planning Group has management responsibility for DEC STD 028-0 and the *Phase Review Process Guide*.

- Drive the development and influence the implementation of an effective Information Systems Architecture across MEM
- Sponsor and support the development of tools that will cause improvements in product predictability
- Provide staff support services to the following groups:
 - *Manufacturing, Engineering, and Product Marketing Staff (MEM Staff)*
 - *Systems Taskforce*
 - *Phase Review Committee*
 - *Product Management Forum*

Any questions or feedback on matters related to the Corporate Phase Review Policy and Process or Engineering Product Planning Process should be directed to the following people:

Claudette Hunt (MLO12-B/T61, 223-5867)
Bill Koteff (MLO12-2/T39, 223-3123)

3.2 MEM SECURITY

Manager: Dave Hamilton (MSO-F1, 223-4282)

Digital has been successful in opening new markets and continues to penetrate existing markets through the consistent development of innovative new products. As a result of our success we have gained increased exposure in the marketplace, which has concurrently increased certain vulnerabilities. In response to this position, MEM has developed a security organization which examines and implements plans and strategies designed to protect Digital's competitive advantage.

The primary goal of the group is to provide a central security focus which promotes the development of consistent protection programs across all MEM business organizations. The group's deliverables include the following:

- Enhance the level of security across the MEM organizations.
- Incorporate intellectual asset protection in business strategy.
- Promote a closer coupling of security to all business objectives.
- Effect positive change in employee attitudes and behaviors in the protection of Digital's information assets.

- Promote cross-functional collaboration in the protection of Digital's long-term competitive advantage.

Any questions or feedback on matters related to MEM Security should be directed to the following people:

Dave Hamilton (MSO-F1, 223-4282)

Gary Brooks (MSO-F1, 223-3125)

3.3 INTERNATIONAL PRODUCTS OFFICE (IPO)

Manager: David L. Brown (MLO4-2/T65, 223-7475, IPOMGR::DBROWN))

The International Products Group (IPO), based in Maynard and Chelmsford, reports to Jim Cudmore, Vice President of Engineering Planning and Operations.

IPO provides product developers and producers with the following services.

- Digital Engineering Standards and writing services to create or modify standards.
- Comprehensive and complete product numbering solutions.
- Accurate and useful regulatory information.
- A comprehensive program designed to overhaul the ECO processes used across the company and to develop new tools for Product Change Processes.

We work with standards owners and regulatory people world-wide.

The IPO organization consists of the following.

- *International Products Office*
Manager: Dave Brown
Secretary: Laura Percy
- *Product Change Process Office*
Manager: Carlton Davenport
- *Corporate Product Safety and Regulations*
Manager: Michael Neuffer
- *Office of the Chief Engineer*
Corporate Chief Engineer: Dick Best
Manager: June Payne
- *Standards and Methods Control*
Standards and Waivers Processes
Manager: Eric Williams
- *Information Systems Development*
Manager: Linda Mckinnon
- *IPO Financial Analyst*
Bill Kelley

For more information, contact IPO at DTN 223-7471.

3.3.1 Corporate Product Safety and Regulations

Manager: Michael Neuffer (MLO4-2/T65, 223-4129)

Corporate Product Safety and Regulations (CPS&R) performs the following functions.

- Manages the total product safety program for Digital and coordinates the activities of product safety groups internationally in engineering, manufacturing, and field service.
- Manages a network of Technical Domains and Country Regulatory Advisors in Digital and provides effective information and processes for international product requirements.
- Arrange Digital's participation on appropriate external regulatory and industry committees on an international basis.
- Coordinates the processes for adding countries to, deleting countries from, and obtaining waivers to the strategic countries list described in DEC STD 066-3 Policy for Designing Products for all Countries Designated as Strategic Markets.

CPS&R maintains product safety standards and policies, and provides training and consultation, agency interface, industry committee participation, and auditing of product safety functions.

CPS&R can help you with questions in the following areas.

- *DEC STD 060-0 Design of Hardware Products to National and International Regulations and Standards*
- *DEC STD 062-0 Product Submittal to Regulatory Agencies*
- *DEC STD 066-1 Technical Domains in the Product Development Process*
- *DEC STD 066-3 Policy for Designing Products For All Countries Designated as Strategic Markets*
- *DEC STD 119-0 Product Safety - Introduction and General Requirements*
- *DEC STD 119-1 Product Safety - Design Criteria*
- *DEC STD 119-2 Product Safety - Test Procedures*
- *DEC STD 136-3 Introductory And Review Processes For Digital Chemical Products*
- *DEC STD 080-0 Product Safety - Industrial Control Equipment, Introduction and General Requirements*
- *DEC STD 080-1 Product Safety - Industrial Control Equipment, Design Criteria*
- *DEC STD 080-2 Product Safety - Industrial Control Equipment, Test Procedures*

CPS&R publishes and updates EL-EN424-00 *Digital Product Safety Handbook*, which provides or references all essential Digital product safety documentation and information.

For further information or assistance please contact the following.

- *Product Safety Domain Manager*
Bob Johnson (CPSR::JOHNSON, 223-4424)
- *Technical Domains and Country Requirements*
Marcia Slarskey (CPSR::SLARSKEY 223-4393)

3.3.2 Standards and Methods Control

Manager: Eric Williams (CTS1-2/D4, 287-3696, JOKUR::WILLIAMS)

Standards and Methods Control (SMC) offers document writing, editing, illustration, administration, publishing, and distribution services to Digital organizations. Types of documentation include the following:

- Digital Standards
- Manufacturing Specifications (process and tools)
- Manuals
- Guidelines
- Lists
- Non product-specific documentation
- Process and Procedures documents
- Project Plans
- Newsletters
- Catalogs

Areas covered by Digital Standards are listed below.

- Hardware Design and Development
- International Product Requirements
- Software
- Systems and Architecture
- Product and Process Management
- Technical Information Management
- Manufacturing Process
- Field Service

Refer to the index document, EL-SMDEX-00 *EL-Class Document Directory*, to determine which standards and related documents apply to your work. You can obtain a copy of the EL-SMDEX-00 by contacting Standards and Methods Order Fulfillment (CTS1-2/D4, 287-3724, JOKUR::SMC). An electronic listing is available on the JOKUR::DEC_STD_INDEX Notes bulletin board.

If your organization has established, or is establishing, policies, requirements, guidelines, or standard procedures that need visibility and distribution beyond your immediate organization, Standards and Methods Control will provide you with administrative control and distribution. Contact Don Mehaffey (287-3675, JOKUR::MEHAFFEY) to discuss your plans. Or, if you wish to discuss writing services, contact Jan Litchfield (287-3681, JOKUR::LITCHFIELD) or Lee Mirkovic (287-3680, JOKUR::MIRKOVIC).

SMC also manages the internal Standards Process as described in *DEC STD 001-0 Management of Technical Standards and Related Documentation* and *DEC STD 066-2 Waivers to Digital Design Standards*. Training on Standards awareness and the internal Standards Review and Approval Process is available. For further information, contact Dana May (287-3669, JOKUR::MAY) or Eleanor Feltes (287-3668, JOKUR::FELTES).

3.3.3 Office of the Chief Engineer

Chief Engineer: Dick Best (MLO3-3/H14, 223-2273)

Manager: June Payne (MLO3-3/H14, 223-2912)

This group develops appropriate nomenclature for all Digital products worldwide, maintains continuity in the option/module numbering system, provides the central focus for reliability prediction data, and furnishes specialized or historical data about options and modules.

The Chief Engineer's Office performs the following functions:

- Consulting on new product nomenclature and other part-number related issues.
- Assigning option and module part numbers based on recognizable logical conventions.
- Gathering pertinent data on model numbers and maintaining a formal record of responsible people for our products.
- Maintaining the integrity and accuracy of option/module data.
- Sourcing option/module Master Part File data on APPIX.
- Providing information to support numerous business functions within the corporation; for example, Export (licensing requirements), Engineering Finance (product financial reporting), Reference Administration (DEC Standard Price File), and Manufacturing Information Center (forecasting).
- Providing reliability predictions (per MIL-HDBK-217) to customers, sales, and field service.
- Investigating and providing information for specialized and historical data requests.

It is important for engineers designing new products and product managers concerned with marketing issues and product offerings to contact the Chief Engineer's Office early to allow for the development of appropriate nomenclature consistent with our other products as well as design, manufacturing, and packaging strategies. Product nomenclature must be in place with the Chief Engineer's Office before other systems (for example, DEC Standard Price System, APPIX Master Parts File, COPUS) can process data associated with the products.

The following forms must be processed and approved by the Chief Engineer's Office:

- Engineering services work requests for printed-circuit boards.
- DEC Standard Price List maintenance forms.

The following publications are available from the Chief Engineer's Office:

- Engineering Newsletter (monthly) containing technical data and systems and procedures that affect engineering and manufacturing, as well as courses and seminars and local IEEE meetings.
- Option/Module List (monthly and quarterly) containing model numbers and associated data.

CHAPTER 4

LEGAL SERVICES FOR ENGINEERING/MANUFACTURING

The Engineering Law Section of the Digital Law Department fills the roles of general counsel to the Engineering/Manufacturing organization, and worldwide intellectual property and product liability expert for the entire corporation. This section provides basic legal information for Digital employees, explains how to deal with the most common legal problems, and tells how to contact an Engineering lawyer if you need more help.

4.1 PROTECTING DIGITAL'S COMPETITIVE ADVANTAGE WITH INTELLECTUAL PROPERTY

Digital is a high-technology company which invests heavily in research, development, and marketing to maintain its leadership in the computer industry. By one measure, these investments are only as valuable as the lead in the market place and the product differentiation which they sustain. The lead obtained through R&D can be sustained by continuing to innovate and improve products at a rate which will keep the company ahead of all other key players, or by obtaining legal rights which will secure the lead once it has been established, or by some combination of the two. Since it is easier to copy an idea than it is to develop one, the value of continuing R&D innovation is enhanced by continually obtaining protection for the innovations.

Digital protects its ideas and innovations, often referred to as intellectual property, by using various methods provided by law. There are five principal areas of intellectual property law: patents, trademarks, copyrights, mask works, and trade secrets.

The following is a brief overview of the law of intellectual property. It explains how you can help Digital protect this valuable corporate asset.

4.1.1 Trade Secrets

The law of trade secrets is based on the recognition that it is unjust to permit the misappropriation of technical or commercial know-how that is not in the public domain. The law provides a legal right to prevent, or to recover damages for, an unauthorized disclosure or use of technical or commercial information that is a trade secret. A trade secret may be any confidential formula, pattern, device, or combination of information used in one's business that gives him or her an opportunity to obtain an advantage over competitors who do not know or use it.

A trade secret must be kept "secret" so that it does not become publicly known. A trade secret may be lost by disclosure to others without any limitations. However, the law of trade secrets can be extended into the marketplace by means of contractual arrangements binding the recipient of information to keep it secret.

To adequately prevent trade secrets, either ours or those of others, from becoming publicly known, appropriate internal procedures must be undertaken. The following procedures should be adhered to:

- Ensure that trade secret information is not provided to customers or vendors except under appropriate agreements.

- Restrict access to the information to those employees and agents having a "need to know" and inform those employees and agents having access to the information that it is confidential.
- Maintain general security precautions on the premises, do not leave confidential information in open or uncontrolled areas, restrict access to those locations having sensitive information, and so forth.

Sometimes during the course of business we may disclose trade secret information that relates to new products before they are announced. If a business decision is made to disclose Digital information, an appropriate nondisclosure agreement must be signed by the recipient. Although the nondisclosure agreement provides some protection, the best protection, of course, is not to disclose the information. Once released by an outside party, whether accidentally or deliberately, Digital confidential information may become public property and subject to unrestricted use. The first approach always should be to try and find a way to conduct transactions without disclosing or transmitting Digital confidential information. This is particularly true for very sensitive and highly proprietary information.

Just as we do not want to disclose our confidential information without restrictions, neither do our customers and vendors. At times we may visit a customer's plant or see what is going on in his or her business, and often the customer may ask us to execute a nondisclosure agreement to protect his or her trade secret information. This is a dangerous situation. We are a large company with a great deal of internal development work. Also, we are exposed to a large number of ideas from our customers. If we internally develop or receive an idea from a third company which resembles information received under a nondisclosure agreement, Digital's legitimate use of the idea could be in violation with the nondisclosure agreement, even if there was no awareness of the other party's trade secret by the developer at Digital.

It is Digital's general policy not to execute nondisclosure agreements. We refuse to receive any trade secret information submitted to us from companies or persons outside of Digital. If for significant business reasons an exception to this policy must be made, then a specific nondisclosure agreement must be negotiated by the Law Department. An appropriate Vice President must sign the agreement on behalf of Digital.

It must be remembered that all Digital employees are obliged to respect the trade secrets of former employers. Thus, no person at Digital is to be given any information which one has reason to believe is a trade secret of a former employer.

4.1.2 Patents

Many countries use patents to grant to inventors the exclusive rights to their inventions. In the United States, such exclusive rights take the form of patents granted by the U.S. government through the United States Patent and Trademark Office in Washington, D.C.

There are several types of patent applications including: Utility patents—covering machines and articles of manufacture; Design patents—covering the appearance of articles of manufacture; Process patents—covering procedures by which machines operate or things are made; and Software patents—covering the steps by which a computer operates.

In return for granting the inventor an exclusive right, the government asks for a complete disclosure or description as to the manner in which the invention operates. This is a crucial part of the patenting process. This crucial part rests most heavily on the inventor. The inventor has the obligation to describe his invention in his patent application with the help of the patent engineers and patent attorneys.

See subhead 4.5.1 for more details on how the Digital inventor may satisfy this obligation.

Digital invested more than a billion dollars in research and development last year, and filed to obtain more than one hundred patents in the United States alone on the results of that research. Patents protect Digital's existing products as well. Every VAX system you sell is covered by at least eight patents. A patent gives the developer of a new idea the legal right to keep others from using or selling the idea in a particular country for a limited period, usually ten to twenty years. Digital needs patents because it is almost always easier and cheaper to copy a good idea than it is to develop it in the first

place. Patents allow Digital to recover and profit from its tremendous investment in technological innovation, and ensure that Digital will continue to have the resources to invest in the technologies of the future.

The patent law provides heavy penalties for disclosing or commercializing an invention before the patent application is filed. While customers and others undoubtedly need some information for planning purposes, inappropriate disclosures in the pre-announcement phases of product development may destroy all Digital's chances of obtaining a patent on the product or, if discovered later, may even invalidate a patent Digital has already received. If you are ever called upon to discuss product futures or if your accounts ever request information on unannounced products, you need to know how you can respond without jeopardizing Digital's patents.

The rules for dealing with customers are in the new Corporate Proprietary Information Disclosure Policy (PID). Copies can be obtained from John Riedl by calling him at DTN 297-9737. The purpose of the policy is to make information more easily available to customers while preserving Digital's patent position. Because many sales-oriented activities, such as providing firm price and delivery data, bringing engineers together for in-depth technology discussions, and asking for orders, can create issues under the patent laws, it is important to operate strictly within the policy. Do obtain a properly executed non-disclosure agreement. Stick with your subject. Give only approved presentations and limit discussion to clarification of the information contained in the slides. Particularly avoid giving "firmer" price or delivery data than is contained in the slides or discussing products not covered in the presentation. Do discuss product performance and advantages, but avoid engineering-level discussions of the technologies and architectures used to obtain performance. Only senior Sales Operations management can agree to accept orders for unannounced products. Never take an order for, or offer to "reserve", an unannounced system for a customer without the appropriate approvals.

If you are ever asked to discuss unannounced products with non-customers, contact your local Field Attorney for an appropriate non-disclosure agreement. Even with a non-disclosure agreement, provide information only on a need-to-know basis (see subhead 4.5.3).

Your participation in protecting our patents is critically important. Well-intentioned but careless discussion outside the company could cost Digital billions of dollars in lost revenue, and could subject the company to expensive and embarrassing lawsuits. With your cooperation, Digital can protect its technology for tomorrow while telling its customers what they need to know today.

4.1.3 Copyrights

A copyright is a legal right to prevent others from copying, distributing, modifying, or publicly displaying an author's work, provided the work is marked with a proper copyright notice. However, a copyright does not protect an author's ideas. It protects only his or her individual expression of those ideas. Ideas expressed in a copyrighted work may be freely used by anyone; however, if someone copies the same expression or modifies it slightly, he or she is not free to use the copy or modification.

For all copyrighted publications, a copyright statement must look like the following.

© Digital Equipment Corporation 1987. All Rights Reserved

This statement must be used on the title page or the reverse side of the title page. The year specified should be the year of initial distribution of the publication. For subsidiary publications the name would be changed, but the copyright notice would remain the same.

NOTE

The U. S. Copyright Office no longer accepts the symbol (c). In those cases where © is not available use both the word copyright and the symbol (c).

A recent change in the copyright laws allows protection for unpublished works. Those may be disseminated to a limited audience, for example to a small group of potential vendors under non-disclosure agreements. The following notice should be used in these instances.

© Digital Equipment Corporation 1985

This is an unpublished work which contains confidential and secret information which is protected under the copyright laws. The existence of the copyright notice is not to be construed as an admission or presumption that publication has occurred. Unauthorized copying is strictly prohibited. All rights reserved.

The above notice also appears in the inside cover of the Digital Telephone Directory.

Digital information protected by copyright is frequently written information. However, it may also include engineering drawings, software, photographs, audio-visual training courses, and other items.

At Digital we make a substantial investment in developing copyrighted materials. We disseminate to our customers a great deal of useful information about our products. At the same time, we use the exclusivity that copyright laws provide to prevent unfair use of our publications. Such unfair use occurs when a similar product is made by a competitor and our copyrighted material is used to describe the similar product.

You should, therefore, be aware that any written works that are expected to be published must have appropriate copyright protection. In the same manner, we must be careful not to violate the copyright of others when we are using their works.

Digital invests a great deal of money and resources to acquire and develop software products. Because the software products, once on the market, are easily reproduced and copied (the vast number of delivered Digital computers are a ready market for Digital software), it is important that our company legally protect software products against improper duplication and distribution. Digital has elected to protect its software by copyright, patent, trade secret, and contract.

A software license agreement is the legal vehicle by which our customers are licensed to use the trade secrets and copyrights incorporated in our software. Without some form of license agreement, our trade secrets and copyrights in our software products may not be protected when software is provided to customers. For this reason, Digital places extreme importance in providing software only under an appropriate licensing agreement.

Digital relies heavily upon copyright to protect its software and firmware products. Recent decisions in the United States have apparently extended the coverage of copyright law to the structure and organization of a program, at least where a number of ways exist to accomplish the end result of the program's functionality.

It is advisable to include a copyright notice on the media carrier (tape hub, diskette cover, chip carrier cover, and so on) and first screen. Further, a string containing the copyright notice should be embedded in the code. The choice of notice is dependent upon whether or not the software is to be published, has been published, or will remain unpublished.

DEC STD 197-0 Legal Guidelines for Digital Publications contains additional information of the legal requirements for publications, and software including requirements for controlling proprietary information and protecting Digital against liability.

4.1.4 Mask Works

Integrated circuits (i.e., semiconductors) are manufactured by using a series of masks to either deposit material or remove material from the surface of the chip in predefined patterns. The masks utilized in this process, and the semiconductor product itself, are protected from unauthorized copying by the Semiconductor Protection Act of 1984.

At Digital, many of the semiconductor chips used in our systems are manufactured internally. Other chips we use are purchased as custom components to be sold in Digital's products only. Both of these types of chips are protectable under the Semiconductor Protection Act.

The protection of these integrated circuits is an important aspect in the overall product protection strategy. The mask works notice should be on the chip (die) itself, and visible to the unaided eye on the surface. The notice should also be visible on the chip package when mounted on a printed circuit board. The notice should include the letter "M" bracketed by asterisks or the letter "M" in a

circle. Additionally, the name of the owner of the mask works rights must be included. Examples of appropriate chip notice are as follows:

DIGITAL OR *M* DIGITAL EQUIPMENT CORPORATION
© 1988

Note that the copyright notice is included in the first example to prevent unauthorized copying of the microcode contained in the chip, as well as to provide protection in countries that do not have specific laws to protect semiconductors.

Also, since the placement of the notice on the chip uses valuable chip surface area, the notices are compressed to occupy as little area as possible, and yet still be readable.

An additional requirement for protection is the formal registration of the mask works and semiconductor product in the U.S. Copyright Office. This procedure is required prior to enforcing our rights against an infringer, and is performed by the Legal Department. All organizations that purchase custom semiconductors are required to insure that proper notices are on the chips, and that registration materials are provided to the Legal Department as soon as the devices are available for commercial uses such as sales or customer demonstrations.

4.1.5 Trademarks

A trademark is one or more words, a name, symbol, device, shape, or slogan used by a manufacturer to indicate the source of the goods or services and to distinguish its goods and services from those of others. Digital trademarks inform the customer that the product was manufactured by Digital and not someone else. By using a trademark, the owner of the trademark is, in effect, guaranteeing that the trademark product is of the same quality as similarly trademarked products acquired in the past. A trademark is a valuable asset since it provides a highly recognizable link between a customer and the products of the company.

Digital has invested significant amounts of money to associate its trademarks with its products. Marks such as DEC, DECUS, PDP, VAX, VMS, and the Digital logo are well recognized in the industry and throughout the industrial world. However, trademarks must be protected or they can be lost. It is relatively easy to protect and care for trademarks. Here are some of Digital's more prominent current trademarks:

DEC	MASSBUS	UNIBUS
DECmate	MicroVAX	VAX
DECsystem-10	PDP	VAXcluster
DECSYSTEM-20	P/OS	VAXstation
DECnet	Professional	VMS
DECUS	Rainbow	VT
DECwriter	RSTS	Work Processor
RSX	The Digital Logo	

In addition, Digital is constantly coining new marks. Before a new trademark is announced or used, it should be submitted to an attorney for a trademark clearance search. This will help us to determine if our new trademark will infringe on a trademark already belonging to someone else. By having the trademark search performed early, most legal problems will be found before the company incurs advertising and other costs.

In addition to the attorneys responsible for the trademark activity emanating from each group, Shirley Fleming, a Trademark Legal Assistant, is available to handle "day to day" trademark questions. These questions may include the following:

- Correct trademark usage
- If a product name may be used as a trademark
- If a potential product name is available for use as a trademark

- What a correct trademark notice is, and why
- Correct spelling of a trademark (for example, ScriptPrinter vs. SCRIPTPRINTER)
- When do we gain trademark rights in a product name

If you encounter any suspicious use of our trademarks by a party outside of Digital, or are planning or participating in the process of choosing a trademark for a new product or service, an attorney should be advised.

Proper selection and use of trademarks is set forth in *DEC STD 197-0 Legal Guidelines for Digital Publications* and *EL-00490-00 Trademark Handbook for Digital Employees: Guidelines for Using Trademarks*, both available from Standards and Methods Control (CTS1-2/D4, 287-3724, JOKUR::SMC). Also available from this group are a list of Digital's trademarks, *EL-00490-01 Trademark Handbook for Digital Employees: Digital Trademarks List* and a list of frequently referenced trademarks of others, *EL-00490-02 Trademark Handbook for Digital Employees: Third-Party Trademarks List*. When one of our marks or the marks of others are used, these lists should be referenced.

4.2 TRADE REGULATION

In general, our marketing, advertising, and other sales material should reflect high standards of fairness and openness in our dealings with customers and competitors. Often in this field of law, even the suggestion of an unfair trade practice, though contrary to fact, is enough to provoke a problem. Internal materials such as planning documents, newsletters, and competitive updates should employ similar standards in reference to how we deal with and compete with competitors.

- Digital's share in a particular market segment should not be defined except where absolutely necessary, and then only in very general terms (for example, "substantial"). Similarly, statements that we "dominate" or "control" a particular market segment should not be made.
- Documents announcing or discussing price changes should be carefully reviewed. No suggestion should be made that a price change is motivated by a desire to injure competition or force a competitor out of a particular market or a market in general.
- Advertising documentation should not contain specific references or implications that different customers will receive different prices or different terms of sale. Though differences in prices are permitted for different types of customers (for instance, the OEM versus the end user), most advertising does not identify the market or type of customer at which it is aimed. Under these circumstances, there should be no statements which would lead the consuming public to believe that there are pricing differentials. It is, however, permissible to indicate differences in price based upon quantities purchased.
- There should be no direct statements or implications that the purchase of one product is required to buy another product.
- Statements should not be made concerning tactics in dealing with suppliers to gain better prices or make the supplier more responsive to our needs.
- Any activity or language that would expressly or by implication raise a question of any anti-competitive activity should first be cleared with the Law Department.
- Many of Digital's customers, vendors, licensees, and research co-venturers are also competitors. Since the most serious antitrust violations involve agreements between competitors that restrain competition, extreme care must be taken to ensure that all communications with competitors are confined to the particular customer, vendor, or other relationship. Any question about the propriety of a communication with a competitor should immediately be brought to the attention of the Law Department.

With base marketing at Digital becoming the responsibility of the Engineering groups, Engineering should be aware of compliance with those laws and regulations that affect the ways in which we deal with our customers and competitors.

4.3 PRODUCT LIABILITY

In recent years, courts and legislatures of the areas Digital sells in, have been focusing considerable attention on the effect of design and manufacturing practices and marketing and sales activities of products being sold and the liability that can be created as a result of these practices and activities. While computer products, because of their traditional use by only a select group of technically sophisticated users, have received only minor attention by the public, the recent broadening markets and wide distribution of the computer is expected to generate more significant legal interest in computer-related product liability lawsuits.

The effect of such interest in Digital products, both hardware and software, manufacturing, marketing, and sales practices and activities for our products, is of greater concern to Digital, and its Engineering community, than ever before.

- The manufacturer of a product is under a duty of care to make products that avoid reasonably foreseeable injury to the user and the public, even if there is no contract (for instance, sales agreement) between the injured party and the manufacturer.
- Damages may be recovered for knowingly making false representations of a product's capabilities. One who sells products or who, by advertising, labels, or otherwise, makes to the public a misrepresentation of a material fact concerning the character or quality of a product sold by him is subject to liability for physical harm to a user of the product caused by justifiable reliance upon the misrepresentation.
- In recent years many regional, national, state and local regulations, along with enforcement agencies, have been enacted covering manufactured products. Failure of products to conform to such regulations can give rise to significant civil liability, and even criminal liability in some cases. Some significant acts include USA Consumer Product Safety Act, USA Federal Hazardous Substances Act, Communications Act of 1934 (regulating RFI/EMI), USA Radiation Control for Health and Safety Act, and USA Uniform Deceptive Trade Practices Act. The notion of strict liability that was, until recently, prevalent only in the U.S. is now a reality in most industrial nations.

The Engineering and Manufacturing community at Digital can help prevent a product liability case against Digital through continued efforts to design and produce high-quality products that meet customers' reasonable expectations. Means for preventing litigation against Digital include design controls, adoption of standards, component and finished product testing programs, advertising controls, and product safety audits.

4.4 U.S. EXPORT CONTROL LAWS

The delivery of Digital's products, technology, and services outside the United States is subject to U.S. export regulations. The heart of these regulations, which are intended primarily to keep militarily-useful U.S.-origin products and technology out of the Soviet Bloc, consists of detailed export license requirements that must be satisfied as a condition of engaging in numerous types of product, technology, and service transactions.

Although most of our international transactions are made under General License or Distribution License authority that permit the transaction to be handled through standard, company channels, Digital has certain products that cannot be exported until the U.S. Government issues an Individual Validated License. Some products and technology (e.g., encryption, TEMPEST) always require such Individual Validated Licenses when delivered outside the U.S. or Canada, while other products (e.g., high-end VAX systems) require such licenses only to certain country destinations. Because the applicable license has a significant effect on exportability, export license classification should be obtained from Corporate Export/Trade at an early stage in product design and development.

The products subject to U.S. export laws include finished systems, as well as subassemblies, modules, parts, and they also include prototypes. Covered technology includes technical data in both tangible and intangible form, as well as software. The oral or written disclosure of technical data to a foreign national anywhere in the world is considered an export and is subject to U.S. export laws.

All Digital employees worldwide, including the Engineering community, whose activities involve the export of products or technical data must be aware of applicable export requirements. Violations of these requirements could have extremely serious consequences for the company, including withdrawal of export privileges and substantial fines.

Potential violations of these U.S. legal requirements should be reported immediately by the employee to his or her manager. If this action fails to resolve the matter, the employee and/or the manager should report the matter to the Corporate Export/Trade Group, in Washington, D.C., and to the Law Department.

For more detailed information, please consult the Corporate Export Reference Manual, which is distributed to various levels of operational and managerial Digital employees, or contact the Law Department or the Corporate Export/Trade Group directly.

4.5 GUIDELINES FOR HANDLING SOME COMMON LEGAL ISSUES

4.5.1 How To Get a Patent on Your Idea

In the course of his or her work, an engineer may develop an invention (a new and useful mechanism, article or method) that has a degree of novelty and uniqueness necessary to satisfy the requirements of the U.S. government.

It is sometime difficult for an engineer to identify an invention from all of his or her day-to-day duties. A simple test is to ask oneself if the mechanism, article or method provides improvements over that which is replaced. For example, does the mechanism perform work faster, better, with fewer parts and using fewer steps? Is throughput increased through a machine or through a mechanism? Is a new substance created by a new process? Is the method such that it uses fewer steps to achieve the same product or different steps to create a new product?

Once an engineer is able to answer "YES" to any one of the above questions or to the myriad of similar questions readily obvious in light of the examples given, the engineer concludes that he or she has made a potential invention.

At this point the engineer/inventor should involve the extensive patenting process currently in place within Digital.

HOW TO START

The inventor should start by obtaining a Record of Invention (ROI) form. The ROI form can be obtained from the Patent Engineer for your engineering group (see attached listing). In the event your engineering group does not have a patent engineer, contact Joyce Lange (223-3737, WITNES::LANGE, MSO/M6).

Once the ROI form is completely filled out, submit it to the Patent Engineer. Again, if there is no appropriate patent engineer, submit it to the Law Department, Engineering Law Section, in care of Joyce Lange at MSO (111 Powdermill Road, Maynard, MA 01754).

The ROI form is then used within the Digital patenting process to determine if a patent application should be filed on the subject matter.

Fill out the ROI during the prototype or breadboard stage during the development cycle of a product. Complete it well in advance of any incorporation of the invention into a product that is announced, shipped or described in any publication!

Whenever an invention is incorporated in a product that is sold, announced or shipped, the rights obtainable by Digital are reduced or even eliminated by this activity. Therefore, it is very important that the Record of Invention form be submitted well in advance of any of these activities to achieve maximum protection for Digital.

It is important to note that within the ROI there are places for the inventor to inform the Engineering Law Section as to when public use, public sale, or publication of the invention is planned. Careful thought should be given in the presentation of information within this section because, as briefly mentioned above, a disclosure outside the company prior to the filing of an application in the United States may result in the loss of worldwide rights to the invention on behalf of both the inventor and Digital.

To aid in the protection of inventions, Digital has established an Intellectual Property Committee to support each engineering group. This committee reviews the ROI form and determines whether or not to file a patent application on the invention.

A basic Digital patent policy has been formulated under which the Corporation attempts to find (and file patent applications for) at least one patentable invention in each product it expects to sell in volume. A patent on our important products may range from protecting a feature in the product to the entire architecture of the product.

Although the company is more likely to file for patents on inventions actually incorporated in products, Digital will file for patents on other inventions.

Patents obtained by Digital are used to prevent other people from making the product. Digital also licenses the use of some of its patents so it is paid a royalty for each product made that is covered by the patent. Business factors will determine if we should share the idea by licensing others to use it.

As part of their responsibility to protect new ideas of the company, all personnel performing scientific or technical work in the fields of research, development, and engineering should maintain accurate and complete records of their work. The purpose of maintaining these records is to have a legal record to substantiate the conception of inventions covered by patent applications.

The Digital Engineering Notebook is a valuable tool developed for this purpose. It is the responsibility of Digital technical personnel to maintain Engineering Notebooks, particularly in those instances involving a description of a development that may be patentable. Notebooks may be obtained from Brian Keefer (225-4200, STUDIO::KEEFER).

PATENT COMMITTEES - U.S.A. BASED

- *Artificial Intelligence Technology Center (AITC)*
(AITC is part of Distributed Systems)
Barry Marshall (291-8447, AIADM::BMARSHALL)
- *Computer Special Systems (CSS)*
Joseph Smith (264-6554, WOODRO::JSMITH)
- *Corporate Research (CRA)*
Wayne Timura (223-6630, CRAVAX::TIMURA)
- *Distributed Systems DILG*
Israel Gat, (226-7751, ERLANG::GAT)
- *High Performance Systems (HPS)*
Joe Zeh (297-5924, BARNUM::ZEH)
- *Low End Systems (LES) Advisory Committee*
 - *LES-D&PE*
Jim King (223-5903, ECADJR::KING)
 - *LES-EMD&S*
Ivan Krisstofy (223-6672, ENGINE::KRISSTOFY)
 - *LES-MSD*
Brian Fitzgerald (223-4490, AXIS::FITZGERALD)

- *LES-PCSG*
Bill Kelly, (226-2507, SPCTRM::BKELLY)
- *LES-DSG*
Dave Sweeney, (223-6371, RAGA::SWEENEY)
- *LES-Worksystem*
John Cyr, (223-5455, CLIPER::CYR)
- *Mid-Range System Business (MSB)*
Charlie Barbas (293-5334, DECEAT::BARBAS)
- *Semiconductor Operations (SCO)*
Rich Hollingsworth (225-4886, ROLL::HOLLINGSWORTH)
- *System Software Group (SSG)*
William Segal (381-1263, MG::SEGAL)
- *Storage Systems (SS)*
Harold Potter (237-3067, STARCH::POTTER)

PATENT COMMITTEES - FOREIGN BASED

- *Canada (KANATA)*
Bill Mooney (621-2515, KAO3/1)
- *Japan (TOYKO; Japan Research and Development Center)*
See Storage Systems
- *West Germany (KAUFBEUREN; European Storage Systems)*
See Storage Systems

ENGINEERS

- *High Performance Systems*
Stan Sherman (297-4524, MRO1-3/T4, BARNUM::SHERMAN)
- *Low End Systems*
Doug Goldhush (223-7310, MLO1-5/U36, MILRAT::GOLDHUSH)
- *Mid-Range System Business*
Charlie Barbas (293-5334, BXB1-1/F11, DECEAT::BARBAS)
- *Semiconductor Operations*
Clay Satow (289-1987, APO-2/F2, NUHAVN::SATOW)
- *Storage Systems*
Bill O'Brien (237-3128, SHR1-3/E29, CACHE::OBRIEN)

4.5.2 Getting Your Publication Approved

Introduction

Digital encourages its employees to publish in recognized scientific and engineering journals and other publications, including presenting papers at recognized symposia and conferences, and participating in such bodies as standards setting committees and groups. Digital and its employees benefit from the prestige of having papers by Digital employees recognized for the value of their content by being so published and by such participation.

However, this encouragement must be tempered by Digital's need to protect its intellectual property rights, and by the need to avoid certain other potential problems for Digital which could arise from the content of a published article or paper.

Intellectual Property Rights Protection

As of the effective date of the publication of an article or presentation of a paper, etc. which discusses possibly patentable subject matter, unless an appropriate patent application has been filed, there may be a destruction of the right of Digital to file for and obtain patent rights to the invention(s) discussed (the more detail discussed the more likely the patent rights will be destroyed). Any other distribution of information outside of Digital which could be considered making the information available to at least that part of the public generally interested in the subject matter of the information, e.g., disclosures to standards setting bodies having essentially industry wide participation, could have the same effect. This applies in virtually all countries outside the United States, in which Digital would be interested in obtaining patent rights. Even in the United States, a one year clock begins to run as of the effective date of any such publication or disclosure, during which a patent application must be filed, or else the patent rights are destroyed. The effective date of the publication could be as early as the date the abstract is sent to be reviewed by the publisher or by the review committee for the symposia or conference. Even if Digital has filed the appropriate patent application(s), prior to product announcement, it may be inappropriate to describe the product in a publication or disclosure. For these reasons, a publication approval should be obtained before any submission is made of anything relating to an article or paper to anyone outside of Digital or any other disclosure that is public in nature is made outside of Digital. Also, if an abstract is submitted first, the final article, paper, or presentation should separately be approved for publication.

Even if the paper or presentation does not disclose patentable subject matter or discloses subject matter which may be patentable but has been decided not to be sought to be patented, by the appropriate PBU Patent Committee, some part(s) or all of the paper may be inappropriate for publication. This is because the publication or presentation could destroy the ability of Digital to maintain whatever measure of exclusivity to the technology discussed in the paper, which Digital could otherwise obtain from trade secret protection. A trade secret, by definition, must be maintained in confidence by the owner of the trade secret rights - Digital. Publication or public disclosure destroys the confidential nature to Digital of the information so published or disclosed.

In some instances, publication can destroy or alter Digital's rights to copyright protection for certain technologies (e.g., software source codes). Publication of an article or paper containing specific source code listings, without a notice of Digital's claim to copyright protection in the code, could destroy Digital's copyright protection in at least that part of the code so published.

It is the responsibility of the author(s), which, for these purposes, shall include presentation makers, the managers of the author(s), and the others designated in Personnel Policy and Procedure Memorandum 6.30, or by the PBU, to review the request for publication, to insure that the above issues are fully addressed before publication approval, and that Digital's rights to obtain patents are not compromised and Digital's confidential information is disclosed only in accordance with Corporate Security Policy 10 and Standard 10.1 "Proprietary Information Protection", and that other proprietary rights are not compromised. In its role in reviewing requests for publication and evaluating the legal impact of permitting publication, the Engineering Law Section (ELS) relies heavily upon the technical and business judgment of the author's(s') management and the impartial experts reviewing the request for publication. When you submit the material to the PBU Patent Engineer, the ELS will rely heavily on the Patent Engineer's input.

Other Issues

Publications can also create potential liability or increased risks of liability for Digital in areas such as libel, fraud, defamation, trade liability, products liability and antitrust, among others. Unfavorable mention of the product(s) of another company, if proven untrue, could lead to liability for Digital. Representations about Digital's products could, for example, set unwarrantedly high expectations among customers or potential customers, and be used against Digital in product liability situations. Statements about markets or market shares for Digital products, or "eliminating" the competition, or "dominating" the market, could have antitrust implications for Digital.

Therefore, these kinds of statements in papers published by Digital employees must be eliminated before publication. The Engineering Law Section is trained to recognize these problems, but this does not eliminate the function of the author's management to review the prospective publication in an effort to spot potentially troubling statements of this type.

Publication Approval Process

In order to avoid adverse consequences to Digital from a publication, and at the same time support the desire to have employees publish, a procedure set forth in Personnel Policies and Procedures Section 6.30, has been established for review of publications by management and the Law Department prior to publication. Personnel Policies and Procedures Section 6.30, dated August 26, 1985, is currently under revision, and the policies and procedures, as they are proposed to be revised, are described here.

The publication approval process applies to all information presented at seminars, conferences, professional and industry standards committees and any other public forum, including degree requirements, articles and papers, and addresses and speeches. It applies to publications like Digital Press, Digital Technical Journal, and others which can be obtained by members of the public, as well as to publications outside of Digital. It applies to co-authoring with non-Digital employees. It applies to trade shows for which Digital appoints Corporate Coordinators.

All publications and the content of proposed public disclosures are restricted to internal Digital distribution until approved for publication or disclosure in accordance with Personnel Policies and Procedures Section 6.30 and with the PBU-specific policies of every author, if any. It is the responsibility of each author to insure that the publication approval process is followed and no publication or release of the information outside of Digital occurs until the process has been completed. Since some PBU's have established additional approval policies, authors should check with their managers or PBU Patent Committee to learn of any additional requirements they may need to satisfy.

According to Memorandum 6.30, the author(s) must obtain the approval of the assigned Corporate Coordinator, or, if there is none, an ad-hoc committee consisting of each author's manager, each manager's immediate manager, an impartial, uninvolved person, qualified to understand the importance to Digital of the information to be disclosed and appointed by the appropriate function Vice-President or his/her designee, and the legal counsel for the group. There may be other requirements imposed by the group Vice-President such as approval of the PBU manager. These approvals must be in the form of an approval signature.

In some PBU's, the policy may include submission of the proposed publication to the Patent Engineer for review of whether some part or all of the subject matter of the publication needs to be presented to the Patent Committee prior to approval for publication.

In some PBU's, approval may have to be obtained from a direct report to the Engineering/Manufacturing PBU manager, if not one of the managers noted above.

According to Memorandum 6.30, each of the approval signatures should reflect that the reviewing person has examined the proposed publication or public disclosure to determine if the material meets any of the following criteria which might require continued restriction:

- It describes part or all of any unannounced product (part, component or system) or service, or an advanced development project (including results), or any other technical development or design not generally known outside of Digital.
- It contains information that, if disclosed, could help our competitors, but, if kept secret, could help Digital maintain a competitive edge. This information could be about past, present, or planned processes, tests, tools, manufacturing or general technology, research projects (including project names), Digital's business (such as its plans or its organization, i.e. the names and titles of co-workers), or basic or applied research having potential long-term effect on Digital's business. It could also be information that Digital is considering or has dropped programs, vendors, methodologies, or technologies.
- It describes a potentially patentable idea for which a patent application has not yet been filed. (All developments made by Digital employees that IN ANY WAY are different from what already exists, whether in Digital or third party products or in existing internal or external publications, are considered patentable until the appropriate Patent Committee or, if there is none, the ad hoc committee, determines that Digital has no current interest in patenting the inventions or in maintaining trade secret protection.)

- It contains comments about proposed, pending, or past litigation or proposed, existing or past legislation. (Statements about such litigation must be approved by the Law Department and Digital Public Relations, and comments about such legislation must be approved by Digital Government Relations and the Law Department.)
- It contains any statements about the capabilities of or performance of any Digital products, or a comparison with or critique of third party products, or representations about Digital's market position, or the ability of Digital or its products to "eliminate", "control", "dominate", etc. any third party or its products, or any such statements which might be construed as detrimental to Digital or its business.

The ad hoc committee or Corporate Coordinator should consult other experts as necessary to determine whether the proposed publication meets the above criteria for restriction. The Corporate Coordinator must work with the Law Department in making this determination. Some of these criteria clearly call for judgment by the reviewers, weighing the importance of publication against the degree of risk to Digital. The ad hoc committee or Corporate Coordinator is expected to act promptly so as not to unnecessarily delay the timely publication of the material. Similarly, the authors are expected to submit the material to the ad hoc committee or Corporate Coordinator soon enough so that adequate review is possible. The ad hoc committee or Corporate Committee is not a "rubber stamp". Authors should recognize that, for Digital's best interest, publication approval may be withheld, revisions to the material may be necessary, or higher level approval may need to be sought.

In rare cases Digital may decide to publish technical information that would be restricted under the rules described in this policy. An example was the publication of the DECNET specifications. Such decisions must be approved by the Law Department, Marketing Committee, and Vice-President of Central Engineering.

The publication request procedure starts by the authors making up a package for the reviewers. For ongoing activities, such as professional or standard committees, participants should prepare a "committee memo" outlining the committee's purpose, their proposed participation, and a description of the information they intend to or may have to disclose through their participation.

Along with the "committee memo" or documents to be released and copyright form, if any, that the authors may have received from the publishers, the authors must attach a cover memo (one page) or the following sample form:

Example 1: Publication Approval Request Form

REQUEST FOR PUBLICATION APPROVAL

Author(s): _____
 (Print Name) (Badge No.) (DTN)

 (Print Name) (Badge No.) (DTN)

 (Print Name) (Badge No.) (DTN)

Authors' Manager(s): _____
 (Print Names) (Title) (DTN)

Managers' Manager(s): _____
 (Print Names) (Title) (DTN)
 (Be sure you include all managers required by your FBU)

Expert: _____
 (Print Name) (Title) (DTN)

Attorney: _____
 (Print Name) (Title) (DTN)

Title: _____

Type of Publication (article, paper presentation, degree presentation, etc.): _____

Name of Journal, Conference, Symposia, etc.: _____

Date of Publication or Presentation: _____

Date of Submission Requirement: _____

Abstract of Paper's Content: _____

(Note: In addressing each of the items below, cross out the inappropriate response, e.g., does/does not)

1. The Material does/does not describe all or part of any unannounced Digital product (part, component, or system) or service, or any advanced development project, or any other development or design not generally known outside Digital.
2. The Material does/does not contain proprietary information (about past, present or planned manufacturing, test, design or development processes, technology, research project, Digital business, or basic or applied research having potential long-terms effect on Digital's business) that, if disclosed, could help our competitors.
3. The Material does/does not describe a potentially patentable idea.
4. The Material does/does not mention proposed, pending, existing, or past litigation or legislation.
5. The Material does/does not mention any non-Digital employees or third-party companies; there are/are not any representations about the relative performance or capabilities of any Digital or third-party product; it does/does not mention the marketing or positioning of Digital or its products; it does/does not contain any statements that might be detrimental to Digital or its business.

Signatures:
 Author(s) _____

The identified publication is approved:

Managers _____
 Managers' Managers _____
 Expert _____
 Attorney _____
 Date: _____

If any of the five statements in the cover memo are made in the affirmative, the Authors should recognize that the Corporate Coordinator or ad hoc committee, in balancing the risk to Digital and desirability of publication or committee participation, may disapprove the request, require revisions, or obtain higher level approvals for disclosure.

If approval is withheld, as time passes and the product is announced, the patent is filed, or litigation resolved, the author may resubmit the material for publication review.

If publication is approved, any copyright release form that must be submitted to a publisher should be signed, but not by the Authors. It should be forwarded for signature to the group Vice-President or his or her designee authorized to sign such releases. Authors should ensure that references to Digital as part of his/her professional background should be accompanied by a clear identification that the individual is expressing his or her own views and not those of Digital.

4.5.3 When & How to Use Non-Disclosure Agreements

While it is Digital policy that its employees should do their utmost to complete their projects without disclosing Digital proprietary information or receiving another company's confidential information, sometimes it becomes necessary for Digital employees to do such information exchanges. It is critical for Digital to take care in both disclosing its own confidential proprietary information and receiving such information from outside of Digital. Only such information as is necessary for the successful completion of the project should be disclosed or received, and the exchange must not take place before an appropriate non-disclosure agreement is signed.

Disclosing Digital confidential information without a non-disclosure agreement could compromise or totally destroy certain patent, copyright or trade secret intellectual property rights of Digital.

Receiving confidential information of another without a non-disclosure agreement, which clearly defines the rights and obligations of both parties, could expose Digital to liability, even if such information, disclosed to Digital, is neither used by Digital nor disclosed outside of Digital. Even with a non-disclosure agreement, Digital will have some obligations not to use or disclose the information, but a properly prepared non-disclosure agreement will place some limits upon these restrictions, and in addition will clearly define for management the existence of an obligation on the part of Digital and the scope and nature of this obligation.

Without going through the formal process of executing a non-disclosure agreement, including a review of it by management, the danger exists that the risks to Digital in receiving such information may not be properly assessed, or, worse yet, the obligations upon Digital to maintain confidentiality and limit use of the information may not be fully appreciated and/or may not be met.

Digital has specific policies and procedures for the handling protection and disclosure (within Digital and to outside parties) of its confidential information, and for the receipt, handling and protection of the confidential information of another. No disclosure of Digital confidential information nor receipt of any confidential information should be done without complying with Corporate Security Policy No. 10 "Proprietary Information Protection Policy" and the corresponding Corporate Security Standard 10.1 "Proprietary Information Protection Standard."

In accordance with Corporate Security Policy No. 10 and Standard 10.1, it is the responsibility of the originator or custodian within Digital of information which is proprietary and confidential to Digital to classify such information, to provide for its protection, and to determine the appropriate distribution within Digital consistent with a "need-to-know" criterion, where applicable. (See the Policy and Standard for the different classifications of proprietary information and the different internal handling requirements for each.) Managers of such originators and/or custodians are also responsible to insure that this is carried out.

Proprietary information which must be so protected is defined to also include information provided to Digital in confidence by another party outside of Digital, with the additional requirement that such third-party information must be protected in accordance with the terms of the non-disclosure agreement under which it was received.

Because of the potential for loss of Digital proprietary rights by an unrestricted disclosure of proprietary information and the potential for liability to Digital from an uncontrolled receipt of confidential proprietary information from another, all transfers of confidential information into Digital, out of Digital, or through mutual exchange must be done in accordance with a non-disclosure agreement. Every such agreement either should be put in place through the Sales Organization Proprietary Information Disclosure process or should be reviewed in accordance with a procedure established by the group or Engineering/Manufacturing PBU which originated and/or which is receiving the information, and the Law Department attorney responsible for representing the group or PBU. Call that attorney for information about the Procedure.

The group or PBU-specific procedure will have at least the following requirements:

1. The receipt of confidential information from outside of Digital, whether through mutual exchange or by disclosure by a third-party alone, must be approved by the Vice-President Manager of the PBU receiving the information; and the Non-Disclosure Agreement, whether for mutual exchange or receipt of third party information, must be signed by the Vice-President.
2. Each PBU Group Manager is responsible for the protection of all confidential proprietary information created in or in the custody of the Group, and must determine who, within the Group, has the authority to approve outside disclosures of Digital information and sign Non-Disclosure Agreements in which only Digital is disclosing its confidential information.
3. The following Digital Non-Disclosure Agreement has been approved by the Engineering Law Section of the Law Department for receipt of third party confidential information and/or disclosure of Digital confidential information. Agreements intended solely for receipt of third party information should have, in Appendix A of the Agreement, "none" as the relevant Digital information. Similarly, agreements solely for disclosure of Digital information should have, in Appendix A, "none" as the relevant third party information. Any Non-Disclosure Agreements which vary in any way from the following agreement, must be reviewed by the Law Department.

Example 2: Non-Disclosure Agreement Form

NON-DISCLOSURE AGREEMENT

- A. DIGITAL EQUIPMENT CORPORATION, _____ (hereinafter, together with all subsidiary and affiliated companies which it now or hereafter controls, "DIGITAL"), and _____, having a principal place of business at _____, (hereinafter, together with all subsidiary and affiliated companies which it now or hereafter controls, "COMPANY") have developed certain confidential information, both sets (hereinafter "INFORMATION") more fully described in Appendix A. Both parties wish to exchange, during the period defined in Appendix A, INFORMATION for the sole purpose(s) described in Appendix A.
- B. CONFIDENTIALITY AND COMMITMENTS
1. For _____ years from disclosure, Recipient shall maintain in confidence Discloser's INFORMATION, provided that it (a) is clearly marked with Discloser's name and confidential, proprietary or the substantial equivalent; and (b) if orally disclosed, is summarized in writing or corporeal form and is clearly marked with Discloser's name and confidential, proprietary or the substantial equivalent thereof and delivered to Recipient within thirty (30) days thereafter. Recipient shall use the same degree of care to avoid disclosure of INFORMATION as it employs with respect to its own confidential/proprietary information, using at least a reasonable standard of care. Recipient shall notify its employees who use INFORMATION of the obligation hereunder.
 2. Each party agrees not to disclose existence or terms of this Agreement.
 3. Discloser shall prevent Recipient from being exposed to third party confidential information which is in Discloser's possession.
 4. Recipient shall have no obligation as to INFORMATION that (a) is known to Recipient at the time of disclosure; or (b) is independently developed by Recipient provided Recipient can show that such development was accomplished by or on behalf of Recipient without the use of or any reference to INFORMATION; or (c) becomes known to Recipient from another source without confidentiality restriction on subsequent disclosure or use; or (d) is or becomes part of the public domain through no wrongful act of Recipient; or (e) is disclosed with the prior written approval of Discloser; or (f) is disclosed pursuant to any judicial or governmental request, requirement or order; provided that Recipient takes reasonable steps to give Discloser sufficient prior notice in order to contest such request, requirement or order; or (g) is furnished to a third party by Discloser without similar confidentiality restriction on the third party.
 5. Title to all tangible forms of INFORMATION and any copies thereof shall be and remain with Discloser. Recipient shall not copy or reproduce in whole or in part any INFORMATION without written approval of Discloser, except as is necessary to fulfill the purposes of this Agreement. Upon written request or termination of this Agreement, all such tangible forms of INFORMATION, with the exception of an archive copy to be used solely for complying with Recipient's obligation hereunder, shall be promptly returned to Discloser or destroyed at Discloser's option.
 6. Recipient shall not remove any proprietary, copyright, semiconductor chip protection, trade secret, or other legend ("Proprietary Rights Legend") from any form of INFORMATION. Recipient, when reasonably possible and at Discloser's expense, will add to INFORMATION any Proprietary Rights Legend (or modify same) Discloser deems necessary to protect its intellectual property rights, and requests in writing to be so added or modified.
- C. GENERAL
1. Either party may terminate this Agreement without cause upon three (3) days written notice given to the other, provided that confidentiality obligations under Section B shall survive termination hereof.
 2. No rights or obligations other than expressly recited herein are to be implied herefrom. Nothing except that expressly stated herein shall affect either party's present or prospective rights under any country's patent laws, or be construed as granting any license under any present or future patent or application therefor, or preclude marketing any product unless such marketing constitutes unauthorized disclosure and/or use of INFORMATION.
 3. This Agreement shall be construed, interpreted and applied in accordance with the laws of the Commonwealth of Massachusetts.

Example 2 Cont'd. on next page

Example 2 (Cont.): Non-Disclosure Agreement Form

- 4. Consistent with other provisions herein, each party assures that it will not knowingly, without obtaining prior authorization from the U.S. Dept. of Commerce Office of Export Administration, transmit directly or indirectly the technical data received pursuant hereto or the immediate product (including processes and services) produced directly by use of such technical data to Afghanistan, People's Republic of China, or any Country Group Q, S, W, Y, or Z country specified in Supplement No. 1 to Part 370 of U.S. Dept. of Commerce Export Administration Regulations.
- 5. This document and appendices contain the entire Agreement between the parties and supersedes any previous oral or written understandings, commitments or agreements pertaining to the subject matter hereof. The Agreement shall not be modified or changed in any manner except in a writing signed by both parties. If a court of competent jurisdiction finds any of the provisions hereto so overboard as to be unenforceable, such provision may be reduced in scope by the court to the extent it deems necessary to render the provision reasonable and enforceable.

ACCEPTED AND AGREED:

DIGITAL EQUIPMENT CORPORATION _____

BY: _____
Duly Authorized

BY: _____
Duly Authorized

NAME: _____
(please print or type)

NAME: _____
(please print or type)

TITLE: _____

TITLE: _____

DATE: _____

DATE: _____

APPENDIX A

- 1. COMPANY identifies the following as its confidential information:

- 2. DIGITAL identifies the following as its confidential information:

- 3. COMPANY designates the following person as its focal point for receipt of notices and INFORMATION:

NAME: _____
TITLE: _____
ADDRESS: _____

- 4. DIGITAL designates the following person as its focal point for receipt of notices and INFORMATION:

NAME: _____
TITLE: _____
ADDRESS: _____

- 5. INFORMATION will be transmitted during the period of the next

- 6. INFORMATION will be exchanged for the sole purpose(s) of

4.5.4 How to Avoid Legal Pitfalls When You Write

The outcome of lawsuits can be affected by correspondence written years before by people who never thought about how their words would sound in court. Whenever anything is written (either in hardcopy or electronically) - a memo, a letter, a note - remember that your words might be read some day by an unfriendly competitor or customer, or by an enthusiastic government prosecutor who may interpret its language in the most sinister way possible.

For this reason:

- Don't speculate in writing about the legality or ethics of Digital's actions. While you should be concerned if you have any questions about the legality of any action, the way to handle this situation is to contact the Law Department, and to find out. Speculation might be thought (incorrectly) to be evidence that the company has recognized a law violation, and had tried to camouflage it in some way.
- Don't use "million dollar words"—colorful, careless language that creates an antitrust or other legal problem. Documents containing loose language with dangerous legal implications can be lethal in front of a judge or jury. These are words like "dominant," "entrenched," "predatory," "controlling a market" and "attacking" or "blocking" a competitor. Words implying collusion such as "destroy after reading" are also dangerous and should not be used. To protect confidential information, stick to the published Corporate Information Security labeling scheme.
- Be careful about discussing the company's share in a particular market. Point out that the market "sector" that you are discussing is shaped by your marketing strategy, and may not be the same as the "market" from the view of the customer or competitor. Private plaintiffs and government prosecutors often try to use a company's own records to attempt to show the market within which competition takes place. It would be unfortunate if our documents contained inappropriate market definitions when the economic facts dictate a different market.
- Don't puff up or overstate our importance. Such language might lead a prosecutor or court to make an incorrect inference to our detriment despite the true facts.
- Statements should be avoided that might be construed as defining Digital's fault which may result from a product defect. Avoid making any statements concerning regulatory or product standards policies, including Digital's policies and procedures regarding defective products or products that may fail to comply with product regulations or product standards. Avoid making statements about the difficulties of a product design or the operation of the product. Statements or conclusions as to the reason for or cause of a defective product should be avoided.

4.6 FINDING YOUR LAWYER

The attorneys who support various Engineering and Manufacturing groups are identified below.

- *Engineering/Manufacturing*
 - Ron Myrick - (MSO/C5, 223-2991), *Assistant General Counsel and Manager, Engineering Law Section*
- *Low End Systems & Technology*
 - Al Cefalo - (MSO/C5, 223-8571), *Group Manager, Low End Systems; Manufacturing Operations*
 - Rick Schuette - (MSO/C5, 223-6502), *DSG, PCSG, EMD&S*
 - Carter Pledger - (MSO/C5, 223-6355), *Worksystems*
- *Mid-Range Systems Business Group*
 - Dick Paciulan - (MSO/C5, 223-8426), *Group Manager, Mid-Range - Secured Systems; Engineering Product Strategy and Architecture*
 - Maura Moran - (MSO/C5, 223-3665), *High End Mid-Range Systems; High Performance PRISM Worksystems; PRISM Strategy Office*

- David Pursel - (ZSO, 206-865-8844), *DECWest Mid-Range Systems*
- *High Performance Systems*
 - Jerry Lester - (MSO/C5, 223-6571), *Group Manager, Corporate Research and Architecture, High Performance Systems and Clusters, Engineering and Manufacturing Sites in California, MCC, SEMATECH*
 - Bill White - (MSO/M6, 223-7531), *External Research Programs, Software Engineering, Cambridge Research Center, Paris Research Lab, Systems Clusters and Fault Tolerant Systems*
 - Joe Funk - (MSO/C5, 223-5740), *Large Vax Engineering, Systems Manufacturing, Systems Research and Engineering*
- *Storage Systems Engineering and Manufacturing*
 - Vince Pitruzzella - (MSO/C5, 223-6604), *Medium and Large Disk Systems, Thin Film Media, Thin Film Heads, Advanced Development, Database Systems*
 - Penny Smith - (MSO/C5, 223-4293), *Tapes and Optical Storage, Small Disks, Electronic Storage Device*
- *Distributed Systems*
 - Ron Reiling - (MSO/C3, 223-2991), *Group Manager, Local Area Systems, Networks/Communications, Computer Integrated Manufacturing, Image Systems Engineering, European Engineering*
 - Gary Clapp - (MSO/C3, 223-8943), *Image Systems Engineering*
- *Software Systems*
 - Lindsey Kiang - (MSO/C5, 223-6745), *Group Manager, SSG*
 - Gary Clapp - (MSO/C3, 223-8943), *SSG*
- *Manufacturing Operations*
 - Al Cefalo - (MSO/C5, 223-8571), *Group Manager*
- *GIA Manufacturing & Engineering*
 - Lindsey Kiang - (MSO/C5, 223-6745), *Group Manager*
- *Semiconductor Operations Law Group*
 - Bill Cray - (MSO/C5, 223-2469), *Group Manager, Semiconductor Operations (SCO), Semiconductor Acquisition and Test (SCAT), Semiconductor Business Operations (SBO), Process Technology Group (PTG), Semiconductor Engineering Group (SEG), Semiconductor Industry Association (SIA), SEMATECH, Semiconductor Task Force*
 - Bob Mayes - (MSO/C5, 223-6984), *Semiconductor Manufacturing Technologies (SCMT), Physical Technologies Group (PTG), Semiconductor Engineering Group (SEG), Mask Works Protection, SCO Patent Committee*
- *Patent Services Law Group*
 - Ron Clark - (MSO/C5, 223-3683), *Group Manager*
- *Trademark Services Law Group*
 - Jim Perkins - (MSO/C3, 223-6982), *Group Manager*
 - Shirley Fleming - (MSO/C3, 223-2778), *Trademarks Paralegal*
- *David Double - (GEO, 821-4611), IP Coordinator*
 - Peter Oliver - (KRR, 734-854290), *European Intellectual Property, Safety and Regulation*

CHAPTER 5

MISCELLANEOUS INFORMATION SERVICES

5.1 DIGITAL LIBRARY NETWORK

The Digital Library Network (DLN) is comprised of 14 technical information centers and two Market Research Centers, which work cooperatively to provide information services to many facilities and all functional groups at Digital. The site-managed information centers share resources through common use of tools, services, and coordination provided by the Distributed Library Systems Group in Concord, MA (VRO6). The DLS Group staff includes systems programmers and information consultants. The DLS group is part of the Content-Based Systems Group (CBS).

You may gain access to the central data base of the entire DLN's holdings through public access terminals (PACs) located in the site information centers. From the PAC you may browse through the DLN data base to find material at any node in the network.

In addition to loaning books and periodicals, information centers in the DLN provide the following services.

- Online database searching service in engineering, marketing, management, education, and other areas.
- Research consultants to assist you with specific technical or business questions.
- Market research reports and planning services. See more under Corporate Market Research Centers, Section 5.2.2.
- Technical reports, including Digital and university reports.
- Indexes and abstracts of periodical and report literature.
- Standards
- Audio and video cassettes, including internally-produced tapes.
- Competitors' manuals and promotional materials.
- Digital manuals, handbooks, and bulletins.
- Directories, dictionaries, encyclopedias, handbooks, and phone books.

Several site information centers also sponsor or contribute to technical seminar programs, and the Market Research Centers plan and conduct marketing symposia.

Contact the information center nearest you for assistance with engineering, technical, and business questions.

The DLS group (CBS) offices are located at VRO6-1/B4. If you have questions about setting up an information center for your site or becoming a member organization in the DLN, call 273-5465.

Digital Library Network

Location and Mailstop	DTN	Contact
SITE INFORMATION CENTERS		
Andover APO-1	289-1609	Richard Maxfield NUHAVN::APO_LIBRARY
Boxboro BXB1-1/C05	293-5033	Martha Moore PHENIX::MOORE
Colorado Springs CXO1-1/S18	522-2113	Chris Bowman GENRAL::LIBRARY
Colorado Springs CXO3-2/N10	522-5214	Serena Riesgaard TAS::LIBRARY
Hudson HLO2-2/N06	225-4771	Linda Maguire SHARE::LIBRARY
Littleton (Foster St.) LTN1-2/F12	229-6858	Martha Moore PHENIX::MOORE
Littleton (King St.) LKG1-2/J10	226-7067	Janet Hebert DELNI::LIBRARY
Marlboro MRO1-2/A94	297-5040	Michelle Rehill DLNVAX::MARLBORO
Maynard MLO4-3/A20	223-6231	Janice Eifrig DLNVAX::MAYLIB
Merrimack MKO1-1/K11	264-7175	Alison Eckert CIVIC::LIBRARY
Salem NIO/W22	261-2254	NISYSI::LIBRARY
Shrewsbury SHR1-2/G18	237-3271	Carole Piggford MEMORY::LIBRARY
Spit Brook ZKO1-3/B31	381-1058	Cathy Sloan ZEKE::LIBRARY
Tewksbury TWO/LIB	247-2094	Cal Norton PARITY::CNORTON

MARKET RESEARCH CENTERS

(For Detailed Information, See Section 5.2.2)

Merrimack MKO1-1/K11	264-6847	Alison Eckert CIVIC::MARKET
Marlboro MRO2-L/C01	297-5361	Barbara Klein FASTER::MARKET
	297-6009	Competitive Literature FASTER::LITTLEFIELD

CUSTOMIZED RESEARCH SERVICE

(For Detailed Information, See Section 5.7)

Merrimack MKO1-1/K11	264-6911	Andrea Schulman CIVIC::SCHULMAN
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5.1.1 Information Services

The research staff in each DLN node provides professional consulting to answer your questions on a wide variety of topics. The staff uses thousands of published sources and over 200 online databases to obtain timely, critical information to help you with key decisions. Most information centers have computer-aided reference services and current awareness services to match your information needs.

5.1.2 Books, Technical Reports, The DLN Catalog, and Interlibrary Loan

Materials selected for the Digital Library Network are current and chosen with Digital employees information needs in mind. Recommendations for acquisitions are always welcome.

Books in the DLN collections are arranged by the Library of Congress alpha-numeric classification number that appears on the spine of each book. The traditional library "card catalog" has been replaced by an online system, developed by the DLS Group. This system allows you to search for materials in any DLN node by subject, author, or title.

In addition to books and technical reports in the Digital Library Network, each information center has access to over 7.5 million volumes in a national online network of university and special libraries.

Soon the DLN will provide online catalog access directly from employees' offices through the Corporate Videotex Library Menu, as the DLN Catalog.

5.1.3 Circulation of Materials

Any Digital employee may borrow material from the Digital Library Network by visiting, sending a request to, or telephoning the nearest site information center. The loan period is usually four weeks, but policies may vary.

The DLN's circulation system is automated. Employees are encouraged to use the public access terminals or check with the site information center staff to register in the DLN client data base.

5.1.4 Periodicals

The Digital Library Network subscribes to over 1000 periodicals. In most cases, back issues may be borrowed, and photocopies of articles may be requested.

5.1.5 Instructional Media Services

Audio cassette and video cassette training courses are available through the DLN. The collection includes all technical seminars conducted at Digital sites. Call your information center to obtain up-to-date information on these programs.

5.1.6 Digital Publications

Most information centers have assembled a collection of Digital publications, which are indexed in the online catalog. Hardware manuals, software manuals, handbooks, technical reports, special publications, and directories are available for use in the information centers. In addition, local and specialized Digital newsletters and bulletins are available.

5.1.7 Competitors' Publications

Digital exchanges publicly-available information (promotional material, software and hardware manuals) with many other computer manufacturers. The Market Research Center maintains a complete collection of these documents at MRO2-L/C01. Copies of these publications are available for loan.

5.1.8 Purchasing Activities

The Information and Library Purchasing staff buys books, subscriptions, reports, standards, online services, competitive literature, instructional media, and association memberships for most locations. All items must be submitted to Information and Library Purchasing, NRO2-1/13A (DTN 234-4823), on a Digital Internal Purchase Requisition, form number EN-01072-08.

Subscription purchases must be authorized by a Vice President or a person designated by a Vice President.

It is Digital's policy to purchase only one membership to an organization per cost center.

5.1.9 Information Supply Base Management

Information Supply Base Management negotiates major contracts with information producers, brokers, clearinghouses, universities, marketing firms, publishers, journal suppliers, and data base services. They participate in a team of supply base managers within DIS, work closely with the operational purchasing group, and advise and consult with the purchasing group and remote site buyers. Contact Renata Baptiste (VRO5, DTN 273-5446) for further information.

5.1.10 Consulting Services/Library Start-Up

Consulting services are available to help groups solve problems involving document/information acquisition, organization, storage and access. Library start-up services can help in planning for a library of any size. Questions regarding membership in the Digital Library Network may also be directed to this office. For more information, call 273-5465.

5.1.11 European Digital Library Network

In Europe, library services are provided by the emerging EDLN. EDLN consists of both engineering and marketing libraries, and will comprise a resource-sharing network which is independent from the DLN network in the U.S. For further information, contact CBS offices (DTN 273-5438).

5.2 MARKET INFORMATION SERVICES GROUP (MISG)

Manager: Nancy James (CFO1-1/M38, DTN: 251-1003)

MISG, through its component organizations, provides central support for external market and competitive research. Our goal is to integrate external market data with Digital's efforts to address customer needs across:

- geographies
- industries
- accounts
- channels
- products
- applications.

Our services range from VTX-based information delivery systems to customized research, and include assistance in locating and retrieving market-related information in our research centers.

See separate entries for the MISG component organizations, including:

- Customized Research Service (see subhead 5.2.2)

- Information Access Services (see subhead 5.2.4)
 - Competitive Information System (see subhead 5.2.1)
 - External Market Data System (see subhead 5.2.3)
- Market Information Resource Management (see subhead 5.2.5)
- Market Research Centers in MKO and MRO (see subhead 5.2.6)

Questions about MISG can be directed to Nancy James, MISG Manager, at CFO1, 251-1003, CIVIC::NJAMES or on DECmail @CFO.

5.2.1 Competitive Information System

Manager: Denice Brait (CFO1-2/J50 DTN:251-1504)

The Competitive Information System (CIS) is a full-text infobase that provides sales and marketing groups with timely information on over 200 companies and 650 products that compete directly with Digital.

CIS is a very powerful, yet easy-to-use online information resource. The infobase allows for both keyword searching and text searching within the VTX menu format. CIS is available on Corporate VTX Menu, the US Videotex Library, and the ACCESS menu.

Updated daily, CIS contains product evaluations and comparisons, company intelligence, competitive moves, sales and marketing tactics, and pricing policies. CIS staff compiles and indexes this critical information from more than 30 external and Digital publications ranging from the Wall Street Journal to consultant group reports such as those from Gartner Group, Forrester Research, and Sierra Group. The latest news option in CIS features newswire stories and press releases from PR Newswire and MicroTech.

5.2.2 Customized Research Service

Manager: Andrea Schulman (MKO1-1/K11, DTN:264-6911)

The Customized Research Service (CRS) is an in-house, fee-based consulting group whose services are available to marketing and engineering groups throughout the corporation. Reports can be commissioned on a particular market, company (competitor or customer), application, product or technology.

CRS consultants are highly skilled in research techniques and qualitative and quantitative analysis. Each has advanced training in business administration, marketing, or information science, and has broad experience doing research in the computer industry.

The work we do is based on a variety of sources including:

- Published material from:
 - Market research reports
 - Government documents and statistics
 - Trade and industry literature
 - Local and national press
 - Investment reports
 - Company literature and financial reports
- Interviews with:
 - Industry and/or investment analysts
 - Industry players

- Government officials
- Officers of trade associations
- Customers/potential customers
- In-house experts
- Databases of:
 - Computer installations in the US and Canada
 - Computer market size and growth
 - Business establishments in the US

When necessary we utilize outside researchers who can conduct interviews where confidentiality is required.

The deliverable can be in the form of a concise memo, a bound report, weekly, monthly or quarterly news summaries, slides, an electronic file, or spreadsheet.

Research is billed by the day. For information on rates or to discuss a project call DTN:264-6911.

5.2.3 External Market Data System

Manager: Christopher Hallgren (CFO1-2/J50)

External Market Data System (EMDS) is an online market analysis information resource designed to incorporate multiple external quantitative data sources in one system. EMDS allows market researchers and planners to create reports on various segments and aspects of the U.S. computer market. These reports can be based on either Digital-defined or externally-defined product, price-band, industry code, channels, geographic, and applications data definitions.

At present, EMDS has access to the COMTEC Market Analysis Program. COMTEC surveys a sample of 8000 US business establishments for information concerning current and planned use of all kinds of computer products. COMTEC is produced by the Gartner Group. The next release of EMDS, due in the summer of 1988, will incorporate the Computer Intelligence Corporation's Computer Installation Data File. This source describes 180,000 systems (hardware, peripherals, and software) installed and planned at over 75,000 US and Canadian sites.

Future additions to EMDS will include International Data Corporation's (IDC) Information Systems User File, Infocorp Industry Analysis Program, Dun's Market Identifiers, IDC's International Installation File, IDC's Processors in Census File, and IDC's Value Added Reseller File.

EMDS is available on the Corporate VTX Library.

5.2.4 Information Access Services

Manager: Laura Hunt (CFO1-2/J50 DTN:251-1653)

Information Access Services (IAS) specializes in the design, development, and production of marketing- and sales-oriented online information and research systems. IAS systems are designed for distributed access across functions and geographies, and deliver both external and internal data sources.

IAS custom-designs information to fit user's retrieval needs. It coordinates all data entry, software development, and staffing of the project. Moreover, IAS prepares the information to exact specifications (*i.e.*, codes, formats, abstracts, and indexes full-text documents). IAS will also support operational online systems with documentation, customer support hotlines, training, and promotion.

In addition to design and development, IAS can provide support in selecting information from external vendors. The group can assist in locating, negotiating, and purchasing information in cost-effective electronic format.

Two IAS systems, Competitive Information System and External Market Data System, are currently available on corporate VTX menus.

5.2.5 Market Information Resources Management

Manager: Camille Ahern (CFO1-1/M38, DTN: 251-1587)

Marketing Information Resources Management (MIRM) manages the evaluation and acquisition of external marketing information resources. MIRM's functions include:

- Evaluating and coordinating the purchase—and intergroup funding—of marketing research databases, planning services, and reports
- Managing corporate contracts with major market research firms
- Influencing the content and methodology of purchased marketing research to match Digital's research needs
- Coordinating market research firms' presentations to wide or intergroup audiences

5.2.6 Market Research Centers

Manager: Alison Eckert (MKO1-1/K11, 264-7175)

The Market Research Centers, located in Merrimack and Marlboro, serve Digital's marketing community by providing access to a wide range of external sources for market research, market analysis, and competitive information.

The centers' staff includes Information Consultants can help you answer questions such as:

- What evidence is there to link productivity increases to the acquisition of workstations and office automation equipment?
- What has been written about Digital vs. Intel's software development?
- Are chemical companies automating, and what are they buying?
- What has been written about function-point analysis?
- What does E.I. DuPont have installed and what are they planning in terms of computers and communications?
- I need a prospecting list of companies in Florida in the pharmaceutical business with sales of \$10 million and up.

To answer these and other questions the information consultants utilize online databases of computer installations, telephone calls to market research firms from whom we have purchased inquiry privileges, as well as material organized in the market research centers.

Among the collections maintained by the market research centers are the following:

- Over 1000 market research reports covering topics ranging from in-depth analyses of specific companies and markets to broad overviews of industry trends and forecasts. Some of these reports are received on a regular basis as part of vendor planning services, while others are issued on a one-time only basis.
- Company information including product brochures, SEC filings and investment reports in vertical files and on CDROM.
- Competitive Literature Collection containing: product announcements and other documents under the Exchange of Publicly Available Information (EPAI) Program; competitive product information; Datapro and Data Decisions looseleaf manuals; competitor reference manuals.
- International files containing information on the non-U.S. marketplace at the Marlboro site.

- Directories and reference sources, including Moody's, Dun and Bradstreet, Standard and Poor's, State Industrial Directories, Industry Surveys, U.S. Industrial Outlook, and Industry Norms and Key Business Ratios.

For reference information call: DTN: 264-6487, MKO1-1/K11 Reference Desk, or DTN: 297-5361, MRO2-L/C01 Reference Desk.

The Market Research Center publishes the monthly MARKET RESEARCH CENTER MEMO, which abstracts research received during the previous two months.

Inter-group funding of our market research planning services and reports is coordinated through the Marketing Information Resources Management Group.

5.3 PUBLISHING AND CIRCULATION SERVICES

Manager: Brian Riddle (NRO2-2/A1, 234-4434)

Publishing and Circulation Services (P&CS) assists the Digital community in managing its information and communicating it around the world. P&CS, located in Northboro, Massachusetts, has facilities for printing, mass mailing, and the distribution and warehousing of literature. The P&CS goal is to provide an expertise center for publishing-related services and commodities.

- Printing Media Services provides one- and two-color offset printing, high-volume copying, and laser printing.
- The Mailing Services Operation offers mass mailing, bulk distributions, kittings, trade show fulfillment, media response, complete mailing list maintenance, and Corporate Mail systems support.
- Corporate Forms Administration analyzes, designs and prints the company's business forms. They also manage the Corporate Forms program.
- Literature Order Fulfillment (LOF) stores bulk quantities of promotional literature, hardware documentation, print sets, and business forms which are available for order by Digital employees and customers. LOF also provides complete inventory control services on all stored items. For customer convenience, the Literature Order System (LOS) allows the user to browse through a listing of literature available from P&CS and place orders on-line. It can be reached through all VTX databases.

P&CS Customer Service Representatives are available for consultation and presentations covering all the P&CS businesses as well as on-site tours of the production facilities. For additional information, call one of the following:

- Northboro hotline: 234-4429
- Maynard, Parker Street: 223-8542
- Merrimack, NH: 264-3027

5.4 DIGITAL TELEPHONE DIRECTORY

The Digital Telephone Directory is an employee resource that provides address and telephone information for communicating by telephone or mail. The directory is available to all employees wherever office supplies are stocked. Your department secretary or administrator can direct you to the proper source, or obtain one for you.

The following information is contained in the directory:

- Corporate Directory Assistance number (inside front cover)
- Corporate Customer Assistance number (inside front cover)
- Digital Telephone Network (DTN) codes

44 MISCELLANEOUS INFORMATION SERVICES

- International suggested calling times
- Domestic suggested calling times
- Mail services information
- Fiscal calendar
- Extension Notification Form (extension change form)
- Personnel listing
- Departmental listing
- Domestic office listing (including facsimile equipment and number information)
- European office listing (including facsimile equipment and number information)
- General International Area listing (including facsimile equipment and number information)
- Information on ELF (Employee Locator Facility)
- Location Code listing

5.5 PRODUCT FINANCIAL REPORTING INFORMATION CENTER

Manager: Jerry Shusterman (MLO12-3/A16, 223-9100)

The Product Financial Reporting (PFR) Information Center is an interactive database which contains worldwide external shipment information on most of Digital's Hardware and Software Products from FY81 to present. PFR does not contain Revenue Information on Technical and Consulting Services. This restricted database, maintained by The Product Reporting Group in MEM Finance, is an online, interactive system using 1032. 1032 is a 4th generation relational database.

Most PFR users are in the Product Business Units. However, anybody with a need to know product shipment information could also benefit from the information on PFR. Users can query PFR for both current and historical product shipment data. PFR carries selected data appearing on an invoice including the Part Number, Quantity, Gross dollars, and Sold to and Ship to Customer (U.S. only). PFR also contains reference files which carry such product information as Part Number, Description, MLP, USCLP, Transfer Cost, etc. The Product Shipment information is available at both the Invoice line-item level as well at the embedded (component) level. Because of the flexibility of 1032 and the structure of PFR a user can:

- Determine which products to include in the analysis.
- Aggregate these products.
- Determine the total units shipped, Gross dollars, NOR dollars (U.S. only), Transfer Cost dollars, etc., of products for a given time period.
- Analyze how product componentization (embeddedness) is handled through the bill of material explosion.
- Sort and total the data in many ways, including PBU and Geography.
- Decide on the reporting format.

There are also several standard online reports available monthly and quarterly to analyze Systems and Components units and Gross dollars by major product categories within PBU and Geography. If the standard reports do not contain the necessary information, customized reports can be created by users.

Hierarchical aggregation including PBU is made easy and flexible by having several coded fields. The PFR database is the originating source of Quantity, Revenue and Transfer Cost information in the Quarterly Product Financial Performance Reports.

PFR also generates a quarterly Software Product History Shipment Report and a quarterly summary of Shipment Data by Part Number. These reports are available from PFR with appropriate level of approval.

Contact PFR's Account Administrator (223-8453) if you need access to the information in this system. Access requires both the applicant's Cost Center Manager's and Group Controller's signatures. Upon receipt of your approved application form, PFR opens an account and the new user is notified of the password and given a PFR User's Manual. PFR offers new users a 1/2 day tutorial about every 6 weeks. The tutorial explains to new users what information is contained on PFR and an overview of how to extract that information. PFR does not offer a class on 1032, but Education Services in Bedford offers a 3 day 1032 Fundamentals class. PFR strongly recommends that all new users take the class, especially those who will be using PFR extensively.

5.6 SYSTEMS MATERIALS ENGINEERING

Manager: Dave Baldessari (NIO/P19, 261-2360)

Systems Materials Engineering provides materials technical expertise to the designers and manufacturers of CSM products to meet product goals and base technology requirements.

Systems Materials Engineering consists of the following groups or technical cells:

- *Applied Module/PWB Technology (Producibility)*
Manager: George Beckner (LKG-A/W4, 226-5618)
- *CSM Component/Subsystem Technology*
Manager: Jules Deschamps (NRO5-1/J2, 234-4886)
- *Applied Fabrication Technology and Development*
Manager: Erv Parris (LKG2-A/W4, 226-5601)
- *Plastics Technology and Development*
Manager: Ira Morris (NRO5-1/J2, 234-5188)
- *Finishes Technology and Development*
Consulting Engineer: Art Clockedile (NRO5/K2, 234-5382)

Systems Materials Engineering's goals are as follows:

- Minimize the time-to-market for new products by promoting design for manufacturability through the evaluation and implementation of new materials and new processes.
- Provide competitive material process technologies for future products to minimize plant costs and maximize product performance.

These goals are met through the efforts of the organization's highly technically-oriented engineering specialists who provide the following:

- Pre-Phase 0 consultation to Design Engineering
- Design Engineering support
- New product start-up support
- Technical Buyout/External Resource Management support
- Manufacturing plant support
- Base material technology development
- Applied material technology development

To accomplish its goals, this group provides the following general strategies:

- Maintain a core of experienced technical engineering specialists.

- Provide the primary technical link (for its areas of expertise) in technology simulation, application evaluation, and application to new and existing Digital products.
- Provide technical engineering support to shift Digital's quality approaches from those emphasizing internal inspection and test to one of supplier responsibility for quality and reliability of purchased materials.
- Provide CAD/CAM and simulation tools to assist design engineering with real-time manufacturing facts, costs, time trade-offs, and ready access to corporate standards to make sound engineering decisions.
- Support all technical aspects of complex CSM product and subassembly buyout activities.
- Translate new product designs into manufacturable, reliable, and cost effective systems products.

For more information about Materials Engineering Services please contact:

Engineering Operations

Manager: Paul Rae, (NIO/P19, 261-3051)

5.7 CENTRAL MASSACHUSETTS ADMINISTRATIVE SERVICES (CMAS)

Manager: Jim Magaldi (MRO3-2/R17, 297-7394)

Central Massachusetts Administrative Services (CMAS) manages the corporation's property (land and buildings) and delivers quality administrative services to resident businesses - in a partnership role—supporting corporate goals. These services include property management (facilities), administrative purchasing, community relations, information services, financial management center, travel, and space planning.

Our mission is to achieve and maintain excellence in customer satisfaction, promote employee development, value differences, meet changing business needs, and promote a competitive advantage for Digital.

The CMAS organization is headquartered in Marlboro and supports several facilities in Westboro, Southboro, Northboro, Hudson, and Boylston, as well as the Marlboro locations.

5.8 EASTERN MASSACHUSETTS ADMINISTRATIVE SERVICES (EMAS)

Manager: Mitch Kur (MLO23-2/U34, 223-7671)

Eastern Massachusetts Administrative Services (EMAS) provides administrative services to resident business organizations and assists them in accomplishing their business goals.

Administrative services include traditional facility services such as plant engineering, security, building and grounds maintenance, custodial services, office services, mail distribution, and shipping and receiving. Other administrative services included are design and construction projects, space planning, telecommunications (both voice and data), and site MIS.

The Eastern Massachusetts region includes the Mill, Parker Street (1-2-3), Powdermill Road, West Concord (1-2), Virginia Road (3-6), and the LKG site.

5.8.1 Eastern Massachusetts Administrative Services Information Services (EMAS-IS)

Manager: Guilford (Gil) M. Dunn III (PKO1-1/C2, 223-5298)

Information Services (IS) functions as an Information Utility to the Maynard area tenant community to support common requirements in the following areas.

- Voice and Data Telecommunications
 - Area/Cluster PBX and LAN services
 - Area/Cluster EASYnet Router services
- Electronic Mail/Message Routing services
 - Message Transport Service (MTS)
 - DECmail and ALL-IN-1 mail services
- Computer Resources
 - Timesharing
 - Backup/Contingency Support
 - Dedicated System Operation
 - Tape Library
- Data Center Support Services
 - Data Entry Services
 - COM Microfiche
 - Laser Printing
 - Report Distribution
- Management Information Systems Development and Support
 - For the common administrative services functions
 - For area tenant customers on a contracted basis

The group also provides information and media related products and services to EMAS area-wide users as follows.

- Library services
- Information/Data Servers, including Videotex Server Operator (VSO) services
- Microfilm/fiche (COM) Origination/Duplication
- Production (high volume) Laser Printing
- IT (In-Transit) Interplant Magnetic Tape Distribution

The goals of EMAS-IS are to assist the Digital Information Systems (DIS) function by maximizing the use of information resources such as human, computer, and facilities, and to provide a cost-effective quality service in a cross-functional environment.

The following is a list of groups within EMAS-IS.

- *Telecommunications*
Manager: Don Andrews (MLO3-4/T57, 223-9931)
 - *Voice Telecommunications*
Manager: George McInnes (MLO4-5/B91, 223-6410)

- *Data Telecommunications*
Manager: Don Davis (MLO3-4/A25, 223-8974)
- *Computer Services*
Manager: Dick Austin (PKO1-1/C1, 223-9084)
 - *Mill Cluster*
Manager: Lynn Lanigan (MLO3-4/P56, 223-6744)
 - *Parker Street Cluster*
Manager: Tim Wilson (PKO1-1/E1, 223-1677)
 - *West Concord Cluster*
Manager: Dan Irvin (CFO1-1/M40, 251-1470)
- *Systems and Programming*
Manager: Ron Colaianni (MLO4-4/3C, 223-2595)
- *Special Services*
Manager: Dick Wesche (PKO1-1/E1, 223-5188)
- *Data Entry and Videotex Services*
Manager: Kathy Robinson (PKO1-1/E1, 223-9975)
- *Media and Support Services*
Manager: Mike Stout (PKO1-1/E1, 223-4041)
- *Maynard Area Information Services (Library)*
Manager: Janice Eifrig (MLO4-3/A20, 223-6322)

CHAPTER 6

DIS STRATEGY, TECHNOLOGY, AND ARCHITECTURE

Manager: Ken Gordon (VRO3-2/B7, 273-3275)

DIS Strategy, Technology, and Architecture (DSTAR) provides a central technology focus for the DIS function and provides the interface between Engineering and Information Systems. To support this interface, DSTAR works closely with Engineering by performing field tests and evaluating new hardware and software products.

One of DSTAR's primary activities is to develop and promote the DIS Technical Architecture. This architecture defines the "style" of distributed computing to be used internally by Digital to support its business objectives, and it also provides an implementation strategy. Knowing that Digital is its own largest customer, marketing and engineering groups rely on solutions formulated as part of the Technical Architecture to provide guidance regarding the needs of similar external markets. For example, tools developed in support of automatic software management on distributed systems have been adopted for external sale.

DSTAR is chartered to do the following:

- Evaluate and implement technology and tools applicable to the DIS function
- Expedite the introduction of applicable technology into the function
- Maintain a strong relationship with Engineering, cooperating on field tests and providing feedback on product design and characteristics
- Guide the implementation of corporate architectures
- Support the selling effort to key Digital customers

DSTAR's deliverables are embodied in prototype utilities; updates to the Technical Architecture; new or updated methods, protocols, and standards; articles in the DSTAR Journal; presentations at seminars for technical and management levels; customer presentations; and consulting and design reviews. The effect in Digital is measured in contracts or sales won, faster introduction of enabling technology that improves the effectiveness of the business, better products from Engineering (as a result of better understanding the IS area needs), better designs of new applications, and organizations and training that reflect the new environment.

For more information, contact Ken Gordon or one of the DSTAR managers:

- *Advanced Development*
Bob Erickson (VRO3-2/B8, 273-3200)
- *Planning and Integration*
Henry Theberge (VRO3-2/W3, 273-3408)
- *Implementation*
Worth Robbins (VRO3-2/W3, 273-3414)

6.1 INTERNAL EQUIPMENT GROUP

Manager: John Pacy, (VR03-3/Y4, DTN 273-3527)

The Internal Equipment Group (IEG) manages the internal acquisition of Digital products by providing:

- A central source of information about current and future Digital products
- Direction for implementation of new systems, system architecture and technology
- Decision support for cost-effective selection and use of Digital's computer systems and products, consistent with Corporate, DIS, Engineering, Marketing and Financial strategies

IEG helps engineering to plan for new product acquisition and implementation, equipment forecasting, system sizing, migration strategies, pricing, and ROI justification.

6.1.1 IEG Orders

(Call DTN: 273-3515)

- **SYSTEMS**—All hardware, CPUs, PCs, workstations, tape/disk drives and controllers, cables, expansion cabinets/hardware
- **OPTIONS**—Printers, adapters, network and communications gear, terminals, expansion cabinets/hardware

6.1.2 DECdirect (DDD) Orders

(Call 1-800-344-4825)

- **MAGNETIC MEDIA**—Mag tapes, tape cartridges, disk packs, diskettes
- **ACCESSORIES/SUPPLIES**—Fonts and printwheels, laser printer supplies, plotter and ink jet printer supplies, ribbons, printer accessories (stands, etc.), video accessories (tilt swivel stands, etc.), serial (A/B) switches

6.1.3 Software Distribution Center (SDC) Orders

(Call DTN 241-3383)

- **SOFTWARE**—All software with the exception of the DECmate III operating system and those applications packaged with the VAXmate VIP Publishing System, must be ordered through SDC. Use an Internal Software Order Form.

6.1.4 Account Management Services

IEG has account managers assigned to serve all functional areas of the company. To use IEG resources effectively, customers should work with an account manager early in the planning/purchasing cycle. Account management services can help in the planning process and help justify acquisition of new products for critical internal users. Call DTN 273-3418 to schedule some time with your organization's appropriate IEG account manager.

6.1.5 IEG CAS Services

IEG Customer Administrative Services (CAS) is chartered to manage your internal orders through the administrative and manufacturing process. CAS also addresses your order-related issues and questions including pre- and post-shipment information. They also serve as your interface with manufacturing.

6.1.6 IEG Customer Center

(IAMOK::IEGHELP, 273-3515)

You can initiate and conduct business with IEG through the Customer Center which is staffed by a product support analyst and a Customer Administrative Services representative. They are available for technical assistance and answering questions related to ordering, configurations, product selections, pricing and availability.

CHECK YOUR ORDER'S STATUS ONLINE—Don't waste valuable time making phone calls to track orders. Log into IEGs VTX infobase from the Corporate VTX Library. Your order's status can be checked by keying in your order number, CAR number or cost center.

6.2 DIS INFORMATION OPERATIONS AND SERVICES

Manager: Russ Pittenger (VRO3-2/B7, 273-3354)

Finance Manager: Pat Flanagan (VRO3-2/B7, 273-3356)

This group provides leadership and program management for Site Information Services, Information Operations, Information Delivery and Access, Electronic Data Interchange, Distributed System Services, and Libraries. It also provides development of text and content-based applications, and the Purchasing focus for DIS.

6.2.1 Information Operations Program

Manager: Les Norman (VRO3-2/B7, 273-3590)

This program provides strategic focus for Digital's information operations and the distributed computing environment. Current projects include operations standards and metrics, tools portfolio management, and information security.

6.2.2 Information Distribution and Access Program

Manager: Gene Kusekowski (VRO3-2/B7, 273-3138)

This DIS program provides focus and direction for the internal deployment of Digital's strategic electronic publishing and document-based information management and distribution solutions. The program's goal is to promote implementations that effectively showcase Digital's publishing products in our internal business operations. Areas of involvement include electronic publishing, corporate Videotex, online reference systems, optical distribution media, and Company Identity.

6.2.3 Electronic Data and Information Interchange (EDI-EII) Program

Manager: Sara Ann Gephart (PKO1/C1, 223-4518)

This program develops Digital's EDI-EII technical strategy and architecture, solves EDI-EII technical issues, and implements EDI-EII technology and standards across Digital organizations. The program also influences external document and communication standards, disseminates EDI-EII information, and promotes cross-functional and integration activities within Digital.

6.2.4 Reference Information Systems Development (RISD)

Manager: Joyce Ward (VRO6-1/B4, 273-3433)

RISD is an applications development group that builds content-based systems. The group's specialty is text retrieval applications.

RISD provides the following services:

- Electronic publishing
- Videotex applications (infobase design, screen design and editing, and page creation)
- Indexing and abstracting
- Human factors and testing
- Library-based services

RISD groups include: On-Line Publishing; Vocabulary and Indexing System Development; and Advanced Text Solutions.

Joyce Ward also serves as a Functional Manager of the Digital Library Network Group, providing focus for the Library members and automated library systems.

6.2.5 DIS Purchasing

Manager: Tom Cavanaugh (VRO3-2/B7, 273-3555)

DIS Purchasing provides supply base management for DIS-related commodities, including telecommunications, information bases, electronic publishing, and electronic data interchange.

6.2.6 DNS Program Office

Manager: Ron Jansen (VRO3-2/B7, 273-3241)

The Distributed Name Service (DNS) is a major component of DECnet Phase V. It must be installed and managed as one unified worldwide naming service for Easynet. The DNS Program Office is chartered to deliver a program plan for DNS use on Easynet, to be the focus for common DNS issues, and to manage the top level of the Digital Namespace.

6.3 HUMAN RESOURCE MANAGEMENT GROUP

Manager: Susie Woods (VRO3-2/B7, 273-3466)

DISHRM assists Information Systems professionals with their contribution to Digital's business by providing programs that develop the skills and knowledge of the I.S. professional while creating a work environment that allows for growth, recognizes and rewards contributions, and manages the changing role of I.S. within Digital.

6.3.1 Digital Information Systems/Human Resource Management-End User Education

Contact: Tony Thomas (273-3396)

Contributes to keeping I.S. "current" through three major thrusts, each designed around the premise that the value of continuing education comes from involving the participants in a variety of experiences. The programs are targetted at the senior level of DIS, the technical/middle level of DIS, and the broader category of "end user".

6.3.2 DIS/Executive Contact Program (DIS/ECP)

Provides skill training and the opportunity for senior level DIS professionals to interact with their industry peers through involvement as an expert resource to major sales opportunities.

6.3.3 IDECUS (Internal Digital Equipment Corporation Users Society) Symposia and Seminars

Presentations are given in the three key areas for managing the transition to the 21st Century: technical, business, and individual development areas.

The semi-annual IDECUS Symposia and monthly IDECUS Seminars provide the DIS community with a timely platform at which to present new information and encourage its rapid dissemination within Digital.

6.3.4 Professional Resource Exchange Program (PREP)

Consists of facility level "end user groups", drawn cross-functionally from all levels, which have two primary objectives: empowerment of the "end user" to understand and clearly articulate their needs to I.S., and fostering within the "end user" community the requirement that all business systems and individual productivity tools be part of an enterprise-wide integration effort.

6.3.5 DIS Training and Education

Contact: Ginny Mardirosian (273-3598)

Technical competencies required for I.S. professionals are identified and curriculum are developed.

The goal is specific focusing at maintaining state-of-the-art technical competency through a comprehensive Technical Training Program. This effort encompasses a variety of subjects delivered at various levels of intensity and conducted through numerous formal and informal channels.

6.3.6 Network Training Program

Contact: Dave Dauphinais (273-3236)

This program is a twenty week, full-time training program in telecommunications. Graduates become managers of networks or Network Analysts within Digital.

6.3.7 Advanced Network Training Program

Contact: Dave Dauphinais (273-3236)

This program is a two-year program which provides selected qualifiable employees, who are currently working in the telecommunications area, an opportunity to enhance their telecommunications career.

The goals of this program are to provide participants with:

- Expose and awareness of the current state-of-the-art technology in the telecommunications area
- Knowledge and appreciation of "DATA" and "VOICE". (i.e.: DATA people should be knowledgeable about VOICE and vica versa)
- Management skills development
- An opportunity to work with and communicate with peers from different functional and geographical areas

6.3.8 Operator Training Program

Contact: Dave Dauphinais (273-3236)

This is a sixteen-week training program to train computer operators. The program consists of four weeks of in-class training and twelve weeks of on-the-job training in two different computer operation environments. The curriculum is mainly VAX-based. The graduate of the program is able to function at the D61, Computer Operator II level.

6.3.9 Internship Program

Contact: Charlene Plotkin (273-3120)

Recruits top undergraduates in computer science and business for a two-year internship at Digital. Interns are provided with training on Digital's equipment, close supervision, and monitoring. Upon completion, the program interns continue as Digital employees within information systems.

Training courses related to information systems are also offered through Educational Services to members of DIS and its users. Courses are mostly technical and are available on a first-come, first-served basis.

6.3.10 Management Development Program

Contact: John Hopkins (273-3082)

Concentrates on the factors necessary to successfully manage this rapidly changing technological environment. This effort concentrates on management needs and utilizes a variety of approaches for delivery. External speakers and consultants play a significant role in this program.

Within the context of understanding the changing I.S. role within Digital, job structures are evaluated, tools developed to assist with career movement, demographic analysis and job opportunities identified. Strategies reflecting Personnel thrusts (Valuing Difference and Career Development/Succession Planning) are evaluated and, where necessary, specific programs developed to provide DIS functional leadership.

Contact: Donna Friedrich (273-3501)

6.4 DIGITAL TELECOMMUNICATIONS

Manager: Peter Brown (VRO5-2/Y3, 273-3280)

Telecommunications provides and manages Digital's internal voice, data, electronic mail, videotex, video telecommunication and bandwidth resources. Major networks and systems include the following:

- *Digital Telephone Network (DTN)*
Contact: Mike Dougherty (VRO6-1/W11, 273-3065)

Serves more than 258 Digital locations in the continental United States, Puerto Rico, Canada, and Europe.

- *EASYNET*
Contact: Bob McCauley (VRO6-1/W11, 273-3063)

The single worldwide DECnet network which was formed from the merger of the Engineering Network, the DECnet Business Network (DBN), and the European network EASINET.

- *Terminal Switching Network (TSN)*
Contact: Bob McCauley (VRO6-1/W11, 273-3063)

A private, interfacility terminal switching network based on TYMNET, Inc. hardware and software. Users can access this network directly from more than 100 Digital locations or through the public TYMNET or CompuServe networks, using a local phone call in more than 400 cities in the United States.

- *Message Transport System (MTS)*
Contact: John Beirne (VRO5-2/D6, 273-3150)

An electronic mail system integrating three standard Digital products: DECnet - the transport layer using EASYNET; message router, the transfer medium; and a user agent (currently ALL-In-1 is the most commonly used user agent).

- *Internal Videotex System*
Contact: John Beirne (VRO5-2/D6, 273-3150)

Digital Telecommunications has the responsibility of establishing and managing the use of Videotex within the company.

- *Bandwidth Management*
Contact: George Pendleton (VRO5-2/B9, 273-3061)

The overall planner/manager of Corporate Transmission capacity. Its function is to ensure adequate transmission/bandwidth capacity to meet the needs of the Corporation.

- *Digital Video Network*
Contact: Mike Dougherty (VRO6-1/W11, 273-3065)

The internal video network used for training. Digital Telecommunications is responsible for the transmission portion of the network.

- *Digital Telecommunications Engineering*
Contact: Mark Endry (VRO5-2/D7, 273-3259)

Engineering support, research and development, network design, integration, and technical architecture development for Digital Telecommunications Networks and Applications.

CHAPTER 7

CORPORATE RESEARCH AND ARCHITECTURE

Group Manager: Sam Fuller, V.P. (MLO12-2/T7, 223-7310)

Corporate Research and Architecture (CRA) provides the research, technical leadership, and technical foundations necessary for the development of leadership products for Digital. CRA responsibilities include the following:

- LEAD in Research Critical to Digital
 - DO applied research in high leverage, high return, but often high risk areas that will be the foundation for leadership products in five to ten years.
 - DESIGN, build and use computer systems five to ten years before they become commonplace.
 - PROMOTE, sponsor, and fund strategic technological opportunities.
 - SPONSOR, via universities, the basic, leading edge research that is of strategic importance to Digital.
- INTEGRATE and TRANSFER Technology across Digital
 - Effectively INFLUENCE the decisions about future products and technologies.
 - TRANSFER ideas, research prototypes and tools to development groups.
 - COORDINATE research and advanced development across engineering and the corporation.
- CULTIVATE Technical Excellence within DIGITAL
 - PROMOTE technical excellence to establish Digital as an innovator and technical leader to our customers.
 - STRENGTHEN the technical career ladder and help ensure that we have the needed range and depth of technical skills for future research and development.
 - DEVELOP technical expertise in areas new to Digital or requiring unusual expertise.

CRA is organized into three major areas: research, sponsored research, and technology programs office. These groups are described in the following sections.

7.1 CAMBRIDGE RESEARCH CENTER

Manager: Victor Vyssotsky (CRL, 259-6621)

The Cambridge Research Lab (CRL) has a small nucleus of researchers located at the One Kendall Square complex near M.I.T. CRL will expand steadily during FY89 and FY90 as qualified researchers can be recruited. CRL's objectives are to advance the state of computer science and engineering, and to furnish development groups with new technology for future products.

CRL's immediate goal is to identify, attract, and hire top-quality researchers. Once a "critical mass" is built, the CRL team can identify the most fruitful research areas. Then that team can begin to build the links into development groups that will lead to successful technology and knowledge transfer.

Some of these potential research areas include methods for dealing with the complexities of real data from multiple sources, better tools for applications programming, fault-tolerant computing, and integrating image data with other data types.

7.1.1 Computational Quality Group

Manager: Mary Payne (HLO2-3/M08, 225-5631)

The Computational Quality Group ensures the accuracy and optimizes the performance of Digital's arithmetic hardware and mathematical software. It provides the technical foundations for a numerical computational environment and consults with hardware and software groups on mathematical problems.

7.2 PARIS RESEARCH LAB

Manager: Patrick Baudelaire ([33] 1 46 45 17 50)

Administrator: Gisele Karchen

The Paris Research Laboratory (PRL) is a small recently formed research group. It contributes to strengthen the company's know-how in key technologies for future products in a 5 to 10 year time frame. PRL aims to help establish a stronger Engineering presence in Europe by being a center of attraction for first rate computer scientists and building technology transfer exchanges with product development groups.

The lab long-term research plan covers three main areas: interactive applications and graphics technology, programming technology, theory. PRL is also planning work on special-purpose hardware.

7.3 SYSTEMS RESEARCH CENTER

Manager: Bob Taylor (UCT, [415] 853-2202)

The Systems Research Center (SRC) engages in research, engineering, and analysis aimed at discovering knowledge that will be useful in developing future products. SRC designs, builds, and uses new Digital systems five to ten years before they become commonplace. The focus is on distributed personal computing—workstations, networks, and servers. Currently, SRC is exploring tightly coupled multiprocessing and programming technology as main themes.

The SRC strategy builds prototypes, uses them throughout SRC as daily tools, and feeds the experience back into the design of better tools and more relevant theories. Large advances in information systems research have come through this strategy, including timesharing, networking, and distributed personal computing. This strategy requires that technical activities be closely integrated.

SRC's research activities are described in five areas: hardware, theory, and the three software areas, which are distributed systems, programming environment, and applications technology. Individual researchers at SRC work in more than one area—the categorization applies to tasks, rather than to people.

7.4 WESTERN RESEARCH LABORATORY

Manager: Richard Swan (UCO-4, [415] 853-6627)
Administrator: Joella Hornor (UCO-4, [415] 853-6616)

The Western Research Laboratory is a computer systems research group that was founded in 1982. Our focus is computer science research relevant to the design and application of high-performance computers. We test our ideas by designing, building, and using real systems. The systems we build are research prototypes; they are not intended to become products.

Our goal is to develop and test new hardware and software techniques that can be applied in Digital's future products. Our research is directed towards mainstream high-performance computer systems. Our prototypes will foreshadow the future computing environments used by many Digital customers. We also work cooperatively with product development groups for product reviews and to study specific technical problems. We encourage and support the use of our design tools by product development and other groups in the corporation.

7.5 ARTIFICIAL INTELLIGENCE RESEARCH GROUP

Manager: John McDermott (DLB5-3/E3, 291-8431)

The AI group engages in research aimed at discovering problem-solving and learning techniques is useful in new Digital products. It organizes itself in a way that promotes the rapid transfer of these discoveries into the Artificial Intelligence Technology Center (AITC) groups who incorporate the discoveries into products. This group also organizes itself in a way that gives the AITC workers high visibility into its research activities.

7.6 EXTERNAL RESEARCH PROGRAM

Manager: John W. McCredie (HLO2-3/K11, 225-5808)

The External Research Program is a worldwide virtual laboratory in which research faculty and students work on problems of strategic importance to Digital. The program serves as a lens to focus information transfer from universities to any Digital group needing resources available in university laboratories and related organizations. Through interactions with key projects, Digital employees are better able to challenge, enhance, expand, and support the missions of their own organizations.

The primary goals of the University Research Program are to create and enhance a comprehensive set of programs and projects that

- Serve as a catalyst to transfer concepts, prototypes, base technologies, and application developments to Digital organizations
- Strengthen Digital's leadership position and traditional relationships with the scientific, education, government and corporate research communities
- Develop long-term research and development relationships with, and communications paths and on-going access to, outstanding research and engineering personnel throughout the world
- Help Digital become a key partner in the information technology market in the countries where we operate by increasing our local presence and participation
- Support Digital's higher education and product/applications marketing strategies by ensuring that important research and development activities are carried out on Digital products
- Serve as a focal point for information about Digital relationships with our strategic university research, engineering, and applications development partners
- Develop joint projects on university campuses with Digital's key industrial partners and major corporate accounts to strengthen both our relationships with these corporations and the education and research infrastructure

ERP has an outstanding people network of campus residents and project monitors who can transfer the best of what is happening within university environments to Digital. This activity goes beyond the traditional role of monitoring research to helping Digital understand both its current competitive position and future requirements for complete system solutions.

There is a segment of the program that operates in Europe under the management of Robert Boers (SHIRE::BOERS). A description of this program can be found under the section on International Engineering.

7.7 TECHNOLOGY DEVELOPMENT PROGRAMS

Manager: Sharon Lipp (HLO2-3/N11, 225-5976)

Technology Development Programs (TDP) manages Digital's investments in highly-leveraged research consortia and manages a technology transfer/integration process that maintains Digital's technical leadership position through future generations of computing and information processing systems. The charter of TDP includes the following:

- Identify in concert with the Technology Strategy Council (TSC) critical areas in technology development that are of strategic interest to Digital.
- Facilitate the formation of both focused-sponsored research and technology development projects in concert with Digital's University Research Program, the Microelectronics and Computer Technology Corporation (MCC), and other external research institutions.
- Serve as the corporate focal point and catalyst for technical liaison and technology transfer activities between MCC, universities, external research institutions, and Digital in order to facilitate the timely transfer/integration of research and technology development results into Digital.

Key Goals and Strategies are as follows:

- Continue to manage and strengthen TDP by monitoring Digital's investments in MCC and other focused research programs external to Digital to ensure these investments support Digital's long-term strategic needs.
- Explore effective alternatives for transferring research results from MCC into Digital through short-term (6-month) assignments, prototype transfer projects, and consulting arrangements with selected research professionals at MCC and Digital.
- Sustain Digital's internal advanced development technology transfer program (TTP) to facilitate the transfer of results from MCC, universities and other sponsored research programs into broad segments of Digital's advanced development organizations and product development mainstream.
- Continue Digital's investments and sustain the nominal growth rate of MCC through FY90 and beyond.

7.8 RESEARCH AND ADVANCED DEVELOPMENT COMMITTEE

Manager: Bob Stewart (LTN1-2/B17, 226-6268)

The Research and Advanced Development (RAD) Committee is composed of senior engineers whose function is to review technical work in research and advanced development and to promote activity in these areas. Part of the role of the committee is to allocate seed money and to promote research and advanced development work that does not fall naturally into ongoing engineering plans (for example, work that falls between groups, or work that would suggest a major change in strategy).

RAD solicits, reviews, and approves proposals for twice-a-year funding cycles. Selection occurs at the end of Q2 and Q4. Reviews of work in progress are held on an ongoing basis. Presently this comprises review of funded work, review of technology areas, and review of specific problems. Our primary deliverable is a quality program of funded work. Other deliverables include meeting minutes and a periodically published summary of work.

Current RAD Committee members and their areas of interest are as follows:

- Dan Dobberpuhl—VLSI technology, circuits, architecture systems
- Les Fox—interconnect tech., cooling, multichip packaging, reliability physics, materials, test methods, advanced manufacturing processes
- Don Gaubatz—logic programming, PROLOG, formal specification analysis, simulation, verification of hardware systems, "low end" systems and architectures
- Jim Grochmal—semiconductor tech., signal integrity, interconnect tech., circuit design & reliability physics, VLSI technology
- Rich Grove—compilers, languages, S/W tools & environments, vectorization, parallel processing
- Judy Hall—operating systems, applications software, security, CPU architecture
- Mark Kempf—networks, communications
- Larry Kenah—VMS, operating systems, VAXclusters, DECwindows, software development, OLTP
- Butler Lampson—architecture, distributed systems, programming languages, office systems
- Steve Lipner—operating systems, security, local area systems, software, formal specification and verification
- Don Nelsen—semiconductor device and reliability physics, ESD, cryogenic semiconductor operation, signal integrity, CMOS latchup
- Jim Ravan—database systems, languages, tools, expert systems, AI languages & applications, parallel processing software & hardware
- Bob Rottmayer—storage; storage technology
- John Shebell—CSSE; reliability, diagnosis
- Dick Sites—CPU architecture, systems, buses, microcode
- Bob Stewart—bipolar circuits, linear circuits, crash recovery, timing, architecture, science

7.9 MANAGEMENT SYSTEMS RESEARCH

Manager: Ron Smart (MLO10-1/F41, 223-7011)

Management Systems Research (MSR)'s mission, executed in collaboration with other groups in DIGITAL, is to research, test and distribute knowledge for effective Organization Management (OM), leading to applications products and services.

MSR's goal is to provide DIGITAL with the knowledge for taking the lead in developing and applying new OM products and services.

Important to DIGITAL: There exists a critical need to improve the performance and competitiveness of companies in the global marketplace through better management. OM products/services have a long-term market potential of \$100's of billions, based on potential organization performance gains.

7.10 TECHNOLOGY PLANNING AND DEVELOPMENT

Manager: Tom Gannon (HLO2-3/N11, 225-5415)

Technology Planning and Development (TP&D) is responsible for managing programs in Sponsored Research and the Technology Office. These programs are focused on ensuring the appropriate technology development programs are in place for the Corporation's long range product needs.

To support its mission, TP&D has established the following major programs and functions in strategic planning; technology assessment; research; and technology transfer and integration.

- Strategic Planning
 - Technology Strategy Council/Technology Planning (TSC)
- Technology Assessment
 - Technology Assessment Group (TA)
- Research
 - Technology Development Programs (TDP) - MCC, SEI
- Technology Transfer/Integration
 - Engineering Interface Program (EIP)
 - Technology Development Programs (TDP) - Technology Transfer Programs

The primary results and benefits provided by TP&D through these programs to Digital's engineering, manufacturing, and service organizations include the following:

- Strategic Planning
 - Drive Digital's corporate technology planning and integration process to ensure a balanced and integrated research and technology development strategy for the corporation (TSC).
 - Influence Digital's research and technology development investments to support Digital's corporate technology strategy (TSC, TA) and the needs of Digital's corporate accounts (EIP).
- Sponsored Research
 - Invest in a high-leverage research consortia to acquire critical emerging technologies that complement Digital's corporate technology strategy (TDP).
 - Manage Digital's investments in selected research consortia to gain maximum leverage and return to Digital (TDP).
- Technology Transfer/Integration
 - Ensure that new emerging technologies acquired through external research investments are brought into Digital's product development mainstream to ensure Digital's competitive edge in the future (TDP).
 - Influence the development of new leadership products to meet the future needs of Digital's corporate accounts (EIP).
 - Accelerate the development of key technical resources in new emerging technologies through rotational assignments at leading research consortia and laboratories (TDP).

7.10.1 Technology Strategy Council (TSC)

Co-Chairmen: Sam Fuller (MLO12-2/T7, 223-3710)
Tom Gannon (HLO2-3/N11, 223-5415)

The Technology Strategy Council (TSC) is a small, functionally oriented committee composed of key technical contributors representing Digital's strategic technology areas. TSC provides a corporate-wide focus on the strategic management of Digital's technology assets. Its mission is twofold:

- Within the context of DEC's technology strategy, identify, assess and recommend resolution of key technological issues of strategic importance to the Corporation.
- Review and advocate technology development programs to support the Corporation's long-range product needs.

7.10.2 Technology Planning Group (TPG)

Manager: Scott Gordon (HLO2-3/N11, 223-5849)

The Technology Planning staff provides direct support for the TSC's technology strategy and planning activities through coordinating and administering TSC's activities and conducting analyses of technological and business issues and trends as they relate to TSC's agenda. In doing so, Technology Planning seeks to promote and represent a Corporate-wide focus in the technology strategy and planning process. In complement to direct support of TSC, the group also sponsors and manages ad hoc reviews and assessments of new technological opportunities.

7.10.3 Technology Assessment Group

Manager: Dick Rubinstein (HLO2-3/N11, 223-5853)

The Technology Assessment Group assists the Corporation in responding to rapid technological innovation. The group seeks to identify new technology opportunities of long-term strategic importance to Digital. It provides a foundation of technical and business assessments, and supports development of opportunities through consultation, dissemination of information, promotion of A/D projects, and coordination of cross-organizational efforts. To this end, it works with the Technology Strategy Council (TSC) and the Technology Development Program office.

Goals:

- Identify technology risks and opportunities before their consequences affect Digital in the marketplace.
- Evaluate specific technology opportunities and recommend appropriate actions.
- Assist the Corporation in establishing long-term technology strategies and research priorities
- Provide the technical and business analysis needed to respond to new opportunities.
- Provide a long-term perspective as a counterbalance to more immediate product and market concerns that often guide corporate behavior.

Strategies:

- Create and maintain a list of technologies of potential value to Digital and to our competition. For each area, we keep data including bibliography, names of researchers and technology trackers, and current projects.
- Identify strategic technology areas for tracking and analysis.
- Track competitive technologies and technology investment, domestic and foreign.
- Prepare technology analyses and forecasts for selected domains.

- Combine technical and business perspectives in analyses, ensuring that these disparate considerations balance each other properly.
- Develop and pursue means of transferring knowledge of new technologies into Digital.
- Develop and pursue means of starting and supporting internal work on new strategic technologies.
- Identify and develop internal and external sources of technological expertise, both individuals and organizations.
- Emphasize system and user issues, not just base technologies.

7.10.4 Engineering Interface Program

Manager: Sonja Israel (HLO2-3/N11, 225-5397)

Associate Program Manager: Eliane Markoff (HLO2-3/N11, 225-6074)

The Engineering Interface Program (EIP) gives Digital's consulting engineering community the opportunity to create and participate in ongoing technical exchanges with their professional counterparts in our corporate accounts. The program is a vehicle for establishing direct communication between these senior engineers and key worldwide customers for the purpose of influencing and enriching Digital's long-term product/technology strategy.

7.11 DIGITAL TECHNICAL JOURNAL

Manager: Dick Beane (CRL, 259-6627)

The strategy is to continue to develop the Digital Technical Journal as a high quality communications channel that supports Digital's image as a technical leader in the computer systems business.

7.12 INTELLECTUAL PROPERTY PROTECTION PROGRAM

Chairman: Sam Fuller (MLO12-2/T7, 223-7310)

Protection of Digital's Intellectual Property and increasing the number of Digital patents has become a high priority for the company. Patent applications tripled during the first year of the program. In this program, we continue with our oversight responsibility working with the PBU Intellectual Property Committee Chairmen to understand how the individual PBU committees can work together respecting decentralization of operations but developing strategic policy; useful consistency; and potential sharing of resources. We will continue to work with the Engineering law group and have established training programs for the patent engineers. A video presentation on software patentability and what it means to Digital software engineers and research scientists was created as an educational tool.

This program will also be responsible for creating and implementing an intellectual property strategy for Corporate Research.

7.13 FINANCE AND ADMINISTRATION

Manager: Agnes Connors (MLO12-3/U35, 223-5745)

7.14 PERSONNEL

Manager: Jenny Watson (MLO12-3/U35, 223-9173)

CHAPTER 8

SEMICONDUCTOR OPERATIONS

Group Manager: Robert B. Palmer, V.P. (HLO2-2/MII, 225-6677)

Semiconductor Operations (SCO) designs, develops, manufactures, acquires, and supplies LSI and VLSI semiconductor chips, modules, and design services required to build systems, and to serve the needs of Digital's engineering and manufacturing groups, so as to maximize Digital's competitive advantage at the systems level.

The Semiconductor Operations group supports Digital by the performing the following:

- Supply, through Acquisition and Test activities, integrated circuit solutions that achieve highest quality and competitive costs.
- Design and manufacture internal solutions unique to Digital's systems architecture.

The group's objectives are to achieve increased semiconductor value added to Digital's systems by providing a higher level of supply performance (make or buy) than competitors' captive semiconductor operations as measured by Semiconductor Industry Association (SIA) data, and to improve the total cost/performance ratio of the silicon content of Digital's systems at least 20% more aggressively than Digital's competitors.

8.1 SEMICONDUCTOR BUSINESS OPERATIONS

Manager: Dan Hamel (LMO2/P35, 296-5550)

Semiconductor Business Operations (SBO) is the primary interface between Digital users and SCO for both internally and externally acquired integrated circuits. SBO has corporate component responsibility to provide the most reliable integrated circuits for Digital's products, while achieving the speed, functionality, and cost goals of the target system products.

SBO works with several Digital engineering groups to specify devices, define sourcing requirements, and develop necessary CAD/CAT tools and test programs. SBO provides integrated circuit design and programming services for custom gate arrays, standard cells, and programmable devices. SBO provides technology analysis, device applications, and characterization assistance during the system development phase for custom and standard integrated circuits. SBO purchases, tests, and distributes most integrated circuits within Digital. SBO also works with other Acquisition and Test centers that interface with local manufacturing facilities and represents the internal semiconductor design and manufacturing facilities to its customers.

8.2 SEMICONDUCTOR MANUFACTURING AND TECHNOLOGY (SCMT)

Manager: W.C. (Bill) Robinette, Jr. (HLO1/J06, 225-5036)

SCMT provides Digital with MOS chip manufacturing/sourcing of internally designed circuits and develops processes/base technology for CMOS wafer processing, chip packaging, chip/package interconnect and testing.

8.2.1 U.S. Manufacturing

Manager: Ruth Rawa (HLO1/P06, 225-4535)

U.S. VLSI is responsible for all U.S. Semiconductor Manufacturing in Hudson and Andover, MA including wafer fabrication, probe, component assembly and test. It consists of process, product, test and assembly engineering and manufacturing whose charter is to accept state-of-the-art semiconductor technology from development and incorporate this technology into manufacturing.

8.2.2 European VLSI

Manager: John Perry (AYO, 011-44-506-417111)

The VLSI European Operations organization, consisting of Edinburgh and Ayr, are world-class manufacturing facilities that supply internal state-of-the-art wafer fabrication, package assembly and final test capacity to produce semiconductor products for advanced Digital systems.

8.2.3 Advanced Semiconductor Development (ASD)

Manager: Rich Hollingsworth (HLO1/P06, 225-4488)

ASD develops and transfers to manufacturing semiconductor technology for the SCO component business. In order to remain competitive, R&D is pursued in base technologies and their integration consistent with maintaining a leadership position in semiconductors required by SCO.

8.2.4 Physical Technology Group (PTG)

Manager: Rob Hannemann (APO2/F2, 289-1560)

PTG provides the SCO internal customer base with packaging and interconnect solutions from the chip through the system level of the interconnect hierarchy. Their mission includes technology and manufacturing process development and product applications.

8.2.5 Computer Integrated Manufacturing (CIM)

Manager: Marlin Shopbell (HLO2-1/D07, 225-6146)

CIM is defined in SCMT to be the application of advanced computer hardware and software systems, coupled with automated material handling process control, cycle time, manufacturing yields and costs, as a means to obtain a competitive advantage for the Corporation.

8.2.6 Materials/Planning

Manager: Ted Workman (HLO2-2/L05, 225-7307)

Materials is responsible for the planning, acquisition, receiving, storage and delivery of all materials and equipment needed by the Semiconductor Manufacturing facility in Hudson, MA. On a worldwide basis, we plan/schedule the other manufacturing sites in Ayr and Andover.

The goal of the Semiconductor Manufacturing and Technology Group is to support Digital's MOS chip and related base technology requirements for system sales to our customers.

Contact can be made directly with the organizations listed above. More general questions should be directed to the Business Operations Manager, Gerry Smyth (HLO2-2/J03, 225-6837).

8.3 SEMICONDUCTOR ENGINEERING GROUP (SEG)

Manager: Duane Dickhut (HLO2-2/N07, 225-4941)

Semiconductor Engineering (SEG) provides most of the MOS (CMOS) silicon design expertise within Digital. This group performs the following functions:

- Designs and develops high performance, advanced technology Digital architecture microprocessors.
- Provides peripheral chips for other parts of the computing system (video, disk, interconnect, and others).
- Develops CAD tools necessary for MOS chip design.

Major groups within SEG are as follows:

- *Architecturally Focused LSI (AFL)*—responsible for microprocessor product development
- *Advanced Development (AD)*—explores new applications and design methods
- *Semicustom Business Group (SBG)*—provides access to a state-of-the-art semicustom design capability via a 1.5 micron CMOS standard cell library and tool suite. SBG also designs and develops chips in support of the video and interconnect areas.
- *Computer-aided Design Group (CAD)*—supplies SEG and other parts of Digital with the CAD tools necessary for integrated circuit design
- *DETCI (Israel)*—provides design expertise for complex peripheral controllers in the serial interconnect and low-end disk areas
- *Computer Resources (CR)*—manages the complex computer network in Hudson, MA necessary to support integrated circuit design

8.4 SEMICONDUCTOR OPERATIONS GROUP QUALITY & RELIABILITY

Manager: Victor (Vic) S. Aramati (HLO2-2/L13, 225-5925)

The SCO Group Quality & Reliability organization is responsible for developing and implementing a strategic and comprehensive quality and reliability assurance program for SCO in support of its business goals. Within the Q&R group, there are four organizations: Customer Satisfaction, Design & Reliability Assurance, Manufacturing Quality Control, and Advanced Development.

The Customer Satisfaction group is the primary focus regarding the quality of the products and services provided to all of SCO's customers. This is accomplished through establishing linkages with the customers, providing a Quality Assurance program for SCO Manufacturing through process and product audits, and the management of the Device and Material Analysis lab.

The Design & Reliability Assurance group ensures that reliability is considered an integral part of the chip design and process development. The DRA group is closely linked with SEG and the ASD group. Their responsibility also includes qualification, infant mortality management, and ORT.

Manufacturing Quality Control is responsible for establishing worldwide, continuous, product quality, improvement programs in Manufacturing utilizing SPC and SQC techniques. This group spans the operations in Hudson and Andover, and is linked with the Ayr, Scotland Quality group.

Advanced Development is focused on the development of the next generation of applicable quality tools and statistical techniques. The AD group is linked to the Statistical and Scientific community both internal and external to Digital.

Contacts within the SCO Q&R group are as follows:

- *Customer Satisfaction*
Manager: Paul Matranga (HLO2-2/N04, 225-5289).

- *Design & Reliability Assurance*
Manager: Maria Menendez (HLO2-2/N04, 225-4171).
- *Manufacturing Quality Control*
Manager: Sharon McAfee (HLO2-2/N04, 225-4968).
- *Advanced Development*
Manager: John Kitchin (HLO2-2/N04, 225-4650).
- *Q&R Program Office*
Manager: Sharon Silverman (HLO2-2/N04, 225-7137).

8.5 SEMICONDUCTOR OPERATIONS STRATEGIC PROGRAM OFFICE

Manager: Sharon Wulf (HLO2-2/L09, 225-4568)

The Semiconductor Operations Strategic Program Office provides leadership in developing, communicating and coordinating integrated strategies for the Semiconductor Operations Group.

CHAPTER 9

LOW END SYSTEMS (LES)

Group Manager: Dom LaCava (MLO12-2/T81, 223-5063)

The Group Manager of Low End Systems is responsible for the operations and strategies for low end systems. This organization consists of the following groups.

- *Micro Systems Development*
Group Manager: Don Gaubatz
- *Design & Process Engineering*
Group Manager: Bill Picott
- *VAX Workstations PBU*
Group Manager: Art Williams
- *Personal Computing Systems Group*
Group Manager: John Rose
- *Desktop Systems*
Group Manager: Larry Cabrinety
- *Electro/Mechanical Design & Support*
Group Manager: Ralph Dormitzer
- *MicroVAX*
Group Manager: Jesse Lipcon
- *Base Product Marketing & Planning*
Group Manager: Matthew Kochan

9.1 MICRO SYSTEMS DEVELOPMENT (MSD)

Manager: Don Gaubatz (MLO5-5/E71, 223-4858)

As the premier systems integration organization for Low-end Systems Engineering, MSD performs system integration and development activities for Digital's least expensive, general purpose, multi-user and realtime MicroVAX and PDP-11 based systems. MSD has product responsibility for low-end realtime hardware and software (e.g. rtVAX and VAXELN); PDP-11 hardware and software including operating systems, languages and layered products; generic Q-bus options and enclosures; and a platform for small business application software.

The group manages the architectural and interface standards for the traditional 16-bit systems and leading edge 32-bit systems domain. The group also works with Software Development, Storage Systems, Distributed Systems, Semiconductor Engineering, and terminals groups to focus on a total systems approach.

In addition, MSD has program management responsibility for the development and implementation of Digital's realtime strategy.

9.1.1 Micro Systems Development Program Office

Manager: Richard Mollin (MLO5-5/E71, 223-2506)

This group provides product management, base product marketing, strategic planning and forecasting, and business operations activities for Micro Systems Development. It also provides management of corporate-wide programs for the development and implementation of a Realtime Strategy and the sale of chips.

The *Product Management Groups* bring hardware, software, and systems to the marketplace and manage the business elements for MSD's products.

The *Base Product Marketing Group* provides customer product and business requirements information as input to engineering. It also provides product information, product messages and marketing programs to external customers and internal Digital groups such as marketing and sales.

The planning, forecasting and business operations functions deal with short-term and long-term business opportunities and issues of the total realtime and PDP-11 businesses.

9.1.2 MSD Hardware Engineering

Manager: Brian Fitzgerald (MLO5-5/E60, 223-4490)

MSD Hardware Engineering manages the development of options and components for MicroVAXs and PDP-11s, the overall integration of new products into micro-systems, realtime hardware engineering, and the development of MicroPDP-11 systems. Responsibilities include 16-bit CPU design and the integration of complete system offerings including mass storage and other options, packaging, and software.

9.1.2.1 MSD Systems Integration Engineering

Manager: Don Derome (MLO5-5/T90, 223-3765)

MSD Systems Integration develops new realtime VAX and MicroPDP-11 configurations around the MicroVAX and J-11 CPU architecture, respectively. The group also qualifies new mass storage devices, and communications and other options across all Q-bus hardware configurations and 16-bit operating systems. The group designs and specifies complete system products including packaging, customer and field information kits, and system diagnostics.

Current realtime projects include the design, development and documentation of realtime systems based on the single user version of the MicroVAX CPU module. Other products/projects include the 11/73, 11/83, and 11/53 systems, Q-bus option qualification, upgrades of PDP-11/84 systems, and new mass storage packaging and integration.

9.1.2.2 MSD Options Development

Manager: Remi Lisee (MLO3-5/U26, 223-3492)

MSD Options Development manages the development of Q-bus CPUs and options. The group also develops other options needed in low end systems. Current projects include the development of electronics for low-end servers and program management of BA200 module design standards and handles.

9.1.2.3 S-BOX Development

Manager: George Hitz (MLO5-5/E60, 223-3408)

This group develops the BA200 family of Q-bus packages for end user applications that cover a wide range of environments including office, laboratory, and factory applications. The S-BOX features ease of installation, expansion, manufacturing, and service through new packaging techniques.

9.1.2.4 MSD Desktop Systems Development

Manager: Roger Gagne (MLO5-5/T20, 223-7446)

MSD Desktop Systems development develops low-end MicroVAX systems that can be used in small, multi-user applications and as LAVC servers. The group is responsible for the overall system engineering of a product from definition through the first shipments. This involves writing the engineering specifications and working with other engineering groups to create the various pieces of the product and test them as an entire system. The group also carries the system through into manufacturing and first customer ship.

9.1.2.5 Systems Engineering

Manager: Bob Jurgen (MLO5-5/T58, 223-3526)

The systems engineering group is part of the corporate wide effort to further define complete systems level computing solutions for customers. A complete systems level computing solution consists of a fully integrated environment of hardware, systems software, and applications software all connected together with networks. The MSD Systems Engineering group is focused on defining platforms for work group level computing solutions based on Local Area VAXclusters (LAVC), Distributed Realtime and work group level support for desk top devices.

9.1.3 Micro Systems Advanced Development

Manager: Jim Scott (MLO3-5/U26, 223-5514)

Micro Systems Advanced Development investigates and performs pre-design studies of all system components crucial to the next generation of 16-bit and MicroVAX 32-bit products. Emphasis is on multi-user systems, but issues relevant to single-user systems are also investigated when necessary. Activities include working systems architecture issues (PDP-11, Q-bus, UNIBUS architecture management) with software engineering groups, CPU chip development groups, and the peripheral development groups.

Emphasis within Micro Systems Advanced Development is placed on the engineering training and process issues affecting time-to-market, testability, and product quality.

MSD Advanced Development is also working on the definition of a distributed realtime architecture for Digital and performs performance evaluations of realtime systems in support of this effort.

9.1.4 MSD Systems Quality

Manager: Vic Penney (MLO5-5/E71, 223-3753)

The goal of the Systems Quality Group is to perform actions that will enable MSD, MVB, and other LES groups provide quality microsystems for our customers worldwide. To achieve its goal, the SQG is organized into the following areas. For further information, contact the listed managers.

- *Quality Management*
Hank Moran (MLO5-5/U52, 223-3708, AXIS::MORAN)
- *Customer and Competitive Information*
US: Hank Moran (Acting) (MLO5-5/U52, 223-3708, AXIS::MORAN)
EUR: Lorraine Tartaglia (RTO, 865-1167, DCC::TARTAGLIA)
- *Systems Qualification*
Dick Bennett (MLO5-5/U52, 223-6538, SYSENG::BENNETT)
- *Electromagnetic Compatibility Engineering (EMC)*
Bob Howland (MLO5-5/U52, 223-6635, AXIS::HOWLAND)

- *Competitive Systems Evaluation*
Ken Kuenzel (Consultant) (MLO5-5/U52, 223-1211, KAKVAX::KUENZEL)

9.1.5 Micro Systems Software

Manager: Chuck Turley (MLO5-5/E71, 223-1895)

This group develops and maintains system software for PDP-11 systems. It also maintains tools for developing dedicated real time applications for VAX processors. Products include: RSX, RT-11, RSTS/E, DSM-11, VAX DSM, MicroPower/Pascal, VAXELN, P/OS, Languages (BASIC +2, COBOL-81, and others) and tools.

The group includes software development and maintenance, product management, quality testing, and documentation for all products.

Contact the following product managers for further information.

- *RSX*
Charlie Franks (ZKO1-3/H1, 381-1134)
- *RT-11*
Bill Parm (MLO5-5/E76, 223-8636)
- *RSTS/E*
Paul Laba (MKO1-1/L02, 264-7776)
- *MP/P, ELN*
Maureen Johnson (MLO21-2/U12, 223-1164)
- *Languages*
Joe Mulvey (ZKO1-3/J10, 381-1218)
- *DSM*
Barry Herring (MRO3-2/H7, 297-2355)
- *P/OS*
Jeff Slayback (MLO21-2/U12, 223-9340)

9.1.6 General Business Engineering

Manager (Acting): Chuck Turley (MLO5-5/E71, 223-1895)

The goal of this group is to make Digital the highest-quality systems vendor for small businesses. The group provides a VAX based system platform for small business marketing targeted for direct sales to Digital's small business customers.

9.2 DESIGN AND PROCESS ENGINEERING

Manager: Bill Picott (MLO1-5/U36, 223-8076)

The Design and Process Engineering Group (D&PE) focuses on key cross-functional engineering needs within Low End Systems (LES) and across the Corporation. The goals of the Group are the following:

- Improve test coverage and system availability.
- Reduce product development cycle through development of tools and process.
- Ensure that LES required base technology needs are anticipated, understood, and applied in a timely and competitive manner.
- Establish LES as the market leader in providing networking, local area systems, and communications solutions.

To achieve these goals, the following functional groups are utilized.

- *Diagnostic Engineering*
Manager: Jeff Katzif (MLO1-2/C31, 223-1156)
- *Engineering CAD*
Manager: Jim King (MLO5-2/T40, 223-5903)
- *Low End Network Systems (LENS)*
Manager: Dick Belanger (MLO1-5/U36, 223-5857)
- *Engineering Process and Technology (EP&T)*
Manager: Joe Cannizzaro (MLO1-5/U36, 223-4383)
- *Regulatory Engineering*
Manager: Dan Deknis (MLO6B-1/U30, (223-4163)

9.2.1 Diagnostic Engineering

Manager: Jeff Katzif (MLO1-2/C31, 223-1156)

The Low End Diagnostic Group provides diagnostic and firmware development to support the Low End Engineering design groups based on product, customer, field, and manufacturing specifications.

The diagnostic/test programs developed are used in design verification, manufacturing, and by the field for installation and repair.

The Diagnostic Group develops test and diagnostic requirements in the conceptual stage of the product to meet product requirements and systems issues. The group is also available for consultation in the advanced development phases of products.

The group is organized in the following manner.

- *Operations*
Manager: Don Lind (MLO1-2/C31, 223-3871)
- *Systems Development*
Manager: Bruce Rozett (MLO23-1/P53, 223-8798)
- *Worksystems Development*
Manager: Bill Walsh (MLO21-4/E10, 223-3142)
- *Advanced Development*
Manager: Ron Ross (MLO1-2/C31, 223-7954)
- *Quality/Release*
Manager: Charlie Santos (MLO1-2/C31 223-8245)
- *MicroSystems Development*
Manager: Hugh Bowen (MLO21-4/E20, 223-7013)

9.2.2 Engineering CAD

Manager: Jim King (MLO5-2/T40, 223-5903)

The Engineering CAD group provides a focus on resources for System Simulation and PCB Engineering needs. Engineering CAD provides a consistent set of Design Automation tools, libraries, and technical expertise that will support new technology, time-to-market, quality, and cost goals for Low End Systems (LES) PBUs.

Services fall into PCB Engineering and System Simulation.

PCB Engineering provides the processes, tools, libraries, and technical expertise that enables design engineers to generate a schematic/data base and to transfer that data base to a design center which provides fast turn-around time for PCB layout and fabrication. On average, it takes two weeks from schematic to PCB fabrication, with faster turn-around possible on priorities.

System Simulation provides a total System Simulation-based Product Development Process, Library, and Tool Suite which encompasses Electrical/Logical, Mechanical/Network, and Software Design disciplines within LES. System Simulation enables an engineer to simulate the overall system before committing to layout, thus allowing the engineer to make fewer passes through the PCB shop, which results in considerable time saved in the development process.

Engineering CAD also participates in the development and implementation of training for new skill sets required by Design Engineers so that they can avail themselves of new technologies. Valid training is an example of this.

The following is a list of subgroups.

- *PCB Engineering*
Manager: Bob Murphy (MLO5-2/T40, 223-8141)
- *Systems Simulation Group*
Manager: Don Conrad (MLO5-2/T40, 223-7959)
- *Operations and Administration*
Manager: John Grose (MLO5-2/T40, 223-8008)

9.2.3 Low End Network Systems

Manager: Dick Belanger (MLO1-5/U36, 223-5857)

Low End Network Systems (LENS) is responsible for the following major program areas:

- Generating Low End Systems related long-range strategic plans, and near-term product plans using networks and communications technology.
- Monitoring and refining the Engineering Phase Review Process.
- Program Office and Engineering for LES Network/Communications products.
- Program office for Fiber Optics (Janus) products.

LENS provides a focus and direction to ensure that Low End Systems (LES) products have a competitive edge within the networks and communications discipline. The program includes defining LES networks and communications strategy in conjunction with LES PBUs and NAC, and maintaining program management for cross-functional NAC programs.

The present cross-functional programs are as follows.

- *Janus* introduces into the Low End the benefits of using fiber optics for certain communications-based products. Initially it will deliver a terminal concentrator, Q-bus module, and fiber optic link for serial asynchronous communication, including architecture and a set of tools.

The present structure of this group is:

- *Systems Architecture and Technology*
Manager: Kami Ajgaonkar (MLO1-5/U36, 223-8927)
- *Network Systems Planning*
Andrei Shishov (MLO1-5/U36, 223-5944)
- *Engineering*
Manager: Tony Bryan (MLO3-5/U26, 223-6007)

- *Fiber Optics Program*
Manager: Hector Torres (MLO1-5/U36, 223-1010)

9.2.4 Engineering Process and Technology (EP&T)

Manager: Joe Cannizzaro (MLO1-5/U36, 223-4383)

The Low End Systems (LES) EP&T Group is responsible for creating an environment which enhances and stimulates technology, process development, and implementation across the LES organization. This effort ultimately supports the LES long range strategies and goals for the development of industry leading competitive products.

EP&T will perform its mission in the following manner:

- Development, integration, and communication of the LES technology and process strategies.
- Development and management of a unified process and technology strategy and funding process.
- Development and implementation of a LES strategy to reduce the new product development times.
- Identification of new and emerging technologies and the management of their introduction and development throughout LES.
- Act as an interface for LES on technology related issues within Digital to such Corporate organizations as TSC, CRA, MCC, and CPT.
- Manage the LES Technology Transfer Organization which is comprised of the Patent Office, Maynard Area Engineering Training, and the Technology Exchange Group.

EP&T is made up of three project oriented groups and two support groups.

9.2.4.1 Project Oriented Groups

- *Strategic Technology Planning*
Contacts: Raul Brauner (MLO1-5/U36, 223-1103)
Jonathan Griep (MLO1-5/U36, 223-4766)

Chartered to develop comprehensive technology investment plans and strategies which will permit the development of LES' products at the lowest possible cost.

- The first major goal of the Group is to ensure Digital/LES has the technologies required for the development of new products which will lead the competition or, at worst, match the competition.
 - The second major goal is to maximize the technology investments made by Digital/LES with the development or purchase of technologies which will have multiple uses in several new products, or the re-use of a technology developed by a group which is not a part of LES.
 - The third major goal is to make sure all technologies developed or purchased are compatible with the other technologies required to design and build a new product.
- *Technology Transfer*
Manager: Serge Paul-Emile (MLO1-5/U36, 223-2694)

Composed of three separate elements:

- *Patent Office*—Chartered to identify and protect the intellectual property of LES by aiding in the preparation of legal paperwork and by providing recognition to the developer of the intellectual property.

- *Maynard Area Engineering Training (MAET)*—Chartered to provide high impact, cost effective training and education programs for LES and Small Systems Manufacturing. These programs consist of Technical Seminars (live and satellite); National Technological University (NTU) Courses; and a Technical Orientation Series.
- *Technology Exchange*—Chartered to work with Digital organizations to determine which universities and other research centers are engaged in the exploration or development of technologies and/or processes which are, or may be, applicable to the design and manufacture of new LES' products. This group will also act as the focal point for LES funding for outside universities or research centers.
- *Simultaneous Development Process*
Manager: Subhash Dandage (MLO1-5/U36, 223-1039)

Chartered to design, model, and test a set of new product development processes for LES which will reduce the time-to-market of products of similar complexity, or will allow the development of highly complex new products without increasing the time-to-market. In either case, LES will have a new product development process which is highly predictable and will increase the efficiency of the development of a new product.

9.2.4.2 Support Groups

- *Operations and Planning*
Manager: Ken Brabitz (MLO1-5/U36, 223-6629)

Has the responsibility to ensure that the plans, goals, and projects of each of the project oriented groups are integrated into a master plan which fulfills the mission of EP&T and supports the mission and goals of LES. A second responsibility is to assist the other groups in the planning and/or execution of their projects.
- *Finance and Investments*
Manager: Steve Barker (MLO1-5/U36, 223-3550)

Has two main responsibilities: the first to manage the EP&T resources and prepare any financial reports required; the second to work with the other groups and provide the financial analysis of projects and investment proposals and/or recommendations.

9.2.5 Low End Regulatory Engineering (LERE)

Manager: Dan Deknis (MLO6B-1/U30, 223-4163)

Low End Regulatory Engineering (LERE) obtains regulatory approvals, certifications, and listings for all Low End products in a manner consistent with business goals. Its primary expertise is in the Product Safety and EMC areas. LERE manages the EMC domain in Digital and orchestrates FCC and VDE testing and approvals.

LERE maintains *DEC STD 103-0 Electromagnetic Compatibility (EMC) Hardware Design Requirements* and *DEC STD 062-1 Telecommunication Certification/Approval Process For Products*.

LERE performs numerous lab tests and writes product documentation reports to obtain UL, CSA, VDE, FCC, and TUEV approvals. LERE has the engineering skills to support product development in those areas.

- *Product Safety Engineering Support*
Jose Crespo (MLO6-1/U30, 223-1833, SAFETY::CRESPO)
- *EMC Engineering Support*
Stew Jackson (MRO1-D, 297-2847, FCCVDE::JACKSON)
- *Product and/or Approvals Status*
Sue Camber (MLO6-1/U30, 223-5205, EMIRFI::CAMBER)

9.2.5.1 Electromagnetic Compatibility (EMC) Domain

Manager: Peter Boers (MLO6B-1/U30, 223-5452)

Electromagnetic Compatibility (EMC) is the ability of equipment or systems to operate without malfunction in an electromagnetic environment. A device must be able to operate next to other devices without detecting interference from, or emitting interference to, these other devices. The Federal Communications Commission (FCC) and other international agencies have established levels of allowable Radio Frequency Interference (RFI) that computer devices may emit.

The EMC engineering group is also concerned with designing computer equipment that operates in the presence of other devices (such as radio and TV transmitters) that generate electromagnetic fields. Digital's design and test requirements are documented in DEC STD 103-0.

A number of EMC engineering skill centers serve the engineering clusters with design guidance and testing support. Representatives from the EMC skill centers meet at regular intervals in the EMC Domain Forum to discuss policy matters. The EMC Domain Manager interfaces with outside agencies, chairs the EMC Domain Forum, organizes VDE approvals, and is responsible for DEC STD 103-0.

The following individuals and test facilities provide expertise in EMC matters and assist with FCC and VDE product compliance.

- *Government Systems*
Bruce Archambault (MKO2-1/G6, ENGGSG::)
- *High Performance Systems*
Steve Bellanca (MRO1-2/G6, BARNUM::S_)
- *Low End Systems—LERE Group*
Stew Jackson (MRO1-D, FCCVDE::)
- *Low End Systems—LERE EMC Domain Manager*
Peter Boers (MLO6B-1/U30, EMIRFI::)
- *Micro Systems*
Bob Howland (MLO5-5/E60, KRYPTN::)
- *Mid-Range Systems*
John Sherwood (NIO/A2, MSEE::)
- *Storage Systems*
Tom Tuttle (CXO1-1/P12, NERMAL::)
- *Test Sites:*
 - Colorado Free Field Test Site (522-2295 or 522-2291)
 - Marlboro Anechoic Chamber (MRO1-E Hilltop Test Site, 297-2864 or 297-2865)
 - Marlboro Free Field Test Site (MRO1-F Horizon Test Site, 297-2881 or 297-2882)
 - Salem Anechoic Chamber (261-3632)

9.3 VAX WORKSTATIONS PBU

Manager: Art Williams (MLO5-2/G1, 223-3954)

This group designs and builds workstations which are computing systems that provide high quality user interaction and allow a user to work on multiple activities simultaneously. Workstations offer stable and predictable performance for technical and business professionals alike are designed to operate as standalone systems and in distributed and/or networked environments.

The VAX Workstations PBU is committed to becoming a leader of Systems of Workstations that serve the needs of technical and business professionals whose applications require high quality graphics and windowing capabilities in a distributed environment. It is expected that growth in distributed workstations marketplace will be significant over the next five years. VAX Workstations will work to establish workstations as the preferred style of computing in our target markets. Additionally, our technical focus will be RISC architecture and graphics.

The following VAX Workstations managers can help you determine whether or not their group can be of assistance to you.

- *Low End VAX Workstations*
Manager: John Clarke (MLO5-2/B6, 223-9129, JACOB::CLARKE)
- *Mid-Range VAX Workstations*
Manager: Carol Peters (UCO, 415-853-6714, DECWSE::PETERS)
- *High Performance VAX Workstations and Graphics*
Manager: Steve Bourne (LMO4-1/H4, 296-6648, 3D::BOURNE)
- *VAX Workstations Advanced Development*
Manager: Jeff Lane (UCO, 415-853-6741, DECWSE::LANE)
- *VAX Workstations Quality/Continuation Engineering*
Manager: Joe Bitto (MLO1-2/U2, 223-6093, ADVAX::J_BITTO)
- *VAX Workstations Product Management*
Manager: Steve Hansmire (MLO5-2/G1, 223-6882, JACOB::HANSMIRE)
- *VAX Workstations Systems and Evaluation*
Manager: Paul Kruger (MLO1-2/U2, 223-9161, ADVAX::KRUGER)
- *VAX Workstations Finance and Operations*
Manager: Barbara Keller (MLO5-2/U13, 223-6549, JACOB::KELLER)
- *VAX Workstations Business Management and Planning*
Manager: Gillian Scholes (MLO5-2/U13, 223-5388, JACOB::SCHOLES)
- *VAX Workstations Personnel*
Manager: (Open)

Additionally, supporting the VAX Workstations PBU are the following groups:

- *Workstations Product Marketing*
Manager: Dave Spinney (MLO1-2, 223-2446, ADVAX::SPINNEY)
- *VAX Workstations Base Product Marketing*
Manager: Sandy Carpentier (MLO1-2/C30, 223-3145, HARBOR::CARPENTIER)
- *VAX Workstations Customer Service Systems Engineering (CSSE)*
Manager: Ron Bogue (OGO, 276-9743, CSSE::BOGUE)

9.4 PERSONAL COMPUTING SYSTEMS GROUP

Manager: John Rose (LJO2/F4, 226-2550)

The Personal Computing Systems Group (PCSG) is responsible for the integration of industry-standard PCs and Apple Macintosh systems into the Digital environment. PCSG provides products which leverage upon Digital's strengths in VAX, VMS, LAVc, DECwindows, and DECnet technologies. PCSG is responsible for integration strategies pertinent to these markets and for proposing future PC integration products/systems. The group's goal is to assure that Digital becomes the #1 integrator of PCs in the industry.

9.4.1 Personal Computing Systems Software Engineering

Manager: Joe Carchidi (LJO2/I4A, 226-2796)

The Personal Computing Systems Software Engineering Group provides PC integration architecture, delivers products for MS-DOS integration and new integration products for OS/2 and the Apple Macintosh. The group provides a strategy which aligns with the Corporate strategy and coordinates the many technologies and architectures of the Corporation needed to deliver a successful integration of the personal computer.

9.4.2 Personal Computing Systems Program Office

Manager: George Symula (LJO2/C10A, 226-2447)

The Personal Computing Systems Group (PCSG) Program Office provides planning, program management, and product management for PC integration products. Group activities include:

- Developing product and pricing strategies for PC integration in support of the Corporate Network Application Support (NAS) architecture.
- Planning and Product Management for both PC integration system software and for PC integration applications. Included are both Digital-developed and ISV-developed applications. Ownership of the Digital Marketed Software (DMS) catalogue is included.
- Management of the Phase Review Process for PCSG.
- Management of the Corporate relationship with Apple Computer Corporation for the joint development of products.
- Management of the Macintosh Program Office, an advanced development group for DEC/Macintosh integration products.
- Contract management with major third party software companies.
- Responsibility for the management and direction of the European PC Clone Testing operation located in Valbonne.

9.4.3 Personal Computing Systems External Relations Program Office

Manager: Geoffrey Burr (LJO2/G10A, 226-2441)

External Relations is chartered to explore the feasibility of forming "alliances" with strategically-selected PC manufacturers and "niche" manufacturers in the PC integration areas.

The concept behind the "alliances" is to use them as an avenue for playing to Digital's value-added strengths in networking and software integration, provide PC hardware to the marketplace, and yet not invest DEC resources in the design and manufacture of PC hardware.

9.4.4 Base Product Marketing Group - Integrated Personal Computing (IPC)

Manager: Deane Curran (LJO2/C11, 226-2326)

The Base Product Marketing Group which reports into both the LES Marketing and Planning Group and PCSG provides product marketing services and support to PCSG and DSG (Desktop Systems Group). The group provides market input for Digital in both product strategy and marketing strategy in all areas of integrated personal computing, including desktop systems.

The group works with Product Marketing and Industry Marketing on market solutions which include the integration of MS-DOS, OS/2, and Macintosh with VAXes and Digital's Networking.

9.5 DESKTOP SYSTEMS GROUP

Manager: Larry Cabrinity (PKO3-1/K88, 223-7560)

9.5.1 Font Engineering

Manager: Paul Nelson (MLO1-3/E12, 223-8020)

Font Engineering is the Focal point for providing fonts to be used on the Digital product line, either for printing or display. The group provides expertise in selection, procurement, and appropriate use of fonts.

9.5.2 Hardcopy CSSE

Manager: Bob Bills (PKO3-1/10B, 223-7914)

CSSE provides maintainability engineering expertise to Hardcopy Engineering for their internal development and buyout activities. This group coordinates all service planning activities and ensures a smooth introduction of products to the field. After initial product shipment, CSSE tracks product performance and provides the interface between the support organization and continuation engineering.

In addition, there is a Field Service product management group within Hardcopy CSSE. This group establishes service product strategies and develops pricing proposals to complement these strategies. The group also monitors products through their life cycles to ensure continued success of the related service products.

9.5.3 Video Engineering

Manager: Al Johns (PKO3-1/K90, 223-5520)

This group designs a variety of video terminals from simple text-only to sophisticated graphics and imaging terminals. This group designs or coordinates the buyout of monochrome and color monitors for Desktop Systems Group (DSG) products and other PBU products. Video Engineering also coordinates and directs video terminal development in Taiwan.

The *Terminals Team*, headed by David Upton (PKO3-1/K90, 223-8905, REGINA:), designs video terminals. The *Display Team*, headed by Craig James (PKO3-1/K90, 223-3915, RANI:), designs or coordinates buyouts of monitors. The *International Team*, headed by R.A. Hoffman (PKO3-1/K90, 223-6914, SIERRA:), coordinates and directs video terminal development in Taiwan.

9.5.4 Hardcopy and Input/Output Engineering Group

Group Manager: Dave Sweeney (MLO1-3/E62, 223-6371)

This group designs and develops (or tests and selects) printing devices and input/output equipment. This includes keyboards and scanners to be used with Digital's systems.

The group consists of engineers with printer and I/O product design experience and project management capability. Engineering expertise includes the following.

- High-performance mechanical design engineering skills requiring expert knowledge in the following areas.
 - Vibration
 - Stress analysis
 - Kinematics
 - Materials and processes
 - Servomechanism design engineering skills
- Electronic design engineering skills requiring expert knowledge in:
 - Analog circuit and logic design
 - Microprocessors
 - EMI/RFI
 - Regulatory agency requirements
 - Software/firmware development skills with particular emphasis on real-time techniques

Managers to contact include the following:

- *Advanced Development*
Manager: Tom Dundon (MLO1-3/E12, 223-8305, RAJA::)
- *Buyouts and Input Device Development*
Manager: Paul Nelson (MLO1-3/E12, 223-3528, RAJA::)
- *Low-End Printing System Development*
Manager: John Davis (MLO3-6/B16, 223-2934, RAJA::)
- *Low-End Printing System Development*
Manager: (acting) Dave Sweeney (MLO1-3/E62, 223-6371, RAJA::)

9.5.5 Architectural Systems

Manager: Peter Conklin (PKO3-1/19A, 223-3221)

This group develops architecture and implements firmware for DSG products. The group designs and implements software to provide drivers, protocol translation, or other functions unique to a product's operation.

The *Architecture/Advanced Development Group*, headed by Sujit Kumar (PKO3-1/K90, 223-1300, RANI::), works with the development groups and all corporate groups whose products will interface with DSG products. The group owns responsibility for several standards concerned with terminal and printer functionality, and represents Digital on various ANSI and ISO committees. The group also works on advanced development projects to implement prototypes demonstrating new architecture and technology.

The *Firmware/Software Product Development Group*, headed by Richard Glantz (PKO3-1/K90, 223-5444, RANI:), designs firmware for video terminal products. The group develops host system software for video products and hardcopy products. On request, the group provides terminal emulator software for other products, and it will develop code for unusual languages, touch screens, or other special terminal functions. The group also provides long-term support for firmware and software of all released products.

The *Hardcopy Firmware Development Group*, headed by Harold Hager (MLO3-6/B16, 223-5637, RAJA:), designs firmware for printers, scanners, keyboards, and related I/O devices. The group also works on software for these devices and on the development of standards and protocols for printers.

The *Quality Assurance and Certification Group*, headed by George Cacioppo (PKO3-1/10C, 223-4078, REGINA:), tests all products developed within DSG with respect to firmware and software. The group works on products such as PCs and workstations as requested, to test functions, such as terminal emulators. The group certifies all corporate products for compliance with standards for terminal and keyboard functionality.

9.5.6 DSG Program Office

Manager: Rick Landau (PKO3-1/C10, 223-0915)

The DSG Program Office is an interface between the hardware, firmware, and software groups of the DSG and the software community at large.

The group determines the impact of DSG system product shipment by how well the hardware and software components work together, and whether they were announced and shipped together.

For all major programs in this area, such as printers, video terminals, scanners, and the like, the program office must understand all the components of work the system user needs, and find resources for them. If components of a system are not being built, components not working, components not properly integrated, or other component problems, then the program office is responsible for the repair of those components.

9.5.7 Video Advanced Development

Manager: Tom Stockebrand (ABO, 552-2551)

This group performs advanced development for terminals and display products.

Southwest Engineering, also managed by Tom Stockebrand, performs advanced development for high end/imaging terminals and display products.

9.6 ELECTRO/MECHANICAL DESIGN AND SUPPORT

Manager: Ralph Dormitzer (MLO6A-3/T96, 223-2146)

Electro/Mechanical Design and Support (EMD&S) is a design center in electrical and mechanical engineering and in technology development. The group offers a broad range of integrated customer services for designing, packaging, powering, connecting and cooling computer enclosures.

EMD&S provides cross corporate advanced technology and domain management in power conversion, electro-mechanical design, industrial and graphic design, human factors, acoustics and thermal engineering, mechanics, materials, and industrial packaging.

9.6.1 Program Management

Manager: Frank Digilio (MLO8-4/U50, 223-3778)

Program Management provides an effective and uniform TEAM approach to manage new product development programs, on an interdisciplinary basis, utilizing EMD&S, company-wide and outside resources, from the EMD&S exploratory phase through manufacturing start-up.

Program Management also provides methods to:

- Minimize the product time to market
- Assure predictable EMD&S program costs
- Achieve excellence in the Power and Packaging of the product (high quality, manufacturability, standards compliance).

Program Management shall:

- Serve as primary EMD&S product development interface to client(s).
- Ensure Power and Packaging Requirements Document and Engineering Projects Plans are developed, communicated and executed.
- Serve as the EMD&S Power and Packaging resource managers from the exploratory phase through manufacturing startup

Program Management attains its goals and objectives by:

- Developing and implementing controls and tools which result in program predictability.
- Coordinating EMD&S Power and Packaging activities to provide effective system integration solutions across all contributing disciplines.
- Improving and maintaining communications between clients and EMD&S.
- Focusing project planning, budgeting and scheduling activities to minimize the effort required across all engineering groups.

9.6.2 Corporate Design Group

Manager: Paul Benigni (MLO11-3/L12, 223-5676)

The Design Group, comprised of the Industrial Design, Human Factors and Graphic Design departments described below, is responsible for the visual and ergonomic design quality of Digital's products and their cross-product consistency.

The strength of the group is its cross-discipline relationship in the development of design solutions and its central focus. The group conducts advanced development domain activities prior to specific product development and design services on an international basis.

Contact the Design Group during the concept phase of user-visible products in order to ensure understanding of your product needs and its relationship to other Digital products.

9.6.2.1 Industrial Design

Manager: Richard Johnson (MLO11-3/L12, 223-5113)

Industrial Design develops and maintains product designs that have broad applications. Services of this group in product design encompass the related aspects of aesthetics and product recognition. The unique professional skills of Industrial Design include the ability to communicate concepts and problem solve through the use of conceptual sketches, detail drawings, three dimensional mock-ups, and so on. The group develops a distinctive aesthetic appearance that denotes a high quality product appropriate to the end-user's environment, and establishes and maintains a strong physical resemblance among products throughout the product lines. Product recognition ensures that the basic configuration of a product relates well to other products in structure, materials, finish, and physical and mechanical attributes.

Industrial Design initiates and participates in advanced development programs. The intent is to visualize the combinations of product aesthetics and functionality, as applied to future users for computers which are made possible through the revolution of emerging technologies.

Industrial Design also participates in environment design (ACT Facilities, etc.) and exhibit/display design.

9.6.2.2 Graphic Design

Manager: Charles Conn (MLO8-2/L13)

Graphic Design develops and maintains the corporate visual identity. The department strives to meet functional requirements and ensure aesthetic quality in the graphic presentation and perception of Digital and its products.

Specific services include designs for hardware and software product markings, including symbols and typefaces, packaging, labeling and documentation. The department also develops and supports corporate requirements for signage, fleet identification and literature.

Functional units with the department include the following:

- Graphic Design includes the creation and management of all design solutions, from concept to comprehensive to finished application.
- Graphic Art includes the mechanical production, including illustration, photography and CAD, for all design solutions.
- Design Support includes the specification and documentation of design solutions, including component engineering, external resource management and domain management of DEC and Corporate Identity standards.

9.6.2.3 Human Factors

Manager: Charles Abernethy (MLO11-3/L12; 223-5641)

Group supervised by: Betsy Comstock (MLO11-3/L12; 223-5642)
Tom Abrahamsen (MLO11-3/L12; 223-3545)

Human Factors Engineering participates with software developers and hardware engineering product design teams to increase the usability of the entire product including hardware, screens (windowing font, layout), symbols, interface design, input devices, documentation, and packaging. Direct human performances testing of concepts, mock-ups, prototypes, and product revisions is provided. Testing is conducted under controlled conditions in our laboratory located in Maynard in MLO11-3, at other locations, or in the field.

Considerable experience has been gained developing computer systems for the end-user. Early involvement with product development teams is strongly encouraged. Responsible for DEC STD 105 and 107.

9.6.3 Electro/Mechanical Design Engineering

Manager: Dick Gonzales (MLO11-4/U32, 223-4832)

Electro/Mechanical Design Engineering (EMDE) provides mechanical engineering services for the development of Digital's low-end products. These services include mechanical project management, conceptual study, plastics consultation, design, functional models, documentation, value added engineering, release to production and post release support. The areas of design expertise include electro/mechanical packaging of small enclosures, cabinets, small systems, terminals, workstations, interconnect strategies, and a variety of accessories. Specific information can be obtained from the following managers:

- *Engineering Operations - Design for Manufacturing - CAD Technologies*
Rich Castellano (MLO11-4/U32, 223-8451, THOTH::CASTELLANO)
- *Product Strategies - Competitive Analysis - Technical Consulting*
Jim Walls (MLO11-4/U32, 223-6565, THOTH::WALLS)
- *New Product Development*
John Bagley (MLO8-4/U50, 223-7018, THOTH::BAGLEY)
- *New Product Development*
Paul Lorusso (MLO11-4/U32, 223-6817, THOTH::LORUSSO)
- *Advanced Development - Plastic/Product Consulting*
George Doumani (MLO11-4/U32, 223-9124, THOTH::DOUMANI)
- *Engineering Services - Documentation & Checking - Lab Services*
Tom Maher (MLO11-2/E83, THOTH::MAHER)

9.6.4 LEPS Engineering and Corporate Power Conversion R&D

Manager: Dave Bertetti (MLO6A-3/T96, 223-3091)

9.6.4.1 Power Conversion Product Development

Manager: Howard Kaepplein (MLO6-3/T96, 223-6191)

The Power Conversion Product Development (PCPD) Group services the power supply needs of Digital's product development groups which require power supplies with less than 500 watt output, predominantly the Low End Systems organization. Program involvement most often begins at the concept stage of a new product and continues until the product is no longer in production. The group works with the system designers to develop a complete power supply specification and business strategy that is consistent with the performance requirements, transfer cost, reliability, funding, and development schedule for the program. In addition, the group helps resolve problems related to the entire power system, not just the power supply itself. The group also coordinates efforts to achieve the necessary safety agency approvals and to facilitate the introduction of the power supply into manufacturing.

Once a supply has been developed for a product, PCPD supports manufacturing, field service or corporate product safety in resolving issues concerning the supply that may come up at any time during its life. This is true whether the supply was designed and manufactured internally or purchased from an outside vendor.

Contact this group whenever a power supply in a 10- to 500-watt range is needed for a product.

9.6.4.2 Corporate Power Conversion Research and Development

Manager: Anil Ohri (MLO6A-3/T96, 223-5990)

The Corporate Power Conversion Research and Development Group is responsible for the development and/or acquisition of new power conversion technologies/tools/processes for meeting the power needs of future computer systems and related products of the corporation. The group sponsors and directs long-term research programs at various universities for advancing the state of power conditioning technology and tools. The group also develops CAD/CAE tools for simulation/analysis/modelling of power supply and systems for use by power supply designers through out the corporation. The group helps in transferring technology from research by developing hardware just short of introduction into products.

The group also provides Digital with the exploration of strategies for providing power integrity including EMI/ESD protection, AC power measurement and control, design of power controllers and the maintenance of corporate power standards.

The group provides consulting services to all the power supply groups as well as to various product groups in power related areas. The group provides a communication link between various power supply groups by publishing journal and providing a monthly forum for technical exchange.

This group should be informed of any functional power system problems, improvements, or changes that are required to optimize product performance.

9.6.5 Mechanical Technology Development

Manager: Frank Grimaldi (MLO8-3/T13, 223-4177)

Mechanical Technology provides engineering consulting and testing services in mechanical specialties vital to product development. Mechanical Technology consists of the following groups.

- *Advanced Materials and Processes* (engineering materials, finishes)
Richard Thibeau (MLO8-3/T13, 223-6001)
- *Environmental Engineering* (product environmental capabilities)
Frank Grimaldi (acting) (MLO8-3/T13, 223-4177)
- *Product Acoustics* (product acoustic noise)
Bob Lotz (MLO8-3/T13, 223-5774)
- *Solids Mechanics* (statics, dynamics, kinematics)
Frank Grimaldi (Acting) (MLO8-3/T13, 223-4177)
Model Lab (MLO8-1, 223-3830)
Dynamics Lab (MLO8-1, 223-3761)
- *Thermal Engineering* (product cooling and climatics)
Ralph Larson (MLO8-3/T13, 223-9102)
Thermal Lab (MLO11-1, 223-4759)
I/R Lab (MLO11-1, 223-3795)
T/H Lab (MLO11-1, 223-3795)
- *EMD&S System Support*
Larry Warfield (MLO8-3/T13, 223-8721)

Mechanical Technology resources are contracted members of product development teams where they are responsible for identifying design goals and solutions to achieve desired product performance.

Mechanical Technology design consulting activities involve all levels of the physical packaging hierarchy and span the entire spectrum of Digital hardware products.

Mechanical Technology maintains comprehensive discipline laboratory facilities and testing capabilities. A recent expansion of the laboratories has provided important enhancements, especially in dynamics, thermal, and climatics. Shipping package testing facilities have been expanded to include all capabilities necessary for National Safe Transit Association (NSTA) certification.

Mechanical Technology also performs independent projects to ensure that appropriate knowledge, tools, and consulting capabilities are available to meet future product needs. It monitors, influences and communicates discipline issues of importance, such as international acoustic noise regulations and materials regulations.

Involving Mechanical Technology early in your product development program can aid in setting mechanical/package design specifications and in identifying design alternatives to meet product performance and cost goals in the desired development time.

9.6.6 Industrial Package Engineering (IPE)

Manager: Larry Nielsen (MLO4-2/D17, 223-3758)

Industrial Package Engineering (IPE) is responsible for the design and implementation of shipping packages for Digital manufactured and buyout products as well as associated options, spares, sub-assemblies, and related items. The group also offers design and process consultation for Digital manufacturing in solving plant-specific as well as cross-plant packaging problems. A fundamental goal in providing these services is to achieve cost effective package design while maintaining product protection and distribution efficiency through the shipping environment.

The above responsibilities are shared by two subgroups within IPE which do similar activities for different categories of Digital products. Additionally, there is another subgroup that is concerned with services that support Industrial Packaging design work. These subgroups are described below.

Contact the IPE group for the design of any protective shipping package(s). The group can also provide assistance in making changes to existing designs and consulting on packaging processes.

IPE is a service group and requires funding to provide its services. Written estimates and schedules can be provided. Requests for service should be made well in advance of first shipments to be effective. Phase 0 is not too early to contact IPE to establish initial packaging requirements as this will often minimize related problems later in the development process.

9.6.6.1 Low End Systems Industrial Packaging Engineering

Manager: Bill Davies (MLO4-2/D17, 223-9179)

Low End Systems Industrial Packaging Engineering does package design and is associated with manufacturing operations mainly for Low End products.

9.6.6.2 High & Mid-Range Systems Industrial Packaging Engineering

Manager: Brian McBride (MLO4-2/D17, 223-3833)

High & Mid-Range Systems Industrial Packaging Engineering does package design and is associated with manufacturing operations mainly for High and Mid-Range products.

9.6.6.3 Industrial Packaging Engineering Services

Manager: Nelson Simkins (MLO4-2/D17, 223-3882)

Industrial Packaging Engineering Services provides the Component Engineering function with respect to packaging at Digital. In doing this, it works closely with Purchasing to evaluate and specify packaging materials. Documentation services for packaging purchase specifications and packaging instructions, are provided by the group. Development of packaging related information systems is another service provided by this group.

9.7 MICROVAX PROGRAM

Manager: Jesse Lipcon (MLO5-5/E71, 223-3207)

This group develops general-purpose MicroVAX timesharing and server systems based on the MicroVAX, CVAX, and follow-up on chip sets. The group is also responsible for business management of the MicroVAX PBU. Current products are the MicroVAX II, MicroVAX 2000, and MicroVAX 3500/3600. The organization consists of *Development* under Jay Nichols, *Operations* under Len Kreidermacher, and *Product Management* under Lou Philippon.

9.8 BASE PRODUCT MARKETING AND PLANNING

Manager: Matt Kochan (MLO1-2/U44, 223-6450)

The LES Product Marketing mission is to integrate, coordinate, and manage the LES marketing and planning organizations to ensure that Digital realizes its maximum world-wide potential from the products it designs, develops, and offers in the Low End space (General Purpose & Desktop Systems). The Base Product Marketing and Planning Group consists of the following organizations, managers and missions:

- *Worksystems BPM*
Sandy Carpentier (MLO1-2/C30, 223-3145)

Be recognized as the leading vendor of workstations to the technical and business professional where there is a requirement for high quality graphics and windowing capability in a distributed environment.
- *Terminals and Printers BPM*
Joe Meany (PKO3-1/D9, 223-3827)

Be the leading worldwide supplier of high quality, cost effective terminals, printers, and services for Digital's systems and networks in support of the Desktop Strategy.
- *Integrated Personal Computing BPM*
Deane Curran (LJO2/I4, 226-2326)

Deliver a family of architected products which will allow Digital to become the leader in the integration of industry standard PCs and Apple MacIntoshs into departmental as well as corporate-wide networks.
- *MicroVAX Systems BPM*
Duncan Anderson (MLO21-2/P62, 223-2442)

Provide standard-setting, general purpose, multiuser 32-bit VAX architecture systems and servers in the \$7K to \$200K price range. Position MicroVAX as the first choice for:
 - The server intelligence behind the machine on the desk
 - The system in front of the corporate mainframe
 - The system that ties it all together
 - The preferred migration path from PDP-11's, IBM System/3x and PC's
- *Microsystems/Realtime BPM*
(Open)

Successfully manage the PDP-11 business for the remainder of its useful life; keep the PDP-11 customers within the Digital family.

Re-establish Digital's leadership in realtime factory and laboratory markets and prevent the further migration of realtime applications away from Digital solutions.
- *Desktop Communications*
Ronnie Morvay (MLO1-2/C30, 223-3120)

90 LOW END SYSTEMS (LES)

Promote and facilitate the sale of LES Desktop products worldwide through high quality communications to target audiences in support of LES and corporate marketing and sales strategies.

- *General Purpose/Realtime Communications*
Abbot Gilman (MLO1-2/U44, 223-7953)

Create and implement high quality communications that make it easy for customers to buy, and easy for the sales organization to sell, our products.

- *Europe BPM*
John Forde (RTO/D2, 865-1149)

Be the operational arm of LES in Europe to provide Base Product Marketing support to Europe from Europe.

- *BPM Finance*
Mark O'Connell (MLO1-2/U44, 223-5211)

Develop an integrated, well managed, planning function that results in an organized LES-wide planning process that ensures resource investments which optimize contribution to profit and/or optimize contribution to well defined strategic goals.

- *BPM Personnel*
Kathryn Smith (MLO1-2/U44, 223-5467)

Develop and motivate creative leadership employees.

CHAPTER 10

MID-RANGE SYSTEMS BUSINESS GROUP

Group Manager: Bill Demmer, Vice President

Mid-range Systems Business (MSB) Group develops, manufactures, and markets competitive systems for commercial and technical customers. The PBU provides a range of general purpose systems in the following pricebands.

- \$75K-250K
- \$250K-500K
- \$500K-1M
- \$1M-2M

MSB is comprised of the following major groups.

GROUP	PRIMARY RESPONSIBILITY	GROUP MANAGER
Low-End Mid-Range Systems	Product Development	Don Harbert
Large Mid-Range Systems	Product Development	Steve Jenkins
High Performance PRISM Worksystems	Product Development	George Hoff
DECwest Engineering	Product Development	Dave Cutler
Systems Engineering	Architecture, Systems Advanced Development, Performance Analysis, Applications Technology, and Consulting	Cathy Learoyd
DECwest Strategy		Dick Angel
Operations		Dan Jennings
MSB Marketing		Ken Swanton
Business Finance	Investment Analysis/Control	Rich Butler
Personnel		Tony Picardi

The Mid-range Systems Business Group is located in LTN, BXB, VWO, NIO, ZKO, ZSO.

10.1 DECWEST

Manager: Dave Cutler (ZSO, 206/865-8700)

The DECwest engineering group is located in Bellevue, Washington. DECwest is responsible for the design and development of an extended VAX Architecture which incorporates parallel processing, vector processing and an enhanced privileged architecture. In addition to managing this architecture, DECwest is also designing and implementing high-end systems which are based on this architecture.

A reimplemention of VMS incorporates a number of enhancements and alleviates known problems. A special implementation of ULTRIX runs concurrently with, and is integrated with, VMS.

DECwest will maintain a strong product set focus over time, which includes product maintenance, base product marketing, long range planning, architectural expansion and extension, enhancement of operating system software and implementation of additional high-end processors using state-of-the-art technology.

CHAPTER 11

HIGH PERFORMANCE SYSTEMS (HPS)

Manager: Bob Glorioso, V.P. (MRO1-1/A65, 297-5919)

The High Performance Systems Group (HPS) consists of three businesses:

- *VAXcluster Systems Business Unit*
Delivers highly available and fault tolerant VAXcluster systems.
- *On-line Transaction Systems Business Unit*
Delivers highly integrated distributed TP systems solutions.
- *System Components Business Unit*
Delivers the highest performance and high availability uni- and multi-processors as well as fault tolerant computers.

The HPS Group includes function and support groups described below and works in concert with Manufacturing, Customer Services and Marketing to specify, develop, deliver, and service high performance computer systems.

11.1 LARGE VAX ENGINEERING

Manager: Joe Zeh (MRO1-1/A65, 297-5924)

The Large VAX Engineering Group is responsible for the development of high end VAX products. Current products include Aquarius, Aridus, Aquarius II, and Centaurus. Functions within the group include CAD, CPU Development, and Technology, Research and Engineering.

11.1.1 Aquarius Program

Manager: Carl Gibson (MRO1-1/M31, 297-6779)

This program will establish the next generation of design process and CAD tools, basic physical technologies, and implementation architecture for high performance VAX/VMS systems.

11.1.2 Technology Research and Engineering

Manager: Jim Esselstyn (MRO1-3/T4, 297-4979)

Technology Research and Engineering develops the basic physical technologies required by HPS for its high end products.

11.1.3 CPU Engineering Group

Manager: Jurgen Brommelhoff (MRO1-2/E47, 297-4778)

The CPU Engineering group develops, implements and verifies (through Simulation and Hardware Verification) high performance CPU Kernels, including primary I/O adapter and Service Processor H/W and S/W, for use in HPS systems.

11.1.4 CAD/CAM/Diagnostics

Manager: Mimi Chen (MRO1-1/M31, 297-6316)

This group supplies the design process methodologies (acquisition, design, development, and integration of computer-aided tools into the design environment) needed to develop, manufacture, test, and support HPS products.

11.2 HPS OPERATIONS AND INFORMATION SYSTEMS

Manager: Nick Cappello (MRO1-2/L25, 297-6261)

HPS Operations and Information Systems provides MIS systems computer services and facility services for the High Performance Systems Group.

11.2.1 HPS Computer Services

Manager: Barney Lorence (MRO1-2/E69, 297-4374)

HPS Computer Services provides computer and network support to the High Performance Systems Group.

11.2.1.1 HPS Computer Services Operation

Manager: John Barker (MRO1-2/E69, 297-7478)

Computer Operations provides the following services.

- Operations support
- System monitoring, backups, and restores
- Printer and plotter output distribution
- Tape and disk media storage
- Operations analysis
- Hardware support - interface with Field Service
- System management
- System software and applications software installations and upgrades
- Daily software troubleshooting and repair
- System performance monitoring
- System/Cluster Security

11.2.1.2 HPS Computer Services Technical Support

Managers: Lou Jacques (MRO1-2/E69, 297-4581)
Josh Dane (MRO1-2/E69, 297-4483)

Technical support provides the following services.

- Network management and support
- Automation tools
- Distributed output software support
- Performance analysis
- Financial tools support
- Network Security

11.2.1.3 HPS Computer Services Administration

Manager: Judy Foreman (MRO1-2/L25, 297-5916)

Administration provides the following services.

- System planning - configurations, layouts, technical edits
- Financial administration - automated budget and process control
- Order administration - order processing and control
- Capital administration - asset control and data management
- Program management - user interface, equipment forecasts and contract administration

11.2.2 HPS Facilities Management

Manager: Ken Culverwell (MRO1-2/L25, 297-2686)

Facilities Management provides worldwide Facilities management support to the HPS organization.

- Strategic Facilities Planning
- Construction Management - New or Refit Facilities
- Project Management - Computer rooms, Laboratories, Environmental Chambers, Clean rooms
- Facilities Management Support

11.2.3 HPS MIS

Manager: Drum Chapman (MRO1-2/L25, 297-6462)

To provide HPS with the information necessary to execute the business. MIS is responsible to ensure that the information can be readily accessed in a timely, accurate, and cost effective manner.

To support HPS in the achievement of its key goals and strategies; to set the strategic direction and to provide business systems planning for MIS application related services for the administrative businesses (including HPS Manufacturing); to influence systems integration and commonality, resource sharing, and MIS planning.

11.3 SYSTEMS RESEARCH AND ENGINEERING

Manager: Fernando Colon-Osorio (MRO1-1/L26, 297-7230)

Systems Research and Engineering will provide the basic research and engineering needed to build leadership high performance systems, cluster systems, and fault tolerant systems within HPS, and verify their effectiveness. The basic technologies are:

- *Clusters*—Evolution of the cluster model of computing from a time sharing Design Center to a distributed model of computing.
- *System Availability*—Characterize existing systems (clusters and multiprocessors) in terms of their availability.
- *System Performance*—Characterize existing systems in terms of their performance as measured by standard benchmarks and workloads. Develop and incorporate into Digital's suite of tools new workloads which are representative of computing in the 1990s.
- *Fault Tolerance*—Continue to explore both proven and innovative techniques in designing/building highly reliable systems and incorporate their design as part of Digital's high availability cluster offering.
- *Advanced Architectures*—Research and engineer structures extending Digital's high end. The Centaurus system development program is a major part of this effort.

11.4 PLANNING, QUALITY, AND STRATEGIC RELATIONS

Manager: Jan Jaferian (MRO1-1/A65, 297-6524)

11.4.1 Planning

Manager: Rachel Shimkin-Oberai (MRO1-1/A65, 297-7040)

The Planning Group is responsible for defining and driving the various planning processes (e.g., PBU, Engineering, LRPs) within HPS and for contributing to the definition and driving of corporate planning processes. This group also provides industry, market, and business analyses to the HPS Management Committee to aid in their decision making. It defines metrics and models and disseminates timely business performance data, including product availability, revenues, and other information.

11.4.2 Strategic Analysis

Manager: Dianne Mahany (MRO1-1/A65, 297-4134)

The Strategic Analysis Group performs cross-functional strategic analysis for HPS, utilizing independent industry analysis and output from the HPS and corporate planning processes. The group focusses on HPS business positioning, both as a business unit within Digital and as a competitor within the industry. This group prepares corporate-level presentations covering HPS strategic and business positioning, and also provides business management and analysis for the Strategic Relations Group.

11.4.3 Quality

Manager: Lou Cohen (MRO1-1/A65, 297-5580)

The Quality Group is responsible for providing Quality leadership in HPS. It does this by providing full time product quality managers to product development programs, providing quality consultants to all of HPS, and providing Quality information to HPS. The quality managers act as quality goal setters and goal keepers for the products they are assigned to. They facilitate and promote the cross-functional communications that must occur within programs for quality success. They provide the link between program needs and the quality expertise in the Quality Group. The quality consultants provide support to HPS by training and on-the-job consulting in a variety of quality technologies, including Statistical Quality Control, Experimental Design (including Taguchi methods), Human Factors research, Quality Function Deployment, and other techniques.

11.4.4 Strategic Relations

Manager: Jan Jaferian (MRO1-1/A65, 297-6524)

The Strategic Relations Group is responsible for leveraging HPS investments, revenue potential, and time-to-market with strategic third party alliances that complement and support the HPS business, development, services and manufacturing strategies. This group provides focus and expertise in the analysis of strategic partnering opportunities and in the structuring, negotiation and implementation of third party collaborations. This group reports jointly to HPS and to Corporate Strategic Relations.

11.5 TRANSACTION PROCESSING SYSTEMS ENGINEERING

Managers: Rich Whitman (MRO1-1/C2, 297-7498),
John Manzo (MLO3-2, 223-7248)

The TP Systems Engineering Group is responsible for leading Digital into the TP market in a coordinated and strategic manner.

The organization is divided into the following functions:

- *Systems Architecture*—Provide comprehensive and evolutionary architecture for TP Systems that drive individual product architectures.
- *Systems Engineering*—Coordinate and facilitate implementation of architecture plans with all products that comprise Digital's TP System.
- *Design Consultation*—Consult to customers with designing and implementing large complex TP Applications.
- *Performance Analysis*—Provide Systems performance characterization (debit/credit benchmark) to position DEC's hardware and software TP products against competitive offerings. Currently, developing an application sizing tool to be used in the field.
- *SW Engineering*—Develop Software products that meet both Corporation's quality goals as well as comply with the TP Architecture goals.
- *Product Management*—Facilitate bringing the products to market by managing and coordinate the Phase Review Process working with the Engineering, Finance, Marketing and appropriate Corporate Committees.
- *Marketing*—Design and implement a comprehensive marketing strategy that will ensure the largest market penetration with the available products by focusing on DEC resources.

11.6 VAXCLUSTER SYSTEMS ENGINEERING AND MARKETING

Manager (acting): Fernando Colon-Osorio (MRO1-1/L26, 297-7230)

The VAXCluster System Engineering and Marketing (CSEM) Group manages and delivers the high availability/fault tolerant strategy and Cluster system products for the corporation. The major goal is to establish VAXcluster systems as the preferred solution to IBM for mid-range and high-end systems in both the technical and commercial marketplaces.

The VAXcluster Business Management group provides business analysis functions and information systems to support VAXcluster System business plans, marketing plans and development efforts.

The VAXcluster engineering projects are divided into five categories:

- *CIRRUS Systems Engineering*—Develops high performance, fault tolerant system products.
- *Packaged VAXCluster Systems Engineering*— Develops packaged VAXcluster systems (897X, 88XX etc), upgrades to packaged VAXcluster systems, and consulting to other groups developing VAX-cluster systems.
- *VAXCluster Technical Office*—Provides a technical and architectural focus for strategic issues for the entire program and which also develops new technologies in VAXcluster validation.
- *VAXCluster Systems Engineering*— Provides engineering support for our traditional mode of business and customer base. A major component of this group is the Cluster Verification Group.
- *Component Hardware and Software Products* – (Pleiades, XCD, VCS, VPA, etc). This group will center on assuring and enhancing "systemness" in both the current CI-based and the next generation of VAXcluster systems.

11.7 SYSTEMS SOFTWARE ENGINEERING

Manager: John Manzo (MLO3-2/E84, 223-7249)

The Systems Software Engineering (SSE) Group was formed in 1987 in recognition of the critical roles that Software Engineering and Systems Development Process are playing in both High Performance Systems (HPS) and Digital's future.

SSE was formed by the merger of Center for Systems Development Process (CSDP), the HPS Software Engineering Group (SWE), and the On Line Transaction Processing (OLTP) Software group. The CSDP program is now called the Systems Productivity Tools (SPT) program to reflect its new focus on providing top quality, state-of-the-art systems productivity tools to HPS and the Corporation.

11.7.1 OLTP Software Engineering

Manager: Laura Woodburn (ZKO2-2/M37, 381-2243; 297-2658)

This group is responsible for the development of transaction processing monitors and related system management tools, and for the definition and delivery of an integrated environment based on new and existing tools to design, build, and test OLTP systems. As part of the HPS Transaction Processing organization, this group participates in the development of Digital's OLTP strategy and architecture. Currently located at two sites, MRO and ZKO, OLTP Software Engineering will also sponsor work in Cupertino and Europe in the future.

11.7.2 Processor Specific Software (PSS)

Manager: Tom Lofgren (MRO1-2, 297-5170)

This group provides software engineering development and support to several of the HPS programs such as Cirrus, Aquarius and Clusters. The extent of the involvement of PSS varies with the needs of the respective program. For example, several significant products such as VAX Performance Advisor, VAXcluster Console and the Cray Server Interface have been produced for the Cluster Program. PSS is developing the entire system software package for the Cirrus Program.

11.7.3 Systems Productivity Tools (SPT) Program

11.7.3.1 Information Environment (IE)

Manager: Roy Rezac (MRO1-1, 297-4260)

This group has developed the DATABUS, an information management architecture, designed to address specifically the need for managing information in Digital's product development environment. The DATABUS Architecture will enable Digital to develop products in a timely, efficient, and effective manner. This architecture will be implemented in accordance with the Digital Process Strategy in a series of base levels of the Knowledge Environment for Evolving Products (KEEP) data management system. KEEP is the internal software product that implements the database programming language components of the DATABUS Architecture. The IE group offers a database system, several layered applications (see below), application support, training, seminars, consulting, and project modeling to understand information needs and usage.

11.7.3.2 Project Management Facility (PMF)

Manager: Oleh Kostetsky (MLO3-2/E84, 223-3704)

This group developed PMF, an integrated system for describing, scheduling, and monitoring the progress of a single project or a collection of related projects (a program) for diverse applications including hardware or software development, manufacturing, document production, construction or relocation projects. PMF provides a set of tools and methods that work together, each focused on a different aspect of project management. The core of PMF is a Monte Carlo simulation tool that generates a probabilistic projection based on risk estimates. PMF also provides interactive tools for building and revising project description, analyzing and reporting on projected and actual project status. The group provides additional assistance in the form of project management practitioners who are trained in operations analysis and project management and can help users to define their project and to use PMF effectively.

11.8 VAX 8600 AND 8650 SYSTEMS

Manager: Rich Whitman (MRO1-1/C22, 297-7498)

The VAX 8600 and 8650 Systems Engineering Support responsibilities have been transferred to the SASE High End Systems Group which has responsibility to resolve any technical problems at the component, subsystem or system level.

11.9 ADVANCED TECHNOLOGY ENGINEERING AND MANUFACTURING (ATEAM)

Manager: Paul McEnroe (UCF, 408-973-1521)

ATEAM provides research, development, and manufacturing of high end interconnect and packaging technologies which maximize the performance of IC technologies. Process Development Group - functions are film interconnect technology process development and transfer to manufacturing. Engineering Systems Group - functions are mask design, electrical modeling, test, debug, failure analysis, interconnect reliability, and Data Center support. ATEAM will also provide corporate support for both the development of custom bipolar IC's on Motorola's Mosaic 2 and Mosaic 3 processes and the application of advanced interconnect technology to other Digital products.

11.10 HIGH PERFORMANCE SYSTEMS MARKETING

Manager: Richard Whitman (MRO1-1/C22, 297-7498)

HPS Base Systems Marketing is responsible for stimulating demand for high performance, high availability and mission critical systems within Digital and within new and current markets while keeping Digital's product image consistent in the marketplace. The organization includes the following groups:

11.10.1 VAXcluster Base System Marketing

Manager: Clem O'Brien (MRO1-1/C22, 297-5605)

- Communicate Digital's high availability/fault tolerant strategy.
- Launch new Packaged VAXclusters.
- Define the next generation customer requirements.

11.10.2 High End VAX Marketing

Manager: Bill Askins (MRO1-1/C22, 297-7268)

- Launch the next generation High End VAX family in the market.
- Ensure that Digital delivers all the elements of sales, service and support associated with the next generation product family to meet customer requirements.

11.10.3 OLTP Marketing

Manager: Allan Titcomb (MRO1-1/C22, 297-2967)

- Market comprehensive Digital "systems" products into the rapidly growing OLTP marketplace.
- Position Digital as a primary competitor in this market.

11.10.4 Systems Marketing/Competitive Expertise Center

Manager: Bill MacCormack ((MRO1-1/UP7, 297-2972
Stan Pearson (MRO1-1/C22, 297-2962)

- Market current HPS products, stimulates demand for future HPS products.
- Establish and maintain direct interface to both the salesforce and targeted customers to ensure market feedback is channelled into future HPS products and to promote customer satisfaction with HPS products.
- Provide, through the CEC, analysis and interpretation of competitors' products and strategies in the high end market.
- Provide, through the TP Support Center, benchmark and demonstration support for ACTs and CMPs.

11.11 MANUFACTURING BUSINESS UNIT

Manager: Chris McGill (MRO1-2/FX1, 297-1091)

The MBU is responsible for managing manufacturing requirements for HPS products by influence of product design, direction of manufacturing technologies and ensuring the worldwide manufacturing strategy of HPS products and systems. The group is structured along product lines with supporting functions.

CHAPTER 12

STORAGE SYSTEMS ENGINEERING AND MANUFACTURING

Manager: Grant Saviers, V.P. (MLO1-5/B94, 223-9765)

Storage Systems Engineering and Manufacturing is responsible for the worldwide engineering product strategy, base product marketing, business planning and U.S. Manufacturing for Digital's storage products and database systems. These products include semiconductor and other solid state memory devices, arrays, subsystems, flexible disks (floppies), cartridge and cassette tape drives, 1/2-inch industry-compatible tape drives, optical storage products, and removable and fixed media hard disk drives of all sizes, relational and network database systems and tools. The organization supplies these products to Digital either by developing or purchasing them.

Storage products are manufactured in Colorado Springs, Colorado; Enfield, Connecticut; Tempe, Arizona; and in Springfield and Shrewsbury, Massachusetts. Products and subassemblies are also manufactured in Hong Kong, Taiwan, and Singapore. European requirements are met by facilities in Kaufbeuren, Germany and Galway, Ireland. Database systems are developed in Spit Brook, New Hampshire and Colorado Springs, Colorado.

In addition to product development activities in Shrewsbury, Colorado Springs, and Tokyo, Japan, there are product management, planning, and advanced technology groups that support the mission of the organization.

12.1 TAPE AND OPTICAL PRODUCT DEVELOPMENT

Manager: David W. Brown (SHR1-4/D25, 237-2070)

This group provides the strategy, business planning, product development, marketing and support for magnetic tape and optical disk products. The group works with the responsible CSSE and Manufacturing organizations for these product sets. These products are used on virtually all systems and sold by Digital's marketing units.

The products include tape drives, optical storage devices, related software products, associated formatters, and controllers. Products range from low-cost devices such as the TK50 to the more expensive IBM-compatible units such as the TA79, TU81 and TA81 and TU80. Also, the group is developing a family of laser-based optical disk products, including CD Reader and future optical products. Software products include Storage Library System (SLS) software product for archiving and media management.

The group either develops or purchases its product designs. The group interacts with customer services, manufacturing, systems engineering groups, and Corporate Marketing during the planning, design, and testing phases of new product development to ensure that total systems meet their performance and competitive requirements. As a Product Business Unit (PBU) the group is also responsible for the financial contribution of these products, for customer satisfaction and our competitive position for these products.

12.1.1 Tape and Optical Product Management and Marketing

Manager: Bruce Gordon (SHR1-4/D25, 237-3538)

This group includes product management and base product marketing for tape and optical disk products and related software products. The group manages strategic and business planning activities. The group plans and manages the business, and communicates the status, of our products throughout Digital. The group works with systems engineering organizations to coordinate product plans.

Marketing activities include market research, product promotion, literature development, trade show support, sales training and customer presentations. The Tape and Optical Program Office interacts with the sales and marketing arms of Digital, to understand customer and market needs, to support the company's sales efforts, and to integrate messages with those of the other marketing organizations.

12.1.2 Industry-Compatible Tape Development

Manager: Walter Manter (SHR1-4/D27, 237-2623)

This engineering group is responsible for the development (or buyout procurement) and system integration of Digital's IBM-compatible tape products and related software products like SLS, and optical products like RV20 for archival applications. These include the current nine-track products like TU80, TU81, TA81, TU78 and TA78 and other high-end IBM compatible tape products that are currently in development.

12.1.3 Cartridge Tape Development

Manager: Demetrios Lignos (SHR1-4/D28, 237-2136)

This engineering group is responsible for the design, development and system integration of the TK50 and TK70 family of cartridge tape drives and controllers. They are also involved in programs to develop follow-on members of the TK50 and TK70 subsystem family.

12.1.4 Optical Disk Development

Manager: Doug MacKenzie (SHR1-4/D27, 237-3136)

This group develops and integrates optical disk products, including the CD Reader subsystems, and future optical disk products.

12.2 ADVANCED DEVELOPMENT STORAGE SYSTEMS

Manager: Mike Riggle (CXO1-2/Q22, 522-2300)

Storage Advanced Development ensures that a technology base exists to allow Digital's storage products to be competitive and/or in a leadership position. The group primarily develops technology, but technology acquisition occurs when that makes sense. Advanced Development develops or trades critical, fast-moving technology because it is hard to acquire otherwise.

The group works with digital and analog circuits, large scale integration, magnetic recording, magnetic heads and media, servos, recording and error-correcting codes, mechanical systems, solid state memory subsystems, storage subsystems, data base systems, optical memories, and storage architecture.

The group provides technology, subsystem breadboards, and occasionally product breadboards to product development groups. Consultation on storage issues and technology is also available.

Advanced Development Storage Systems has the following two subgroups.

- Storage Advanced Development, Shrewsbury and Colorado
- Storage Architecture, Colorado and Shrewsbury

It also has the following dotted line (functional) responsibilities:

- Heads and Components Advanced Development, Shrewsbury
- Media Advanced Development, Forge Road, Colorado
- TOPS Advanced Development, Shrewsbury, Boulder
- JRDC Advanced Development, Tokyo
- ESD Advanced Development, Shrewsbury
- Advanced Data Base Systems, Colorado

12.3 JAPAN RESEARCH AND DEVELOPMENT CENTER

Manager: Tom Kobayashi (JRD/F8, [81]-(3)-2657451)

The Japan Research and Development Center (Japan R&D Center) provides an incremental Central Engineering resource that allows Digital to access the technology existing within Japan by doing advanced development projects and product development projects for the worldwide market.

Japan R&D Center provides the following functions.

- Provides Central Engineering with easy access to a pool of technical talent difficult to find in the U.S.
- Provides Central Engineering with information on new Japanese products, technologies, and government-sponsored research activities like the Fifth Generation Computer Systems Development. As a tool for information dissemination, it publishes the monthly JAPAN REVIEW - Translated Technical News. For further details on this publication, contact JRDV01::HISHIKI or JRDV01::S_SATO.
- Provides Digital with an alternative management and business-practice approach to engineering.
- Collaborates with the Japan Procurement Center for various buyout projects.
- Develops Japanese language related products for the Japanese market and provides a presence for the Digital sales/services organization in Japan to enhance Digital sales in what is now the second-largest, single-nation computer market in the world.

Contact the Japan R&D Center when you need information about the products being developed.

Japan R&D Center is located in a leased building in Tokyo. However, a project to build a permanent facility in Yokohama is under way.

12.3.1 Storage Systems Development

Manager: Jim Lacey (JRD/F6, [81]-(3)-2657501)

Storage Systems Engineering in Japan presently has two primary activities.

12.3.1.1 Storage Systems Advanced Development

Manager: Masahide Suenaga (JRD/F3, [81]-(3)-2370971)

Advanced Development concentrating on advanced media (rigid and flexible) based on vertical recording. The group is providing VR rigid samples in support of the Storage AD goals. They also are evaluating flexible media in support of the TOPS tape activities.

The group provides technical support for buyout of disk and tape components for U.S. based engineering groups.

12.3.1.2 Storage Systems Product Development

Manager: Jim Lacey (JRD/F6, [81]-(3)-2657501)

The group develops small storage devices. For this project activity the group is aligned with the TOPS PBU and product management and project decisions is done by TOPS.

12.3.2 Semiconductor Engineering

Manager: Kenji Oka (JRD/F8, [81]-(3)-2657506)

This group is an LSI design resource for the Storage Systems. As such, the group is working under the Storage LSI strategy developed by Mike Riggle.

Currently the group is designing DSSIC (DSSI controller for tape) and has started designing SPACE chips for SCB.

12.3.3 Interconnect Technology

Manager: Kaz Ono (JRD/F3, [81]-(3)-2370971)

Assistant Manager and Project Leader: Yoshi Kawamura (JRD/F3, [81]-(3)-2370971)

This group is supported by Physical Technology Group of SCO and NaC, and working on optical data link technology. Currently this group is developing a laser link technology which could extend the distance between FDDI stations.

12.3.4 Asian Base Systems Software

Manager: Kaz Ono (EWB/F6, [81]-(3)-2072575)

Asian Base Systems Software at JRD (ABS/JRD) is a part of ABS in SSG. The mission of this group is to design, implement, support, and maintain a set of software products - called "Base Systems." These products are required for Digital in the Asian Region.

Under the ABS charter, ABS/JRD is going to participate in enhancing and augmenting the architecture, design, and implementation of those Base Systems so that they become as effective in Japanese as in English. ABS/JRD primary consists of three groups, ABS/JRD Product Plan and Administration, ABS/JRD Operating System Engineering and ABS/JRD System Software Engineering.

12.3.4.1 ABS/JRD Product Planning and Administration

Manager: Key Kawamoto (EWB/F6, [81]-3-2072577)

Assistant Manager: Ken Oyama (EWB/F6, [81]-3-2072579)

Assistant Manager: Yoshi Aori (EWB/F6, [81]-3-2072497)

ABS/JRD Product Plan and Administration (ABS/JRD/PPA) provides the following three functions.

- Documentation preparations
- Product administrative services
- SQM/JSQG for ABS/JRD products

12.3.4.2 ABS/JRD Operating System Engineering

Manager: Shin-ichiro Kurimura (EWB/F6, [81]-3-2072583)

Assistant Manager: Takao Chubachi (EWB/F6, [81]-3-2072584)

ABS/JRD Operating System Engineering (ABS/JRD/OSE) develops Asian VMS and ULTRIX for the Japanese market, including Natural Language Processing.

12.3.4.3 ABS/JRD System Software Engineering

Manager: Kaz Ono (EWB/F6, [81]-(3)-2072575)

Assistant Manager: Kokichi Takahashi (EWB/F6, [81]-3-2072585)

ABS/JRD System Software Engineering (ABS/JRD/SSE) develops various Layered Software products for the Japanese market, including Languages, Data Base Systems, Windowing System and Printer Software, as well as the design and implementation of the Asian Base Systems.

12.3.5 Hardcopy Buyout Support

Manager: Yash Garge' (JRD/F3, [81]-(3)-2370971)

The group provides technical assistance during all phases of Digital's procurement of various printer products in Japan.

Activities range from product/vendor evaluation, selection, specification development, and technical support until high volume shipments start. The group also provides technical tracking.

12.3.6 Japan Procurement Center

Manager: Toshio Nagamine (JRD/JPC, [81]-(3)-2656951)

As part of the GIA Manufacturing and Engineering Group and under Japan R&D Center site management, the Japan Procurement Center procures high-quality, cost-optimized products from Japanese suppliers for Digital worldwide. The purchased products include 64K, 256K and 1M DRAMs, LA50, LN03 and LN02, and LN04, LPS40, LPS20, LA75, LA85, and various other components.

12.4 COLORADO STORAGE SYSTEMS ENGINEERING

Manager: Mike Riggle (CXO1-2/Q22, 522-2300)

This group provides the product strategy and development of medium and large disk storage products. After selecting the appropriate technologies, the group designs, builds prototypes, and tests entire storage subsystems. Products are released to manufacturing complete with documentation and test tools.

Contact this group if you need information on mid-range and large disk drives and controllers for storage subsystems. They are knowledgeable in disk recording, servo and precision mechanical technologies, software, microprocessor, and VLSI technology. They define storage subsystem architectures and interface protocols. They also monitor and understand the competition, develop the strategy, and make business recommendations for medium and large disk subsystems development.

12.4.1 Disk Drive Development

Managers: Paul Esling (CXO1-1/P26, 522-2228)

Bill Brown (CXO1-1/P23, 522-2239)

Bert Miller (CXO1-1/P27, 522-2226)

Ray Parry (CXO1-1/P27, 522-2710)

This group develops and supports Winchester-type disk drives such as the RA70, RA90 and future drive families. Non-removable head-disk-assemblies (HDAs) containing data are used on Winchester products.

Developing high capacity, high performance disk drives for use with Digital's computers, is also done by this group.

This group is also responsible for magnetic, rigid disk drive development to meet the applicable storage requirements primarily for Digital's mid-range system offerings. Product(s) will demonstrate leading edge quality and reliability with the primary performance emphasis on I/O response time (as opposed to pure access time).

12.4.2 Subsystems Engineering

Manager: Bob Rennick (CXO1-2/N27, 522-3830)

This group develops intelligent controllers such as the UDA50, KDA50, KDB50, HSC50 and HSC70 for mid- and high-end disk and tape storage devices and future storage subsystems. The group also develops embedded and host diagnostics, subsystem verification and performance measurement tools, and manufacturing process software for all Colorado Springs (CXO) products.

12.4.2.1 Small and Advanced Controllers

Manager: Bob Blackledge (CXO1-2/N26, 522-2329)

This group develops the Q-bus and Unibus intelligent DSA controllers for the RA series disk drives, future controller families, and mixed storage subsystem configuration and architecture.

12.4.2.2 Mid-Range and High Performance Controllers

Manager: Phil Roettjer (CXO1-2/N26, 522-2305)

This group develops the VAXBI and high performance controllers for the RA and TA series disks and tapes.

12.4.2.3 HSC Engineering

Manager: Glenn Englund (CXO1-2/N28, 522-2313)

This group develops the VAXcluster HSC storage servers.

12.4.2.4 Diagnostics/SQA

Manager: Karen Pherson (CXO1-2/N27, 522-2240)

This group develops the BIST and high level storage diagnostics for the mid- and high-end disks and controllers, does the software quality assurance through the product life cycle, does System Verification Testing of CXO products, and develops software tools and data acquisition programs for use by Storage Manufacturing and Engineering.

12.4.2.5 Storage Subsystems Performance Engineering

Manager: Ed Woosley (CXO1-2/N27, 522-2918)

This group does the analysis and measurement of Digital and competitors storage products, focussing on the mid- and high-end storage products, and develops storage performance measurement tools and models.

12.4.3 Engineering Operations Group

Manager: Renate Benton (CXO1-1/Q13, DTN 522-3659)

This group provides technical expertise, product and process development and services which support CXO and DEC strategy for existing and future products.

12.4.3.1 VLSI Development Engineering

Manager: John Shanklin (CXO1-1/P13, DTN 522-3820)

This is a VLSI development group providing IC design and microelectronic consulting support to state-of-the-art medium/large disks and subsystems development programs. Current group emphasis is on CMOS digital circuits via a standard cell/custom cell design methodology. Future expansion will be into CMOS sea-of-gates and analog design techniques.

12.4.3.2 Power Systems Engineering

Manager: Ryan J. Johnson (CXO1-1/P12, DTN 522-2304)

The MLDS Power Systems Engineering Group is responsible for the development of power supplies, power controllers and power distribution systems for all of CXO's disk drive and disk controller products. In addition, the Arapahoe Power and Packaging Project is managed by this group. Consulting on power related problems with sales, installation and maintenance is also provided.

12.4.3.3 Mechanical Packaging Design Engineering Group

Manager: Mike Elkins (CXO1-1/P12, DTN 522-2192)

The Packaging Design Engineering Group is responsible for proposing and developing cabinets, enclosures and cabling systems for Winchester disk drives, disk drive storage arrays and disk drive controller subsystems. It is also a subcontractor to other storage and CPU design engineering groups for packaging design.

12.4.3.4 Computer-Aided-Design and Engineering Department

Manager: Bob Hess (CXO1-1/Q13, DTN 522-2467)

The CAD and Engineering Department consists of two primary areas: Mechanical and Electrical. Both groups provide software and hardware CAE, CAD and CAM tools, processes, development, analysis and support for the drives and subsystem products designed at CXO. Both organization's goals are to provide tools and processes that keep pace with product technology advances and permits more of the design process to become automated.

12.4.3.5 Printed Circuit Design Services

Manager: Harry Weinbrenner (CXO1-1/P17, DTN 522-2186)

The group's primary objective is to provide accurate, releasable CAD printed circuit board design layouts and prototype etched samples of new designs or changes to existing designs that are generated by the CXO/Storage Systems Development Engineering Group.

12.4.3.6 Engineering Information Services

Manager: Mike Diaz (CXO1-1/P17, DTN 522-2447)

The charter of the Engineering Information Services Group is to implement, develop, manage and consolidate information resources in the area of people, software, systems, networks and services resulting in cost effective, high quality, accessible, reliable and consistent computer resources which are required for the development of products for CXO Engineering.

12.4.3.7 Mechanical Design/Documentation Services/Model Shop

Manager: Bill Major (CXO1-1/Q22, DTN 522-2175)

Mechanical design and drawing for all new products and servowriters and ECO administration for all mechanical parts and assemblies. Document Services includes Document Control of released data, Micrographics, Engineering Reprographics and the CXO high volume Copy Center. The Model Shop provides machining and fabrication support for prototypes, pilot production, manufacturing and facilities. Includes Computer Aided programming and machining capabilities.

12.4.3.8 Regulatory and Component Engineering

Manager: Tom Tuttle (CXO1-1/M12, DTN 522-2295)

This group is responsible for providing FCC/VDE/EMC and Product Safety consulting services as well as compliance testing and certification for all Colorado Springs (CXO) products. Further responsible for selecting, specifying and qualifying high quality components and suppliers.

12.4.3.9 Reliability and Design Assurance

Manager: Clark Alumbaugh (CXO1-1/M12, DTN 522-2560)

This group is responsible for insuring highly competitive product reliabilities on all current and future products developed by CXO, perform predictions, predictive comparisons for design alternatives, stress screen recommendations, perform environmental testing on modules, HDA's, power supplies, control panels and selection and specification of reliability requirements on components and suppliers.

12.4.4 MLDS PBU and Program Management Group

Manager: Tom Burniece (CXO1-2/Q22, 522-2100)

This group provides the business focus and program integration for all medium/large disk drives and subsystems for the company. The MLDS Product Business Unit (PBU) resource base includes two engineering and six manufacturing sites worldwide.

12.4.4.1 MLDS Product Management

Manager: Ron Johnson (CXO1-2/N25, 522-2961)

Product Management manages the business planning, phase review process, competitive analysis, announcement strategy, and pricing recommendations for MLDS products. In addition, Base Product Marketing provides direct key customer contact on technical marketing situations and provides base product literature and sales training.

12.4.5 Site Management

Manager: Tom Burniece (CXO1-2/Q22, 522-2100)
Mike Riggle (CXO1-2/Q22, 522-2300)

This group manages the Colorado Engineering site, interfacing with and assisting various engineering support groups located in Colorado, including Customer Services Systems Engineering (CSSE), and Technical Publications. This includes the following groups:

- *Finance*
Manager: Ed Ellis (CXO1-1/Q21, 522-3278)
- *Personnel*
Manager: (Open)

12.4.6 Customer Service Systems Engineering (MLDS)

Manager: Al Snyder (CXO1-2/Q13, 522-2370)

This group provides the strategy, business planning, and development of Service products and features for all medium and large disk and subsystems developed by the MLDS PBU. Their primary deliverables are as follows.

- To ensure customer satisfaction by defining and developing Storage product features that support our MLDS Service goals.
- To integrate product reliability, availability, and service features that optimize overall product life cycle costs for our customers.
- To develop service pricing strategies that provide maximum service margins while balancing Cost of Ownership and product sales.
- To provide competitive analysis of Third Party vendor's service offerings and products.
- To conduct system level testing and qualification of the reliability, availability and maintainability features designed into Storage products.
- To provide the highest level of remedial support for product problems that escalate to our level from Field Service or customers.
- To provide the MLDS management team with timely and quality information the performance of Storage products in the field.

Contact this group if you need information on Service or customer issues relating to mid-range and large disk drives and controllers for storage subsystems.

12.5 ELECTRONIC STORAGE DEVELOPMENT (ESD)

Manager: Tom Frederick (SHR-3/O10, 237-3437)

There are four groups within ESD—Product Development and Methods, Advanced Development and Technology, Device Technology, and Business Management. All are located in the new Storage Systems East Technology Center at Digital's Shrewsbury facility.

Product Development and Methods designs and develops electronic storage (memory) systems and tester packages for the corporate set of base products and works, primarily with the GIA Manufacturing Group, to move these products into high-volume production.

Advanced Development and Technology provides a corporate resource for electronic memory technology and architecture. This group is involved with the definition of memory sub-system architecture for new products, as well as establishing memory system strategies for next-generation CPUs. Advanced Development and Technology also provides a resource for the evaluation and development of new technologies to improve the density, performance and cost of Digital's memory products.

Device Technology provides a corporate resource for electronic memory device technology and helps other groups within Digital select the best memory part for an application. The group also surveys, characterizes, and qualifies semiconductor memory devices for use across all of Digital's product families.

Business Management provides business planning, product management, and reporting support for memory systems. Functions include the following:

- Cost projections
- Pricing
- Competitive analysis
- Market and product needs definition

- Business and option forecasting
- Business plans
- Promotion
- Sales tools
- Sales support

Reasons to contact ESD include the following:

- Design and development of memory systems
- Upgrade of present memory system
- Test strategy and test tools for these systems designs
- Evaluation of memory system design strategies
- Development of appropriate memory system architecture
- Selection of a memory device for your application
- Advice on the application of that device
- Qualification of new RAM, DRAM, VRAM, or like device
- Counsel on development of new memory product plans
- Availability of memory devices
- Memory device or system cost projections
- Memory system business planning or management
- Memory sales support
- Memory competitive analysis

To get assistance or learn more about the functions of ESD, visit, phone, or send mail to the appropriate person (APOLLO::last name).

- *Memory PBU and Operations*
Sr. Group Manager: Tom Frederick (SHR-3/O10, 237-3437)
- *Product Development and Methods*
Manager: Tom Marmen (SHR1-3/O19, 237-3436)
- *Business Management*
Manager: John Woelbern (SHR1-3/O12, 237-3380)
- *Advanced Development and Technology*
Manager: Martin Czekalski (SHR21-3/O11, 237-3795)
- *Device Technology*
Manager: Steve Cullen (SHR1-3/O12, 237-3377)

12.5.1 Storage Systems East Technical Operations

Manager: Ed Lee (SHR3/H26, 237-3394)

This group provides a variety of engineering and support services for the Storage Systems development and manufacturing organizations. The group participates in all phases of product development by providing information resources and support, design services, CAE/CAD/CAM tools and support, prototype fabrication, and other technical services.

12.5.1.1 Engineering Services

Manager: Richard Cook (SHR3/H29, 237-3440)

Engineering Services provides hardware-oriented services to New England Storage Systems. Services include mechanical CAD/CAM, drafting, and model shop functions. This group also provides engineering stockroom, reproduction, document control, mailroom, and calibration laboratory support to Shrewsbury and other Digital sites.

12.5.1.2 Information Resources

Manager: Joseph Onorato (SHR3/E27, 237-2459)

Information Resources operates the Shrewsbury Information Resource Center, and provides computer and data communications systems and consulting support and site-wide MIS software development and production services.

12.5.1.3 CAE/CAD/CAM

Manager: Jack Miller (SHR3/F27, 237-3454)

CAE/CAD/CAM provides and supports electronic and mechanical computer automated engineering and design tools, and provides producibility engineering and printed circuit board design and prototype procurement services.

12.5.2 Organization Development Consulting

Peter Rojcewicz (SHR1-3/E21, 237-2003)

12.6 LOW END DISK SYSTEMS (LEDS)

Manager: Ed Barron (NKS1-2/H2, 291-7041)

LEDS provides the strategy, business planning, engineering development, and manufacturing support for low-end disk subsystems, such as floppies and 5 1/4-inch Winchester. Uses include all PC systems, low- to mid-range PDP-11 and MicroVAX systems and workstations. LEDS maintains a worldwide product strategy for these families of products and implements this strategy through internal development and external buyouts. For internally developed products, the group designs and builds prototypes and tests entire disk subsystems. Products are released to manufacturing complete with documentation and test tools. For buyouts, LEDS makes aggressive use of vendors worldwide to support our needs for disks, media, and controllers.

Engineers and technicians have skills in digital and analog circuitry, magnetic, servo feedback mechanisms, electro/mechanical components, mechanical hardware, software diagnostics development, and LSI chip development.

Contact this group if you need planning or technical information on low-end disks and controller devices.

12.7 FORGE ROAD MEDIA OPERATION

Manager: Phil Arnold (CXF, 524-6002)

The Forge Road Media Operation, located in Colorado Springs, Colorado (CXF), is responsible for the development and prototype production of thin film rigid disk media. This organization is the media development operation of the Storage Systems Process Technology Group managed by Charlotte Frederick. Group activities include advanced development, product development, process development, product support and new product start-up.

Contact this group to discuss actual or proposed thin film media applications, and for assistance with technical problems related to this media and its applications. The group may also be consulted on issues concerning some thin film materials, processes, and analytical techniques.

Key contacts include the following:

- *Plant Manager*
Phil Arnold (CXF, 524-6002)
- *Technology Manager*
Bob Raymond (CXF, 524-6007)
- *Operations Manager*
Dan Schaefer (CXF, 524-6005)

12.8 STORAGE SYSTEMS ENGINEERING (FOR ENGINEERING AND MANUFACTURING ENGINEERING)

Manager: Peter van Roekens (MLO1-5, 223-1443)

This is a Storage-wide engineering function responsible for all engineering at the eight Storage Systems sites, U.S. and International, and includes four additional functions that report directly to Peter van Roekens:

- *Storage Systems Architecture*
Alan Kotok
- *Storage Systems Education and Training*
Susan Anderson-Khleif
- *Storage Systems Advanced Manufacturing Technology*
Gordon Norquay
- *Storage Systems Information Systems*
(Open)

12.8.1 Storage Systems Education and Training

Susan Anderson-Khleif, Storage Systems Manager of Education and Training, Storage-wide U.S. and International.

Our primary goal is to provide education and training to Storage Systems employees in the subjects needed to design and manufacture current and future Storage products. We deliver courses, workshops, and seminars that impact the development and production of Storage Systems products across the eight Storage Systems sites U.S. & International including Shrewsbury, Springfield, Enfield, Colorado Springs Rockrimmon, Colorado Springs Forge Rd, Tempe, Japan R&D Center, and Kaufbeuren. A strong internal faculty contributes to the program by teaching courses in magnetics, architecture, quality and reliability, advanced manufacturing technology, our annual Introduction to Storage Systems course, and other subjects key to our business success.

Two major geographic hubs, ETR Storage East/SHR and ETR Storage West/CXO deliver a full range of education programs including a technical core curriculum, VAX/VMS systems and software courses, CAE/CASE and simulation workshops, Library services, on-site university and satellite courses, self-paced instruction in the SHR ETR Lab and CXO Learning Center, DVN programs, an Advanced Manufacturing Symposium Series, a Servo-Mechanical Seminar Series, technical seminars, and the Management of Technical Business Organizations program.

- *ETR Storage East/SHR*
Manager: Marianne Hedin (SHR1-4/D20, 237-3258)
- *ETR Storage West/CXO*
Manager: (TBA) (CXO1/Training Center, 522-3834)

12.8.2 Advanced Manufacturing Technology Organization

Manager: Gordon Norquay (SHR4/E10) 237-2526

The Storage Systems Advanced Manufacturing Technology Group (AMT) will continue in fiscal 1989 to act as a technical resource to Storage and Digital Manufacturing in the development and implementation of its core technologies through the linkages and contractual partnerships that it creates.

As a group, AMT represents over 500 years of experience in advanced manufacturing, specializing in the following core technologies:

- Robotics and Automation
- Vision systems for inspection, automation, and process control
- Artificial Intelligence
- Computer Integrated Manufacturing
- Flexible Manufacturing Systems
- Material Handling Systems and Controllers
- Statistical Process Control

This organization is also chartered for Research and Development activities in support of Advanced Manufacturing Technologies.

The AMT group supports the Storage product and Product Family strategies by demonstrating and implementing competitive solutions in Storage and Digital Manufacturing plants to favorably impact Cost, Quality, and Time-To-Market.

If you have a problem and think that AMT may be able to provide the solution, please contact Phil Smith (237-2393).

CHAPTER 13

DISTRIBUTED SYSTEMS

Manager: Bill Johnson (B.J.), V.P. (MLO12-3/U29, 223-3982)
Operations Manager: Dick Pigman (LKG2-1/Y4, 226-7307)

Distributed Systems consists of the following groups.

- *Local Area Communications*
Manager: John Adams (LKG1-2/M7, 226-7990)
- *Wide Area Communications*
Manager: Jac Simensen (LKG1-2/M7, 226-7124)
- *Network Management and Systems Evaluation*
Gary Gottschalk (LKG2-2/N1, 226-5304)
- *Architecture and Advanced Development*
Technical Director: Mahendra Patel (LKG1-2/E19, 226-7000)
- *Artificial Intelligence Technology Center*
Manager: Scott Flaig (DLB5-2/E05, 291-8004)
- *Artificial Intelligence Technology Group*
Manager: Norma Abel (DLB5-2/B07, 490-8002)
- *Image Systems Group*
Manager: Rich Kalin (MKO2-2/K03, 264-6145)
- *Networks and Communications (NAC) Product Management*
Manager: Mike Thurk (LKG1-2/M7, 226-7320)
- *Networks and Communications (NAC) Marketing*
Manager: Bob Murray (LKG1-2/K07, 226-7371)
- *Manufacturing*
Manager: Glenn Armbruster (WJO2-2/B9, 282-1438)
- *International Engineering*
Manager: David Stone (GEO/609A, 821-4956)
- *Network Support Service*
Manager: Tom Karpowski (OGO1-1/G17, 276-9637)
- *New Business and Ventures*
Manager: Bob Daley (LKG2-1/Y4, 226-7627)
- *Strategic Relations*
Manager: Ulf Fagerquist (LKG1-2/K07, 226-7225)
- *Technology*
Manager: Sultan Zia (LKG1-2/K07, 226-7737)
- *Finance*
Manager: Sheldon Aronoff (MLO2-2/A62, 223-4385)

- *Personnel*
Manager: Liz Aberdale (MLO2-2/A62, 223-4470)

13.1 LOCAL AREA COMMUNICATIONS ENGINEERING

Manager: John Adams (LKG1-2/M7, 226-7990)

13.1.1 Local Area Systems Software

Manager: Peter Hurley (BXB1-1/D03, 226-7766)

The Local Area Systems Software organization is composed of three distinct departments: the NAC Documentation and Publications group, Distributed Systems Services Engineering, and the Network Engineering Technical Services group.

13.1.1.1 NAC Documentation and Publications

Manager: Dick Sweeney (LKG1-3/L12, 226-7221)

The Documentation and Publications group produces the documentation for all of the NAC hardware and software products developed in U.S. This department is organized into three sections: *Documentation*, managed by Neville Fleet; *Editing*, managed by Claudia Sheehan; and *Production*, managed by Alice Phalen.

13.1.1.2 Distributed Systems Services

Manager: Peter Hurley (BXB1-1/D03, 226-7766)

The Distributed Systems Services Engineering group designs and develops systems services aimed at making it easier to own, manage, and use large networks. Specific services being developed by the DSS engineering group are a Distributed File Service that allows high-speed, transparent file access throughout the network, a Distributed Name Service that allows the definition of network-wide names (for objects such as distributed applications, databases, servers, and so on), a Distributed Authentication Service, a Distributed Queue Service permitting people to queue printing requests to printers throughout the network, and a Remote System Manager service that lets the system manager centralize the backup/restore, software update, and software installation functions to support a community of hundreds of remote systems.

The DSS group is divided into two sections. Jim Jackson manages the DSS group developing the Distributed File Service, the Distributed Name Service, and the Distributed Authentication Service. Mary Ellen Lewandowski manages the DSS group developing the Distributed Queue Service, the Distributed Printing Service, the Distributed Time Service, and the Remote System Manager product. Jeff Schriesheim is the overall technical consultant for the DSS group.

13.1.1.3 Network Engineering Technical Services

Manager: Paul Keresey (LKG1-3/A06, 226-7631)

The Network Engineering Technical Services group provides various technical services for the U.S. NAC Engineering organization. These services include performance and certification, lab services, systems and network management, and operations. Jane Morency manages the performance and certification group. Her group provides performance modeling, simulation, testing and analysis services, performance and certification tool development, and product certification services for the NAC community. Keith McLaren manages the Lab Services group.

Keith's group manages the computer labs in the LKG facility. Rob Spence manages the Systems and Network Management group, which is chartered to support all of the NAC systems and all of the networks located in and emanating from the LKG site. Bill Perkins manages the NAC operations group whose role is to perform the operational support for all of the NAC computer systems.

13.1.2 Communication Systems Engineering

Manager: Bob Krueger (LKG1-2/M7, 226-7849)

This group produces system products for the Terminal Interconnect and Local Area Networking (LAN) markets.

13.1.2.1 Bridges & Terminal Server Hardware

Manager: Peter Chow (LKG1-2/J6, 226-7082)

This group is responsible for the design and introduction of Terminal Servers such as the DECserver 200, DECserver 500, and the 3270 Terminal Server, as well as LAN bridges for the creation of extended Ethernets and the bridging of 802.3 LANs to 802.4, 802.5, and DEC-FDDI LANs.

13.1.2.2 NAC XI Program

Manager: Bob Krueger (LKG1-2/M7, 226-7849)

This group is responsible for the development of the base technology for DEC-FDDI, as well as the XI Wiring Concentrator and the XI Monitor. The base technology includes the chip set and the design layout guidelines. Also included in this area is the DEC-FDDI Technology center, which is responsible for testing and verification of the DEC-FDDI chips and ownership of the DEC-FDDI Standard.

13.1.2.3 Channel Products

Manager: Jim Caldwell (LKG1-2/M7, 226-7847)

This group develops hardware products that provide the physical channel and data link support for Local Area Networks and is responsible for the migration of the current Ethernet product line to 802.3. Included in this group is the Ethernet/802.3 Technology Center, which is responsible for all Ethernet chips and Ethernet Standards.

13.1.2.4 NAC Ireland

Manager: Jim Finnegan (KLO, 826-2387)

This group develops cost-reduced asynchronous and synchronous communications controllers and LAN controllers.

13.1.2.5 NAC Engineering Design Support

Manager: Gary Klinker (LKG1-2/C12, 226-7778)

This group consists of focused engineering functions that support the mainstream hardware, firmware, and software design activities. The main areas of activity are CAD, CAE, Diagnostics, Quality Assurance/Product Assurance, Field Test Administration, and Ethernet Certification.

13.2 WIDE AREA COMMUNICATIONS ENGINEERING

Manager: Jac Simensen (LKG1-2/M7, 226-7124)

13.2.1 Wide Area Networks Program Office

Manager: Lynne Kershaw (LKG2-2/N11, 226-7733)

In addition to direct management of the programs listed below, Lynne Kershaw also chairs the Wide Area Communications Strategy Committee.

13.2.1.1 Wide Area Networks Program

Manager: Joseph Schatz (LKG2-2/N11, 226-7495)

This program provides for company-wide coordination of all activities associated with integrated voice and data engineering and products. This includes: CIT, ISDN, IN2, and public switching.

13.2.1.2 Enterprise Network Program

Manager: Richard Hovey (LKG2-2/N11, 226-7369)

This program provides for company-wide coordination of all activities associated with Wide Area Network backbone switching in addition to systems engineering for Enterprise Network Products.

13.2.1.3 Network Standards Program

Manager: Derek Stevens (LKG2-2/N11, 226-7167)

This program provides service and support to network standards participants and management concerning the Digital Network Standards Policy and Strategy, technical/support position papers, an online standards information service, periodic network standards review meetings, and a center for the resolution of network standards issues.

13.2.2 Wide Area Systems Engineering

Manager: Dick Crosby (LKG1-3/L6, 226-7105)

13.2.2.1 Wide Area Communications (Reading)

Manager: Jim Reynolds (REO2 G/B3, 830-4610)

The Wide Area Communications Engineering Group located in Reading, England, is responsible for the design and engineering of wide area networks communications products for Digital.

The group consists of the following major functions.

- Hardware Development
- Software Development
- Architecture, Product and Business Management
- Engineering Development Support
- Systems and Advanced Development.

These functions support the goal of being a center of excellence for Wide Area Networks and Data Switching. In a number of cases the groups have direct functional relationships with their counterparts in NAC U.S. (LKG). The Reading center of excellence will establish the strategy, market the requirements, and perform developments for worldwide markets.

The group is responsible for OSI, X25, X21 and data link software, and wide area synchronous communications hardware and backplane products and VAX architecture communication servers. In addition, the group has established a center of technology for ISDN and circuit switching.

To fulfill this mission the group has established interfaces and representation to Marketing, Product Management, and Engineering activities in other groups. The operational strategy has the following objectives:

- Deliver projects to planned timescales, within budget, and to specification.
- Set Design objectives that are aware of distribution and/or manufacture, and driving to more simple designs to meet the objectives of ease of implementation, support, and maintainability.
- Use the expertise in Europe and to act as a constituent European Engineering group.
- Develop and evolve the building-block systems strategy to maximize returns on product development and be in a competitive position to react to time-to-market needs.
- Take advantage of European presence in relating our developments to the market and maintaining the necessary involvement with our key customers.

13.2.2.2 WASE - IBM Interconnect Engineering

Manager: Scott Davidson (LKG1-3/A10, 226-7106)

IBM Interconnect Engineering is responsible for a product set that allows a bi-directional flow of information between Digital and IBM computing environments.

The group develops and supports a comprehensive set of products that complement Digital's computing and networking capabilities, such as DECnet and Ethernet, VMS, and All-in-1. Two key products provide the basis for communication between the Digital and IBM environments: the DECnet/SNA Gateway provides communication services between DECnet networks and IBM's SNA networks; and VMS/SNA provides SNA communication services for single departmental MicroVAX systems communicating directly with IBM host systems.

The product set also includes the following.

- DISOSS Document Exchange (DDXF)
- Application programming interfaces such as APPC/LU6.2 and 3270 data stream
- Reverse virtual terminals (DHCF)
- 327x terminal emulation
- Remote Job Entry (RJE)
- Printer emulation

IBM Interconnect Engineering also maintains an IBM computer facility to support Networks and Communications product development, marketing, and demonstration activities.

13.2.2.3 WASE - Computer Integrated Telephony

Manager: Keith Regli (MKO2-1/D9, 264-3364)

The WASE/Computer Integrated Telephony (WASE/CIT) group in Merrimack develops software products relating to managing voice networks (telephone systems). Two such current products developed by the group are P/FM (PBX/Facilities Management) and C/FM (Cable/Facilities Management). The former is an SMDR package that includes Cost Allocation and Traffic Management reports, as well as billing for equipment, telephone usage, and services. The latter product tracks PBX Common Equipment, telephone features, and cable plant.

13.2.2.4 WASE - DECnet Software Engineering

Manager: Marty Spence (LKG1-3/L6, 226-7612)

DECnet Software Engineering is responsible for the base DECnet products for the operating systems MS/DOS, ULTRIX, and RSX, and the DECrouter 200, a dedicated 8-line asynchronous router server. Software development from design to product shipment is done for DECnet-DOS, DECnet-Rainbow, DECnet-ULTRIX, and DECnet-RSX. These products include communication device drivers, system-level modules for protocol processing, and the standard DECnet utilities for network management, remote file transfer and access, and remote terminal access.

13.2.2.5 WASE - Mail/Interchange Engineering

Manager: John Kell (REO, 830-3719)

The purpose of the Mail/Interchange group is to build the necessary software to ensure that Digital captures the information dissemination needs of the major companies. This is achieved by developing a set of services to provide a comprehensive corporate electronic mail and messaging system.

The mailbus architecture can be exploited by building software that allows the integration of user agents (ALL-IN-1, PC ALL-IN-1, VMsmail) into a common core of services provided by the mailbus and plugged together with DECnet. Additionally, the group builds the gateway software that allows us to exploit Digital's connectivity with IBM, public carriers, and other vendors.

The products that achieve the above goals are listed below.

- Message Router (MAILbus) that provides store and forward message transfer DECnet routing between message routers and delivery information, distributed directory services (DDS) for subscribers, and network management services providing a combined tool for message router and DDS.
- X.400 Gateway development will lead to full compliance with the OSI standards program. Prime goals in the X.400 area are full-conformance testing and interworking capability with other vendors.
- In the multivendor interconnect space, the major developments are mail exchange products to IBM SNADS and PROFS. Both these products allow exchange of mail between Digital electronic mail users (for example, ALL-IN-1, VMsmail) and IBM SNADS and PROFS users through the message router's store and forward capability.
- EDE/DISOSS and EDE/Wang already exist and provide the capability of exchanging text documents with IBM and Wang users, specifically in the document exchange area.

13.3 NETWORK MANAGEMENT AND SYSTEMS EVALUATION (NMSE)

Manager: Gary Gottschalk (LKG2-2/N1, 226-5304)

Networks and computer systems in today's organizations has heightened customer concern for control and management of information processing assets. This means the demand for network management as an integral component of vendor's networking product family.

To accomplish the Network Management Program objectives, NMSE will pursue five strategies:

- Establish market presence by providing a flexible and integrated base Network Management System, basic management applications and management for Digital's wide-area (DECnet) and local-area (Ethernet 802.3) products.
- Obtain third-party endorsements by providing the necessary architectural and interface specification, certification process, and joint development and marketing support to allow them to extend and tailor the base system to their environments.

- Gain industry leadership by developing state-of-the-art integrated network management applications based on well-documented Management Applications Architecture spanning the ISO/OSI management functions to meet the network life-cycle needs.
- Strengthen market position by integrating Voice Network Management into the base product.
- Influence standards bodies, vendors and partners to ensure consistency among their and Digital's Network Management approach and thus offer the industry an alternative to IBM's SNA-based management approach.

13.3.1 MCC Base System Engineering

Manager: Dale Messenger (LKG2-2/T2, 226-5331)

The Network Management Program key product is the Management Control Center (MCC), Digital's open and integrated network management system.

The Base System Engineering group will provide a foundation for the development of network management products. It will consist of a user interface based on DECwindows that will present our users with an integrated and consistent way to access functions and entities. An executive that will provide an operating environment, and key entity management modules (DECnet and Ethernet). This group will provide an entity management module "Cookbook" to enable internal/3rd parties to build Entity management modules.

13.3.2 MCC Applications Engineering

Manager: Mark Hebenstreit (LKG2-2/N1, 226-5391)

The purpose of MCC applications development is to build key network management applications that relate to OSI application categories (configuration, fault, performance, accounting and security) as well as the network life cycle (planning/design, operation/maintenance, growth/evolution). Due to the diverse number of network management applications, not all will be built within NMSE. Therefore, an applications architecture will be documented to help coordinate development of applications within NMSE, within the rest of Digital, and those built by third parties.

13.3.3 Network Diagnostic Strategy

Manager: Jim Tereshko (LKG2-2/N1, 226-5368)

The charter of this function is to evaluate present network product diagnostic functionality and present methods used to troubleshoot network problems and to recommend future functions and methods which will help Digital maintain a leadership position in network management.

13.3.4 Third Party Transmission

Manager: Earl Ingalls, (LKG2-2/N1, 226-5371)

Network management relationships with third party vendors will focus on:

- Transmission management which involves developing third party relationships with transmission vendors for integrated management of T1 multiplexors, CSUs/DSUs and modems.
- SNA management which involves developing a management gateway from MCC to SNA Management PC with one SNA vendor.

13.3.5 DS Technical Evaluation

Manager: Emilio Marianelli (NIO/B18, 261-3865)

Subsystem Testing - Each distributed system product must be tested in a representative design center configuration prior to release. A distributed system product is defined as a product that Digital builds or reference sells that either implements an internal or external communication standard or shares the interface of such a standard with other applications. This includes both hardware and software products.

Performance and Stress Characterization - DSTEg will test and characterize entire design centers (Verification). The design centers will be defined by the Program Management Group relative to configuration, load, applications, tools, and expected performance. The Verification effort will ensure that Design Center requirements are met. Verification testing will address boundary, stress, and pathological testing.

Program Management - DSTEg provides a test coordination function to ensure that all component and integration test functions are planned. This coordination function is done by implementing the Distributed Systems Software Register, updating and maintaining the design center configurations, and coordinating the Network New Products Committee.

13.4 DISTRIBUTED SYSTEMS ARCHITECTURE AND ADVANCED DEVELOPMENT

Technical Director: Mahendra R. Patel (LKG1-2/E19, 226-7000)

Primary responsibilities of Distributed Systems Architecture & Advanced Development are as follows.

- Develop a coherent set of architectures for all Distributed Systems products and projects.
- Develop appropriate communications and distributed systems technologies.
- Drive DS standards efforts (external).
- Formulate and implement an overall technical strategy for Distributed Systems, ensuring that the architecture, A/D, and standards work is properly used as the basis for our competitive strategy.

13.4.1 Distributed Systems Architecture and Advanced Development

Manager: Tony Lauck (LKG1-2/A19, 226-7644)

This group provides a technical focus for the Distributed Systems program, defines the overall Digital Network Architecture (DNA), and defines and maintains the specifications of key interfaces and protocols that constitute the DNA. The group also initiates advanced development projects in new technologies or speculative applications of old technologies to broaden our experience in designing and implementing distributed systems.

In its architecture capacity this group convenes the DNA Review Group (DRG). The DRG is the forum for the review and approval of the architectural specifications that define the Digital Network Architecture, as well as selected additional specifications that are closely related to the DNA.

If you are developing a product that will be a component of a distributed system, contact this group to receive assistance in understanding or interpreting a DNA interface or protocol. This group can also help resolve incompatibilities among products that are supposed to adhere to an established architecture or to help determine if a change to an architecture is warranted, and can assist in the development of a proposal to change the architecture when appropriate.

Distributed Systems Architecture and Advanced Development consists of the following subgroups.

- *Communications and Advanced Development*
Manager: Alan Kirby (LKG1-2/A19, 226-7652)

- *XI Architecture*
Manager: Bill Hawe (LKG1-2/A19, 226-7666)
- *Distributed Systems Services Architecture*
Manager: Lois Frampton (LKG1-2/A19, 226-7759)
- *Wide Area Communications Environment Architecture*
Manager: John Harper (REO2-G/B2, 830-3647)

13.5 ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY GROUP

Manager: Norma Abel (DLB5-2/B07, 490-8002)

The Artificial Intelligence Technology Group, one of five AI groups completing the AI technology center, develops products and technologies that enable Digital to become a leading, world-wide AI vendor.

The AITG works closely with other Digital engineering and product development efforts to ensure that AI Technology is effectively integrated into Digital's computing architecture.

The AITG is focused on developing an AI product business in languages, tools, and hardware. These products are developed for internal use (mainly within manufacturing and engineering) as well as for external sale.

AITG is comprised of the three following major components.

13.5.1 Product Management Group

Manager: Tim Yeaton (DLB5-2/B07, 291-8009)

This group provides the AITG with business planning and analysis, product and market forecasting, marketing and communications strategies and competitive evaluation, while ensuring timely release of quality products. Products include the AI VAXstation family, the VAX system designed expressly to meet the needs of the artificial intelligence researcher and application developer. These packages systems are the combination MicroVAX processors (2000, 3500, 3600) and VAX LISP and the VAX LISP user environment which integrates into the entire Digital product set.

13.5.2 Core Products Development Group

Manager: Peggy Doucet (DBL5-2/B07, 291-8006)

This group produces products and tools for the AI market. Current product offerings are VAX and ULTRIX LISP, implementations of Common LISP, and VAX OPS-5, a rulebased system. In the near future the range of shipping products will be expanded with an additional language (VAX Prolog) and expert systems building tools. This group also maintains the tools that are used in building expert systems for use in manufacturing and other functional components of Digital.

13.5.3 Problem Solving Systems Development Group

Manager: David Hartzband (DLB5-2/B07, 291-8009)

This group reinforces the AITG's overall goals by developing AI technology and ways to convey it to other groups. This group ensures a company-wide commitment to AI through product development efforts which allow AI to permeate Digital's overall technology strategy.

In addition, they do the advance development and product development of a suite of strategic products that integrate AI technology with existing Digital data base products to leverage the MIS markets use of AI technology.

13.6 IMAGE SYSTEMS GROUP (ISG)

Manager: Rich Kalin (MKO2-2/K03, 264-6145)

Engineering Manager: Tom McKinney (MKO2-2/K03, 264-8099)

The Image Systems Group (ISG) is responsible for getting DEC's product set to support digitized images as data. ISG functions as a product development group building tools and base components, as a program office working with other engineering groups, and as a research organization focused on key technologies and standards.

ISG's current product commitments are for toolkits and building blocks to enable document imaging applications. Future directions include support of grayscale and color pictures, as well as higher levels of system integration.

Some contacts in the ISG group are:

- *Product Management*
Manager: Jean Sifleet (LKG2-1, 226-7995)
- *BPM*
Manager: Joel Arker (MKO2-2, 264-1696)
- *Research*
Greg Wallace (HLO2-3/MO8, 225-5873)
- *Architecture*
Manager: Ron Higgins (MKO2-2, 264-0868)

13.7 NETWORKS AND COMMUNICATIONS (NAC) PBU MANAGEMENT

Manager: Mike Thurk (LKG1-2/M07, 226-7320)

13.7.1 NAC PBU Management

Operations Manager: Geno Alissi (LKG1-2/M07, 226-7110)

The primary responsibility of this group is to drive NAC PBU business strategy, plans, and goals. NAC PBU Management ensures integration among Distributed Systems functions and non-Distributed Systems functions. Another responsibility is to drive the execution of NAC business plans via appropriate functions to meet PBU metrics of revenue, operating profit, market share, gross margin and ROA.

13.8 NETWORKS AND COMMUNICATIONS PRODUCT MANAGEMENT

Manager: Mike Thurk (LKG1-2/M7, 226-7320)

NAC Business Management is responsible for operations, strategic planning, product management, and external ventures product management for NAC, focusing on ensuring long-term profitability of NAC products and successful technical innovation over a multiyear planning cycle. The organization provides a focus based on strategic business units, where product management is performed within technologically- and market-consistent product sets, allowing product portfolio management to occur.

13.8.1 Local Area Communications Product Management

Manager: Cornel Faucher (LKG1-1/B10, 226-7334)

This group provides product management support for the Local Area Communications engineering organization, managed by John Adams. This organization provides a business and strategic focus based on three Strategic Business Units (SBUs): Terminal Interconnect and Communications Servers, Transmission and Controllers, and Low End Communications and Transmission. The overall Local Area Communications Group is responsible for Terminal Interconnection, DECconnect, Synchronous Communications, and Local Area Networks programs. The group's goals focus on the long-term profitability of its products and successful technical innovation over a multiyear planning cycle.

13.8.2 Wide Area Communications Product Management

Manager: Jeff Low (LKG1-1/B10, 226-7325)

This group provides product management support for the Wide Area Communications Engineering organization, managed by Jac Simensen. The organization provides a strategic and business focus based on two SBUs: the Multivendor Interconnect SBU and the Digital Interconnect SBU. This group is responsible for the following programs.

- DECnet/OSI
- IBM Interconnect
- Mail/Document Interchange
- Distributed System Services
- Computer Integrated Telephony
- DNA Architecture

The group's goals focus on the long-term profitability of its products and successful technical innovation over a multiyear planning cycle.

13.8.3 Network Management Product Management

Manager: Deepak Goyal (CHM1-2/N4 272-7068)

This group provides product management support for the Networks Management Engineering organization, managed by Gary Gottschalk. The organization provides a strategic and business focus based on a single Strategic Business Unit (SBU). This group is responsible for defining and promoting the Networks Management Program for Digital's multivendor networking strategy. The group's goals focus on the long-term profitability of its products and successful technical innovation over a multiyear planning cycle.

13.8.4 NAC Europe Product Management

Manager: Lloyd Atkinson (REO2-G/C3, [44]-(734)-85-3578) DTN: 830-3578)

The NAC Product Management Group located in Reading, England, is responsible to NAC Product Management for managing the products developed by NAC Europe Engineering, which includes the engineering groups in Reading, England and Clonmel, Ireland. These products fall under the strategic and business direction of the SBUs located in the U.S. The product sets managed in England and Ireland encompass both Wide Area Communications and Local Area Communications Environment products. Current products include the Microserver Program, OSI products, the PSI Program, synchronous routers, ISDN, X.21, the DECserver 500, and DELQA.

In addition to providing product management to specific programs and products, this group also provides European input to strategies, business plans, and programs, as well as European forecasting and revenue projection for NAC Operations.

13.8.5 Operations

Manager: Steve Gormley (LKG1-1/B10, 226-7331)

The Operations Group provides a central focus for worldwide NAC business-related activities. Included in these activities are the following.

- LRP planning support and design of an automated planning tool.
- Coordination and reporting (Headcount and Budget) of the Networks and Communications LRP, Beige, and Yellow books.
- Development, coordination, and publication of both Hardware and Software forecasts. Provide a channel to communicate Networks and Communications business direction for other business groups (AMC, P&SG, Manufacturing, Corporate planning).
- Coordinate the NAC business management staff agendas, minutes, and action items. Review, develop, and present the group's cost center budget. Support Europe in product management and operational needs. Maintain a central file to include documents (PAC proposals, business plans, product requirements, forecasts, Beige, and Yellow books) published by the Business Product Management Group.

13.8.6 Strategic Planning

Manager: Bob Logan (LKG1-1/B10)

This group manages the Networks and Communications Long Range Planning process and generates the Long Range Planning (LRP).

The group manages, negotiates, and integrates inputs to LRP from SBUs, NAC Marketing, D.S. Planning, system engineering groups, and marketing groups.

The group also give presentations of the NAC strategy to groups within Digital.

13.8.7 Customer Information Group

Manager: Jack Mandelbaum (MLO3-5/B39, 223-7408)

The objective of the Customer Information Group is to keep Digital informed of the perceptions, requirements, beliefs, and behaviors of its existing and potential customers. The CIG is committed to ensuring that Digital's understanding of its customers and potential customers is superior to its competitor's knowledge of customers, particularly IBM. The CIG will help drive Digital's strategic advantage in customer information by aggressively working to ensure that Digital's development efforts are efficiently and effectively focused on priority customer problems.

The CIG is an independent, unbiased research group committed to quality market research. Its association with NMSE is based on historic background, and the willingness and commitment of NMSE and DS management to continue to support the function. CIG's priorities and responsibilities are to the corporation, with almost exclusive emphasis on the development community.

13.8.8 Network Ventures Group

Manager: Sue Goldman (LKG1-2/B10, 226-7330)

The Network Ventures Group integrates third-party products in a complementary way toward complete network solutions. This group will organize and implement third-party activities for both Local Area and Wide Area Networks, and for hardware and software. In general, the selection of external ventures projects will be driven by the LACE and WACE SBU strategies.

This group will handle buyouts and referrals, provide liaison with non-NAC network and communication projects, and provide focused vendor management for hardware and software acquisition. The referral avenue offers the means to let newer technologies prove themselves in the market without heavy NAC investment, while buyouts—particularly in commodity areas—enable quicker time-to-market using fewer development resources. As we move in to the arena of multiple networking technologies, being able to work successfully with third parties becomes crucial.

To be successful, the Network Ventures Group will need to work closely with manufacturing, services, external relations and marketing.

13.9 NETWORKS AND COMMUNICATIONS (NAC) MARKETING

Manager: Robert G. Murray (DELNI::MURRAY, LKG1-2/M07, 226-7371)

Networks and Communications Marketing (NACM) is responsible for the worldwide marketing of Digital's communication product set.

NACM is a worldwide organization of 140 people, consisting of the following groups and their contacts:

13.9.1 Product Marketing

These four groups provide direction and marketing messages and are the contact for product-related marketing questions.

- *Workgroup/LANS Marketing*
Manager: Gail Daniels (DELNI::DANIELS, LKG2-1/N2, 226-5169)
(All current workgroup networking products)
- *Enterprise Marketing*
Manager: Lee Sudan (DELNI::SUDAN, LKG2-1/N2, 226-7385)
(Emerging products—corporate distributed information systems)
- *Network Management Marketing*
Manager: Dave Korf (APPLE::KORF, MKO2-1/E10, 264-4427)
(Network management products)
- *Integrated SVCS Marketing*
Manager: Ray Grenier (DELNI::GRENIER, LKG2-1/N2, 226-5125)
(Collaboration with the various groups that service the customer)

13.9.2 Merchandising

These groups package the marketing messages.

- *MARCOM Marketing*
Manager: Dennis Rossiter (ENUF::ROSSITER, MKO2-1/E10, 264-3310)
- *NACM Education and Training*
Manager: Dan Tobin (DELNI::TOBIN, LKG2-1/N5, 226-5082)
- *Technical Support*
Manager: Jim Miller (JEDI::MILLER, MKO2-1/E10, 264-0191)

13.9.3 Geographies

These groups get the messages out.

- *U.S. Marketing Programs*
Manager: Al Vaskas (DELNI::VASKAS, LKG2-1/N5, 226-5079)
- *European Marketing*
Manager: Red Crossman (BONNET::CROSSMAN, VBO, 828-5436)
- *GIA/EUR Marketing*
Manager: Ed Schmidt (ENUF::SCHMIDT, MKO2-1/E10, 264-3321)
- *PACIFIC RIM Marketing*
Manager: Fred Balfour (DELNI::BALFOUR, LKG2-1/N2, 226-5134)

13.9.4 Strategic Planning & Feedback

These groups measure what is going on.

- *DS Strategic Planning*
Manager: Ralph Dement (DELNI::DEMENT, LKG2-1/Y4, 226-7188)
- *Marketing Business Management*
Manager: Brian Owen (DELNI::B_OWEN, LKG2-1/U2, 226-7839)

13.9.5 Industries

This group identifies how we relate to DEC'S industry focus.

- *Network Applications/Industry Marketing*
Manager: Rod Flakes (DELNI::FLAKES, LKG2-1/N5, 226-5103)

13.9.6 Strategic Programs

This group is responsible for specials.

- *DW88/TELCOM Special Events*
Manager: Bob Carty (APPLE::CARTY, MKO2-1/E10, 264-0945)

13.9.7 Administration

This group offers support to the group manager.

- *Operations Marketing*
Manager: Bill Seaver (DELNI::SEAVAR, LKG2-1/N2, 226-7857)
Finance: Jean Knapp (ZORRO::KNAPP, LKG2-1/N5, 226-5109)

NAC Marketing's goal is to be the industry leader in networking and provide communications products to successfully leverage and promote Digital's computing environment in the customer's multi-vendor, multi-national network.

In order to achieve this goal each NaC Marketing program is the implementation of one of the following strategies:

- SIMPLIFY NETWORK PRODUCTS, SERVICES, AND SOLUTIONS through packaging, education, and marketing/merchandising to make it easier for sales and sales support to sell and for customers, including market influences, to buy.
- SEPARATE DIGITAL "OUT" FROM THE COMPETITION and provide sales, service and Digital marketing groups with competitive support including proactive marketing programs.

- DEVELOP, IMPLEMENT, AND SUPPORT COOPERATIVE MARKETING PROGRAMS with the various marketing, sales and service channels within the company while providing these channels with both technical and marketing support and education.
- SUPPORT DIGITAL'S NETWORK LEADERSHIP THROUGH LONG RANGE STRATEGIC POSITIONING, shaping customer expectations, and educating the company and the customers on the evolution and implementation of Digital's network direction.
- SUPPORT PBU PLANS, FORECAST, AND REVENUE by analyzing and recommending emerging areas of new business opportunity for Digital, as well as expand market presence in key strategic communication market segments, while providing ongoing market feedback for product development.

If you have a product related marketing question, contact the appropriate product marketing group.

If you service the customer, contact Ray Grenier.

If you are in industry marketing, contact Rod Flakes.

If you are in a particular geography, contact the appropriate geographies person.

If you are still confused, contact Bill Seaver or Bob Carty.

13.10 DISTRIBUTED SYSTEMS MANUFACTURING (DSM)

Manager: Glenn Armbruster (WJO2-2/B9, 282-1438)

Distributed Systems Manufacturing (DSM) is a Manufacturing Business Unit (MBU) organizationally aligned with Computer Systems Manufacturing (CSM) and Distributed Systems PBU. It is the worldwide manufacturer of Network and Communications PBU products, Local Area Systems PBU products, as well as products for other Distributed Systems and Systems PBUs. DSM manages the manufacture of the Ethernet product set, other communications options, systems expander cabs, power controllers, Modems, and loose piece and/or "C" class options. The organization maintains a Support Engineering function, a Value Engineering function, Engineering New Products Purchasing, Component Engineering, Producibility, worldwide business management, Product Safety, Quality and Technology. DSM products are produced in Augusta, Clonmel and Aguadilla.

DSM offers the Engineering community a focal point for manufacturing and management of communication products. Engineers can contact the DSM Support Engineering Group if there are any technical questions regarding the DSM product set, including ECOs. They should contact the Business Management group for any questions regarding the availability of any DSM product.

The Quality Group should be contacted if there are any questions on the current or historical quality or reliability results, and the Technology Group for any questions on process or test capabilities. In addition, there are significant CIM and CAD/CAM efforts within DSM.

The DSM staff consists of the following:

- *Group Manager*
Glenn Armbruster (WJO2-2/B9, 282-1438)
- *Group Business Planning Manager*
Tom Rines (WJO2-2/B9, 282-1425)
- *Group Materials/New Product/Component Engineering Manager*
Jim Hart (WJO2-2/C10, 282-1432)
- *Manufacturing Technology and Engineering Manager*
Len Levy (WJO2-2/C9, 282-1448)
- *Group Controller*
Mike Frongillo (Acting) (WJO2-2/B9, 282-1431)

- *Group Personnel Manager*
Hilary O'Donnell (WJO2-2/B9, 282-1440)
- *Support Engineering/Value Engineering Manager*
John Morgan (MKO1-1/D28, 264-5672)
- *ASO Plant Manager*
Beth Reuthe (ASO/4AJ, 271-5672)
- *AGO Plant Manager*
Luis Rivera Oyola (AGO, 722-2234)
- *KLO Plant Manager*
Martin McCarthy (KLO, 826-2211)
- *New Products Manager*
Bill Burke (Acting) (WJO2-2/B9, 282-1318)
- *Logistics Business Unit Manager*
Kay O'Leary (DAS1-2/Q02, 275-2340)
- *NaC Technology Liaison*
Mike Rinaldi (LKG1-2/E20, 226-7332)

13.11 INTERNATIONAL ENGINEERING

Managers: David Stone (GEC/609A, 821-4956) V.P., Policy/Decisions
Ken Litsios (GEC/707D, 821-4433) Operations
Mike Horner (GEO/C0207, 821-4307) Engineering Strategy

International Engineering (IE) is part of Central Engineering's Distributed Systems. IE is a distributed organization, made up of over twenty groups spread throughout Europe and the United States. The coordinating management team is located in Geneva, Switzerland.

International Engineering's mission is three-fold:

- To ensure that corporate products are designed to adapt easily to country markets and perform the adaptation and complementary local product development necessary to meet country plans and the required quality standards.
- To strengthen Digital's presence and involvement in all European and GIA countries.
- To support European Marketing objectives.

This mission is secondary and complementary to the overall Digital mission of providing customers with quality information systems, products, and services.

Fulfilling this mission depends upon meeting the following objectives.

- Ensure that Corporate products are designed to meet competitive standards of strategic country markets.
- Increase strategic investment by attracting Corporate investment to Europe.
- Develop international country-specific partnerships and products.
- Support all product design groups by providing timely standards and regulatory information.
- Provide best Engineering environment for country-level product development activities.

13.11.1 European External Research Program (EERP)

Manager: Robert Boers (GEO, [41]-(22)-87-4111 x4763)

Administrator: Janet Maillard (GEO, [41]-(22)-87-4111 x 4288)

The European External Research Program (EERP) identifies critical research areas in Europe of potential use to Digital and initiates collaborative projects with the appropriate external research organizations.

Program objectives include the following.

- Function as the focal point of Digital's interaction with both European research institutes and customers to stimulate potentially beneficial relationships.
- Provide European research results that will be interesting to Digital engineering groups, using product discounts as leverage.
- Provide financial support to European researchers to allow them to put their most valuable tool, human knowledge, to better use.
- Establish Digital Europe's image as a sponsor of public research activities in Europe, thereby contributing to Number 1 (presence in educational and research community) and Number 4 (local presence) of Digital Europe's Mission and Objectives.

The EERP offers three types of external research support.

- *Project Sponsorship*— Locate European research groups with the expertise to assist and complement internal research. Internally circulate project proposals in order to link with a Digital sponsor. Project support takes the form of equipment allowances provided by EERP for the participating customers. The Digital Sponsor (an Engineering group) is responsible for working closely with the external project team to ensure the transfer of results into the company.
- *Technology Transfer and People*— EERP maintains a database of world-class research centers and accessible research programs in Europe. Our experience has shown, however, that technology transfer takes place only if people are involved. The EERP office supports visits, seminars and conferences related to EERP projects.
- *Student sponsorship*— Once a working relationship is established between a "center of excellence" and a Digital Engineering Group, graduate students can be sponsored financially for work on EERP projects. Under responsibility of the project sponsor, these students can be subsequently invited to work in Digital on a temporary or permanent basis, transferring the benefits of external research inwards.

Technologies currently covered include the following.

- VLSI
- Storage/data bases
- Communications and networking
- Languages and software tools
- Automated manufacturing
- Office workstations
- Artificial intelligence
- Multiprocessor software

FY88 goals include the following:

- Ensure a good overview of all major research capabilities and locations in Europe.
- Maintain existing links with European research organizations. Help Engineering groups to establish contacts with external world class Research and A/D activities in Europe.

- Build and maintain good communication channels with the U.S. ERP, Digital's worldwide Engineering Community, and the corporation as a whole.
- Co-locate with, and support the activities of, the European Digital Competence Center for the Public Sector.
- Develop specific new European opportunities of strategic importance to Digital Europe, around the model of a Customer/Campus Engineering Centre (CEC). A CEC is a small DEC group managing technology transfer and joint project activities, close to a customer site.
- Manage the allocation of a \$24.0 (MLP) research allowance budget.

13.11.2 International Standards and Regulations

Group Manager: Jan Scherpenhuizen (GEC/614C, [41]-(22)-87-4681,EUROPE::S12N)

The Mission of International Standards and Regulations (IS&R) is to ensure that Digital products are designed to existing and emerging International Regulatory/Marketing demands.

International products are affected by a variety of special technical requirements. Some are legislatively driven, for example EMC, Acoustics, and PTT approval, while others are driven by market requirements such as trade union pressures.

Some of the ways that IS&R ensures that the Regulatory/Marketing Demands are met include the following:

- Ensure compliance is understood in terms of regulatory or market requirements.
- Ensure that these requirements are clearly understood and documented.
- Distribute this information to all engineering groups affected, the relevant standards-domains, or IPO.
- Assist in balancing future standards requirements against business needs and determining what is an "acceptable business risk."
- Continue to increase the experience of IS&R as markets, standards, technologies, and products evolve.
- Implement the concept of country Standards Co-ordinators

Most of the activities within this group are performed in close conjunction with Corporate Standards, Standards & Methods Control, or Component Engineering and Manufacturing.

In cases where additional information is required—where design requirements are not yet covered in Digital standards, or are not known in the responsible domains—questions can be directed to the one of the following responsible managers:

- *International Standards and Regulations Manager*
Jan Scherpenhuizen
- *Secretary*
Brigitte Roessler
- *Special Projects*
Fred Pieters
- *European Product Safety Manager Acting*
Richard Hughes (RDGENG::RHUGHES, DTN 830-6151)
- *International Standards and Systems Interconnection*
Peter Jones
- *PTT Bureau (Reading, UK)*
Nick Spalding

- *ISDN Standardization (Valbonne, FR)*
Pierre Jardin
- *Standards Coordination Managers*
Isabelle Valet (Valbonne, France)
Verena Horsnell (Reading, UK)
OPEN (Germany)
OPEN (Italy)

13.11.2.1 Product Safety Europe

MANAGER: Richard Hughes (Acting) (REO2-G/L3, DTN 830-6151, RDGENG::RHUGHES)

Product Safety Europe has been driven by the same mission for the last three years to minimize Digital's liability by preventing, detecting, and correcting safety hazards in products designed, produced, or maintained by Digital. Safety is the essential foundation of quality, and thus forms the cornerstone of Digital's mission "to provide customers with quality information systems, products, and services."

Fulfillment of this mission depends upon meeting the following objectives.

- Integrate Product Safety into the operational responsibilities of the three main functions: Engineering, Manufacturing, and Field Service.

Contacts:

Manufacturing Product Safety Manager
Bob Black (AYO, EAYV00::BBLACK, DTN 823-3411)

Field Service Product Safety Manager
Malcolm Corke (VBO, BONNET::CORKE, DTN 828-5045)

- Enhance our sensitivity to new technologies in developing and existing market places from a product safety perspective.
- Expand our expertise to ever-changing environmental and company requirements.
- Maintain the necessary policies and procedures and establish the required controls.

The main activities of the European Product Safety Organization are as follows.

- Advising engineering teams throughout the development cycle and testing to the applicable standards; performed by the Product Safety Laboratory in Reading, England.
- Using the services of UL, CSA, TUEV and BSI to verify test results and grant approvals, as applicable, to the product; performed by the Product Safety Laboratory in Reading, England.
- Maintaining and enhancing the Product Safety status of products and processes at manufacturing sites—performed by the Plant Product Safety Coordinators.
- Representing Digital's interests in safety through organizations such as: ECMA (European Computer Manufacturers Association); IEC (International Electrotechnical Commission); and BEITA (Business Equipment & Information Technology Association).
- Performing Field support (for example, incident pre-investigation) as well as establishing and maintaining a recall database—performed by Field Service Product Safety in Valbonne, France.

For further information or assistance, please call or send your requests to us.

13.11.2.2 International Standards and Systems Interconnection

Manager: Peter E. Jones (GEC/B613, [821-4296, EUROPE::PJONES]
Coordinators: Verina Horsnell (REO 2G/H9, [830-4833, RDGENG::HORSNELL])
Isabelle Valet (VBE ALGO3, [828-5755, LEROUF::VALET])

International Standards and Systems Interconnection administers Digital's participation in the communications, network, and OSI standards activities of the ISO/IEC, International Telegraph and Telephone Consultative Committee (CCITT) and the European Computer Manufacturers Association (ECMA). It also monitors and when possible arranges participation in related standards activities of European organizations such as the European Commission, CEPT and CEN/CENELEC. (The Standards Promotion and Application Group (SPAG), European Workshop on Open Systems (EWOS), and the European Telecommunication Standards Institute (ETSI) are also included.)

The group is in the process of implementing the initial stages of the Digital plan for External Standards Activities so as to have a more formal and disciplined way of supporting standards activities in the countries through our engineering management in Europe.

The group, presently comprising a team of three, (Peter Jones, Verina Horsnell, and Isabelle Valet) has the mission, inter alia, to improve the proactive role of Digital in external standards development, to create and maintain an awareness of emerging standards, and to introduce standards planning into corporate strategic planning activities.

It is anticipated that the Group will provide a central information and consultation service on standards activities in Europe in coordination with the corporate standards department.

Questions may be directed to any member of the standards team.

13.11.2.3 Integrated Services Digital Networks Standardization

Manager: Pierre Jardin (VBE, [33]-(92)-95 54 26, LEROUF::JARDIN)

The Integrated Services Digital Networks (ISDN) Standards Group is representing Digital's future telecommunication interests by contributing to the development of the standards which define the next generation of Digital worldwide networks. This is done by direct participation to European standardisation bodies like ECMA and CEPT and to the International Telecommunications Committee (CCITT). The group also publishes a monthly "ISDN Newsletter" and serves as a focus for ISDN consultation and strategy formulation within Digital.

13.11.2.4 Post, Telephone, and Telegraph (PTT) Bureau

Manager: Nick Spalding (REO2G/C2, [44]-(734)-85-3570, JANUS::SPALDING)

The PTT Bureau's mission is as follows.

- To ensure that corporate communications products are designed to meet the requirements of International PTTs and Telecom Regulatory Bodies.
- To minimize the time taken to gain "permission to connect".

The overall objectives are met through the following provisions.

- Consultation
- Education
- Up-to-date interpretation of PTT requirements in a proactive rather than reactive manner.

To help Product Management and Engineering define product requirements to meet country needs, overviews of PTT communication services and their associated standards are provided on a regular basis.

13.11.3 CIM International Engineering

Manager: Donald Young (RTO +49/89/9591-1164)

Within the Corporate Engineering Strategy this group delivers Computer Integrated Manufacturing (CIM) solutions for the International Market. The goals of this group are as follows.

- Develop or modify CIM solutions to satisfy specific European needs.
- Develop worldwide CIM solutions in technology areas where Europe has special expertise, resources, or need.

This group is part of International Engineering and the Digital Competence Center for Manufacturing Industry in Munich, and is building two centers of excellence:

- Manufacturing Data Integration (MDI) focused upon the interchange and synchronization of data between applications in a manufacturing enterprise.
- Shop Floor Integration (SFI) focused upon getting data into the VAX environment from the shop floor.

13.11.3.1 CIMIE Shop Floor Integration (SFI)

Manager: Nino Olivotto (TNO +39/11/7413-111)

The technical centre for implementing and adapting Digital's Shop Floor Integration strategy. Including systems engineering work with Fiat, advanced development efforts in AI scheduling, product development in device integration (e.g., Siemens industrial ethernet).

13.11.3.2 CIMIE Manufacturing Data Integration (MDI)

- *MDI Systems Engineering*
Manager: Winfried Gruhnwald (RTO +49/89/9591-1237)

The goal of this group is to develop Systems Engineering solutions with large customers (e.g., ABB) and to actively drive changes to the base product set and corp architecture to satisfy the manufacturing customer needs.

- *MDI Architecture, EERP and Standards*
Manager: David Fisher (RTO +49/89/9591-1186)

The goal is to work closely with US-based corporate groups to establish an Application Architecture, will satisfy the manufacturing environment. Further to coordinate the External research in europe related to CIM, and coordinate MDI related standards.

- *MDI Product Management*
Manager: Ernst Juergen Schrader (RTO +49/89/9591-1139)
- *SFI Product Management*
Manager: Issa Azar (TNO +39/11/7413-111)

The goals include defining and maintaining the MDI/SFI Product strategy, establishing and maintaining communication channels to marketing, digital manufacturing, customers, and universities, and managing the system engineering efforts according to the Engineering Phase Review Process, especially driving Phases 0 and 1.

- *MDI Advanced Development (ESPRIT)*
Manager: Alfred Bauer (RTO +49/89/9591-1122)

The goal of the Esprit CIM Software research projects (COSIMA/CIM-OSA) is to develop advanced CIM technology in collaboration with Digital's industrial partners and Corporate Engineering. They develop advanced Application Software, research new technology for the usage in CIM, and help to build Digital's leadership as a competent partner in CIM projects by working closely with customers, users, and research organizations.

The expertise of this group is transferred to other groups in Digital by exchanging personnel, presenting papers and seminars and the like.

- *ESG Systems Engineering*
Manager: Donald Young (acting) (RTO: +49/89/9591-1164)

As part of the Core Engineering Systems Group, perform systems engineering in the area of Mechanical CAD developing a worldwide resource in this area. The initial work would focus upon solution systems.

13.11.4 International Advanced Product Development (IAPD)

Manager: Bob Camelio (MKO1-1/N30, 264-0971)

International Advanced Product Development is focused on low-end systems engineering and marketing activities which increase Digital's ability to engineer quality worldwide products and strengthen Digital's presence in Europe.

Specific objectives of IAPD are as follows:

- Facilitate European product development efforts that are supported by Low End Systems Engineering (LESE) and act as a technical and management liaison for these efforts.
- Support efforts which will assist the European field organization with large account business opportunities.
- Establish mechanisms which will demonstrate to our key European accounts Digital's directions in the desktop space. Use this as an opportunity to collect account feedback and increase initial product sales.
- Foster PBU recognition of international market needs.

13.11.5 International Engineering Development

Manager: Jim Mills (VBE, [33]-(93)-95-54-62)

This group is a major component of International Engineering. Its manager, Jim Mills, is based in Valbonne and reports to David Stone, Vice President of International Engineering and Strategic Resources.

As International Engineering Development Manager, Jim is responsible for product internationalization in Europe. He is also the site engineering manager for Valbonne.

The groups in International Engineering Development are International Products Group, International Engineering Consultants Group, Applications Engineering Group, International Engineering Process and Quality, Engineering Support activities in Valbonne, France. The activities of all of these groups are included in the following subheads. Today International Engineering includes five groups in Valbonne with 160 engineers:

- Applications Engineering Group
- European AI center
- Telecommunication Application Engineering Center
- CASEE

- IDP

13.11.5.1 Valbonne Engineering Support and International Engineering Development

Manager: Jim Mills (VBE, [33]-(93)-95-54-62)

MISSION

Ensure that the Valbonne IE groups and the new startup Engineering groups have a quality supporting Engineering environment composed of facilities, services, and processes to help them meet their objectives.

Ensure that Corporate products are designed to adapt easily to country markets and perform the adaptation and complementary local product development necessary to meet country plans and the required quality standards.

Contribute to and support International Engineering in becoming a key partner in the information technology market in countries where we operate, by increasing our local presence and participation.

OBJECTIVES

Deliver Local-Language Products (Objective 1)

- Provide product design consultancy, documentation, and training on translatability and adaptability
 - Monitor phase transitions of Corporate product development and identify non-conformance to Digital internationalization standards
 - Escalate non-conformance issues
- Manage product internationalization - modification, translation
 - Working with Central Engineering and with Local Engineering, coordinate the translation and adaptation of a set of products as planned in the Beige book and agreed with European and Country Marketing
 - Announce and ship >3 local-language products to >= 5 countries simultaneously with U.S. announcement and ship schedule
 - Manage the metrics for translation and adaptation to show improvement over FY88
- Perfect processes for translation and adaptation of Corporate products
 - Continue to manage and perfect the translation decision planning process; revalidate process with Area marketing; educate major PBUs involved in translation
 - Define internationalization needs to be addressed by Phase Review Process
 - Ensure Corporate PRP incorporates internationalization requirements
 - Establish and deliver training for PRP
 - Educate required Corporation, Area, and Country functions on these processes and get their commitment to follow them
- Complete the implementation of the Translation Program
 - Implement available third-party tools
 - Develop plans for follow-on third-party efforts
 - Manage the conclusion of the AD efforts and its follow-on activities
 - Negotiate agreements with SWAS, DCC, and country teams for longer term requirements
 - Establish metrics for translation costs, processes and systems for capturing the costs, and management plans for improving the translation cost metrics

- Complete the Local Engineering Program

Attract Maximum Corporate Investment to Europe (Objective 2)

- Chair the European Engineering Development Managers Committee, ensuring that needs identified get addressed by Central Engineering sponsor (Bill Johnson) and International Engineering sponsor (David Stone)
- Develop a plan for addressing Engineering IS requirements for Europe, particularly in the areas of application portfolio management and data management
- Manage Engineering operations and development according to Corporate engineering and financial standards (phase review process, prudent cost center management, internal controls, cost per person reductions, etc.)
- Implement automated project accounting systems and procedures
- Acquire and develop a few very capable consulting engineers who can serve as architects for targetted areas of product development
- Continue development capability for UNIX
- Provide host management for Reading and Valbonne Engineering groups
- Working with Jim Wade, Don Young, Nino Olivotto and the Country Engineering Operations Committee, support the establishment of the Engineering infrastructure for Munich and Turin
- Establish graphics and videotex capabilities in AEG

Engineer European-specific Products using the Corporate Phase Review Process (Objective 3)

- Establish a center in IPG for providing engineering support for marketing's relationship with ISVs
- Develop required videotex, telex and teletext interface products
- Engineer Arabic products per plans
- Provide product management coordination for Hebrew Local Engineering group

Support Country-level Activities working with SWAS (Objective 4)

- These activities are covered primarily under Objective 1 (particularly the Local Engineering and Translation programs) and the McLuhan Program
- Continue the McLuhan Program for European Electronic Publishing

1987 ACCOMPLISHMENTS

This past year, we have been very successful in upgrading our Engineering campus to an excellent state. All of the Valbonne Engineering groups are now located in the Algorithmme complex and have sufficient contiguous space to meet their growth plans for the calendar year 1988.

The Engineering library is now a well founded part of the Digital Library network, and offers a full set of services on par with US-based libraries. We are just now completing a hardware laboratory, and installing a CAD/CAM system to support LEG engineering activities in Europe.

We have also significantly enhanced our network capabilities with direct circuits to Marlboro, Paris and Nijmegen. The computing environment has been secured by installing non-interruptible power in all of the facility, including a plug for workstations in each engineer's office. In addition, the hardware acquisition process has been improved giving us good delivery times on all necessary engineering equipment.

The supporting services from Personnel, IS and Finance are now very much integrated with the objectives of Engineering, and we have the understanding and teamwork to continually meet the needs of all of the Engineering groups.

Considerable progress has been made this year in product internationalization - in local language products shipped and in the level to which Corporate products are now directly translatable.

The work to create a Basic European Version of ALL-IN-1 has been integrated into the standard product. Version 2.3 of ALL-IN-1 has pioneered our work in shipping translated versions of a product simultaneously with the U.S. product.

The Local Engineering Program (LEP) has progressed very well resulting in effective Engineering and Translation organizations in each subsidiary. European SWAS now has an Area focus for Engineering which provides functional management for these groups.

Cooperation with Area Marketing has been quite effective in the initiation of a Translation Decision Process for determining the portfolio of products which will be translated.

1988 PLANS

We have just purchased 20 hectares of land to construct a new Engineering facility which should be ready in 1989/90. Next calendar year we will be continuing to improve the Engineering environment and planning for the new facility.

In addition to this, we will move to the second stage of the program to ship translated products simultaneously with the U.S. product. DECwindows will be the focus for these efforts.

We will also have a focus on improving the productivity of developing language products by designing tools and processes which support Central Engineering developers as well as Local Engineering and Translation groups.

ORGANIZATION

- *International Engineering Development Manager*
Jim Mills
- *International Engineering Consultancy Group*
Don Marchand
- *Reading Engineering Support*
Stuart MacKenzie
- *International Products Group*
David Bell
- *IE Process and Quality Manager*
Bruce McNaughton
- *User Information Architecture Advanced Development*
Jon Barrett
- *Applications Engineering Group*
Jem Scanlan
- *Digital/Ericsson Joint Development*
Goran Lindblad
- *Staff Consultant and Special Projects*
Odd Jorgensen
- *IE DECwindows Program Manager*
John Hurd
- *IE DECwindows Architect*
Jürgen Bettels

13.11.5.2 Applications Engineering Group

Manager: Jem Scanlan (VBE, [33]-(92)-95-52-14)

The Applications Engineering Group's mission is:

- To provide quality services and tools to Corporate Engineering in order to develop quality product adapted to local market needs
- To develop quality Corporate products in the extended office space in support of worldwide and European business strategies

The objectives of the Applications Engineering Group are as follows:

- Ensure production of International Base Versions (BV) of relevant Corporate software products by the relevant Corporate Engineering group, mainly in the integrated office space
- Ensure delivery of Local Language Variants (LLV) of these Base Versions and provide Local Engineering Group (LEG) supporting activities
- Develop and deliver timely quality components of Corporate software products, as agreed with the owning CE group and/or Area Marketing, and, if required, the local language development of the complete product as above. The component will clearly be a BV.
- Integrate the Local Engineering Groups into the projects of the AEG, as an integral part of, and in accordance with, the Local Engineering Program of International Engineering
- Transition relevant parts of the AEG organization to the relevant PBU as a specific portion of the Engineering Presence Program

The accomplishments for FY86-87 (Status November FY 87) are as follows.

- Basic Version and Language Version:

FCS: ALL-IN-1/BEV V2.0

ALL-IN-1/Dansk, /Deutsch, /Espanol, /Francais, /Hebrew,
/Italiano, /Nederlands, /Norsk, /Suomi, /Svenska

ALL-IN-1/BEV V2.1(co-engineered by IOSG and AEG)

ALL-IN-1/Deutsch, /Nederlands, /Portugues, /Suomi, /Svenska

WPS-PLUS/ALL-IN-1/BEV V2.0

WPS-PLUS/ALL-IN-1/Dansk, /Deutsch, /Espanol, /Francais, /Italiano,
/Nederlands, /Norsk, /Suomi, /Svenska

WPS-PLUS/VMS/BEV V2.1

WPS-PLUS/VMS/Dansk,, /Espanol, /Francais, /Italiano, /Nederlands,
/Norsk, /Suomi, /Svenska

WPS-PLUS/DOS/BIV, /Italiano

PC ALL-IN-1/BIV V1.0

PC ALL-IN-1, /English, /Espanol

DECpage/BEV V2.1

DECpage/Deutsch V2.1, /Espanol

- In Phase 3:

ALL-IN-1 V2.1 (co-engineered by IOSG and AEG)

ALL-IN-1/Dansk, /Francais, /Italiano, /Norsk

DECpage/BEV V2.1 /Dansk, /Espanol, /Francais, /French Canadian,
/Italiano, /Norsk, /Svenska

PC ALL-IN-1 V1.0 /Svenska

PC ALL-IN-1 V1.1 /Deutsch, /English, /Nederlands

WPS-PLUS/DOS/ Dansk,/Suomi

- In Phase 2:

ALL-IN-1/BIV V2.3 (ex AMETHYST)

ALL-IN-1 V2.1/French Canadian

PC ALL-IN-1 V1.1 /Espanol

WPS-PLUS/DOS/ Deutsch, /English, /Espanol, /Nederlands,
/Norsk, /Svenska

- In Phase 1:

ALL-IN-1 V2.3/Dansk, /Deutsch, /English, /Espanol, /Francais,
/Hebrew, /Italiano, /Nederlands, /Norsk, /Portugues, /Suomi,
/Svenska

- In Phase 0:

ALL-IN-1 V3.0

Software Components:

- FCS: VTX/VTX20, VTX/Minitel
GKS/VSV21, GKS/PANDA
WPS-PLUS/GEX
- Phase 2 VAX GKS-3D V1.0
- Phase 0: VTX/Prestel Gateway
Message Router Telematic Server

IN FY88

As during last year, we will be continuing on the deliverables as mentioned above throughout this year. In addition we are heavily involved in the DECwindows Program, with these products entering Phase 1 and 2 in the next weeks/months. Clearly the ALL-IN-1 V3.0 product and its associated "children" will also be a major portion of the work for AEG in the remainder of 1988.

The Corporate Engineering sections of AEG are becoming more and more integrated into the Base Groups—BOSE and CAG—both in the deliverables that we are planning in FY88, and in the planning process for FY89. This development of the organization will clearly have repercussions on the AEG structure and organization next fiscal.

As the Valbonne engineering campus grows in size and importance, AEG will continue to play a key role in the future of Valbonne engineering. We are already planning to investigate the extension of the QA and UI groups to a side-wide entity, and are actively reviewing the possibility of a simultaneous-ship center in Valbonne.

ORGANIZATION

- *Applications Engineering Group Manager*
Jem Scanlan
- *Secretary*
Brigitte Llorca
- *Product Internationalization*
Piero Balladelli

- *Quality Assurance*
Myriam Martin-Kail
- *User Information*
Bill Rees-Lewis
- *Operations*
Jean-Jacques Creux
- *EERP/Technology Transfer*
Leszek Kotsch
- *Graphics Development*
Joerg Kochan
- *Business Communication Development*
Brian Mottershead
- *Corporate Engineering Product Management*
Dave Flynn
- *CE Product Management*
Mike Oughton
- *CE Product Mananagement*
Jeff Knibbs

13.11.5.3 International Engineering Consultancy Group

Manager: Don Marchand (MLO3-2/M16, 223-8119)

The International Engineering Consultancy Group provides consultation to Digital engineering groups worldwide to assist them in designing, developing, and distributing quality international software and hardware products.

The objectives of this group are as follow.

- Collect and disseminate international product requirements, guidelines, process and engineering and manufacturing information to software and hardware engineers, product and marketing managers, management, third-party vendors, and others actively developing or supporting international products.
- Provide international consulting on strategic products, processes, and systems.
- Actively transfer the knowledge accumulated about international products to Digital employees involved in the design, manufacture, distribution, and service through formal training programs, demonstrations, and seminars.
- Develop and coordinate the implementation of international architectures leading to the delivery of higher quality international products. These areas include hardware, software, manufacturing, delivery, and support systems.

1987 Accomplishments

This year saw the start of IECG's formal training program for software developers and architects. To date we have trained over 250 engineers worldwide in "Principles of International Software Design" (POISD). Special training courses are being designed for product and development management; we are also actively engaged in training independent software vendors in how to produce international products. This program is expected, eventually to train approximately 500 Digital software suppliers in the art of designing international software.

We continued to be active in all aspects of Digital architectures-both in hardware and software, and also in all areas of systems consultation.

Consultancy in the form of information and technical support was also supplied to a number of European and US marketing groups, GIA marketing, and country local engineering groups in both GIA and Europe.

In the area of standards and processed IECG made important contributions to the development of the international phase review process and contributed to the further development of the following design standards: DEC STDs 178, 060, 062, 012, 073, 028, 002, 047. These standards covered power, labeling, international requirements, nomenclature and software documentation manufacture.

1988 Plans

- Active systems consulting for PRISM, PRISM ULTRIX, GLACIER, CHEYENE, PVAX, Firefox, Digital/MacIntosh, and other major systems products
- Work on Product Management Internationalization Training, The Digital Standard for international Software, the International Expertise Program, the Principles of International Software Design, and the IE Handbook
- Organization of third-party international seminars
- Activity on Multilingual International Distribution Application
- Establishment of Digital international and external software architectural committees

Organization

- *International Engineering Consultancy Group Manager*
Don Marchand
- *Secretary*
Diane Marino
- *Engineering Manager*
Guy Vancollie
- *Engineering Manager*
Michael Juergensen
- *Marketing Consultant*
Dee Anderson
- *Principal Engineer*
Jon Stewart
- *Product Management Consultant*
Lee Rodabaugh
- *Software Engineer*
Carine Avakian
- *User Information Specialist*
Lydia Velez

13.11.5.4 International Products Group

Manager: John Kappler (REO, [44]-(734)-85-46-25)

MISSION

To partner selected PBU Engineering groups to assist them in meeting their International Product Charter and to enable Digital subsidiaries to have quality products that meet their country plans.

OBJECTIVES

- Work with selected PBU Engineering groups to ensure that their products are designed to adapt easily to country markets.
- Manage the process and provision of information that enables the Countries to develop complete LLP portfolios.
- For selected PBUs, manage the delivery of LLPs consistent with PBU goals and Country Product Portfolios.
- Provide the capability to enable selected third party (ISV) products to be tested, certified and supported as part of Digital systems within Country and European Area strategies.
- Through the Local Engineering Programme/Translation Program cause specified subsidiaries to have an effective Engineering and Translation capability.
- Deliver quality products in a timely and cost effective manner to support the Arabic market.
- Ensure the success of the European Ultrix Engineering Group.
- Establish an Excellence Program to enable a demonstrable level of excellence to be achieved in our activities.
- Create and maintain an excellent environment for our activities.
- Create and maintain an integrated Human Resources Development Program that supports our business goals and enables maximum opportunity and chance of success to be offered to those working in IPG.

1987 ACCOMPLISHMENTS

Product Development

Many activities of major importance were carried out in support of the Internationalization goals of the Corporation and International Engineering. They were wide ranging and included:

- Reviewing product specifications and business plans for suitability (specifications, code, etc.)
- Persuading Corporate Engineering groups to make their products as easily adaptable and translatable as possible and helping with the education effort
- Managing the development and shipment of Local Language Versions of products
- Preparing Internationalization routines for inclusion in base operating systems (VMS and Ultrix)
- Testing, certifying and reporting on the suitability and technical qualities of Independent Software Suppliers' products.

The number of variants in development at any one time, including end-user documentation, remained high throughout the year. At year end, for example, IPG was working on a total of 90 variants; there were approximately 100 phase reviews satisfactorily completed during the year.

Product Highlights

- Internationalization of DECwindows started. IPG is now working on Internationalization and delivery of Local Versions of DECwindows operating system platforms, addressing VMS, Ultrix and DOS operating systems' base requirements.
- LA75 PRINTER achieved the landmark of being the first product to ship Local Language Versions simultaneously with the US version. Translated User Books were made available with the product in five languages.
- Fifteen variants of VAXmate were produced to tight schedules. This product was also on the Engineering Top-100 list.
- Sixteen variants of A to Z were developed covering Micro/PDP and Micro/VAX versions and the Base System, Word Processing, and Graphics modules.
- Another landmark, of a different sort, was achieved with the shipment of the final variant of DECmate WPS.
- Development of products to meet the specific requirements of the Arabic market continued. The strategy being followed is to develop and ship a matched set of hardware and software products early in Q3 FY88 (VT3xx, LN03, FMS, TPU/EVE) to provide a completely Digital Arabic system offering.
- In direct support of European Area Marketing, an ISV test and certification facility was established. It has now become the European focus for this work. During 1987 many products from vendors such as LOTUS, Ashton-Tate, Microsoft, and Access Technology have been tested and reported on. New procedures had to be developed and published.
- ALPS (a translation product of potential major European significance) was ported on to Digital equipment with the help of the Translation Program Manager.
- The ULTRIX product development group (EUEG) steadily achieved a closer working relationship with Ultrix Engineering in the US and worked on several developments that were, or will be, incorporated into the base operating system. They included a mail interface between Ultrix and VMS Mail, and Internationalization routines that enabled Ultrix to be nearly 100% X/OPEN compliant. EUEG also provided major representation on the X-OPEN committee.

IE Programs

Last year saw the first full operational year of the Local Engineering Programme, and for many of the Local Engineering Groups (LEGs), their first ever operational year. Together we have enabled the programme to support and deliver against its objectives. Most important of these were the delivery of the Local Engineering Handbook and the job definition and career structures for the LEGs.

A significant event last year was the assignment of Herman Oggel as the SWAS Engineering Manager with whom the LEP has been able to resolve many of the outstanding problems around the "Home" of the Local Engineering and Translation Groups. Although these groups were created (LEGs) or moved (Translation Groups) within SWAS, their structure and operation was unclear and differed widely across the subsidiaries. The structure and organization of the groups has now been rationalized within each subsidiary's SWAS organization.

The Translation Programme has continued its support of translation technology, and has supported the successful porting of the ALPS TSS (Translation Support System) product to VMS.

The primary goals of the Programmes have always been the effective implementation and management of change. Most of the planned change is now complete and consequently the closure of the Programmes is planned for the end of FY89.

Non-Product Highlights

An Electronic Publishing Taskforce was established with support from IPG.

2-year Product Strategies were developed and communicated to Country portfolio managers to help them prioritize and plan their Translation and Engineering resource levels.

A European Phase Review Task Force was established to provide European requirements for the Corporate review of the Phase Review Process. Several reviews of proposals, and responses, were made.

The latest Digital technology, the Translators Workstation, in an Advanced Development form, was piloted in France and Germany. Offering such things as split screen editing of English and foreign language text, we hoped to increase the productivity of the translation groups. This work is continuing.

1988 PLANS

We will be working with PBUs, Countries and other groups within IE Development, to establish programs of activities that result in the delivery of LLPs consistent with PBU goals and Country product portfolios. This includes developing and delivering information to PBUs that will ensure that Corporate products are designed to adapt easily to Country markets.

PBU focus in late FY88 and FY89 will be principally on LESG, SSG (base systems groups), and Storage Systems. We will continue to manage the process on behalf of IE Development, providing the information that enables the Countries to develop complete LLP product portfolios consistent with PBU goals.

Significant emphasis will continue to be placed on the DECwindows product set in the belief that a successful international implementation of this will address the majority of the Internationalization issues for a considerable period to come.

We will continue to support the SWAS-Engineering Local Engineering and Translation Groups, particularly through the development of tools for the translation process and the transfer of Engineering processes. The programme will continue to better define a strategy for translation technology especially aligning the strategy against CUP's translation charter whilst at the same time supporting the translation groups in their technology requirements. Emphasis will be on the coordination between CUP-Engineering, SWAS/E and IPG/AEG for the delivery and support of a consistent and cost effective translation technology solution.

The support of the Arabic Business Groups, MEG and CDG will continue with the expansion of the range of integrated Arabic products.

Engineering focus will also be given to the emerging Greek market with a project to place Greece on the Strategic Country List and develop the necessary standards/architecture to enable Greek character set products to be developed.

Host Management of the European Ultrix Engineering Group will be provided as EUEG formally becomes a full part of Corporate Engineering. Prime objectives for EUEG during FY88 are: to continue to develop the group towards a critical mass; to deliver the first complete Corporate Product (as opposed to parts of other products) from the group; to commence work on a number of Corporate products; to ensure full advantage is taken by UEG of both the technical and market opportunities that are presented in Europe.

ORGANIZATION

- *International Product Office Manager*
John Kappler
- *Product Management*
Mike Humm
- *Development*
Bob Dray

- *Ultrix*
Vic Goddard
- *Local Engineering Programme/Translation Program*
Dave Harvey
- *Operations*
Stuart Burnley

The International Products Group's mission is to enable Digital subsidiaries to have competitive products that support the Corporate Product Strategy, available in a timely, cost-effective manner, and to start the transition to becoming a Corporate Engineering Group.

The objectives of the International Products Group are as follows.

- Develop local variants of products
- Develop corporate ULTRIX products
- Develop corporate Arabic products
- Define and implement processes for corporate and local engineering
- Define and implement quality goals for IPG's Corporate and Local Engineering development work
- Conduct research into Human Factors
- Manage programs to provide Translation and Local Engineering facilities in European Countries
- Product Development
 - 36 LLVs of eight major Corporate products shipped
 - First Corporate base international version of a product
 - DECmate
 - Last 12 versions developed at the end of FY86
 - LOLA (Local Language Assistance) French and German versions completed
 - The last versions of this interim product
- Arabic
 - Strategy and plans established and agreed on by Middle East and SEENA Groups
 - Justification prepared for addition of Egypt, Algeria, and Saudi Arabia to the Corporate Strategic List
 - Provided consultancy to Boeing and Hughes
 - Represented Digital on Arabic standards working groups
- New Developments
 - ULTRIX development group established in Q3/Q4
 - Provided corporate representation to X-Open Technical Committee
 - Independent software vendor focus and program established to satisfy demand for versions of third-party VAXmate products
 - Arabic Translation and Consultancy service established
- Process and Quality
 - LLP development process established and in use by IE and Country Groups
 - Formal inspection techniques tested and adopted

- Contributed to SARA on international requirements
- STRIP tool developed, enabling text for translation to be identified and easily reinserted into software sources after translation
- User Interface
 - "Standard Translation Pack" designed and introduced, providing a consistent package of material to country translation teams
 - DSR-plus established as standard mark-up tool in IPG and countries
 - UI Guidelines and material for use by IECG and all Engineering groups prepared and published
 - European keyboard surveys carried out and reported, covering:
 - CSS & LK207
 - Gold Key standards
 - LK250 with VAXmate project
 - DECUS and other User Investigations carried out with significant improvement in our knowledge of users' requirements

The overall goal of the group is to become a Corporate Development Group. A prerequisite is that countries are able to produce their own local versions of products. Currently, IPG will continue to develop LLVs and also continue to implement programs that will enable that work to move smoothly to the countries.

Eventually, the focus will be to increase the contribution to Corporate Development by working on more products within a specific product area and by considering additional product areas.

2-Year Focus

- Growth of LLP development will continue, but flatten out
- Increasing importance of Corporate development, particularly in ULTRIX and Workstations
- Significant growth in ISV-related work

5-Year Focus

- Local engineering groups doing all LLV work from Corporate BIVs
- IPG becomes a Corporate Development Group

13.11.5.5 International Engineering Process and Quality

Manager: Bruce McNaughton (REO, [44]-(734)-85-31-41)

MISSION

Define, develop, and assist in the implementation of integrated (cross-functional) processes, which support the delivery of quality products to our customers.

OBJECTIVES

- Improve cross-functional Product Team communication and Product Management processes.
- Improve predictability of Engineering Planning Processes.
- Improve consistency and quality of Engineering Product Development Processes.
- Assist groups in implementing the improved processes and training.

1987 ACCOMPLISHMENTS (Status December 1987)

Formal links have been established to the Corporate Phase Review Task Force. A cross-functional European Team has been formed and is participating in the revision of the Phase Review Process to incorporate European needs.

A Phase Review Process overview training module has been developed and delivered to over 300 staff in Europe to ensure consistent implementation of the Phase Review Process.

A Project Planning and Control training module has been defined, developed and piloted. This development is a joint venture with SWAS and CSS to ensure consistency within project management disciplines in Europe.

A Product Management training module is being developed as a joint venture between Marketing, International Engineering, and SWAS Country Product Management. In parallel to development of the training module, the roles and responsibilities of product management within Europe are being defined.

A program has been established to automate project planning processes.

To support product management processes a database system has been developed to automate the process of providing the information required to review the progress of the Top 100 products.

1988 PLANS

- Continue participation in the review of the Phase Review Process. Activities will concentrate in review and approval of the new Phase Review Process Manual.
- Continue delivery of the Phase Review Process Overview training module. Focus will change to monitoring and assisting implementation.
- Pilot the Product Management training module. Achieve "steady state" delivery of the course, and build a network of trainers in Europe.
- Pilot the Project Planning and Control training module to the Engineering community. Achieve "steady state" delivery of the course, and build a network of trainers in Europe.
- Define, develop, and begin implementation of consistent software development, translation, and user information processes and training modules.
- Focus on consistent implementation and full automation of project management processes across groups.
- Define, develop, and begin implementation of a consistent Engineering Management Process training module.
- Continue providing support to assist groups implementing the training and new processes.
- Implement the New Product Database system in Maynard, and review a number of new systems.

ORGANIZATION

- *Process and Quality Group Manager*
Bruce McNaughton
- *Group Secretary*
Fiona Ramcharan
- *User Project Manager*
Francoise Fry
- *Project Administrator*
April Haxby
- *Principal Process and Quality Engineer*
Nancy Lee-Bennette

- *Process and Quality Manager*
Alan Speight

13.11.6 Telecom Application Engineering Center

Manager: Stan Smits (VBE, 828-5746, TAEC::SMITS)

TAEC is part of International Engineering and is linked with the Telecom Systems Group and with the Networks and Telecom DCC.

This group's mission is to acquire or deliver quality network, communication and transmission products, platforms and consultancy in accordance with Telecom System Group (Marlborough), Networks and Telecom DCC (Valbonne) and Systems Marketing (Europe) requirements.

The following are objectives to be achieved.

- To ensure that TSG delivers products, platforms and solutions that fit the European Telecom market requirements.
- To contribute to TSG solutions as they apply to the world-wide Telecom market.
- To give engineering support to the different DCC marketing groups (TIMG, NaC, high-end systems marketing and CIS).

TAEC is currently focused on the development of VAX SS7, a layered software product to link Digital computer platforms to the internal common channel system protocol of public networks.

TAEC is also defining the European Operations Support Systems (OSS) architecture and assisting the field in developing coherent solutions in this domain.

Finally, TAEC is developing systems engineering skills for Public Electronic Mail and Videotex platforms.

CHAPTER 14

SYSTEMS SOFTWARE GROUP

Manager: Bill Heffner (ZKO1-3/J35, 381-1125)

Software Systems provides Digital with the following software products.

- VAX/VMS
- Software Development Technologies
 - Strategic and Tactical languages - FORTRAN, etc.
 - CASE tools - DEC/CMS, DEC/MMS, DEC/Test
 - Core user applications - editors, spreadsheets - EPIC, WPS-PLUS
 - End User Information applications - VAX/Teamdata
- Asian Base Systems
- Corporate User Publications
- Software Quality Management and clearinghouse
- Software Manufacturing
- Software Business Practices, Base Product Marketing

SSG also provides Facilities Management support for those groups in the Spit Brook Road facility and personnel support at the various SSG locations.

Contact the appropriate group when you need information about products being planned or developed, or when you identify future requirements that can be met by this organization's expertise.

14.1 SOFTWARE QUALITY MANAGEMENT

Manager: Bob Lindenberg (ZKO1-3/J35, 381-1549, SQM::LINDENBERG)

Software Quality Management group contributes to the overall product quality of 32-bit software systems by providing engineering and testing support in the following areas.

- *Systems Quality*, headed by Mike Sowers (ZKO1-2/D19, 381-1334, SQM::SOWERS), performs certification and system evaluation for all 32-bit layered products and new processors. Contact this group if you are building a VMS layered software product or a hardware product that requires software certification. Products developed in Europe are evaluated by the European System Quality Group which reports to Mike Nation (REO, 830-6762, RDGENG::NATION). For Japanese products, contact Key Kawamoto (EWB/F6, JRDV04::KAWAMOTO).
- *Performance Measurement and Analysis*, headed by Frank Hassett (ZKO3-2/Y05, 381-2239, CHALK::HASSETT), provides performance measurement and analysis of software systems and builds performance measurement and monitoring tools.

This group concentrates on the following areas:

- *VMS Performance Group*, headed by Dan Doherty (ZKO3-4/S23, 381-1558, CHALK::DOHERTY) works with developers on new system features, ensuring that the system meets its performance goals.
- *Performance Tools*, headed by Joe Marconis (ZKO3-2/Y05, 381-2675, CHALK::MARCONIS), develops performance measurement and management tools for end-users as well as special tools for internal use. A part of this effort is the development of performance models of VMS systems.
- *Test System Development*, headed by Chuck Dermody (ZKO3-4/S23, 381-1548, CHALK::DERMODY), works with VMS development to achieve higher software quality by building software test tools and a methodology for functional testing of operating systems. This group is also responsible for certification of Local Area VAXclusters.
- *VMS System Management*, headed by Ed King (ZKO1-2/D19, 381-1333, SQM::KING) works to obtain a uniform high level of quality in the VMS family of products.

14.2 SPIT BROOK FACILITY MANAGEMENT

Manager: Brad Glass (ZKO3-3/S26, 381-1800)

The Spit Brook Facility Management group provides administrative support and services for the facility. This support includes the following.

- *Administrative Services*, headed by Ken Madore (ZKO1-3/B22, 381-1001), provides facility planning, purchasing, and office services.
- *Plant Engineering*, headed by Jim DiRico (ZKO1-3/B22, 381-1009) provides maintenance of building and grounds, the plant emergency organization, and safety engineering.
- *Security*, headed by Dick Barbett (ZKO1-3/B22, 381-1032) provides site physical security.
- *Computer Services*, Fred Kilmartin (ZKO1-3/C10, 381-900), provides computer operation support, equipment planning and forecasting, asset management, data communications, telecommunications, and the interface to Field Service.
- *Information Security*, headed by Fred Robinson, (ZKO1-3/B22, 381-1012) is developing a comprehensive information security program for the site.

14.3 VAX/VMS DEVELOPMENT

Manager: Kurt Friedrich (ZKO3-4/Y02, 381-1422)

The VAX/VMS Development Group consists of five software engineering groups jointly responsible for the design, implementation, and continuing maintenance of the following products.

- VAX/VMS
- MicroVMS
- DECnet VAX (for both VMS and MicroVMS)
- DECwindows
- LAVC Local Area VAXclusters
- Volume Shadowing

The five software groups are as follows.

- *Networks and Clusters*
Manager: Richard Merewood (ZKO3-4/U14, 381-1429)

- *System Management and Operations*
Manager: Ron Schaefer (ZKO3-4/U14, 381-1450)
- *Systems Group*
Manager: Rick Spitz (ZKO3-4/W23, 381-1570)
- *System Resources*
Manager: Nigel Turner (ZKO3-4/Y02, 381-1419)
- *Project and Process Engineering*
Manager: Trevor Kempself (ZKO3-4/T61, 381-1442)

The groups engage in a wide range of software engineering technology, from basic operating system support of the VAX hardware, to clustering, networking, files systems, system security, command languages, timesharing facilities, and a variety of system- and user-oriented utilities. The group is involved in all stages and aspects of product evolution, beginning at initial ideas, design, implementation, field test, customer support and user documentation, in both "hands-on" and consultative capacities.

The products listed are the base for a wide range of Digital's business and thus the interactions with other parts of the company are many and diverse. They are worldwide and involve most of Digital's present and future markets.

14.3.1 VAX/VMS Product Management

Manager: Dick Mahoney (ZKO1-3/J33, 381-1060)

VMS Product Management manages software products developed by the VMS Software Development Group. These products include VMS, DECnet-VAX, VAXcluster software, VAXstation software, POSIX and on-line transaction processing primitives.

Software product managers are the primary interface between Engineering, other groups within Digital, and the customer base. They manage the Phase Review Process, define product requirements, generate business plans, introduce new products, and manage DECUS activities.

14.4 SOFTWARE DEVELOPMENT TECHNOLOGY

Manager: Bill Keating (ZKO2-3/Q08, 381-2330)

Software Development Technology develops most VAX Programming Language Products, the Software Productivity tools, the Information Management products, and key terminal and graphics products. This group also manages the strategy for most languages, and for the Digital programming development environment. Other responsibilities include the Technology, Methodology and Architecture of the Product Marketing Software Engineering Groups.

14.4.1 Technical Languages and Environments

Manager: Leslie Klein (ZKO2-3/N30, 381-2055)

Technical Languages and Environments develops compilers for technical language on VAX systems. The current languages supported are PASCAL, BLISS, FORTRAN, APL, C, PL/I and Ada.

The group is also involved in the design and maintenance of various software environment tools, such as the VAX Debugger, Language Sensitive Editor (LSE), Integrated Program Support Environment (IPSE), Source Code Analyzer (SCA), Program Design Language (PDL), and the Performance and Coverage Analyzer (PCA). This group is also responsible for Dictionary Services (CDD and CDD+).

Advanced Development in areas such as compiler technology and layered product support for multi-processors and parallel processors is in progress.

Contact this group on questions or issues related to the products listed above; Technical Languages/Environments can also provide additional information on Standards issues for the languages mentioned.

Additionally, contact this group when you identify future requirements that can be met by this group's expertise.

14.4.2 Commercial Languages and Tools

Manager: Tom Harris (ZKO2-3/K06, 381-2234)

This group develops and maintains language processors, utilities, and programmer productivity tools for VAX-11 systems. The languages have industry-wide appeal for commercial applications although they are not limited to that area. Such languages include COBOL, the extended Digital BASIC products, and RPG.

The group also develops key system utilities, including SORT packages, language translators, and the VAX/VMS Common Run Time Library. A set of programmer productivity tools including DEC/CMS, DEC/MMS, DEC/TEST, SCAN, Software Project Manager, VAX NOTES, and various VNX tools are developed here also. Additional tools for project design are also being developed by this group. This group is also responsible for our Fourth Generation Languages: the COBOL Program Generator, Datatrieve and Rally.

Contact this group on questions or issues related to the products listed above. Commercial Languages and Tools can provide additional information on VAX RTL Standards, CODASYL COBOL, ANSI COBOL and BASIC or Command Language committees, and DEC Standards for Editors, BASIC, or COBOL.

14.4.3 Core Applications Group

Manager: Jeff Rudy (ZKO2-3/R56, 381-2994)

This group develops and supports the following software.

- Graphics Software
- Editing Software TPU & EDT
- Desk Top Publishing, including WPS-PLUS, DECpage, DECslide, DECgraph and the forthcoming EPIC series
- Digital Spreadsheets (DECalc and DECalc-PLUS)

This group owns the strategy for "Core Applications" and be responsible for their use in various applications. This group is also responsible for End User Information and Computing.

14.5 CORPORATE USER PUBLICATIONS

Manager: Sue Gault (ZKO1-3/J35, 381-1126)

Corporate User Publications (C.U.P.) is a geographically dispersed publications group located with hardware and software engineering groups in Nashua (Spit Brook Road), Maynard, Marlboro, Hudson, Littleton, Galway Ireland and Reading England.

C.U.P. writers, editors, and production people generate and maintain technical publications for customers at all levels of experience. Collectively their responsibilities include the planning, organization, completeness, accuracy, appropriateness, user orientation, and appearance of software publications.

To effectively design a software manual, groups gather information from software and hardware engineering, the product lines, software quality management, Software Services training, DECUS, and visits to customer sites.

14.6 SSG MARKETING AND BASE PRODUCT MARKETING

Manager: Bill Segal, (ZKO1-3/J33, 381-1263)

These groups set software product business, marketing, marketing communication and licensing strategies for VAX software.

- VAX System Base Product Marketing
- VAX Business Strategy and Planning Group
- Central Engineering DECUS Administration

14.6.1 VAX System Software Base Product Marketing

Manager: Gail Holland, SDT/ULTRIX/VMS (ZKO3-3/Y25, 381-2345)

The primary function of these groups is to create and improve the market "awareness" of VAX System Software. The groups achieve this by developing and implementing programs involving advertisement, promotion, sales training, and other activities that address the markets, customers, and environments applicable to these products.

The groups also contribute to the product/business planning and product market requirements planning, provide market feedback to Product Management, and interface with engineers to do the following:

- Clarify/investigate product marketing requirements
- Provide engineers with potential product marketing requirements
- Assist in defining the function aspects of a product in preparing presentations, or in determining possible product availability dates

14.6.2 SSG Business Strategy and Planning Group

Manager: Bob Dockser (ZKO1-3/J33, 381-1216)

The SSG Business Strategy and Planning group's function involves business practices and planning for the software products built by the Systems Software Group (SSG). These products include VMS, ULTRIX, and layered products.

Business strategy and planning group members are a primary interface for SSG in areas relating to group business practices and strategies. For example: price tiers, volume discounts, corporate software revenue goals, Digital software licensing architecture.

14.6.3 Central Engineering DECUS Administration

Coordinator: Trish Gagnon (ZKO1-3/J33), 381-1239

This function is in place to allocate slots for the DECUS Symposia worldwide and to carry out the necessary planning to ensure that speakers and their topics are selected at the appropriate times, to register speakers and other attendees, to direct exhibit hall participation and to plan and implement the annual DECUS Europe Engineering Support (DEES) activity.

14.7 ZKO PERSONNEL

Manager: Chuck Poe (ZKO1-3/J35, 381-1267, VORTEX::POE)

The primary mission of ZKO Personnel is to deliver high quality and cost effective personnel services to ZKO site organizations. It does this by providing the following services:

- PSA
- Compensation/Benefits
- Library Services
- Personnel Systems Development
- Health Services/EAP
- Training & Development
- Personnel Consulting Services
- Marketing Research Support
- Organizational Development
- Human Resources Planning
- Wellness Center

The group also makes a special contribution to achieve organizational business goals through management of an on-site Wellness Center, technical seminars, and a variety of targeted programs.

14.8 SOFTWARE MANUFACTURING BUSINESS UNIT

Manager: Brad Glass (ZKO3-3/S26, 381-1800)

Software Manufacturing Business Unit (MBU) is the worldwide supply organization for Digital's software. The MBU is responsible for the worldwide introduction of new and revised software products, the development and implementation of electronic publishing technology for software supply, manufacturing product standards, and manufacturing integration with Engineering.

Specific activities include the following:

- New product introduction
- Design for manufacture
- Consolidated software supply
- Manufacturing product management
- Development and introduction of new technologies for manufacturing of software
- Business analysis and management

Contact Brad Glass for further information.

14.9 ASIAN BASE SYSTEMS

Manager: Trevor Porter (ZKO3-4/Z25, 318-1258)

This group designs, implements, supports and maintains Base Systems Software products required for Digital to profitably increase market share in Japan and the Far East Region. In particular, it strives for simultaneous release of chosen products that are equally effective in Chinese, English, Japanese, Korean and Thai. Also, it delivers software architectures, new products, and special versions of products designed for the Far East Region.

160 SYSTEMS SOFTWARE GROUP

CHAPTER 15

PRODUCT STRATEGY AND ARCHITECTURE

Manager: William Strecker, V.P. (MLO12-2/T8, 223-3726)

The Product Strategy and Architecture group is composed of senior technical personnel who are involved with investigating cross component architectural issues, resolving cross component strategic issues, and systems level architectural consulting. In addition to participating in projects that are defined internally, the personnel within this group are available for consulting assignments throughout engineering as required.

The Product Strategy and Architecture Group also has responsibility for the identification of both internal and external topics which are important for Digital's business success.

Listed below is the organizational structure of Product Strategy and Architecture.

- *Security Architecture*
Contact: Alex Conn (ZKO1-3/B10, 381-1678)
- *Workgroup Architecture*
Contact: John Holz (LTN2-2/G11, 226-6600)
- *Secure Systems Development*
Manager: Steve Lipner (LTN2-2/C08, 226-6088)
- *Queuing System A/D for OLTP and VMS Communications Architecture*
Contact: Bruce Mann (ZKO1-2/E34, 381-1298)
- *Corporate Standards*
Manager: Gary Robinson (MLO12B/E51, 223-5094)
- *Data Management Architecture, TP Architecture, I/O Architecture*
Contact: Barry Rubinson (LTN2-2/G11, 226-6103)
- *PC Integration Architecture*
Contact: Gayn Winters (LTN2-2/G11, 226-6084)

15.1 SECURE SYSTEMS DEVELOPMENT

Manager: Steve Lipner (LTN2-2/C08, 226-6088)

Secure Systems Development is an engineering group that is focused on improving the security of Digital's product set. The group functions by executing architecture and advanced development projects intended to result in security enhancements to Digital's products, and by developing secure system products. The group has developed a security product set (DESNK and KDC) that provides cryptographic security for Ethernet at the data link level with flexible key management. Secure Systems is currently supporting and enhancing the DESNK and KDC. The group also supports the VAX/VMS encryption layered product and is developing a highly secure operating system for VAX.

Engineers should contact Secure Systems Development when they have questions about the security feature content of their products. The group provides information about security techniques and standards that apply to software and hardware. Since security features and controls are best 'designed in', contact Secure Systems Development early in the product design cycle. As an outgrowth of its work on secure operating systems, the group also has tools and expertise in formal specification and verification of software and hardware.

Key contacts in Secure Systems Development are as follows:

- *Security Architecture and Advanced Development*
Engineering Manager: Morrie Gasser (LTN2-2/C08, 226-6760)
- *Secure Operating System Development*
Engineering Manager: Marty Hurley (LTN2-2/C08, 226-6813)
- *Secure Network Product Development (DESN, KDC, VAX Encrypt)*
Engineering Manager: Jeff Sebring (LTN2-2/C08, 226-6094)

15.2 CORPORATE STANDARDS

Manager: Gary S. Robinson (MLO12B/E51, 223-4094)
Operations Analyst: Mary White (MLO12B/E51, 223-5980)

This group manages both internal and external standards. Corporate Standards impact the engineering architecture that is the key to Digital's business success. Standards representatives who participate on behalf of Digital at national and international standards committees, which create architectural standards, are either direct reports to this group or are matrix managed by Corporate Standards. Internally, Corporate Standards ensures that Digital's strategic systems standards are not put at risk by the activities of external standards groups.

Other responsibilities of Corporate Standards include the following.

- Definition of corporate policies and strategies for standards in conjunction with the engineering and marketing groups.
- Coordination of standards strategies to create industry standards that are technically sound and have a positive impact on Digital's product strategies.
- Management of software, functional, and architectural standards that are created by international and national agencies and used by the corporation.

Corporate Standards is the primary source of information for Digital's position in the standards efforts of ISO, ECMA, CCITT, IEC, ANSI, IEEE, and others. This group has the expertise available to evaluate standards activities and requirements by the various marketing and engineering groups and advise on what actions are necessary to make the external standards process work. In accordance with Digital corporate policy, Corporate Standards must also be contacted prior to joining or attending any external standards committees. This requirement is based upon the fact that a Digital employee is perceived as a Digital spokesperson representing Digital's official corporate position when she/he attends such a meeting. Corporate Standards does seek technically qualified individuals to review proposed standards; members of Digital's engineering groups who would like to contribute to creating an international or national standard are urged to contact Gary Robinson (MLO12B/E51, 223-4094) or Mary White (MLO12B/E51, 223-5980).

The following organizations fall under the management of Corporate Standards.

ANSI	American National Standards Institute
CODASYL	Conference on Data Systems Languages
CCITT	International Telecommunications Organization
ECMA	European Computer Manufacturer's Association
EIA	Electronic Industries Association
IEEE	Institute of Electrical and Electronic Engineers
ISO	International Organization for Standardization
JEDEC	Joint Electronic Devices Engineering Council
NBS	National Bureau of Standards

Standards does not manage participation in standards committees concerned with environmental and safety issues (electrical safety, EMI, RFI). This is presently under the managerial focus of the International Products Office (IPO). Likewise, standards committees on micrographic issues are the responsibility of Engineering Image/Information Services.

The following standing committees are maintained to develop Digital standards and review product specifications: BASIC, COBOL, PASCAL, Keyboard arrangements, VAX languages, and DECnet architecture.

Standards supplies you with the following documents and services.

- Consultation services: Consultation on interpretation of industry standards, the standards process, politics of the standards organizations, and business consulting services to help in justifying or marketing standards.
- Assistance in developing text to describe standards conformance in user manuals or software product descriptions.
- Liaison with the National Bureau of Standards and other Governmental standards bodies.

If standards are of concern to your engineering or marketing activity, Corporate Standards should be contacted during the earliest phases of a project to determine which Digital, or external standards are applicable. At your request, Corporate Standards will review all project plans and any functional specifications where conformance to standards is an important or anticipated part of product definition. Additionally, proposed standards, which may become necessary before your product is shipped, can also be identified and interpreted.

Corporate Standards should also be contacted to review text of software product descriptions or user manuals that describe standards conformance. Because of the legal impact of standards conformance, it is important that the text be accurate. Phrases such as "Conforms to...", "Compatible with...", "Based upon...", or "Subject to..." have very different legal meanings and can have an impact on customer acceptance of products. Additionally, they may have vastly different meanings in the various international countries in which Digital does business.

CHAPTER 16

STRATEGIC RELATIONS GROUP

Manager: Henry Crouse, V.P. (MLO10-1/F41, 223-1555)

One of the goals of Strategic Relations is to use complementary external capabilities to achieve the following:

- Acquire technologies for strategy execution
- Provide more complete solutions
- Increase coverage in our target markets
- Improve time-to-market
- Further improve financial performance
- Focus Digital's internal resources in areas that will yield competitive uniqueness

Other goals of the group include influencing Digital mindset to encourage, value and reward use of external alternatives, and to learn from other companies' experiences.

The primary responsibilities of this group are listed below.

- Identify external technology/business alternatives that complement Digital's capabilities and support its strategies.
- Help develop strategic relations between sources of external capabilities and appropriate groups within Digital.
- Manage executive-level strategic interfaces with selected external allies.
- Drive processes which involve the following.
 - Licensing (In/Out)
 - Innovative/unique alliances
 - Cooperative consortiums
 - External investments
 - Joint ventures
 - Acquisitions

The Strategic Relations staff consists of the following:

- Bill Lowe (MLO12-B/U10, 223-2233)
Focused on *Storage Systems*
- Regis Kaufman (CFO1-3/M35, 251-1428)
Specialist in Software, reports to Peter Koch
- Nils Noren (MLO12-B/U10, 223-4932)
Software Specialist, focusing on *POS/Retail Software* applications and *Product Development*
- Steve Teicher (OGO1-1/G17, 276-8555)
Technical Consultant within *Strategic Relations*
- Gail Mann
Law Department, Investment Contracting
- Larry Ricci (AKO1-3/D14, 244-6400)
Tax and Legal Structure
- Ulf Fagerquist (LKG1-2/M07, 226-7225)
NAC, reports to Bill Johnson
- Jan Jaferian (MRO1-1/A65, 297-6524)
HSG, reports to Bob Glorioso
- Sharon Wulf (HLO2-2/L09, 225-4568)
SSG, reports to Bob Palmer
- Ken Sills (BXB2-1/G13)
MRS, reports to Bill Demmer

16.1 NEW COMPUTING STRUCTURES

Manager: Paul Curtin (MRO2-3/M91, 297-4271)

The New Computing Structures group is responsible for driving business and marketing directions for Digital's proposed utilization of new computing structures. The objective is to insure Digital takes a role in utilizing new computing structures which may adversely affect our existing market share. The group has two focuses.

- On-going market and business analysis of emerging companies and products in this area
- Formulation and recommendation of corporate strategy and direction

The group publishes market reviews and a weekly newsletter that contains current information in the above areas.

Mary Rodock (MRO2-3/M91, 297-4110) is responsible for market and business data collection.

16.2 TECHNICAL BUSINESS DEVELOPMENT

Manager: Walt Dunham (MLO12-B/U10, 223-5388)

Technical Business Development (TBD) supports the corporate strategy by identifying external alternatives that complement Digital's capabilities and present them to internal operational groups. The goal of TBD is to cause consideration of co-development and/or externally developed technologies, products or processes.

16.3 STRATEGIC RELATIONS

Manager: Howard Fineman (MLO12-B/U10, 223-4952)

Strategic Relations focus is to identify and bring in external technologies and business alternatives that complement Digital's capabilities and support its strategies. Unsolicited opportunities are developed with potential sponsoring groups. Potential external collaborators are sought to meet expressed needs of internal sponsors.

Collaborative arrangements include the following.

- Licensing
- Innovative alliances
- Cooperative consortiums
- External investments
- Joint ventures
- Acquisitions

Beyond initial exploration, a Digital business entity must sponsor a program and be its champion. Strategic Relations works with the sponsoring group and the external group to develop and negotiate the business arrangement and to help the sponsoring group through Digital's proposal and approval process.

CHAPTER 17

MANUFACTURING OPERATIONS

Manager: Bill Hanson, V.P. (MLO1-4/R14, 223-2238)

17.1 COMPUTER SYSTEMS MANUFACTURING

Manager: Lou Gaviglia (WJO1-2/C7, DTN: 282-1500)

Computer Systems Manufacturing (CSM) manages the manufacture and shipment of Digital's computer based systems, software, options, clusters, and network and communication products. This manufacturing occurs in Salem NH, Burlington Vt, Augusta ME, Phoenix AZ, Westminster MA, and Franklin MA.

CSM has a strong commitment to world class manufacturing through aggressive goals of quality, reliability, asset usage, customer satisfaction, time to market, and cost effectiveness. These goals are realized through major programs in CIM, Engineering Support, OTP, JIT/TQC, and New Products Introduction. CSM has strong relationships with Engineering and the Field to agree upon the above goals and help implement these programs.

Links to Engineering groups are especially important to CSM's success. The High Performance/Clusters, Mid-Range and Distributed Systems, along with Software and Options Managers work with their counterparts in Engineering on project and program strategy development and System Program Managers on specific systems products. On all new products, Manufacturing and Engineering are linked in this way down to the sub-assembly level. Working with Engineering and other organizations, Computer Systems Manufacturing is involved with products from conception and development to phase-out.

Links to Area Management groups are also especially important to CSM's success. There is a close working relationship in supporting Sales and ensuring that the right products are available at the right time to support our customers needs and expectations. On the matching of orders to Product Manufacturing and the Area, they are linked all the way down to the shipping dock to accomplish our goals and meeting customer satisfaction.

17.2 NEW PRODUCTS OPERATIONS (NPO)

Manager: Fred Oldfield (MLO5-4/F32, 223-2632)

A unit of Small Systems Manufacturing chartered to optimize time-to-market of low end products. NPO provides products and services to LES engineering to finalize product design, and it provides services to volume manufacturing plants to enable high volume manufacturing to successfully introduce new products.

NPO optimizes time-to-market by providing a complete set of new product services from phase zero through volume production.

17.2.1 NPO - Program Office

Manager: Dennis Minnich (MLO5-4/F32, 223-5635)

The Program Office of New Products Operations (NPO) manages complex new products programs that require support from more than one NPO organization. Its function is to integrate NPO's service delivery to ensure that the client's needs are met effectively. Program Managers are assigned to major programs from Pre-Phase 0 to Phase 4.

17.2.2 NPO Engineering Model Shops (MLO5-3 and MLO1-1)

This group consists of the following key people.

- *CC Manager*
George Gerelds (MLO5-3/E22, 223-2309)
- *Operations Manager*
John Holt (MLO5-3/E22, 223-4700)
- *Financial Analyst*
Alison Doherty (MLO5-3/U70, 223-4406)
- *Financial Contact*
Jeanne Gotthardt (MLO5-3/E22, 223-2374)
- *Secretary/Admin*
Linda LaFleur (MLO5-3/E22, 223-3080)

The following services are provided.

- Mechanical/sheet metal prototype Shop
- QTA Prototype Module and Surface Mount Assembly
- Engineering raw material and expendable stockroom
- Cable, electro/mechanical assembly area
- ROM and PROM blasting
- Odd jobs (stamping, handles, staking, fixture and unique assemblies)
- CAD/CAM DECnet system

17.2.2.1 Prototype Module Assembly

Supervisor: Jim Scott (MLO5-3/E22, 223-3255)

This group provides prototype engineering with a dedicated module assembly build process. Services include the following.

- Job scheduling and material coordination with SR 63
- Component pre-forming, assembly, solder flow and inspection of minor and complex modules
- Miscellaneous light bench operations (shearing, eyelets, handles, staking pins, punch press.)
- Surface mount technology, etch cuts, wire adds, wire wrapping, and model verification against the Corporate Qualified Vendor Listing (QVL)

17.2.2.2 Cable/Harness/Sub-Assembly/PROM Program Area

This group constructs prototype items other than PC boards, using given documentation. It generates test equipment as desired, given readable documentation, builds small lot quantities within negotiable time frame to include power supplies, harnesses, cable assemblies, sub-assemblies, and blasts, stamps, and erases programmable devices using various equipment.

17.2.2.3 Sheet Metal/Machine Shops

Supervisor: Ed Mayall (MLO1-1/E22, 223-2583)

This group provides milling, grinding, sawing, lathe, heat treat, etc.

The NPO Engineering Model Shop has two CAD/CAM Systems used to program parts and assemblies, that are connected directly to Digital Engineering NET. The group receives prints over the NET for fabrication.

17.2.2.4 NPO Engineering Stockroom 63

Supervisor: Virginia Barilone (MLO5-3/E22, 223-2455)

The group stocks orders and expedites raw materials, software supplies, and expendable items in support of Engineering and new products. Services includes kitting materials for prototypes, production models, and new product start-ups. Interplant material and transactions for capital equipment are also accommodated.

17.2.2.5 901 - 90 & 91 Class Materials

This group includes purchasing and provides window coverage between the hours of 7:30 A.M. and 4:00 P.M.

17.2.3 New Products Services (NPS)

Manager: Fred Oldfield (MLO21-1/T70, 223-7841)

New Products Services comprises six groups chartered to ensure that new products are developed using state-of-the-art technology, and that they are cost effective, manufacturable, and introduced in a timely manner.

17.2.3.1 New Products Materials

Co-Managers: Bill Berger (MLO21-1/T70, 223-6316)
Mark Daley (MLO21-1/T70, 223-8704)

The group is responsible for program materials management from Pre-Phase 0 through Phase 3 for all low-end worldwide manufactured products, and for the BOM development process.

17.2.3.2 New Products Purchasing

Manager: Terry Cormier (MLO21-1/T70, 223-8270)

Purchasing supports Design Engineering by sourcing unique material and providing vendor support on custom design. It also ensures that externally sourced material for low-end new products is cost effective to procure Worldwide.

17.2.3.3 Component Engineering

Manager: Rao Yedavalli (MLO5-3/U85, 223-8404)
Documentation Supervisor: Mel LeBlanc (MLO 5-3/U86, 223-8090)

The group is responsible for the selection and technical introduction of all new unique piece-parts (non-IC) for low-end new products. This includes performing all Qualification Testing, as well as the preparing Incoming Inspection Procedures and the Purchase Specification.

17.2.3.4 Design-Component Engineering (DCE)

Manager: Ron Roscoe (MLO21-1/T82, 223-9236)

DCE puts a project focus on the introduction of new piece-parts for low-end new products, by working closely with the design and manufacturing communities. Additional services include IC applications engineering for new designs, and competitive analysis of products that fall within the low-end product space.

17.2.3.5 Producibility

Manager: Don DeAmicis (PKO3-1/A20, 223-3451)

The group ensures that low-end new products are designed to be manufacturable and that a focus is driven for cost, Time-To-Market, and Quality. They also provide Manufacturing Engineering external sourcing support and technical resources for vendor qualification/management of new fabrication and subassembly vendors.

17.2.3.6 Test Technology and Applications

Manager: Nick DelVecchio (MLO3-3/T92, 223-5192)

The group develops module test packages and processes to be used in volume production. This includes developing test fixtures and ATE programs for the Fairchild FF303, Teradyne L200, and GenRad testers. Additional services include generating software tools for creating of PWBs and for machine insertion of components, and for designing, developing and installing dedicated test systems for module test at the system level (QV), and for module burn-in.

17.2.4 NPO Low Volume Manufacturing (MLO5-4)

This group consists of the following key people.

- *CC Manager*
Joe Ballou (MLO5-4/F32, 223-3421)
- *Financial Analyst*
Jim Lucey (MLO5-3/U70, 223-2461)
- *Secretary/Admin*
Debbie Post (MLO5-4/F32, 223-7555)

The following services are provided.

- Seed and Production Module Assembly
- Surface Mount Assembly
- Low End System Build
- System Level Test of Modules and Systems
- Sub-Assembly Manufacturing

17.2.4.1 Manufacture of Low End Systems

Contact: Dennis Minnich (MLO5-4/F32, 223-5635)

This group produces work stations, personal computers, and micro systems in small quantities for quick availability. These systems include prototypes, seed units, and other pre-volume production units. This group also provides documented basic processes to transition products into volume manufacturing.

17.2.4.2 Manufacture of Modules and Subassemblies

Contact: Dennis Minnich (MLO5-4/F32, 223-5635)

This group produces modules and subassemblies to support revenue shipments, and it also performs complex ECO wiring, surface mounted modules, and Field Service repairs.

17.2.5 Mechanical Component Engineering Support Services (MCESS)

Manager: Ron Walsh (MLO5-1/P55, 223-7454)

Financial Analysis: Rick Daniels

Secretary/Administration: Lynn Landry (223-6464)

This group supplies comprehensive mechanical tooling, models, prototypes, interim product build and other related services in support of the New Product Introduction Process.

The services are fully supported by Manufacturing Engineering, Quality Engineering, together with customer representatives, purchasing specialists, and Mechanical Processes consulting.

17.2.5.1 Customer Service Center

Manager: John A. Sannicandro (MLO5-1/P55, 223-6769)

This group offers the following services.

- *Customer Representative*
To focus on your individual project and be responsible for coordinating all pertinent information and data to ensure Customer satisfaction.
- *Manufacturing Engineer and New Product Support*
Project Management Process Sheets, BOMs manufacturability, Numerically controlled (N/C) Programming, Quoting.
- *Quality Engineering*
Development of Quality Plans, New Product specifications, Incoming Inspection Procedures, Statistical Tools vendor survey service support.
- *Inspection Services*
Incoming/inprocess inspection first Article Inspection, Source Inspection, Mechanical Calibration.

17.2.5.2 Tooling Service Center

Manager: Paul Caine (MLO5-1/E31, 223-6201)

This group offers advanced toolmaking services for designing and building close tolerance manufacturing fixtures, special purpose assembling, test equipment, and stamping dies.

Computer aided design and documentation tools are used extensively to ensure accuracy of tool configuration.

The group also provides inspection gauging prototype to production tooling, together with a tooling project consulting service.

17.2.5.3 Machining Service Center

Manager: John Mitchell (MLO5-1/P55, 223-6018)

The group provides precision machining, featuring both conventional and numerically controlled equipment with the ability to turn sketches, prints, or CAD data into a model or finished product.

This group also provides all the services of a standard machine shop to support the new product introduction cycle.

17.2.5.4 Sheet Metal Service Center

Manager: Jon Armour (MLO5-1/P55, 223-2685)

The group provides a full Service Fabrication area for all of your Sheet Metal needs.

This Service Center contains a wide range of Sheet Metal Fabrication Equipment.

17.2.5.5 Plastic Service Center

Manager: Ken Berger (MLO5-1/P55, 223-2235)

The group's precision crafts people strive to create three dimensional visions of the customers ideas in model form.

The group recently added 3500 square feet to their Plastic Service Center, giving additional capacity for developing new instant set Polymers to meet the demand of models, prototype and DVT test lots. The group is also able to meet (soft tooled) interim product build requirements.

It offers architectural and product marketing modeling as a service.

17.2.5.6 Finishing Service Center

Manager: Chris Peters (MLO5-1/P55, 223-1134)

Finishing Service Center has a Paint Shop and a Silkscreen Shop.

The Paint Shop will finish products to Digital specifications, smooth or textured. It also does conversion coatings for aluminum substrates, and phosphate protective coatings for steel. Plans for FY88 include Powdered Coatings, Radio Frequency Interference (RFI) Plastic Shielding.

The group has the only full color Silkscreen Shop in Digital, with full type and layout services for creating artwork.

The group can screen labels, logos, sign, keycards, plaques, decals, name plates, panels, etc.

17.2.5.7 Computer Integrated Manufacturing (CIM) Services

Manager: Lloyd Scarsdale (MLO5-1/P55, 223-6495)

The group manages the integration of computer hardware and software systems for the MCESS Manufacturing Processes.

The group also establishes and enhances geometric database networking and applications to optimize fast turnaround of models and prototypes minimizing the use of B/Ps and other formal nomenclature for early product development.

Paperwork is not needed by MCESS; accurate database is much more efficient, and preferable.

17.2.5.8 Purchasing

Manager: Steve Blume (MLO5-2/P1, 223-1702)

The group supports NPO Internal Operations and other Digital groups requiring mechanical component purchasing support.

Purchasing specialists are available for purchasing complete (traditional products) new products, sub-contracting, tooling, and raw materials procurement.

This group, together with the Inspection Services Service Center, provides a complete materials acquisition resource.

17.2.5.9 Materials Research Laboratory

Manager: Dana Deblois (MLO5-1/P55, 223-3058)

The Materials Research Laboratory provides Digital with in-house vendor capabilities for Underwriters Laboratory (UL) and Canadian Standard Association (CSA) flammability testing for all plastics. The group also provides label testing for CSA.

Testing for all color (paint) standards and (plastic) standards, and criteria testing to *DEC STD 092-0 Finish and Color Standard - Introduction and General Requirements*, is also done by this group.

Those needing color chips should contact this group at 223-3058.

17.3 CORPORATE PRINTED-WIRING BOARDS

Manager: Rod Schmidt (WJO2-1/B8, 282-1124)

The Corporate Printed-Wiring Board Group supplies all printed-wiring boards (PWBs) to Digital's Module Manufacturing and Engineering. The group supplies PWB Manufacturing and Purchasing with long-range strategic planning, engineering, and quality support.

The group manages the following independent businesses.

- Greenville, SC supplies high technology, high volume PWBs and future high technology PWBs. Also, GSO develops high technology PWB process/product for the Corporation and provides QTA for small quantities of high technology PWBs.
- External Boards Business procures PWBs of all technologies from an external vendor base.
- San German PWB supplies medium volume, high mix, medium technology PWBs to the Corporation.

Engineering can get information about projects being worked in the PWB world for engineering requested developments. Engineering should contact the group whenever a road block appears between them and manufacturing that could create a time-to-market issue.

Primary contacts are as follows:

- *Group Engineering*
Manager: Duane Napp (WJO2-1/B8, 282-1131)
- *Documentation and Standards*
Group Quality Manager: Carmine Tata (WJO2-1/B8, 282-1134)
- *Group Finance*
Manager: Marian O'Leary (WJO2-1/B8, 282-1129)
- *Group Materials*
Manager: Bob Steele (WJO2-1/B8, 282-1136)

Board sources are as follows:

- *Quick Turn Around (QTA) Business*
John Caulfield (GSO/F3, 354-7412)
- *External Boards Business*
Roger Jaillet (CHM1-1/E01, 272-7331)
- *Greenville Board Shop*
John Caulfield (GSO/F3, 354-7412)
- *San German Board Shop*
Sonia DeLaTorre (SGO, 721-2326)

17.4 SMALL SYSTEMS MANUFACTURING (SSM)

Manager: Fred Forsyth (LJO1, 226-2076)

SSM's mission is to provide the LES PBU with a competitive advantage through manufactured products that meet their business goals.

SSM is responsible for the competitive production and delivery of Low-End systems and terminals. These include the PDP-11 and MicroVAX, Mayfair/GPX, workstations, personal computers, and video and hardcopy terminal products.

Small Systems are manufactured in the U.S. (Albuquerque, Westfield, Maynard) in Europe (Ayr, Scotland and Valbonne, France), and in GIA (Canada, Mexico, Far East).

Terminal components are sourced from the U.S. (Albuquerque, Boston, Phoenix), from Europe (Valbonne) and from the Far East.

SSM also manages major buy-out programs whenever there is a competitive advantage with external suppliers.

The New Products Organization (NPO) located in the Maynard Mill is chartered to optimize time-to-market of low end products. NPO provides products and services to LES Engineering to finalize product design, and acts in partnership with the other Small Systems Manufacturing plants to enable them to successfully introduce new products into volume production. It also supports Tempest manufacturing activities in the Low End space.

Digital's only high-volume metal fabrication facility is located in Westfield. They provide cabinets, frames and assemblies to all of manufacturing.

Small Systems Manufacturing's charter includes the following.

- Deliver competitive Low-End Products that set the standard for customer satisfaction in our marketplace
- Provide a competitive internal source for metals (prototypes through high-volume) in support of all Digital products

- Minimize time-to-market and time-to-volume by leveraging new product Start-Up Services
- Financially contribute to our Low-End Business in order to be successful in achieving our goals for PBT and ROA
- Provide leadership and direction for the effective management of worldwide Low-End Manufacturing Resources
- Cultivate a multicultural environment with skilled, competent people prepared for the current and future demands of our business

The primary goals of SSM's business are as follows.

- Have Digital be recognized as #1 in customer satisfaction for our industry
- Have Digital's Low-End Products be leaders in the Marketplace as evidenced by steady increases in Low-End Marketshare
- Be respected for operational and technical excellence
- Achieve aggressive targets for assets and cost of goods sold in support of profit and asset objectives
- Optimize our worldwide manufacturing resources
- Create an environment that inspires and demands excellence

SSM's key strategies that support their goals are as follows.

- CUSTOMER SATISFACTION
 - Define Customer Satisfaction from the Customer's perspective
 - Give visibility to our Customer Satisfaction measurements
 - Engage each employee in Customer interaction
- LEADERSHIP PRODUCTS
 - Work with Marketing and Sales to promote our Manufacturing solutions
 - Via Program Management, minimize time-to-volume for new products, maximize contributions for current products, and expedite phase-out for end-of-life products
 - Maintain the competitiveness of our products through Value Engineering
- OPERATIONAL EXCELLENCE
 - Strive for "real-time" information flow: locally and globally
 - Establish hierarchical operational control via MRP II, JIT, TQC.
 - Implement effective fiscal control processes close to the sources of spending
- TECHNICAL EXCELLENCE
 - Design flexibility into each process: look to the next generation of technology
 - Vertically integrate: products, processes, expertise, and support
 - Realize Total Quality Assurance in all areas
- ASSETS AND COST OF GOODS SOLD
 - Drive the reduction of pipeline inventory: think J.I.T.
 - Via supplier contracts, reduce the cost of materials while improving quality
 - Operationalize Business Plans to achieve competitive financial targets

- WORLDWIDE RESOURCES
 - Establish and consistently apply a worldwide sourcing strategy
 - Leverage international resources towards operational and functional excellence
 - Maximize worldwide supply flexibility to achieve low cost independent of volume
- ORGANIZATIONAL EXCELLENCE
 - Re-skill our workforce and empower each employee to improve how work gets done
 - Implement a system of Rewards and Recognition consistent with what we value
 - Value our people and have our people feel valued

The following is a list of SSM's Group Managers.

- *SSM Group Manager*
Fred Forsythe (LJO1/B4, 226-2076)
- *G.I.A. Interface*
Manager: Steve Anderson (BPO, 296-3355)
- *European Interface - Small Systems*
Manager: Dave Lawrence (AYO, 823-3230)
- *New Product Manufacturing - Small Systems*
Manager: Bob Hesseltine (LJO1/B2, 226-2290)
- *Terminals Product Manufacturing*
Manager: Joe Lombardo (PKO3-1/19A, 223-9083)
- *Materials*
Manager: Dave Greenlee (LJO1-0/D1, 226-2089)
- *Personnel*
Manager: Fred Johnson (LJO1/B4, 226-2001)
- *Customer Satisfaction*
Manager: Tony Mongillo (LJO1/C2, 226-2134)
- *Finance*
Manager: Bruce Steele (LJO1/B02, 226-2011)
- *Planning*
Manager: Susan Whitney (LJO/B4, 226-2753)
- *Westfield Plant*
Manager: Judy Maudlin (WFO/C9, 242-2345)
- *Albuquerque Plant*
Manager: Tony Ciorciari (ABO/B4, 552-2000)
- *New Product Operations*
Manager: Fred Oldfield (MLO5-4/F32, 223-2632)
- *Boston Plant*
Manager: Harold Epps (BOO, 281-5701)
- *M/E and Technology*
Manager: Dave Thorpe (LJO1/B2, 226-2095)
- *Weekly Program*
Manager: Ron Marchetti (LJO1/B4, 226-2226)

17.5 MANUFACTURING CUSTOMER INTEGRATION GROUP

Manager: Don Hunt (MLO1-4/P14, 223-2859)

This group's goals are to:

- Develop collaborative relationships with leading external sources of manufacturing expertise (customers, universities, etc.).
- Develop technology and expertise transfers that improve Digital manufacturing's performance.
- Support the corporation's goal of increasing manufacturing market share by improving and leveraging our manufacturing performance into our manufacturing customers.

PROGRAM	MANAGER	PROGRAM GOAL
Manufacturing corporate accounts	Don Hunt	Develop mutually beneficial manufacturing relationships with corporate accounts.
Area Corporate Manufacturing Manager	Don Hunt	Develop manufacturing relationships with leading institutions (customers, universities, etc.) within the U.S. areas.
Customer Visits	Royce Fuller	Develop process for managing customer visits to Digital's manufacturing plants and manufacturing technology centers.
Manufacturing Reference Site Program	George Hughes	Support manufacturing plants' efforts to achieve high performance levels highlighting the use of Digital's products in that process.
Area Partnership with Manufacturing	Bob Dangelmayer	Support software services in goal of providing solutions to major manufacturing problems within our manufacturing accounts. Goal is to share in the learning derived from these programs.
Professional Relations Orientation	Ken Kanady	Targeted to improving managers' skills in managing strategic relations and providing consistency in our messages.
Organization Technology	Bruce Dillingham	Leverage Digital's socio-technical leadership to support collaborative relationships with our customers.

17.6 MANUFACTURING INFORMATION AND TECHNOLOGY

Manager: Dan Infante, V.P. (MLO1-4/P14, 223-2643)

17.6.1 CAD/CAM Technology Center

Manager: Dick Anderson (CTC2-1/H12, 287-3010)

17.6.1.1 CAD Systems Engineering (CADSE)

Manager: Bill Wehring (CTC1-2/K4, 287-3331)

This group provides off-the-shelf, characterized, and transportable VAX-based CAD tools in support of CTC's technology developments, process developments, and new product partners. The group provides selective CAD application support services to established engineering and manufacturing partners for the application software that they develop.

Broad elements of responsibility are the following:

- CAD systems
- CAD interfaces
- CAD applications
- Tool-technology characterization
- Demonstratable pilot design capability
- CAD tool training

CAD Systems Engineering consists of the three groups described below.

17.6.1.1.1 Vantage Development Group (VDG)

Manager: Dave Ellis (CTC1-2/G4, 287-3387)

This group is responsible for the development of Vantage, a CAD design environment and tools to service Digital's product design needs through the 1990's. The Vantage Development Group is primarily concerned with the design, layout, and verification procedures and techniques associated with printed-wiring boards, backplanes, and MCAs. Vantage will supercede and replace VLS in the business areas presently served by VLS.

17.6.1.1.2 CAD Environment

Manager: Don Yelton (CTC1-2/K4, 287-3388)

The VLS Development Group (VLSDG) provides complete application and base level environment software support and development services to meet the needs of Engineering, Manufacturing, and Field Service users of the VAX Layout System (VLS).

VLSDG is comprised of the following functional groups, each responsible for a different portion of VLS:

- *Routing Applications*
Brian Gordon (CTC1-2/K4, 287-3391)
Provides VLS automatic and interactive manual etch routing applications for a wide range of packaging and interconnect technologies.
- *Placement and Engineering Applications*
Clayton Martin (CTC1-2/K4, 287-3385)

180 MANUFACTURING OPERATIONS

Develops and supports software to analyze, detect, and prevent phenomena causing adverse signal transmission effects. This group also supports VLS applications to provide automatic and interactive placement of components on an assembly.

- *Data Flow Applications*
Christine Mudgett (CTC1-2/K4, 287-3369)

Responsible for the VLS internal data structure (WDS), the archive data structure (ADS), and data interfaces between VLS and Engineering/CAE systems and Manufacturing/CAM systems.

- *Manufacturing and DFM/T Applications*
Bharat Parikh (CTC1-2/J5, 287-3349)

Responsible for the implementation of manufacturing-oriented verification software in VLS.

- *Environment and Workstation Systems*
Robert Straight (CTC1-2/K4, 287-3320)

Develops operating system level interfaces and utilities for use by VLS-based application level software. A major task is performance measurement and tuning of system environment and CAD applications to optimize through-put and interactive response of CADSE supported systems. This group also provides expertise in the areas of interactive graphics, network communications, and hardcopy plotting to user groups.

17.6.1.1.3 CAD Support, Test, And Release (CADSTAR)

Manager: Fred Haefner (CTC1-2/J4, 287-3383)

CADSTAR tests, distributes, and provides a support focus for the CAD software tools developed and/or supported by CAD Systems Engineering (CADSE).

- *CADSTAR Support Group*
Carol Breest (CTC1-2/J4, 287-3300)

This group facilitates communications among design services, Product Engineering, local site support, and other development groups to ensure that those groups remain aware of each other's problems, plans, and developments. It also monitors each site's ability to use VLS and support themselves.

It assists local software support groups, as required, in isolating and resolving problems. This may involve technical consultation or facilitating the correct communication lines into the CADSE organization.

- *CADSTAR Quality Assurance Group*
Linda Marshall (CTC1-2/J4, 287-3303)

This group ensures that the overall quality of VLS is maintained. It performs individual application tests to ensure the proper operation of new or modified functions within VLS, and appropriate system level process and regression testing to ensure that VLS supports the design processes characterized and/or supported by other groups. It also coordinates BETA test activities at customer sites to ensure that VLS functions properly with site specific design processes and procedures, ensures that the design sites are able to easily and reliably install VLS on supported hardware configurations, and predicts the performance characteristics of those configurations.

Contact CADSTAR for guidance on how to use the CAD tools, when a problem cannot be resolved within the design site, or when you need information about future development delivery of CADSE-supplied CAD tools.

17.6.1.2 CTC Communications

Communications Support: Patricia Bright (CTC2-1/J9, 287-3020)

The CTC JOURNAL is a quarterly publication with news and technical updates in design, manufacturing, and test automation. It serves as an in-depth progress report for the benefit of the users of these technologies. To be added to the distribution list, contact Editor Pat Bright (COGITO::BRIGHT).

17.6.1.3 Technical Information Engineering

Manager: Leo Crosby (CTC2-1/C14, 287-3087)

The Technical Information Engineering (TIE) group provides process consulting and software support to Digital's electrical CAD/CAM interface procedures utilized in the design and introduction of Stage 0 (PWB) and Stage 1 (Module) products. The TIE group also provides CAM software applications and technical engineering support to the Stage 0 and Stage 1 manufacturing environments.

Specific responsibilities of the TIE organization include:

- Implementation of new data transfer mechanisms to be utilized between the design engineering and manufacturing environments.
- Definition and support of a generic, product-descriptive database defined as a primary interface between the design engineering and manufacturing environments.
- Implementation of decentralized CAM software applications for use in all of Digital's Stage 0 and Stage 1 facilities.

As product and process technologies advance, so do the needs for complete and accurate product data descriptions, and applications which utilize that data. TIE's on-going goal has been to provide manufacturing with consistent, transferable product data and a varied set of integrated manufacturing process applications. TIE is interested in helping you with your product/process data processing needs.

17.6.1.4 CTC Technical Operations

Manager: Nick Wells (CTC2-1/H12, 287-3030)

17.6.1.4.1 Engineering Technical Training

Manager: Al Pepper (CTC1-1/L2, 287-3239)

Engineering Technical Training (ETT) provides information, training, and services that result in a more effective hardware development and design process. They provide state-of-the-art CAD tool training in the VLS, VALID, and Unigraphics programs to meet product development design needs. Also, Engineering Technical Training has developed the CAD Detailed Drafting Program (CDDP) to train employees to become Detail Drafters. Acting as a clearinghouse, ETT identifies, develops, and delivers the resources needed to meet a wide range of Engineering and Manufacturing needs in relation to current and future Digital goals.

Engineering Technical Training, a Computer-aided Design training resource, offers training courses and consulting in Valid's SCALD System, Unigraphics (UG), and VAX Layout System (VLS), and Custom VAX courses.

For information and enrollment, contact the following:

- *Unigraphics*
Wayne Moniz (CTC1-1/L2, 287-3224, CADSE::MONIZ)
- *VLS*
Charlie Powderly (CTC1-1/L2, 287-3229, CADSE::POWDERLY)

- *Valid SCALD*
Instructor: Al Ramos (CTC1-1/L2, 287-3238, CADSE::RAMOS)
- *Custom Courses*
Joy Tucker (CTC1-1/L2, 287-3231, CADSE::TUCKER)

17.6.1.4.2 Information Systems

Manager: Lee Allison (CTC1-1/K5, 287-3051)

The IS group provides both Telecom and Operations support for CTC.

The Telecom group is responsible for the voice and data networks for both CTC and CTS.

The Operations group is responsible for mainframe and microvax system management and operations in CTC.

17.6.1.4.3 GDS Facilities/Plant Layout CAD/CAM

Manager: Nick Wells (CTC2-1/H12, 287-3030)

GDS Facilities/Plant Layout CAD specializes in the design and maintenance of buildings and building services. GDS is a command-driven system using an object-oriented database that allows tremendous flexibility in graphics and data manipulation. Ad hoc reports can be generated by the user to quickly get bills of materials, square footages, or other information that the user feels is critical to his job. Because it is best described as having an open architecture, GDS can be customized to fit a variety of needs and situations. This toolkit approach allows users to easily define menus, macros, and higher level programs on the fly. GDS currently runs on all VAX hardware including VAX Stations. GDS can run stand alone or in an LAVC.

For more information contact Jeff Barker (287-3022, COGITO::BARKER).

17.6.1.5 CAD/CAM Applications and Data Management

Manager: Ed Tang (CTC2-2/D10, 287-3288)

CAD/CAM and Data Management (CADM) specializes in the following:

- Integrated CAD Data Structure
- Mechanical CAD/CAM/CAE Applications
- Workstation and Computer Graphics
- Distributed Information Management
- Unigraphics Mechanical CAD/CAM Software

Within each of these areas, CADM's primary goal has been developing integration tools and integrated applications. CADM provides Engineering, Manufacturing, and Software Services a full range of services including software development, process consulting, and applications support.

Organizationally, CADM's groups are managed by the following individuals:

- *Operations*
Fran Merriam (CTC2-2/D10, 287-3289, CADM::MERRIAM)
- *CAD/CAM/CAE Development*
Dana Nickerson (CTC2-2/F12, 287-3148, CADM::NICKERSON)
- *Data Management Development*
Bruce Penney (CTC2-2/D9, 287-3296, MYVAX::PENNEY)

- *Advanced Development*
Mike Thompson (CTC2-2/D10, 287-3125, CADM::THOMPSON)
- *Product Management and Support*
George Shaw (CTC2-2/D10, 287-3179, CADM::SHAW)
- *Mechanical CAD/CAM*
Michaelene Glowacz (CTC2-1/H12, 287-3023, MECAD::GLOWACZ)

The Advanced Development Group brings new technologies to CADM's Integration Development and Applications Development Groups. CADM's Product Management/Support Group brings system solutions to CADM customers.

17.6.1.6 Application of Integrated Manufacturing Technology (AIMT)

Manager: John Behuniak (CTC1/G5, 287-3560, AIMT::BEHUNIAK)

The applied Integrated Manufacturing Technology Center located at CTS in Chelmsford, Massachusetts is chartered by Digital Corporate Manufacturing to migrate and apply technologies for the complete manufacturing enterprise, as developed in Digital's leading plants, into other Digital manufacturing facilities, key customers, and vendors to maximize payoff in our integrated manufacturing investment.

The scope of the group covers the full range of Integrated Manufacturing, from design concept and customer order through delivery of the product to the customer.

The aim of the group is two-fold:

- Bring the most advanced technology in product and process design, business systems, and production systems from the first application into the various groups in Digital's internal manufacturing plants.
- Migrate knowledge and tested systems to strategic Digital customers through the Area Partnership with Manufacturing programs, with software services as the delivery mechanism.

Integral to both aspects of AIMT is helping both Digital and its customers to understand and incorporate design-for-manufacturing concepts into the initial product engineering phase.

AIMT is currently focusing in these areas:

- Planning for Integrated Manufacturing
- Design for Manufacture
- Production Systems Control—Shop floor, Cell and Workstation

For information or assistance with your manufacturing problems contact:

John Behuniak, AIMT Manager
DTN: 287-3560, (617) 250-3560, AIMT::BEHUNIAK

17.6.1.7 Program Management

Program Manager: Michael Laine

Responsible for the functional management of CAD/CAM software development in support of *New Interconnect Technology*, which is primarily directed at Stage 0 and Stage 1 product and processes.

17.6.1.8 CTC Technology Strategy

Manager: Sunil Bhalla

This function provides technical strategic planning for CTC's electrical and mechanical CAD tools used by product groups within Digital.

Currently, a program is underway to define Digital's next generation mechanical CAD system - INTEGRAL. The goal of INTEGRAL is to identify key mechanical and electro-mechanical requirements for DEC's products in the 1990's and to provide the appropriate CAD tools to satisfy those requirements.

17.6.2 Application Systems Development

Manager: Oliver Stone (MKO1-2/E12, 264-7480)

Application Systems Development (ASD) is a full-service consulting, contracting, and development group located throughout the Northeast. ASD offers a wide range of Software Engineering, Hardware Engineering, Technical Writing Services, Marketing Communications Writing, Course Development, and Art and Video Services, at competitive rates, to the entire Digital community. ASD can usually match its engineering and documentation resources with the geographic and technical requirements of any group requiring help. Contact ASD for assistance in meeting your technical or business needs.

- *Finance*
Manager: Don Parnell (MKO1-2/E12, 264-2217)
- *Personnel*
Manager: Bob Maldonis (MKO1-2/G35, 264-0957)
- *Marketing*
Manager: Steve Kuchun (MLO21-3/E87, 223-6898)

The ASD organization includes the following groups; ASD Systems and Communications Software, ASD Documentation and Training Services, Information Systems Engineering, Internal Special Systems, Text and Information Management Engineering, Technical Systems Group.

17.6.2.1 Application Systems Development (ASD) North

Manager: S.S. Bajwa (ZKO2-1/M11, 381-2840)

17.6.2.1.1 ASD Systems and Communications Software Group

Manager: S.S. Bajwa (ZKO2-1/M11, 381-2840)

The ASD Systems and Communications Software Group is a software engineering group which develops technical applications for many internal organizations including CAEM, the Telecommunication Industry Group, Internal Field Service, manufacturing, advanced development groups, the modem development group, and various marketing organizations. The group has particular experience in areas such as networking, communications, database management, device drivers, manufacturing automation, and real-time, and has technical expertise in many operating systems, languages, and software tools.

The group is skilled in the complete software development process - from initial requirements analysis through implementation, installation and support of the application software. The group is available to undertake work ranging from small consulting assignments to full-blown product development of complex systems.

Examples of projects and products include the following:

- Several VMS device drivers for a variety of applications
- GM Manufacturing Automation Protocol software
- VAX/BTS (Bisynchronous Terminal Support) package

- Modem support software and microcode
- Phone billing data capture from Bell electronic switching systems
- Circuit and Module Producibility Automation for manufacturing (CAMPA)
- VAX System Verifier for Manufacturing (VSVP).

Contact this group for any of your software development needs.

17.6.2.1.2 ASD Documentation and Training Services

Manager: Martha B. Dufresne (MKO1-2/E12, 264-7488)

ASD Documentation and Training Services (ASD-DTS) provides an exceptional range of documentation expertise and is available on a contractual basis to any group within Digital that requires documentation and training services. Its experienced staff of writers, training specialists, editors, and artists can handle all types of documentation requirements. In addition, ASD-DTS has the resources to manage documentation projects from beginning to end, providing expertise in the following areas:

- Software documentation
- Hardware documentation
- Training materials
- Marketing materials
- Slide shows
- Video presentations
- Screen design
- On-line help
- Editing services
- Document formatting
- Graphics and paste-up
- Vendor coordination
- Electronic publishing
- Document production

ASD-DTS has developed a well-deserved reputation for providing its customers with a wide variety of quality documentation on schedule and within budget.

17.6.2.2 Information Systems Engineering

Manager: Lee Mari (ZKO1-3/J06, 381-2840)

Information Systems Engineering (ISE) is a group focused on providing support to help realize the corporate goal of attaining 6 per cent of the MIS market for Digital by 1990. This support comes in many forms, such as software engineering, marketing and sales program development, field support, CMP technical support, product management, and the like.

Currently, ISE is working with the CSG/MIS marketing group in the following areas:

- VAXlink development—(IBM database ⇒ RDB/VMS transfer)
- CASE/IS support

- MIS cooperative marketing partner (CMP) support

In conjunction with this effort, ISE is building expertise and experience in the areas of fourth and fifth generation languages and tools (both Digital and third party). This group is also concentrating on the issues involved with distributed system management, distributed processing, and the integration of foreign (such as IBM) data into the Digital network. It is also working with a number of other organizations to "use what we sell" by developing applications using Digital's 4GL and CASE tools.

17.6.2.3 Internal Special Systems

Manager: John Egolf (MLO21-3/E87, 223-3481)

Internal Special Systems (ISS) provides consulting, customized application development, diagnostic development, and documentation services. These services include problem analysis, consultation, definition, design, and full-scale implementation of software systems for groups ranging from engineering, manufacturing, design, and industrial environment to the business and financial world. This group has expertise in VAX/VMS, DBMS, Rdb, BASIC, COBOL, MACRO, BLISS, PASCAL, FMS, DATATRIEVE, PowerHouse, and many other Digital and third party software products and tools.

Products such as PowerHouse and BASIS are being internally supported along with other internally developed products as part of the DIS Toolkit project.

Examples of projects and products include the following:

- Electronic Data Interchange (EDI)
- Paperless ECO System for Terminals Business Unit
- Various Equipment Control Systems (ECS) for Digital Manufacturing
- MOS/MAXCIM Interface—a bridge between the corporate material order system and MAXCIM™
- Skills Assessment Software—a manufacturing training application
- IDECUS registration and billing system
- HAZnet—an automated tool to help minimize the company's risk in transporting hazardous materials
- TEMPEST diagnostics
- CALLIOPE High Speed IO Processor

Contact ISS (SPIDER::SOLUTION) for assistance in meeting your business needs for any of the services described.

17.6.2.3.1 Text and Information Management Engineering

Manager: Dave Lambarth (MKO1-2/D13, 264-6177)

This group supports the DIS Toolkit, provides contract software engineering resources on a project basis to produce both externally sold and internally used application systems, and supports software externally sold, including VAX ADE and the Courseware Authoring System.

The DIS Toolkit is software designated in the DIS Technical Strategy that currently includes third-party products such as PowerHouse and BASIS, which are used under corporate license, internally developed software such as Remote Management Tools, CUE, FTSV, and DDCT. This software and its documentation are distributed to internal user groups worldwide with support, which includes hotline and VAX Notes support, problem resolution, and third-party interfacing, primarily for Digital Information Systems personnel.

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17.6.2.4 Technical Systems Group

Manager: Don Wilson (LMO4-1/K4, 279-6741)

This group combines hardware engineering, software engineering, and technical writing to develop hardware and software products, technical applications systems, real-time applications, custom hardware, and systems consulting.

The systems and products developed by this group are done at the request of internal organizations, including Central Engineering, Field Service, Manufacturing, AMCs, and PBUs.

Sample products and projects include device drivers and support libraries, real-time monitoring and process control systems, hardware and software for Manufacturing and Field Service tester and process equipment, custom hardware for communications systems and real-time control systems, and custom software for external customers.

Technical documentation and communication products include programmer and end-user software documentation, marketing literature and informational videotapes, hardware technical manuals, and program-level project management.

Contact this group at the concept stage of your project if you need their assistance.

17.7 MANUFACTURING MATERIAL/EXTERNAL RESOURCES

Manager: Kevin Melia, V.P. (MLO1-5/B98, 223-3779)

MATERIALS BOARD OF DIRECTORS (MBOD)

Chairman: Kevin Melia, V.P.

Secretary: Kathy Stone

Functions	Staff	Program Leadership	Areas	PBU's
<i>Material Acquisition</i> Mike Eaton	<i>Program Office</i> Barry Weeks	<i>Cycle Time</i> Bob Parmelee	<i>Europe</i> Bruce Anderson (Ollie Butler)	<i>High Performance Systems</i> Charlie Polay
<i>Distribution</i> Herb Shumway	<i>Personnel</i> Pierrette Kelly	<i>Quality</i> Warren Cline	<i>GIA</i> Bob Graham	<i>Mid Range Systems</i> Charlie Polay
<i>Material Operations</i> Mike Flaherty	<i>Finance</i> Bob Faulconer	<i>Technology</i> Sandy Hoffman	<i>U.S. – U.S. Operations</i> Ralph Gillespie	<i>Distributed Systems</i> Charlie Polay
	<i>Systems</i> Steve Stolle	<i>Supplier Integration</i> Dave Knoll	<i>Field Service</i> Fred Traversi	<i>Small Systems</i> Dave Greenlee
	<i>Demand/Supply</i> Jon Braley	<i>Competitiveness</i> Dick Bradley	<i>Software Serv Ed Serv, CSS</i> Bernadette Lionetta (Acting)	<i>Storage Systems</i> Ed Flynn (Acting)
				<i>Software</i> Charlie Polay
				<i>SCO</i> Dan Hamel
				<i>PWB</i> Bob Steele

17.8 STORAGE SYSTEMS MANUFACTURING

Manager: Greg Plakias, V.P. (MLO1-5/T33, 223-9723)

Storage Manufacturing is responsible for supplying customers with products that enhance the leadership of Digital systems and provide our customers total satisfaction.

Our goal will be to support the Corporation's and the Storage business goals of having satisfied customers, targeted returns on Assets and Operating Profits.

We will measure our competitive positioning through the following goals and objectives:

- Quality and Reliability
- Customer Satisfaction
- Profit before Tax
- Return on Assets
- Market Share

Storage Manufacturing's groups and contacts are as follows:

PRODUCT MANUFACTURING UNITS

- *Low End Disk Systems*
Rufus Sanders
- *MLDS*
Ann Sandford
- *Tapes and Optical Systems*
Guido Ciannavei

AREA MANAGERS

- *Europe*
(Open)
- *Storage/GIA Manufacturing*
Bob Shepard
- *United States*
(Open)

FUNCTIONS

- *AMT/CIM*
Gordon Norquay
- *Finance*
Frank Atter
- *Materials and Purchasing*
(Open)
- *Personnel*
Hope Greenfield
- *Program Office*
(Open)
- *Quality and Reliability*
Art O'Donnell

- *Human Resources*
Don Chace
- *Staff Secretary*
Ed Flynn

OPERATIONS

- *Colorado*
Jack Batten (acting)
- *Enfield*
Bob Paul
- *External Products and Technologies*
Dave Crosier
- *Springfield*
Al Tervalon
- *Kaufbeuren*
Werner Burckhardt
- *Shrewsbury I*
Carl Redfield
- *Shrewsbury II*
Jim Tuttle
- *Singapore*
C.K. Wong
- *Tempe*
Rob O'Keefe

CHAPTER 18

GIA MANUFACTURING AND ENGINEERING

Manager: Dick Yen, V.P. (TAO)

The GIA Manufacturing and Engineering Group consists of three major organizations.

- *Far East Operations*
Manager (Acting): Dick Yen, V.P. (TAO)
- *Western Hemisphere Operations*
Manager: Ed McDonough, V.P. (BPO-1, 296-3511)
- *GIA Manufacturing and Engineering Support*
Manager: Ed McDonough, V.P. (BPO-1, 296-3511)

The G.I.A Group is headquartered in the Burough's Plaza (BPO) complex, Marlboro, Massachusetts.

18.1 FAR EAST OPERATIONS

Manager (Acting): Dick Yen, V.P. (TAO)

The Far East Operations has major facilities in Taiwan, Hong Kong, and Singapore, and a purchasing facility in Japan.

18.2 WESTERN HEMISPHERE OPERATIONS

Manager: Ed McDonough, V.P. (BPO-1, 296-3511)

This group has major facilities in San German and Aguadilla, Puerto Rico, Kanata, Canada, Chihuahua, Mexico, and the GIA Business Center in Acton, Massachusetts.

This group manufactures high volumes of power supplies, modules, terminals, PCs, DECmate IIIs, PCBs, backplanes, memory products, micro products, units, and systems.

They also maintain design engineering sites in Taiwan and Hong Kong, and a support engineering group in Puerto Rico.

18.3 GIA MANUFACTURING AND ENGINEERING SUPPORT

Manager: Ed McDonough, V.P. (BPO-1, 296-3511)

This worldwide support organization based in Marlboro, Massachusetts, assists design engineering and manufacturing to introduce new products and processes into GIA manufacturing plants. The organization consists of a Technology Resource Group, Materials and Purchasing, and four business units. The Technology Group is managing the development of the surface mount volume manufacturing process for Digital, as well as the start-up of New Ventures (in new countries) to support GIA Marketing.

Manufacturing Engineering personnel from the Technology Group and/or one of the businesses can assist design engineering to develop manufacturing plans (assembly and test) and schedules, and to communicate with the GIA plants.

The group must review all product documentation, tooling, training plans, procedures, test strategies, producibility, packaging, and component sourcing of products being introduced into the GIA Manufacturing Operations.

Key contacts in the group are as follows.

- *Technology and New Ventures Group*
Jim Melvin (BPO-1, 296-3400)
- *Memories*
John Sistare (MOO, 297-5378)
- *Terminals Business/Small Systems*
Steve Anderson (BPO-1, 296-3355)
- *Storage Systems*
Bob Shepard (MOO, 297-7174)

CHAPTER 19

PURCHASING

Manager: Ron Payne (MLO1-5/B98, 223-3238)

19.1 CORPORATE PURCHASING

Manager: Ron Payne (MLO1-5/B98, 223-3238)

Purchasing assures supply, competitive cost, and timely delivery of optimum quality materials and services from suppliers. They coordinate the development of suppliers and ensure that Digital presents one face to the suppliers.

Corporate Purchasing through appropriate organizational linkages influences strategic business decisions. This influence includes, but is not limited to, lead negotiation strategies and selection of suppliers and materials to meet corporate, product, design, manufacturing, and administrative goals. The organization supports all groups throughout the world, including Field Service and Marketing, and ensures a formal make-or-buy decision process at all levels in Digital. In the vast majority of situations, actual buying is decentralized to purchasing groups linked to major Digital line organizations.

Corporate Purchasing conducts formal training programs and provides guidance on purchasing strategies, policies, and systems. For further information, contact the Purchasing Hotline at 234-5065.

19.2 EXTERNAL RESOURCE MANAGEMENT

Manager: Mike Eaton (MLO1-5/B98, 223-3143)

This group ensures that Digital has contracted for adequate capacity with suppliers of inventory and administrative materials in support of Digital Manufacturing operations.

Day-to-day operational work involves translating broad Digital objectives into functional goals. Functional goals are then refined into five-year commodity business plans. These plans are clearly indicated by an integrated set of local level goals that ensure the achievement of Digital objectives in domestic and international environments.

Objectives being addressed are as follows.

- Making the schedule
- Meeting product-cost goals
- Helping Country Managers sell by leveraging Digital purchases to gain competitive advantages internationally

Specific Commodity Business Plans

COMMODITY	MANAGER
Media Heads Storage Systems Buy-Outs	Erle Dail (MLO1-5/T33, 223-5703, @MLO)
Terminal Systems Buy-Outs	Charles Fowler (MLO3-6/B52, 223-1176, @MLO)
Printed Circuits	Ulf Stoeckelmann (LMO2-2/P35, 296-6827, @LMO)
Printed Circuit Boards	Bob Steele (WJO2-1/B8, 282-1136, @WJO)
Components	Bill Annesi (NRO5/P4, 234-4836, @NRO)
Cables, Connectors, Fiber Optics, Higher Level Assemblies and any new and/or Undeveloped Requirements	Chris Kerylow (NRO5/P4, 234-4787, @NRO)
Magnetics, Power Supplies, Hybrids, Metal Molding, Metal Forming, Metal Removal, Plastics	Tom Dunn (NRO5/P4, 234-4786, @NRO)
Blowers, Breakers, Fans, Fuses, Motors, Relays, Switches, Filters, Capacitors, Transistors, Diodes, Crystals, Oscillators, Resistors, OPTO Devices	Paul Salvaggio (NRO5/P4, 234-4795, @NRO)

19.3 CORPORATE ADMINISTRATIVE PURCHASING

Manager: Tom Grablick (NRO5/Q6, 234-4980)

This group is responsible for the timely and cost-effective acquisition of non-inventory materials and services such as the following.

- Telecommunications
- Furniture
- Office machines and supplies
- Energy sources/environmental concerns
- Travel/rental cars, hotels, airlines
- Temporary labor

For more detailed information, contact Ken Poe (NRO5/Q7, 234-4021), Administrative Supply Base, or call your local purchasing manager.

19.4 STRATEGIC ACQUISITION RESOURCES AND SOFTWARE (STARS)

Manager: Peter Koch (VRO6-2, 273-5843, CPDW::KOCH)

This group has the responsibility of:

- Ensuring that internal decision-makers have complete "supply" information for technology and service make/buy decisions—initially for global software sourcing strategies
- Ensuring that systems provide integrated, accurate and timely management information
- Ensuring excellence in the functional management of software acquisition for Digital's internal use, marketing, engineering, and field resale operations

This group provides the most leverage to your efforts by early, upfront involvement in the product and business planning process.

- *Controller*
Rozanna Patane (VRO6-2, 273-5848, CPDW::PATANE)
- *Attorney*
Bob Perry (MSO/D7, 223-4351, LEAGLE::PERRY)
- *Planning*
Manager: Sandra LeFlore ((VRO6-2, 273-5849, CPDW::LEFLORE)
- *Software Acquisition*
Manager: Brian Ota (VRO6-2, 273-5852, CPDW::OTA)
- *Consultant Acquisition*
Manager: Roger Shaller (VRO6-2, 273-5850, CPDW::SHALLER)
- *Software Supply Base Intelligence and Sourcing Strategies*
Manager: Regis Kaufman (VRO6-2, 273-5851, CPDW::KAUFMAN)
- *Corporate Purchasing Information Management*
Manager: Bill Galloway (VRO6-2, 273-5744, CPDW::GALLOWAY)
- *Purchasing EDI Integration*
Manager: Eric Ericsson (VRO6-2, 273-5844, CPDW::ERICSSON)

19.4.1 Software Acquisition

Manager: Brian Ota (VRO6-2, 273-5852, CPDW::OTA)

The Software Acquisition Group conducts Digital's negotiations and contracting with third-party software suppliers. Our involvement in the front end planning stage of a software acquisition is to participate in team development of business plans, research, selection of supplier, contract drafting, negotiation, and ultimately in processing the purchase order to help assure the best business terms for Digital.

19.4.2 Consultant Acquisition & Programs

Manager: Roger Shaller (VRO6-2, 273-5850, CPDW::SHALLER)

Digital hires consultants to perform various services for the Corporation. These individuals create certain business and legal risks. As a result, no services shall be provided by consultants until an appropriate agreement has been signed that addresses these risks. To ensure adequate protection, contact the Consultant Acquisition Group for assistance.

19.4.3 Software Supply Base Intelligence and Sourcing Strategies

Manager: Regis F. Kaufman (VRO6-2, 273-5851, CPDW::KAUFMAN)
Program Coordinator: Jan Phillips (VRO6-2, 273-5825, CPDW::PHILLIPS)

The goal of this group is to provide general and specific software supply base intelligence to key decision-makers and to assist in the development of software sourcing strategies.

This is done by:

- Providing an overview of the significant developments in the software industry and communicating the potential impact of that development on the corporation.
- Identifying software suppliers that meet specific operating group's business needs.
- Formulating software sourcing strategies that consider the value of the product/technology sourced and the type of relationship to establish with an outside supplier that matches the value of the product/technology.
- Assisting operating groups in structuring negotiations with external software suppliers.

As operating groups begin developing strategies for working with outside software suppliers and structuring relationships with those suppliers, it is recommended that operating group managers contact this office in order to ensure development of a cohesive software sourcing strategy and to help expedite the negotiation process.

19.4.4 Corporate Purchasing Information Management

- *Manager*
Bill Galloway (VRO6-2, 273-5744)
- *Data Center Manager*
Charlie Anthony (VRO6-2, 273-5711)
- *Systems & Programming Manager*
Raymond Rosch (VRO6-2, 273-5710)
- *Data Administration Manager*
Carole Dahlstrom (VRO6-2, 273-5709)
- *Business Manager*
Clarence Dixon (VRO6-2, 273-5705)
- *Program Managers*
 - *Corporate Purchasing Reference Systems*
Mark Goff (VRO6-2, 273-5702)
 - *CONbase*
Jan Ketonen (VRO6-2, 273-5713)
 - *Government Systems Group*
Ana Rogers (VRO6-2, 273-5706)
 - *SOFTbase*
Bill Hartwell (VRO6-2, 273-5701)

The Corporate Purchasing Information Management organization is chartered with the development of Purchasing business and systems architectures in support of Purchasing organizations company-wide.

This group is responsible for system development, data administration and providing operational hardware and system software.

Corporate Purchasing Reference Systems (CPRS)

The Corporate Purchasing Reference Systems provide on-line inquiry and standard reports to Buyers, Purchasing Managers, and the Federal Government on expenditures and contracts with suppliers, worldwide. Integrated systems within the CPRS include the Supplier Master System, the Corporate Contracts and Buyer files, and the Corporate Purchasing VTX Directory.

SOFTbase™

The SOFTbase system is Digital's corporate software information clearinghouse, providing immediate access to product and supplier information. The system is best described as an encyclopedia containing over 6,500 software product solutions from 1,500 suppliers. SOFTbase includes information about internally and externally developed software products that operate on Digital's current hardware offerings.

CONbase™

CONbase is planned to be a companion product to SOFTbase, as Digital's online directory of consultants who are approved to service the Digital internal community and its customer base. Both internal and external consulting resources will be included in CONbase. (Planned implementation, FY90, Q1.)

Corporate Software and Consultant Acquisition Support

This group is responsible for managing and operating transaction-based Purchasing systems to support the Software and Consultant Acquisition business.

19.4.5 Purchasing EDI Program Office

Manager: Eric Ericsson (VRO6-2/M35, 273-5844, CPDW::ERICSSON)

This function is Corporate Purchasing's focus on Digital's efforts to integrate Electronic Data Interchange into Purchasing's business transactions with external suppliers and Purchasing's applications. The function provides planning and status for Purchasing programs and assures integration with appropriate marketing programs and other Digital EDI efforts.

19.5 ENGINEERING/NEW PRODUCTS PURCHASING (ENPP)

ENPP groups are active in each area of Digital product development and serve the engineering community with distinct service as follows.

- Tactical Support Purchasing
- Project Purchasing
- Project Materials Management
- Software Purchasing
- Consulting Acquisitions

Often, complex vendor relationships require specialized skills in negotiations, contract law, and international coordination. For this reason, ENPP managers have access to a wide range of skills, group or Corporate, depending on the task complexity. They also work closely with program managers, component engineers, manufacturing engineers, and other functions such as the law department to relieve you from excessive involvement with administrative tasks associated with materials. This support will give you more time for your technical tasks.

To help engineers save valuable project time and reduce time-to-market, the new product purchasing group needs an engineering parts list, documentation (format unimportant), a willingness to work with the Purchasing Change Authorization (PCA) system, and, at the appropriate time, an Engineering Business Plan. See *DEC STD 130-0 Product/System Business Plans: Content Requirements and Format Guidelines*. Contact ENPP during the conceptual stage of your product.

The *Tactical Support Purchasing* function, usually organized under ENPP management, services Engineering's everyday parts and equipment needs. These include inventory parts for breadboards and prototypes, new items, and out-of-stock materials. They handle consultant, maintenance, and service agreements. They can also assist you in locating sources for engineering support materials. Finally, the group can identify sources for components, equipment, and materials.

To assist you, the ENPP tactical support buyers servicing your area need specification details, part numbers, and catalog data if available. They also need quality standards if applicable.

An authorized Internal Purchase Requisition is also necessary for the groups to do business with you. This authorizes the groups to commit to a purchase order with an outside vendor. It must be completed by the requisitioner with all the necessary signatures. Without this information, order placement may be delayed. Call the individual designated for your area (see list that follows) whenever an engineering stockroom cannot supply your needs. For common breadboard components, it is possible that the material will be in stock.

Because it costs Digital approximately \$85 to place an order, administer it, and generate a check to pay the vendor, it makes sense to group your small items together whenever possible.

The *Project Materials Management* function exists to aid design engineers in obtaining, controlling, and planning material for building prototypes. As a project-oriented group, they aid in documentation control at the preliminary stage by using a Purchasing Change Authorization (PCA) system. The group also structures and maintains, by way of the parts list, a product materials cost database. Project materials professionals help you establish accurate materials estimates and forecasts early in the project life cycle. This process helps engineers get an early and effective grasp of materials cost. Today, this is especially important because the materials cost often exceeds 60 per cent of the transfer cost.

Finally, the group drives processes for the timely resolution of materials issues between manufacturing, engineering, Specification Control Systems, and the manufacturing plants.

Project Purchasing associated with each ENPP group couples with Design Engineering to source all new components, including fabricated plastic, metal items, and packaging. The Purchasing group is generally organized by commodity specialty, handling active devices, handling passive devices, fabrication, and plastics.

ENPP establishes cost-effective sources, evaluating parts availability, lead time, and the capacities of outside sources appropriate for the development and production phases of the product. They communicate sourcing risks to both Manufacturing and Engineering and recommend effective source management. ENPP can also negotiate the most favorable preliminary standard cost, reflecting the proper balance between quality, technical conformance, and expected volumes. It can also provide a "value analysis" using its internal resources.

Contact an ENPP group early in the concept stage of your project. Provide sketches or preliminary line drawings with essential dimensions and specifications. The precise format of these requirements is not important in the early phases of your project. For more specific information on the support available from ENPP and what is required of you, contact the person in your product-area or facility from the following list.

- *Terminals and Printed Circuits*
Ed Griffin (MLO1-5/T70, 223-8946)
- *Storage Systems*
Erle Dail (MLO1-5/T33, 223-5703)
- *Distributed Systems*
Terry Cormier (MLO21-1/T70, 223-8270)
- *Process and Design Support (P&DS)*
Tom Cavanaugh (APO-1/C16, 289-1746)
- *CSM Support*
Wilt Jones (WJO1-2/E3, 282-1557)

- *Maynard Plant*
Bill Keiran (MLO5-2/P1, 223-1700)
- *Japan Engineering Support*
Craig Auman (BPO1, 235-3435)
- *Europe Engineering Support*
Robbie Stewart (NRO5/O6, 234-5026)

If you are not sure whom to contact, call the senior purchasing manager within your facility.

19.6 ADVANCE PURCHASING

Manager: Murvin Lackey (NRO5/K4, 234-5205)

Advance Purchasing is a new component of purchasing whose purpose and mission is to find new ways of meeting customer demands by working with both engineering and the external supplier base in introducing new technologies. An extension of this effort will be to serve as a conduit between Digital and its supplier base as it relates to the preproduct development activities and/or pre-phase 0 issues.

CHAPTER 20

CORPORATE QUALITY GROUP

Manager: Frank McCabe, V.P. (MLO1-5/T55 223-4597)

The Corporate Quality Group provides leadership and strategic direction to Digital in its drive to become the sustained industry leader in customer satisfaction. Working with management, administration and business and operating groups across all geographies, Corporate Quality's role is to help transition the company to greater standards of excellence in all dimensions and aspects of how Digital's business is conducted with customers, with suppliers and with employees.

The Corporate Quality staff collaborates with engineering, manufacturing, the field, finance, marketing, personnel and purchasing to integrate and implement quality improvement processes and practices into every company function.

The quality improvement drive focuses specifically on the areas of predictability, problem-free installations, reliability, availability, ease of doing business and customer partnerships.

For each of these areas, major emphasis is placed on the following:

- Prevention and continuous process improvement
- Anticipating/meeting customer expectations
- Reducing the cost of quality/non-conformance
- Reducing internal cost structures in all functions
- Cross-functional collaboration and team problem-solving
- Communicating Digital's quality strategy and progress in customer satisfaction
- Providing education in quality tools and methodologies

The objective is to engage all members of Digital's employee community in the quality initiative with the result that the quality improvement process will become a way-of-worklife at Digital.

Corporate Quality Contacts are as follows:

- *Quality Education Specialist*
Winni Anketell (MLO1-5/T55 223-7134)
 - Quality/Customer Satisfaction Resource Guide
 - Quality/Customer Satisfaction Education Brochure
 - New Hire Quality Orientation information
- *Marketing Communications Manager*
Cynthia Ellis (MLO1-5/T55, 223-9733)
 - Marketing communications support for programs concerning quality improvement, customer satisfaction, employee satisfaction
 - Media relations contact for Digital's Quality Initiative

- Contact for corporate messages on Digital's Quality/Customer Satisfaction Program
- *Customer Satisfaction, Stage II Group Quality Manager, Manufacturing*
Lou Difinizio (MLO1-5/T55, 223-7493)
 - Interface from Field to Stage II Manufacturing
 - Contact for Problem-Free Installation (PFI) and Installation Quality Process
- *Corporate Quality Finance Manager*
Christine Duvivier (MLO1-5/T55, 223- 2679)
 - Manages Cost of Quality reporting across the company
 - Leads process for incorporating Quality goals into business financial goals of each organization
 - Financial support for Corporate Quality
- *Quality Technical Support Specialist*
Bob Ferrone (MLO1-5/T55 223-5146)
 - Technical consulting
 - Quality processes for internal support products (Manufacturing, Engineering, Field)
- *Planning and Standards Manager*
Bob Kennedy (MLO1-5/T55 223-7196)
 - Inquiries regarding industry and customer quality standards
 - Digital Standards
 - Strategic planning for Quality/Customer Satisfaction function
 - Quality/Customer Satisfaction—internal functional audits
- *Administrative Assistant to Frank McCabe*
Angela McCarron (MLO1-5/T55 223-4352)
- *Customer Satisfaction Manager for Manufacturing*
Paul McGaunn (MLO1-5/T55 223-2260)
 - Corporate Quality interface for Manufacturing
- *Customer Satisfaction Manager for the Field*
Jim Pitts (MLO1-5/T55 223-5946)
 - Corporate Quality interface for the Field
- *Corporate Quality Education Manager*
Rebecca Raibley (MLO1-5/T55 223-9731)
 - Education programs for quality/customer satisfaction
 - Personnel/organizational development interface
- *Group Quality Manager, Manufacturing*
Joe Vernaza (MLO1-5/T55 223-7450)
 - Interface for Stage I Manufacturing
 - Process Control and Total Quality Process in Manufacturing

CHAPTER 21

SALES, SERVICES, INDUSTRY/CHANNELS MARKETING, AND INTERNATIONAL

Manager: Jack Shields, Senior V.P. (OGO1-2/R12, 276-9890)

The Sales and Service Organization is comprised of key functions that are deployed in the U.S., Europe, and General International Area (GIA). These functions include Sales, Field Service, Software Services, Educational Services, Computer Special Systems (CSS), and Industry and Channels Marketing. These businesses are supported by Finance and Administration, and Personnel in meeting their objectives.

21.1 U.S. SALES

The U.S. Sales Organization, under the direction of the senior vice president of Sales, Services, Industry/Channels Marketing, and International, is comprised of the U.S. Sales Manager, U.S. Sales Area Manager, U.S. Sales Operations Manager, Corporate Accounts Manager, as well as the Headquarters Staff and nine U.S. Area Managers.

The U.S. Sales Organization Headquarters Staff consists of:

- *U.S. Sales*
Manager: Charles Shue, V.P. (MRO, 297-6067)
- *U.S. Sales Areas*
Manager: Ray Wood, V.P. (MRO, 297-2789)
- *Corporate Accounts*
Manager: William Lynch, V.P. (OGO, 276-8992)
- *Federal Accounts*
Manager: Frank Posey (MEL, 429-9262)
- *U.S. Products Sales*
Manager: (to be named)
- *U.S. Channels Sales*
Manager: Jay Atlas (UPO, 296-4248)
- *U.S. Business Management*
Robert Nealon (MRO, 297-7736)
- *Special Projects and Planning*
Joseph Zercoe (OGO, 276-8276)
- *Sales and Marketing Programs*
Joseph Ford (MKO, 264-3698)
- *Strategic Sales and Executive Partnership Program*
William McHale (OGO, 276-9679)

- *Sales Methods and Technology*
Gale Morgan (SSO, [916] 361-6562)
- *Controller*
William Vanatten (MRO, 297-2155)
- *Personnel Programs*
Claire Muhm (OGO, 276-0671)
- *Sales Support*
David Salmi (PKO, 223-2293)
- *Sales Training*
Cecil Dye (OGO, 276-9911)

The mission of the U.S. Sales Organization is to:

- Provide integrated computing solutions to meet customer needs.
- Sell all of Digital's products and services.
- Represent all of Digital's functional group by managing account relationships.
- Implement approved strategies and sales channels.

The goals of the U.S. Sales Organization are to:

- Establish Digital as the #1 Sales Organization by being better than the competition at:
 - Satisfying our customers
 - Returning the highest yields
 - Winning new business
 - Expanding the Installed Base
- Establish Digital as the #1 Vendor of computer components, computer systems, network computer products and services.

Our customers are selecting essentially two vendors - and Digital is the best alternative to the competition. We can continue to maximize sales productivity by focusing on target business that meets the objectives of marketing, sales, and service plans, and by achieving a high level of customer satisfaction and preferred vendor sales.

- Establish Digital as the #1 Investment
It is the collective corporate and functional strategies, and collective employee effort that has put Digital's stock where it is today. We want to continue to improve margins, maximize return on investment and be the #1 investment.
- Establish Digital as the #1 Employer
We want to be the #1 Sales Organization and the best possible place to work. We believe the product set, applications, sales programs, support resources, services, and outstanding caliber of sales people, make Digital an unbeatable team, and the best place for the best sales people to work.

21.2 SSMI - CORPORATE COMMUNICATIONS

Manager: Ed Kamins (OGO1-2/R12, 276-9666)

This group is responsible for coordinating advertising, sales communications, promotional literature, direct marketing, public relations, and trade shows or other events for Industry Marketing, Channels Marketing, and U.S. Geographic Sales and Service organizations. The following committees have a major role in this group.

- *Communications Strategy Committee (CSC)*, subcommittee of MSSC, comprised of top marketing and business unit managers. This committee reviews and approves major corporate CSC programs.
- *Communications Team* - Senior Marketing Communications Managers for Corporate Operations, Field Operations and Manufacturing/ Engineering/Marketing. This Team ensures the integration of all of Digital's marketing communications into one corporate strategy.

Corporate Communications is organized in this manner:

- *Corporate Communications Manager*
Ed Kamins
- *Corporate Communications Secretary*
Judy Wilcox
- *Finance*
Maureen Tabor
- *Personnel*
Dick Provencher
- *Advertising and Promotional Programs*
Henry Heisler
- *Public Relations*
Janet Shipman
- *Sales Communications*
Kent St.Vrain
- *Group Communications Channels*
Janet Shipman
- *Group Communications Services*
Bob Roller
- *Group Communications Industry*
Doug Towle
- *Group Communications Field Services*
Joe Allan
- *Group Communications Installed Base*
Marilyn Rutland
- *Direct Marketing Center for Expertise*
Marilyn Rutland
- *DECWORLD*
(Open)

21.3 PERIPHERALS AND SUPPLIES GROUP

Manager: John Alexanderson, V.P. (MKO1-2/G35, 264-51160)

The Peripherals and Supplies Group (PSG) markets Digital products to the existing installed base of Digital customers. Its marketing and selling vehicles include the following:

- Digital Sales Reps
 - Installed Base Reps
 - Account Managers
 - General Business Units
 - Volume Sales Reps
- OEMs and Distributors
- Direct Response
 - DECdirect Plus Catalog
 - Direct Mail
 - Technical Consulting
 - Installed Customer Data Base

A marketing organization, PSG focuses on the following product families, promoting expansion, networking, clustering, and migration of the system base to new technology. It strongly reinforces the continued protection of the customer's investment in Digital.

- Mass Storage
- Networks
- Clusters
- CPU Upgrades
- Terminals and Printers
- Related Accessories and Supplies
- System Growth Planning

In addition, it leverages the sale of application software, services, and systems.

PSG is aggressively involved in assisting the existing system customer transition to newer technology. This System Growth Planning is developed cross functionally within Digital, bringing together software, hardware, and service. Included in this system growth planning strategy are performance management, capacity planning, and customer business planning. The end result is that the sales force and Digital become business planning partners with the customer.

21.4 GOVERNMENT SYSTEMS GROUP (GSG)—PRODUCT DEVELOPMENT

Manager: Suresh Masand (MKO2-1/K06, 264-4701)

The Government Systems Group performs its mission by providing the goals and executable strategies for Digital's Government Business. GSG drives the Corporation so the necessary Government-focused skills, resources, organization and implementation plans are in place.

Furthermore, towards the execution of GSG's mission, we establish policies and enforcement procedures so that Digital is compliant and consistent in its business dealings with the Government. This includes modifying commercial practice to meet Government procurement regulations. GSG also modifies standard products and services to meet Government-unique requirements. Finally, as part of its charter, GSG selects the appropriate channel to deliver competitive proposals.

The Government Product Development Office services the needs of the U.S. and selected foreign Governments directly and indirectly by providing specialized expertise, value-added products and services.

Our Mission:

- Be the leading supplier of secure platforms in the Government Marketplace.
 - TEMPEST
 - Software
 - Networking
 - Physical Security
- Set and manage Digital worldwide TEMPEST Standards and Digital worldwide compliance.

21.4.1 Product Management

Manager: Doug MacLean (MKO2-1/K06, 264-5204)

This group, working with marketing, sales, finance, services, and central engineering develops the product strategies, establishes business plans, manages the phase review process, product life cycle, and the product business analysis.

The product managers and their responsibilities are:

- *Small Systems and Workstations*
Dick Morency (MKO2-1/K06, 264-4661)
- *MicroVAX 3000-Based Products*
Louise Brandwein (MKO2-1/K06, 264-4497)
- *Terminals, PCs, and Printers*
Don Barnabe (MKO2-1/K06, 264-4554)
- *Large Systems and Mass Storage*
Tom Beaudet (MKO2-1/K06, 264-4047)
- *Advanced Networking*
Dennis Cardon (MKO2-1/K06, 264-0759)
- *Networks and Communications*
Frank Novak (MKO2-1/K06, 264-4643)
- *Secure Software Products*
(Open)

21.4.2 TEMPEST Product Development

Manager: Dave Anderson (MKO2-1/K06, 264-4757)

This group provides the product development and design engineering, sustaining engineering, design services, manufacturing and field support for TEMPEST products.

21.4.2.1 Engineering Support Services

Manager: Bob Roney (MKO2-1/K06, 264-4762)

This group provides ongoing sustaining engineering support for released GSG TEMPEST products, as well as engineering design service (MECAD, VALID) and quality engineering service support for GSG engineering. Product manufacturing support, ECO activity, product producibility and cost review, and product quality engineering are focused through this group.

21.4.2.2 Interconnect Product Development Group

Manager: Dan Eisele (MKO2-1/K06, 264-4659)

This group develops networking and interconnect products necessary to meet the security requirements of the government marketplace. Of primary focus are TEMPEST networking and interconnect products. The group interacts with product management and with NAC to assure best implementation of networking products meeting GSG customer requirements in accordance with corporate strategy.

21.4.2.3 TEMPEST Product Design Group

Manager: Paul Tallo (MKO2-1/K06, 264-4760)

This group develops both low and high end TEMPEST products and system components required for the government marketplace. Heavy emphasis is placed upon mechanical design packaging and shielding. The group is active in corporate committees to promote improved and more cost effective EMI design, materials, and finishes; and to promote corporate product designs more readily meeting the requirements of the government marketplace.

21.4.2.4 Electrical Design Technology Group

Manager: John McCoy (MKO2-1/K06, 264-4758)

This group is responsible for development of highly user approachable and cost sensitive products (such as terminals, monitors, and keyboards) best suited by an EMI suppression approach for TEMPEST products in the government marketplace. The group also focuses upon new product conceptual approaches, consults in EMI design, and promotes corporate product designs more readily meeting the requirements of the government marketplace.

21.4.3 TEMPEST/EMI/Encryption Technology Center - Advanced Development

Manager: Phil Becker (MKO2-1/K06, 264-3408)

This group provides the TEMPEST consulting and CATA (Company Appointed TEMPEST Authority) interface to the Government. All TEMPEST Product Certification and Testing, Certified Laboratory Management, TEMPEST Certified Engineers, and Advanced Development are present in this group. The group is also responsible for working with the central engineering groups to design products which meet a level of TEMPEST performance with minimum modifications.

This group includes:

- *TEMPEST Test Lab and EMC Domain Member*
Bruce Archambeault (MKO2-1/K06, 264-4759)

- *TEMPEST Compliance Manager & Company-Appointed TEMPEST Authority*
Robert Bowman (MKO2-1/K6, 264-3418)

21.4.4 System Integration Engineering

Manager: John Gleeson (MKO2-1/K06, 264-4559)

This group provides the resources and the project management for engineering activities required by the approved/won Government Programs. This group also provides technical support for third-party products which are required by the won programs.

This group includes:

- *TEMPEST Product Development & Thermal Engineering Support*
Susan Barnum (MKO2-1/K06, 264-4755)
- *Product Safety Engineering*
Bill Bausha (MKO2-1/K06, 264-4558)
- *Program Engineering*
Paul Fleisner (MKO2-1/K06, 264-4791)
- *TEMPEST Product Development*
Al Ramirez (MKO2-1/K06, 264-3410)

21.4.5 Secure Software Development

Manager: Suresh Masand (acting) (MKO2-1/K06, 264-4701)

This group is responsible for influencing, modifying, supporting, evaluating, and certifying the Digital software with the Government required security features. This group works very closely with Bill Strecker's Secure Systems Engineering group.

21.4.6 Operations

Manager: Carolyn Doherty (MKO2-1/K06, 264-4499)

This group provides the administrative support, material procurement and control, discrete project spending control, and the cross cost center coordination.

21.5 INDUSTRY MARKETING SERVICES

Group Manager: Bob Hughes, V.P. (MKO2-2/A14, 264-7355)

Industry Marketing provides marketing in the United States for specific industries. The following is the current focus within the Service Industry group:

- Telecommunications and Utilities Industries
- Media Industries
- Financial Services Industries
- General Services Industries

The group is responsible for the following activities.

- Determine what the industry needs are now and what they will be in the future, and consider both the requirements of the industry and the capabilities of our competition. Through formal and informal means, product oriented requirements are passed on to Engineering for consideration as products, or features on existing products.

- Determine the kinds of solutions (applications) that are required by industry. Propose an applications acquisition strategy to Product Marketing to ensure that the appropriate applications are available to allow Digital to win in the marketplace.
- Gain and leverage successes in leading edge companies and propagate that success through other companies in the same industry. This responsibility usually results in activities such as the creation of Application Profile brochures, limited numbers of sales calls, and the development of highly-focused education for the sales force.

The five-year vision for Industry Marketing is to be so expert in a particular industry's business operation that:

- Digital is perceived by industry leaders as the vendor of choice.
- Industry Marketing influences Digital product and organization strategy.
- Industry Marketing has a definite positive effect on profitability within Digital.

If you would like more information about Industry Marketing, or any of the focused groups within Service Industry, the following key individuals can help you establish the most appropriate contact.

- *Service Industry Marketing*
Bob Hughes, V.P. (264-7355)
- *Telecommunications/Utilities*
Dan Latham (274-6758)
- *Media Industries*
Bob Farquhar, Director (264-0549)
- *Financial Services*
Sandy Thomas, Director (274-6887)
- *General Services*
Peter Robohm, Director (264-3713)

21.5.1 Consultant and Information Systems Marketing (CISM)

Manager: Rose Ann Giordano, V.P. (MRO2-2/C2, 297-4049)

The Consultant and Information Systems Marketing (CISM) Group is responsible for marketing Digital, its vision, strategy and architecture to key industry influencers, Chief Information Officers (CIOs), and provide a corporate focus for IBM competitive sales.

CISM goals are to profitably increase market share in enterprise-wide computing, be the recognized leader in integrated information systems, and be the alternative to IBM.

CISM consists of the following groups.

21.5.1.1 Consultant and Industry Marketing Group

Manager: James Higgins (MRO2-2/C2, 297-5385)

The Consultant and Industry Marketing Group (CIMG) is responsible for marketing the Digital advantage to the major industry influencers.

The group's goals are listed below:

- Gain market share by leveraging the influence of key industry consultants and analysts.
- Provide consistent Digital relationships with key industry consultants and analysts.
- Align key consulting firms with Digital's strategic targets.
- Provide guidelines when dealing with industry consultants and analysts.

- Co-ordinate international efforts focused on key industry consultants and analysts.

21.5.1.2 Executive and Information Systems Marketing Group

Manager: Pat Mullen (MRO2-2/C2, 297-6866)

The Information Systems Marketing group is responsible for marketing Digital, it's vision, strategy and architecture to Chief Information Officers (CIO's), and key executive decision makers.

The group's goals are to establish Digital as the recognized leader in integrated information systems and to be the alternative to IBM, and to gain mind-share of Chief Information Officers and other key executive decision makers.

21.5.1.3 U.S. IBM Competitive Sales

Manager: Neal Houtz (MKO2-2/A16, 264-3998)

The U.S. IBM Competitive Sales Group is responsible for increasing the Digital share of business from the Digital Named Accounts (DNA).

The group's goals are to assist the U.S. Information Systems Selling Teams (ISSTs) penetrate the Information Systems department in DNAs, along with formulating and implementing U.S. sales strategies, to compete effectively against IBM for the DNAs.

21.6 BASIC INDUSTRIES MARKETING GROUP

Manager: Jerry Witmore, V.P. (OGO1-2/M02, 276-9777)

21.6.1 Education, State and Local Government

Manager: Bob Trocchi (MRO3-2/E7, 297-4351)

The primary focus for the Educational Market is universities, two and four year colleges and school districts.

- **UNIVERSITIES**

There are 170 universities in the United States, most with graduate/professional schools that offer doctoral degrees in various disciplines.

Leading universities emphasize research and are considered innovators in education. Much of this research is focused on the computer sciences, primarily in the area of networking to allow researchers to communicate across national and international boundaries.

The office environment at universities is highly integrated, consisting of multi-vendor products and applications. Virtually all applications can be found in this environment, including UNIX.

- **TWO AND FOUR YEAR COLLEGES**

There are 3200 colleges in the United States with an enrollment exceeding nine million students and continuing to grow. Digital's penetration in this market is very high.

Colleges tend to follow the trends set by the larger universities. This trend indicates that Digital must continue efforts to penetrate the university market if it wants to succeed at the college level.

- **SCHOOL DISTRICTS**

School districts in the U.S. serve a total population of four to five million students.

School districts are increasingly combining their purchasing efforts through statewide contracts in order to reduce costs. Digital's sales focus is on districts with enrollments exceeding 7000 students.

The primary applications in this market are administrative.

21.6.1.1 State and Local Government Marketing

Manager: Dale Darnell (MRO3-2/E7, 297-6201)

The State and Local Government Market consists of all non-federal government departments and agencies including special districts, authorities, and commissions.

The State and Local Government Market consists of two markets:

- *State Government Marketing*
Manager: Dale Darnell
- *Local Government Marketing*
Manager: Dave Knapp

The distinction is made for several reasons: different contractual requirements; different information technology needs; the related influencing associations are different; and perhaps, most importantly, each market perceives themselves to be different. For these reasons, we focus our marketing efforts accordingly.

The following key segments are common to both markets:

- *Legislative/Executive Administrative Segment*
Manager: Marilyn Ashley-Sack
All legislative bodies and executive offices.
- *Judicial/Public Safety Segment*
Manager: Andy Masland
Police, fire, legal council and prosecution, correction and courts.
- *General Government Segment*
Manager: Kevin Mooney
Monetary-related agencies (taxation, budgetary) and internal service (personnel, purchasing, and other internal administrative services).
- *Human Services Segment*
Manager: Barbara Adams
Public assistance and social programs, welfare, unemployment, insurance, etc.
- *Economic Programs Segment*
Manager: (Open)
Economic development, transportation, highways, motor vehicle, utility regulation, and administration and commercial sector regulation.
- *Environmental/Housing Segment*
Manager: (Open)
Natural resources, toxic waste management, housing administration, and urban planning and development.
- *Libraries Segment*
Manager: Joan Blair, EDU Marketing
Public information centers.

21.6.2 Discrete Industry Marketing

Manager: Jerry Paxton, V.P. (OGO1-1/M02, 276-8991)

21.6.2.1 Aerospace Marketing

Manager: Jeff Sands (OGO1-1/R06, 276-8268)

The highly concentrated aerospace market is one of the fastest growing and is critical to the computer industry. Almost all of the target accounts in this market are corporate in nature, characterized by revenue generated and high computer equipment consumption.

The aerospace market is venturing into such leading-edge technology as Computer Integrated Manufacturing and Artificial Intelligence. The following are the primary applications in this market.

- Mechanical Computer-Aided Design (CAD)
- Electrical CAD
- Computer Aided Software Engineering
- Manufacturing
- Real time analysis

21.6.2.2 Automotive Marketing

Manager: Al Fink (OGO1-1/R06, 276-8985)

The automotive industry is dominated by the large U.S. manufacturers. The industry has been the leader in manufacturing automation for years and continues to pioneer the way in this field and in the areas of networking techniques and quality control programs. The primary applications in this market are Computer Integrated Manufacturing, Engineering CAD, and Office equipment.

The first level of suppliers to the automotive industry represents another significant market for Digital. The applications in this market are similar to those listed above, with an additional need for Distribution Control.

21.6.2.3 Electronics Marketing

Manager (Acting): Jerry Paxton (OGO1-1/M02, 276-8990)

All of the major corporations in this market have been strong Digital customers for many years.

The electronics industry is comprised of the following segments.

- Semiconductor
- Electronics
- Electrical equipment
- Computer and business equipment
- Scientific and test equipment

The primary marketing focus is electronics, particularly the military segment, communications, components, and consumer electronics.

The scientific and test market is dominated by resellers; the marketing implementation here will be through the Channels Marketing group.

Market trends in this area are automation for manufacturing processes, the prediction of production problems, and return of manufacturing in the U.S. instead of abroad.

21.6.3 Process Industry Marketing

Manager: Robert Horne (OGO1-1/M02, 276-8501)

21.6.3.1 Chemical Industry Marketing

Manager: Doug Smith (OGO1-1/S06, 276-8971)

The chemical industry represents approximately 5 per cent of the gross National Product in the U.S. with over \$20 billion of capital expenditures in 1986. The EDP market is sized at \$2.0 billion for FY88.

Historically, Digital has competed very successfully in this market providing the most complete set of products to meet industry demands.

Currently Digital has a strong presence in the manufacturing, engineering, and R & D applications with rapidly increasing penetration into office, sales and marketing and distribution applications.

The major opportunity for Digital as a supplier is to be the first to successfully integrate process plant management with corporate administrative functions. The goals of this integration are to improve quality and scheduling, reduce costs, and to capture processing knowledge using expert systems.

21.6.3.2 Oil and Gas Industry Marketing

Manager: Joe Lombardo (OGO1-1/S06, 276-9418)

The U.S. Oil and Gas Industry was a \$570 billion business in 1985 and the Industry spent over \$1.5 billion for computer products and service during the same period.

The recent drop in the price of crude oil has caused major cutbacks in spending, the imposition of tighter controls, and reductions in management and the workforce, primarily in the area of oil exploration.

The emphasis now is toward higher profitability, particularly in the refining, marketing, and distribution of product processes.

Digital is in an excellent position to gain significant market share in these areas based on the following.

- An outstanding reputation in the area of oil explorations.
- Networking capabilities to handle distribution applications.
- Strong position in process control (for refining applications).
- Good relationship with engineering/scientific community.

21.6.3.3 Food and Beverage Industry Marketing

Manager: Larry Greene (OGO1-1/S06, 276-8563)

The Food and Beverage Process Industry is the largest manufacturing industry in the U.S. It is concentrated into 155 firms, each with revenues over \$400 million, that control 73% of the industry. In these firms, our target accounts, external computer expenditures are rapidly increasing, from \$2.06 billion in FY87 to an estimated \$4.27 billion in FY92. This is a growth rate of 15.7% annually (versus the process industry average of 9-10%).

The leaders in this industry are using information technology as a competitive weapon. Accurate and timely analysis of the rapidly changing consumer marketplace for marketing and sales, automated manufacturing, and optimized logistics are emerging as significant areas for the exploitation of information technology. There are important linkages between R&D and manufacturing (quality control lab), and marketing (new products). Industry executives are beginning to understand the value of this type of integrated information and are looking to vendors to supply solutions.

IBM has been the dominant supplier for decades and holds an estimated 70% market share. However, food and beverage companies are actively seeking a second preferred supplier of computer solutions. This industry is moving away from internal development of computer applications. They expect their vendors to provide total solutions and support with proven technologies that deliver business results.

Digital is well positioned to be a significant player in the food and beverage industry. We have strong product offerings in CIM, Engineering, Laboratory and Office Automation. Digital is the leader in networks and integration technology which are necessary to address the emerging areas of marketing and logistics applications. Additionally, we are starting to see positive results in the food and beverage DNA accounts.

In short, trends in this industry match Digital strengths:

- A growing understanding the information and its management is a competitive weapon; and application of that understanding in non-traditional computing departments such and marketing and logistics.
- A trend toward decentralization of computing out of central MIS areas in to local area centers and eventually to individual local plants or sales offices. Consequently there is a need to link together existing and future computing centers.
- A trend toward integrating "islands of computing."
- A move in the industry to 2-3 preferred vendors.

21.6.3.4 Health Care Industry Marketing

Manager: Dick Corley (MRO3-2H/07, 297-2310)

The Health Care Industry generates over \$525 billion in annual revenue representing approximately 11 per cent of the U.S. GNP.

New reimbursement regulations, advances in technology, and social demands have created a dynamic restructuring of today's Health Care Industry.

The rapid pace of consolidation of both suppliers and vendors continues as the industry responds favorably to the challenge of cost containment with new methods of health care delivery and financing, the development of competitive marketing programs, and an affirmation towards health care informations systems as a prime objective of efficient business management.

The health care industry can be characterized in the five following segments.

- Hospitals
- Health maintenance organizations
- Outpatient care facilities
- Medical services provided to health care delivery
- Long term care

The application solutions demanded by the Industry include:

- Interdepartmental and generic applications
- Enterprise wide integration (networking and services)
- Financial/Administrative
- Patient Care/Clinical systems

The primary application in the Hospitals and HMO market is automation, specifically in regards to the following.

- Administration

- Patient care
- Research
- Diagnostic and monitoring

21.6.3.5 Pharmaceutical Marketing

Manager: Fred Wilhelm (MRO3-2/H7, 297-6733)

This market includes the following segments.

- Biological products
- Medicinal chemicals
- Medical chemicals
- Botanical products
- Pharmaceutical preparations
- Medical supplies

The primary marketing focus is on the drug and biological segments as they have the highest concentration and greatest potential for revenue and growth.

The pharmaceutical industry's needs include the following.

- Automation of manufacturing for cost benefits and quality control
- Faster new drug applications processes
- Ability to tie into the FDA computers
- Streamlining of marketing functions (call reporting, post marketing drug interaction surveillance, collection of claim information)

Digital's market position in the pharmaceutical industry is extremely strong, due to our research and development efforts and our excellent reputation and experience in the process control industries.

21.7 CHANNELS MARKETING GROUP (CMG)

Manager: Jack MacKeen, V.P. (UPO2-4, 296-4500)

CMG's Mission is to lead Digital in the Development of Worldwide Channel Relationships, while enhancing end user customer satisfaction and contributing to corporate profitability and market share goals.

Specific Channels Marketing Group Responsibilities are:

- Develop Worldwide All Channels Strategy for Digital
- Develop, Drive and Gain Support from all functions within Digital for an All Channels Strategy (Direct and Indirect) for Digital, including the respective strategic policies, Ts + Cs, practices, support including recruiting and account development, and training to implement the All Channels Strategy in the Field.
- Support integrated All Channels Industry Marketing Plans by managing Digital's Marketing efforts necessary to sell WITH, TO and THRU CSOs. A CSO is a Third Party Complementary Solutions Organization that provides an application, hardware or software, when used with or sold with Digital's products provides a complete solution to meet market requirements. Today's CSOs include Original Equipment Manufacturers (OEMs), Authorized Distributors (ADs), Cooperative Marketing Program Participants (CMPs & SCMPs), Distributor Affiliated OEMs (DAOs), and Digital Distributed Software Vendors (DDS).

- Develop and execute an aggressive and comprehensive Strategy for White Space Markets. The White Space represents indirect end user accounts. Today, these establishments are primarily served by Digital's OEMs and Authorized Distributors.
- Increase Customer Satisfaction Regardless of the Channel which delivered the solution or service.

CMG is structured as follows to support CMG objectives:

- *Direct Channels Group (DCG)*
Manager: Eli Lipcon, V.P. (UPO2-4, 296-4557)

DCG supports Digital's Direct Sales Force through programs concentrating on the Green Space End User markets. Green Space is Digital-Managed Markets, whose primary Sales Channels to end users is Digital's Direct Sales Forces, and System Cooperative Marketing Program Participants (SCMPs) and Cooperative Marketing Program Participants (CMPs) selling total product solutions with Digital.

- *Indirect Channels Group (ICG)*
Manager: John O'Keefe (UPO2-4, 296-4480)

ICG is responsible for developing and executing a comprehensive strategy and marketing support programs for CSOs in Non-Digital Managed Accounts in the White Space End User Markets. The White Space Strategy also includes development of an integrated Plan with Other Digital Functions (e.g. Field Service, Software Services, PSG, Sales) to maximize the revenue potential for these accounts and CSO recruitment.

- *Market Development Group (MDG)*
Manager: Dick Heaton (UPO2-4, 296-4443)

MDG links CMG with Digital's Industry and Application Marketing Groups by aggressively supporting integrated planning teams and recruiting identified targeted CSOs. It also includes the Complementary Equipment Manufacturer Group (CEMs). Complement the Product Marketing Group Plans and Supports sales of Digital products, thru development and implementation of a CEM plan. CEMs sell bundled, turnkey solutions consisting of application software and industry related equipment. Digital computers, typically embedded in the CEM's product, are dedicated to the support of the complementary product.

- *Area Marketing Group (AMG)*
Acting Manager: John O'Keefe (UPO2-4, 296-4480)

AMG is the CMG focal point for integrating and communicating CMG Strategies and programs to the Volume Areas. Responsible for developing Area Specific Marketing Plans and area training.

- *Systems Marketing Group (SMG)*
Manager: Dan Riordan (MKO1-2/D12, 264-8097)

SMG provides the CSO to Digital product interface, encourages Digital to plan develop products to meet the needs of CSOs. Also provides training and technical support.

- *Marketing Service Group (MSG)*
Manager: Joe Arayas (UPO2-4, 296-4265)

MSG promotes the All Channels Strategy through CMG Strategic Planning, Competitive Strategy, Policy Development, Decision Support and Marketing Communications functions.

- *Finance and Administration (F&A)*
Manager: Bob Cohen (UPO2-4, 296-4411)

- *Human Resources Manager (HR)*
Manager: Steve Wentzell (UPO2-4, 296-4387)

- *Key Linkages To CMG:*
 - U.S. Volume Sales
Jay Atlas (UPO1-5, 296-4248)

- *U.S. Volume Sales Operations*
Ray Wilkes (MRO3-3/U13, 297-7905)
- *European Channels*
Toni Steiner (GEC 107H, 822-2353)
- *GIA Channels*
Gunter Lenhoff (AKO1-1/B11, 244-7540)
- *Law Department*
Dan Bernstein (MRO2-1/D7, 297-6604)

21.8 SOFTWARE SERVICES/EDUCATIONAL SERVICES/CSS

Manager: Don Busiek, V.P. (OGO1-2/X08, 276-9470)

21.8.1 Software Services

Manager: Don Busiek, V.P. (OGO1-2/X08, 276-9470)

Software Services (SWS), Digital's worldwide field organization, focuses on the implementation of complete solutions for customer business needs. SWS provides customers with a wide range of software and services. These services include applications and customizing services and resources that SWS has developed and continually refines with the benefit of direct customer interaction in the field.

SWS complements Digital's customer satisfaction goals, marketing, and selling strategies by accomplishing the following.

- Applying SWS products and services in combination with Digital's standard computing products to deliver the complete solution a customer needs for their situation.
- Providing key competitive differentiation from Digital's rivals through high quality, and widely-available products and services.
- Delivering business performance consistent with Digital's financial goals.

SWS's worldwide delivery structure encompasses the following.

- Field offices throughout the U.S., Europe, and GIA
- Computer Services Centers
- Application Centers for Technology (ACTs)
- Appropriate central support resources

SWS's major services and products include the following.

- *Advisory Services* offers pre-sales technical support to the sales force. Advisory consulting services, like network services and other management advisory service packages, are included.
- *Professional Software Services* offers consulting services delivered through local offices and Field Application Centers, including software consulting (short-term or resident), and application projects/project management.
- *Software Products Group* (SPG) encompasses: Application products, developed by Digital, as well as from third parties via the DCS and DDS programs; "H-Kits" (software media and documentation); Add-on software; and Add-on documentation.
- *Computer Services* provides time-sharing, with associated services, for local sales support and customer use. These services are particularly effective for pre-delivery conversion services.

- *Software Product and System Services* offers software support encompassing software updates, telephone support, and computer-aided services. These services are delivered by Field Services so that customers have one post-sale contact for remedial services.
- *Software Services Software Engineering* develops application products for Digital, Engineering application tools, productivity aides and business tools for the Professional Services business of Software Services. In addition, the group is responsible for the transfer of new technologies and advanced development opportunities into the organization. The group is also responsible for the interface to Central Engineering and to Software Manufacturing.

21.8.2 Educational Services

Manager: Pat Cataldo V.P. (BUO/E17, 249-4200)

Educational Services provides one of the most extensive and varied educational programs of any computer manufacturer in the industry. As an organization we offer a worldwide network of training, publishing, documentation, information management and communication services.

Through more than 120 training locations throughout the United States, Europe and G.I.A., we teach both Digital customers and employees how to use the software and hardware Digital sells. We use a variety of training formats including lecture/lab, seminars, self-paced instruction, computer-based interactive video and private satellite communication.

We work with engineering, product business units, marketing, and field organizations on the content that goes into our course materials and documentation.

In addition to training our customers and employees, Educational Services also provides a full trange of communications services from writing and illustrating hardware and software documentation to producing videotapes of successful customer installations for the sales force. We can support the development of communications messages in every media from compact disk and microfiche to our four-color brochure, videotex, and computer-generated image. We can also provide this support at any, or every, stage of the development of a communications product.

We also produce technical books and publish under the name of DIGITAL PRESS.

EDUCATIONAL SERVICES—WHO'S WHO

- *Manager*
Pat Cataldo V.P. (249-4200, @BUO)
- *Customer Training*
Tim Walsh (249-1847, @BUO)
- *U.S. Area Training*
Joe Fabrizio (249-4213, @BUO)
- *Customer Support Programs/Quality Assurance*
Jim Malanson (249-1455, @BUO)
- *European Area Training*
Hermann Binder (893-3434, @OUO)
- *GIA Area Training*
Roger Blomgren (244-6780, @AKO)
- *Digital Press*
John Osborn (249-4435, @BUO)
- *CSO Sales Training*
Karl Soderquist (264-7513, @MKO)
- *Business Fellowship*
Chet Bowles (291-8316, @DLB)

- *Field Service Training*
Charles Tharp (283-7600, @FPO)
- *Office Applications Training*
Susan George (223-2746, @PKO)
- *Sales and Software Services Training*
Cecil Dye (276-9911, @OGO)
- *Management Training*
Roy Steele (249-4716, @BUO)
- *Digital Information Services Training*
Drew Boyd (283-6210, @BUO)
- *Course Development Documentation and Production*
Joluit Vanderhooft (249-1411, @BUO)
- *Media Communications Group*
Don Elias (249-1593, @BUO)
- *Quality Assurance/Survey Group*
Jim Malanson (249-1455, @BUO)

21.8.2.1 Corporate Marketing

Manager: Tim Walsh (BUO/E09, 249-1847)

To ensure customers achieve optimum productivity from Digital's systems and solutions, Educational Services' Corporate Marketing Group works closely with Engineering, Product Application/Industry Marketing and customers to design and market innovative training programs.

Educational Services currently offers more than 600 courses in a variety of delivery formats such as lecture/lab, self-paced instruction, computer-based interactive video and seminars, and via our private satellite communication, the Digital Video Network (DVN).

Course topics range from the basics of computing, VMS, ULTRIX, data management, networking, and maintenance training to MIS management and artificial intelligence training. Our Complementary Solutions Organizations (CSO) Sales Training organization provides product, marketing, and sales skills courses to Digital's distributors (i.e., OEMs, CMPs, and Independent Software Vendors (ISVs)).

If you are in the design stages of a new product and/or are acquiring a new product from a third party vendor to be sold to customers, you should contact the following Educational Services' Product Marketing Managers to help you determine the appropriate customer training solutions.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Digital Software Products (VMS, ULTRIX, DECNET, DECwindows, MIS, etc.)	Jim Stewart	BUO/E10	249-4301	@BUO
3rd Party Software and Applications	Bob Mjos	BUO/E10	249-4205	@BUO
Hardware Maintenance Training	Brian O'Hern	BUO/E10	249-4724	@BUO
Educational Services Customer Visits	Peg O'Brien	BUO/E65	249-4501	@BUO

21.8.2.2 Digital Press

Manager: John Osborn (BUO/E94, 249-4435)

Digital Press, Digital's international computer book publisher, which produces and markets books designed to meet the needs of professionals in business, government and education. Digital Press titles are authored by experts from industry and academia as well as Company consultants and engineers. Subject matter ranges from new technologies to strategic products of particular interest to employees and customers. Digital Press authors receive royalties under an industry standard publishing agreement. Recent best-selling titles include "KERMIT" by Frank daCruz of Columbia University, "COMMON LISP" by Guy Steele of Thinking Machines, and "VAX/VMS Internals and Data Structures: Version 4" by Ruth Goldenberg of Digital.

The Press also collaborates with organizations inside Digital to package Corporate publications for distribution to academic and other professional audiences. Recent examples include the "Digital Technical Journal", technical handbooks, the "Digital Dictionary" and the "VAX Architecture Reference Manual".

Digital Press sells its products directly to technical and college bookstores, libraries and book clubs, as well as to Digital customers through normal Company channels. Digital Press titles are distributed in Europe, Africa, and the Middle East by John Wiley and Sons, Ltd.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Digital Press Publications	John Osborn	BUO/E94	249-4435	@BUO
Senior Editor	George Horesta	BUO/E94	249-4227	@BUO
Executive Editor	Mike Meehan	BUO/E94	249-4809	@BUO
Sales & Marketing Manager	Will Buddenhagen	BUO/E94	249-1498	@BUO
Production Manager	Chase Duffy	BUO/E94	249-1427	@BUO

21.8.2.3 Corporate Marketing—CSO Training

Manager: Karl Soderquist (MKO1-1/J14, 264-7513, @MKO)

Complementary Solutions Organization (CSO) training, provides a comprehensive curriculum of training to third party companies on a worldwide basis. The primary role of the CSO training organization is to support Product Marketing, Industry and Channels Marketing organizations with training programs that increase Digital product knowledge to those organizations that:

- Re-sell our products
- Develop applications for general sale on Digital's platform
- Work in partnership relationship in providing total solutions
- Distribute Digital products through resellers

The courses offered by and through this organization include:

- The same selling skill courses offered to Digital sales
- Custom product sales training
- Custom support training on Digital products and services

These courses are available through a variety of delivery formats such as self-paced instruction in multiple media, seminars, and on-sites.

A catalog is published twice a year describing course schedules, locations, course descriptions, price, ordering procedures and registration.

Further information may be obtained by contacting;

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Curriculum	Karl Soderquist	MKO1-1/J14	264-7513	@MKO
Development	Pam Turner	MKO1-1/J14	264-1875	@MKO
Registration	Irene Chevalier	BUO/E58	249-4072	@BUO

21.8.2.4 The Digital Business Fellowship Program

Manager: Chet Bowles (DLB5-1/E5, 291-8316)

Digital Equipment Corporation's Business Fellowship Program is a highly innovative and challenging educational program unmatched in the industry to date. Organized around three programs, the program provides critical, strategic information in an intense, multi-media learning environment. The goal of the program is to make the participants aware about issues, realities and potential information technology so they can make more informed decisions on the issues that affect their business: Competitiveness, Benefits/Costs, Productivity and Technology Trends.

The Digital Business Fellowship Program consists of three programs: The Executive Program, the Artificial Intelligence Program and the Networking Program.

The Executive Program is designed for CEO's, Presidents, CIO's and Executive Vice Presidents who are directly responsible for making strategic and tactical decisions within their division of responsibility. Designed to last two and one-half days, this Program provides participants with an overview of these advanced technologies, specifically Artificial Intelligence and Networking, and effective strategies to use those technologies in the pursuit of their corporate business goals.

The Artificial Intelligence Program is geared toward applying this technology to solving main-stream business problems. The program consists of nine weeks of formal classroom and lab followed by a four-month apprenticeship. The goal of this program is to enable customers to share Digital's unique Artificial Intelligence (AI) experience and start them off to becoming self-sufficient in AI. This will be accomplished in part by focusing attention on primary business tasks to find practical ways to build working prototypes. This program is intended for selected individuals who are viewed by their company as providing technical leadership in applying the AI technology to meet business goals.

The Networking Program focuses on the business aspects of networking and the strategic advantages of information technology. This is a five-day Program presenting an objective view of networking using a wide variety of approaches including classroom lectures, numerous guest speakers and recognized industry consultants, case studies and demonstrations of networking applications, communication technology, products and services. The goal of the program is to provide participants with the knowledge and skills to make informed, strategic business decision for their organization. Additionally, the Networking Program will assist the participants in developing corporate networking strategies and employ current and emerging communication technologies and trends. This Program is intended for those managers responsible for making or influencing decisions for their company with regards to information technology.

Program participation is highly selective. A controlled evaluation process is in place to ensure that appropriate and qualified corporations and candidates are selected. The Program is conducted in the highest professional manner, in a quality setting, with the best instructors and speakers available with the latest tools and technologies. The entire Program is designed to provide an unmatched, invaluable practical experience for all participants assisting them in solving their business problems by the use of the latest technology.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Executive Program	Ellen O'Brien	DLB5-1/E5	291-8320	@DLB
Artificial Intelligence	Ajay Berman	DLB5-1/E5	291-8319	@DLB
Networking Program	Ellen O'Brien	DLB5-1/E5	291-8320	@DLB

21.8.2.5 U.S. Area Customer Training

Manager: Joe Fabrizio (BUO/E15, 249-4213)

Customer Training is a support service designed to help leverage the sale of Digital products. These services include lecture/lab training, seminars, on-sites, self-paced training products, sales support and training consultant services. We provide a comprehensive range of courses and training products. Our courses and products are all designed to help the user work more efficiently and apply Digital systems in new and more productive ways.

For more information contact your local training center or call Customer Support at DTN: 249-4373

21.8.2.6 GIA Educational Services

Manager: Roger Blomgren (AKO1-2/M5, 244-6779, @AKO)

This group, headquartered in Acton, supports the full range of training activity throughout the five GIA Regions: Canada, Far East Region, Japan, Latin America/Carribbean Region and the South Pacific Region. Area responsibilities include Customer Training, Sales Training, Internal Training, Operations, Sales Programs and Marketing. Area goals are to assist the parallel functions in each Region in meeting their business and financial goals.

GIA Educational Services acts as an interface for the five Regions with the corporation to provide product and marketing information. All types of training solutions are made available to the overseas training facilities.

Digital personnel can contact the persons listed below for information and/or assistance with Educational Services products or functions that relate to GIA Regions. (Please note that GIA responsibilities cover the Regions listed in paragraph one, and do not extend to Europe, Africa or the Middle East.)

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Customer Training	Harry Riddle	AKO1-2/G5	244-7046	@AKO
Operations	Guy Micalizzi	AKO1-2/G5	244-6785	@AKO
Internal Training	Marcia Cullinane	AKO1-2/G5	244-6791	@AKO
Sales Training	Bob Brownson	AKO1-2/G5	244-6549	@AKO
Marketing	Brian Osborne	AKO1-2/G5	244-6768	@AKO
Sales Programs	Bob Sansing	AKO1-2/G5	244-6783	@AKO
Marketing Communications	Nancy Giddens	AKO1-2/G5	244-6772	@AKO

21.8.2.7 Seminar Programs

Manager: Roger Towne (BUO/E58, 249-4937)

Digital Seminars offer the latest product and application specific information on vital issues and trends within the computer industry. The range of offerings include artificial intelligence, networking, and VAXclusters to system management and performance tuning, software version updates, software development and real-time application design which are taught by leading computer professionals from Digital and the industry at large.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Seminar Programs Information	Roger Towne Registrar	BUO/E58	249-4937 249-4949	RHODES::TOWNE

21.8.2.8 Customer Support Programs (CSP)

Manager: Jim Malanson (BUO/E20, 249-1455)

In concert with the growing success of Digital Products and Services, we have experienced an increasing size and number of large project opportunities. Our customers today not only want a technological innovator with products, services and solutions that keep them competitive, they want an educational partner who can work directly with them to train their people to solve today's problems and be prepared for tomorrow's challenges. The Customer Support Programs Group is an outgrowth of our focus on the overall Corporate Accounts Program. Linked to the Corporate Program Management Office under Jon Caputo, program management methodologies and resources have been established to manage large projects from pre-sales through delivery. Our charter is: "In support of Educational Services business within the Areas, provide project/program management services to respond to customer RFI/RFP and to establish the systems and processes to deliver unsolicited proposals to our Corporate, National and Major Accounts.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
E/S Program Management Support	Diane Bauer	BUO/E70	249-4958	FSTVAX::BAUER

21.8.2.9 Digital Management Education

Manager: Roy Steele (BUO/E02, 249-4716)

Digital Management Education (DME) utilizes several strategies to meet the management education needs of Digital's organizations and to prepare managers for current and future job responsibilities:

- *Generic Training Programs*

A core group of general courses which will meet the general development needs of Digital managers.

The DME delivery strategy provides for:

- Open enrollment crossfunctional training which means that participants enrolled are from organizations across the company.
- Onsites. Generic training which allows the customers to schedule training where and when they want.

- *Quality Assurance*

Through a proactive quality assurance process, DME has developed a customer satisfaction approach. Quality is DME's number one goal.

The QA Process is a systematic phase review approach to the design, development, and delivery of instruction. A distinguishing feature of this process is the use of an independent QA Team throughout the program development phases which encourages client participation.

- *Account Focus*

Each major organization within Digital has a DME Account Manager whose responsibility is to understand the specific needs of the business group and help develop an appropriate training/education strategy.

This ensures that DME meets the unique needs of various organizations.

The primary mission of DME is to prepare Digital managers to lead the company to achieve its business goals through high quality management training. A secondary mission is to provide skills development for individual contributors.

MAJOR ACCOUNTS	CONTACTS	MAILSTOP	DTN
Field Service, GIA	Dave Crimmin	BUO/E12	249-4590
Sales, SWS	Terry Melle	BUO/E61	249-1475
Finance, Personnel, Corporate Operations	Phil Randall	BUO/E12	249-1895
MEM	Cynthia Goza	BUO/E12	249-4078
Ed. Services/CSS	Phyllis Rappaport	BUO/E61	249-4141
Others	Louise O'Donnell	BUO/E12	249-4346

21.8.2.10 Office Applications Training

Manager: Susan George (PKO3-2/B11, 223-1676)

The mission of Office Applications Training is to provide office productivity training to support Digital's office information system strategies, products and services for external and internal customers worldwide.

To support our mission, Office Applications Training is organized into one focused organization, providing total expert office solutions in Marketing, Course Development, Consulting, Delivery and Office Productivity Training.

Office Applications Corporate Marketing is aligned with BOIS Marketing and hardware and software engineering, ensuring timely funding, and development of job-relevant, comprehensive curricula for office products.

Office Applications Curriculum Developers develop standard courses or tailor existing courseware to meet your particular requirements.

To assist you with educational planning, we are prepared to offer consulting services; developing training plans to direct you to the best training alternatives.

Our delivery organization provides Office training in the greater Maynard area as well as satellite offices throughout the United States, including New York, Michigan, California, and Atlanta.

We can also bring our training services to your site. This gives you flexibility to meet your training timeframes in a cost effective approach.

We are pleased to introduce our first office professional program for Administrative Support Professionals. This program, Office Productivity Training, (OPT), provides comprehensive training curricula for each secretarial level in Digital. The OPT Curriculum provides an overall guide to assist managers and their employees in planning training. This program is an enhancement to the job planning process, which is a collaborative effort between managers and employees.

One of the services offered through the Office Productivity Training program is Personalized Training Plans (PTP). A PTP is customized to meet specific training needs of administrative support professionals in their present position. The PTP will assist you and your manager in the selection of future OPT and Office Applications courses.

AREA	CONTACTS	MAILSTOP	DTN	NET
Marketing	Carolyn Temmallo	PKO3-1/B11	223-3298	BIGMAC::TEMMALLO
Development	Mike Christensen	PKO3-1/B11	223-4672	BIGMAC::CHRISTENSEN
Delivery	Bill Chaplin	PKO3-1/B11	223-6877	BIGMAC::CHAPLIN
U.S. Training	John Dischinger	PKO3-1/B11	223-4721	BIGMAC::DISCHINGER
Office Productivity Training	Helen Goldberg	PKO3-1/B11	223-7174	BIGMAC::GOLDBERG

21.8.2.11 Sales and Software Training

Manager: Cecil Dye (OGO1-1/E13, 276-9911)

Sales and Software Services Training, a world-wide organization, is chartered to provide training programs and services which support the development and ongoing training needs of Sales and Software Services representatives. The organization is divided into several functional groups (Planning, Development, Delivery) that work to support the training needs of Sales and Software Services.

The Planning group serves the initial point of contact for all training requests and maintains a close link with Sales, Software, and Marketing to "assess" and "plan" training programs that cover a variety of selling related skills, i.e., consulting, technical, and account management.

The Development organization maintains a staff of professional developers who develop courseware in a variety of formats (traditional lecture lab as well as seminars, workshops, DVN, and self-paced packages) based on delivery, cost, and time constraints. In addition to traditional development activity, the organization publishes a monthly audio cassette journal that covers a wide range of topics for its subscribers world wide.

The Delivery group (segmented by headquarters and field functions) is positioned to deliver training programs using the same variety of formats that the Development group employs.

Our catalogs are published twice a year and include curriculum maps, course descriptions, listings of training center locations, and registration information for each course.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Planning Sales	Lou Swinand	OGO1-1/H13	276-9184	
Sales SWS	Bruce Byrne	PKO3-2/K79	223-9262	
GIA Sales Training	Bob Brownson	AKO1-2/G5	244-6549	
Tactical Programs	Sue Everson	OGO1-1/H11	276-9718	CSTVAX
Strategic Programs	Bob Powell	OGO1-1/J11	276-8655	CSTVAX
U.S. Field Operations	Vicki Rose	QLO	264-7202	
New Hire Sales Training	Bristow Watson	QLO	264-7101	
Development	Tom Yocom	BYO2	245-5332	WIZDOM

21.8.2.12 Field Service Training

Manager: Charles Tharp (BUO/EO3, 249-4202)

Field Service Training is committed to supporting the total spectrum of Digital's products and systems by providing up-to-date training and consultancy. The FS Training Curricula includes both hardware and software courses; networks and cluster training; and business applications and skills training.

In the United States, lecture/lab training is offered at the four major Employee Training Centers: Bedford, Atlanta, Colorado Springs and Santa Clara. The Field Training Centers schedule Lecture/Lab training on a limited basis and on-site training is also available as requested.

The Field Training Centers, located in each US area, offer area specific courses in IVIS and SPI format. Each area has a dedicated FS Training Manager who, with the help of his/her staff, responds to the area needs and assists the area organizations in their training planning process.

A formal process and curricula has been developed to assist the Field Service organization with individual curriculum planning and FS Training is currently developing an automated system to be used as a personal training planning tool by FS Unit Managers.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
FS Training Manager	Charles Tharp	FPO-1/A12	283-7600	@FPO
Eastern Zone Training Manager	John Burns	FPO-1/A10	283-6203	@FPO
Western Zone Training Manager	Ray Carrado	CXO3-2/C12	522-3733	@CXO
U.S. Non-Technical Training Programs	George Cann	FPO-1/A10	283-7602	@FPO
Development	Charlie Eicher	OGO-2/E13	276-9751	@OGO
Central Registration: (Lecture/Lab)	Bedford		249-4660	
	Atlanta		435-2359	
	Colorado Springs		522-4429	
Field (FTC) Registration	Area Registrars	FTCs		see EE-Course Schedule or FS Training Catalog

21.8.2.13 Digital Information Systems Training

Manager: Drew Boyd (FPO/A16, 283-6210)

The courses offered by the D.I.S. Training Organization include software product training on tools and methodologies, human resource and management training. These courses are focused on meeting the training and development needs of the information management organizations within Digital, as well as the software product training and development needs of Digital's engineering and manufacturing organizations.

The D.I.S. Training course catalog and course schedule are published twice a year. Courses are offered in Bedford or can be arranged to be offered on-site and all D.I.S. Training classes are open and available to all Digital employees who meet the respective course prerequisites.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
D.I.S. Training	Linda Bell	BUO/E10	249-4960	FORCE::BELL

21.8.2.14 Development and Publishing

Manager: Joluit Vanderhooft (BUO/E73, 249-1411, RHODES::VANDERHOOFT)

Development and Publishing is an internal Digital service organization available to work with you to solve your information needs from conception to delivery by providing a total range of documentation, course development, publishing and information management solutions. Our products and services are designed to cover a wide range of applications such as consulting, general education, technical training development, documentation, software help systems and information retrieval to assist you in meeting your communications requirements.

The Development and Publishing organization is linked with Engineering groups to provide the level of assistance appropriate to your communication needs. Our resources are located in Burlington, Colorado, Europe, Japan, Littleton, Hudson, Marlboro, Maynard, Merrimack, Seattle, Shrewsbury, Spitbrook Road, and Ten Tara Boulevard. We will assemble a special design team for each project to cover the full range of your needs.

Course Development

As course developers, we design and develop sound learning systems tailored to your requirements. We build training programs using any one of many information channels, including lecture/lab, audio, video, Computer-Based Instruction (CBI), Interactive Video Information Systems, printed material, and on-line documentation.

Services

As consultants, we will work with you to determine what services are best suited to meet your needs. Development and Publishing Training Services coordinates with you to assess information requirements to adapt the most appropriate communication vehicle to accomplish your objectives. We can provide task analysis, instructional design, course development, as well as consulting and applications development services for the Compact Disk Read-Only Memory (CDROM).

Documentation

The Development and Publishing group is one of the major providers of documentation for Digital's products and services. Documentation is produced for employees, end-users, customers, OEMs, and service personnel both technical and business related. This documentation includes, but is not limited to, a wide variety of product service related documents, such as illustrated parts breakdown (IPB's), pocket service guides, installation, fault isolation, troubleshooting, Field Change Orders, FRU-inserts and many more. We also produce a wide variety of end-user related documents, such as user, owner's, system reference, customer installation, and other operating manuals relating to Digital businesses such as: Process and Procedure manuals, Policy Documents, How-To Books, Organizational Guides, etc.

Production

We will service your production requirements from start to finish by providing writing, editing, illustrating, typesetting, page make-up, and printing. Our artists can convey your ideas in many forms including, but not limited to, technical illustrations, graphic design, cartoons, posters, logo designs, overheads, and 35mm slides. Editors work with your words on-line or in hard copy to ensure proper spelling, punctuation, grammar, consistency, clarity, and impact.

Documentation Contacts

SUBJECT	CONTACTS	MAILSTOP	DTN	NET
Corporate Documentation Manager	Mike Moffa	BUO/E19	249-4214	EXIT26::MOFFA
Applications	Jerry Pierce	ZK01-3/E11	381-1075	SUPER::PIERCE
Chips, Boards & Systems	Bob Johnson	PK03-2/H31	223-7421	PNEUMA::JOHNSON
Clusters	Al Lachance	MRO2-2/D14	297-4156	MRED::LACHANCE
Communications	Emilie Schmidt	FPO/A4	283-7463	PARROT::SCHMIDT
High Performance Systems	Al Lachance	MRO2-2/D14	297-4156	MRED::LACHANCE
Languages	Jerry Pierce	ZK01-3/E11	381-1075	SUPER::PIERCE
Low End Systems (PKO)	Susan Fields Tamker	PK03-2/H31	223-7197	PNEUMA::FIELDS
Marketing	Peter Browne	TTB1-5/E08	264-2777	WAGON::BROWNE
Mid Range Systems	Al Lachance	TTB1-5/E08	264-2802	WAGON::LACHANCE

SUBJECT	CONTACTS	MAILSTOP	DTN	NET
Networks	Emilie Schmidt	FPO/A4	283-7463	PARROT::SCHMIDT
PC's	Jack Jurras	PKO3-2/H31	223-4251	PNEUMA::JURRAS
PDP11 Operating System	Paul Kent	ZKO1-3/D40	381-1105	SUPER::KENT
Software	Arline Stith	PKO3-2/H31	223-2316	PNEUMA::STITH
Storage Systems (West)	Ron Brown	CXO3-2/C12	522-2884	CLOSUS::RBROWN
Storage Systems (East)	Jerry Kasten	SHR1-4/D21	237-3642	GRAMPS::KASTEN
Terminals	Jack Jurras	PKO3-2/H31	223-4251	PNEUMA::JURRAS
Ultrix/Unix	Paul Kent	ZKO1-3/D40	381-1105	SUPER::KENT
VMS	Paul Kent	ZKO1-3/D40	381-1105	SUPER::KENT
Workstations	Dan Hiller	MRO2-2/D14	297-6731	MRED::HILLER
European	Graham Ward	RGM-A1/G1	830-3040	RDGENG::WARD
Documentation Manager Maynard/Stow/Hudson	Bonnie Samet	PKO3-2/H31	223-7718	PNEUMA::SAMET

Course Development Contacts

AREA	CONTACTS	MAILSTOP	DTN	NET
Course Development Manager	Pat Weger	FPO-1/A6	283-6356	CYCLPS::WEGER
Bedford	Bob Hymes	BUO/E19	249-1499	EXIT26::HYMES
Burlington	George Cope	FPO-1/A6	283-7654	CYCLPS::COPE
Colorado	Dick Stone	CXO3-2/C12	522-2352	CLOSUS::STONE
Europe	Graham Ward	RGM-A1/GA	830-3040	RDGENG::WARD
Hudson	Bob Johnson	PKO3-2/H31	223-7421	PNEUMA::JOHNSON
Japan	Yoshiko Owaga	TKO	81-3-989-7183	TKOV01::OWAGA
Marlboro	Dave Killelea	MRO2-2/D14	297-5057	MRED::KILLELEA
Maynard	George Gardner	PKO3-2/H31	223-7422	PNEUMA::GARDNER
Merrimack	Lou Gobeille	MKO1-2/M26	264-6965	LAUREL::GOBEILLE
Nashua	Alan Friedman	ZKO1-3/E11	381-1080	SUPER::FRIEDMAN
Seattle	Lee Joseph	ZSO	206-865-8739	DECWET::JOSEPH
Shrewsbury	Jerry Kasten	SHR1-4/D21	237-3642	GRAMPS::KASTEN
Stow	George Gardner	PKO3-2/H31	223-7422	PNEUMA::GARDNER

Editing, Illustrating, and Publishing Contacts

AREA	CONTACTS	MAILSTOP	DTN	NET
Publishing Manager	Martin Kelmanson	TTB1-5/E08	264-3286	WAGON::KELMANSON
Colorado	Dick Stone	CX03-2/C12	522-2352	CLOSUS::STONE
Europe	Graham Ward	RGM-A1/G1	830-3040	RDGENG::WARD
Littleton	Steve Cordeiro	LJO-2/I11	226-2292	RAINBO::CORDEIRO
Marlboro	Tom Benfey	MRO2-2/D14	297-2232	MRED::BENFEY
Maynard	John Ridgley	PKO3-2/T12	223-2384	PNEUMA::RIDGLEY
Merrimack	Peg Hurd	MKO1-2/M26	264-7230	LAUREL::HURD
Nashua	Tom Benfey	TTB1-5/E08	264-2599	WAGON::BENFEY
Shrewsbury	Jerry Kasten	SHR1-4/D21	237-3642	GRAMPS::KASTEN
Stow	John Ridgley	PKO3-2/T12	223-2384	PNEUMA::RIDGLEY

Instructional Design and Consulting Contacts

AREA	CONTACTS	MAILSTOP	DTN	NET
Services Manager	Bob Hymes	BUO/E19	249-1499	EXIT26::HYMES
Burlington	George Cope	FPO/A4	283-7654	CYCLPS::COPE
Colorado	Ron Brown	CX03-2/C12	T22-2884	CLOSUS::RBROWN
Marlboro	Reza Sisakhti	MRO2-2/D14	297-5972	MRED::SISAKHTI
Maynard	Kyu Sun Rhee	PKO3-2/H31	223-5793	PNEUMA::RHEE
Nashua	Reza Sisakhti	ZKO1-3/E11	381-1054	HARDY::SISAKHTI

CDROM Services Contacts

CONTACTS	MAILSTOP	DTN	NET
Kathy Jamieson	ZKO1-3/E11	381-1638	HARDY::JAMIESON

21.8.2.15 Media Communications Group (MCG)

Manager: Don Elias (BUO/E17, 249-1593, EXIT26::ELIAS)

The Media Communications Group (MCG) is a full-service communications organization specializing in working with internal clients to design, develop and produce the right messages for the right audiences. We work with a comprehensive range of distribution media from print and computer-generated images to satellite broadcasting and multi-media presentations. Our job is to apply our talents to your communications needs in such a way that your organization will succeed.

Under the MCG umbrella are the Media Design and Development Group, Media and Publishing Production Group, Digital Video Network (DVN), Micromedia, Systems Integration and Engineering Group and Media Archiving/Duplication and Distribution.

Our major locations are in Bedford, Maynard and Marlboro, Massachusetts, Merrimack, New Hampshire, Colorado Springs, Colorado, Atlanta, Georgia and Reading, England.

Media Communications Design and Development

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Media Design and Development	S. Moloney	MKO1-2/N25	264-3299	HYSTER::MOLONEY
Media Development	J. Thompson	MKO1-2/N25	264-6540	HYSTER::THOMPSON
	G. Scontsas	MKO1-2/N25	264-5350	HYSTER::SCONTSAS
	I. Storey	MKO1-2/N25	264-4455	HYSTER::STOREY
	L. Reeg	MKO1-2/N25	264-6996	HYSTER::REEG
Direct Marketing	L. Johnson	MKO1-2/M26	264-8724	HYSTER::JOHNSON
Graphic Design	B. Holland	MKO1-2/N25	264-5655	HYSTER::HOLLAND
Marlboro Office	D. Pitochelli	MRO2-3/C15	297-5672	HYSTER::PITOCHELLI

Media Production Services

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Audio/Video Production and Equipment Rental	K. Maas	BUO/E47	249-4463	EXIT26::MAAS
Computer Images (Slides and Animation)	D. Harbison	BUO/E36	249-1894	EXIT26::HARBISON
Corporate Photography	P. Bailey	PKO3-2/T10	223-2022	EXIT26::BAILEY

Publishing Production Services

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Publishing Services	M. Rothberg	BUO/E35	249-4361	RAINBW::ROTHBERG
Color Prepress	A. Turi	BUO/E35	249-4539	RAINBW::TURI
Print Production	J. Riley	MKO1-2/M26	264-1763	HYSTER::RILEY

Digital Video Network

CONTACTS	MAILSTOP	DTN	NET
R. Warshawsky	BUO/E35	249-4739	EXIT26::WARSHAWSKY

Micromedia

CONTACTS	MAILSTOP	DTN	NET
J. Bourque	FPO/B5	283-6282	EXIT26::BOURQUE

Media Archives, Duplication & Distribution

CONTACTS	MAILSTOP	DTN	NET
B. Morey	MKO1-2/N25	264-6149	HYSTER::MOREY

System Integration

CONTACTS	MAILSTOP	DTN	NET
C. Ball	BUO/E35	249-4327	EXIT26::BALL

Atlanta Operation

CONTACTS	MAILSTOP	DTN	NET
T. Dresen	IPO/IPO	435-2863	TRNING::DRESEN

Colorado Springs Operation

CONTACTS	MAILSTOP	DTN	NET
R. Brown	CX03-2/C12	522-2251	CLOSUS::RBROWN

European Operations

CONTACTS	MAILSTOP	DTN	NET
G. Ward	RGM-A1/G1	7830-3041	RDGENG::WARD

21.8.2.16 Quality Assurance Group (QA)

Manager: Jim Malanson (BUO/E17, 249-1455)

The Quality Assurance Group provides information, decision support tools and consulting support to help Educational Services achieve and maintain excellence in product quality and customer satisfaction. The group applies skills in measurement and evaluation, statistics, programming, computer graphics and decision analysis to assess quality. The focus of these systems is to ensure that Educational Services is fully meeting the needs and expectations of both the employee and customer groups we service. This group also provides a Survey Support Service which is extended not only to Educational Services but all of Digital. They create and implement survey instruments to support large scale gathering of information and completing analysis to support both trend development and problem identification. A few of the annual surveys completed are:

- Corporate Personnel Satisfaction Survey
- Corporate Customer F&A Survey
- DECUS, Pre-Symposium Service Evaluation

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Quality Assurance, Survey Support	Lois Collins	BUO/E70	249-1791	RHODES::COLLINS
ESDP-QA	Connie Seidner	BUO/E70	249-1771	RHODES::SEIDNER

21.8.3 Computer Special Systems (CSS)

Manager: Russ Gullotti (NPO, 264-6209)

CSS exists worldwide to provide solutions to our customers' special computing needs. These solutions may take the form of custom designs or market-niche products that complement Digital's standard offerings either on a world-wide or geographic basis. CSS is Digital's quick response, customer driven, engineering and manufacturing organization.

CSS, primarily a hardware organization, will also design software drivers, tools, and protocols to support the hardware. CSS works with Software Services to provide customers with a total systems solution.

CSS products are either custom or standard with either world-wide, geographic area (or country specific), or customer specific focus.

Custom Products: CSS will respond to customers who have a requirement that cannot be fulfilled by an existing Digital offering. This will result in a contract to supply a unique, customer-specified product. The customer will pay non-recurring engineering fees and a per-unit price. In some cases, CSS will internally fund part or all of the engineering effort, depending on the nature of the opportunity. The resulting product, with some additional effort by CSS, may become a standard low-to-medium volume product for CSS.

Standard Products: Working with customers, PBUs, and Marketing Groups within Digital, and using the experience gained from initial sales of customer products, CSS may identify a market need for a low-to-medium volume product and choose to internally fund its development. These needs will typically arise out of a recognized gap in Digital's product offerings, or from a local requirement unique to a particular geography.

CSS expends significant effort to assure that its products respond to the needs of the geographies and are positioned in a complementary fashion with Central Engineering-developed products.

CSS uses the following parameters to determine if products should be funded for engineering development.

- Strategic fit with CSS, other groups in Digital, and geographic strategies
- Market and profit potential for CSS
- Fit with CSS skills and resources
- Technical feasibility
- Economic and business risks

To achieve these ends, CSS has its own marketing, engineering, and manufacturing organizations in business units located near customers throughout the world. In addition to four business units in the United States (including one responsible for both the Latin America/Caribbean Region and India), CSS has units in the United Kingdom, France, Germany, Canada, Australia, Hong Kong, Korea, and Japan. A volume manufacturing group is located in Nashua, New Hampshire.

An engineer should contact CSS if he or she has any of the following needs:

- A need for technical data on a CSS product.
- A need to understand more about CSS Engineering - strategies, procedures, opportunities.
- A need to solve a customer problem - either a problem with an existing CSS product, or a new problem requiring CSS Engineering help.

If you need help to solve a customer problem or wish to investigate product development status or strategies it is best to contact CSS Marketing. They are the CSS focus for Product Development.

SERVICE	CONTACTS	MAILSTOP	DTN	NET
Group Product Marketing Manager	Dick Scarborough	NUO/H3	264-1000	CSS::SCARBOROUGH A1 MAIL: @NUO
Peripherals and Graphics	Dave Chosiad	NUO/H3	264-3212	CSS::CHOSIAD A1 MAIL: @NUO
Industrial and Scientific	Jim Aitken	NUO/H3	264-3233	CSS::AITKEN A1 MAIL: @NUO
Network Systems	Bill Koester	NUO/H3	264-3239	CSS::KOESTER A1 MAIL: @NUO

Your contact regarding engineering of a CSS product varies depending on its point of design and/or manufacture. If you need more information or direction as to which engineering group to contact, call one of the following:

SERVICE	CONTACTS	MAILSTOP	DTN	NET
CSS Product Group Engineering Manager (ACTING)	Herb Grossimon	NPO	264-6318	CSS::GROSSIMON A1 MAIL: @NPO
CSS Engineering Operations Manager	Joe Kurta	NPO	264-6565	CSS::KURTA A1 MAIL: @NPO
CSS Area Engineering Managers:				
USA	Owen Fisk	NUO/A02	264-1048	CSS::FISK
GIA	Joe Smith	NUO/H10	264-6445	CSS::JSMITH
EUROPE	Andy White	MUT	865-1174	ECCGY2::WHITE

21.9 FIELD SERVICE

Manager: Dave Grainger, V.P. (OGO1-2/L11, 276-9625)

Field Service provides high-quality, accessible, cost-effective preventive and remedial maintenance services to our customers for their Digital products. The organization also supports our hardware product groups with installation and warranty services that are consistent with the marketing strategies of the product groups. As a product group itself, Field Service develops service products that help differentiate Digital products in the marketplace.

Field Service and Engineering work as business partners to develop products that offer Reliability and Maintainability Program (RAMP) features, as well as our service delivery offerings to ensure Digital's competitive edge in the marketplace.

The Field Service Management Committee is the Strategic and Operations Control body for Field Service. Following are its members:

- *Field Service Chairman*
Dave Grainger V.P. (OGO1-2/L11, 276-9625)
- *U.S. Field Service*
Don Zereski, VP (WFR1-2/C8, 268-3326)
- *GIA Field Service*
Jerry Montague, VP (AKO1-2/F8, 244-7477)

- *European Field Service*
John Barrett (GMO, 829-9200)
- CSSE
Steve Davis (OGO1-2/C17, 276-9154)
- *Business Development*
(Open)
- *Logistics*
Bob Good (DAS1-2/N17, 275-2514)
- *Business Ventures*
Bud Keating (OGO1-2/J16, 276-9634)
- *Finance*
Bob Hult (OGO1-2/L17, 276-9811)
- *Advanced Service Delivery Systems (ASDS)*
Tom Karpowski (OGO1-1/G17, 276-9637)
- *Personnel*
Joe Gaffney (OGO1-2/L11, 276-9614)
- *Legal*
Dick Smith (MSO/M6, 223-8266)
- *HQ Operations*
Orson Niederhauser (Secretary) (OGO1-2/L11, 276-9629)

21.9.1 Field Service Logistics

Manager: Bob Good (DAS1-2/N17, 275-2514)

Field Service Logistics (FSL) is a worldwide organization supporting the Field Service objective of providing high quality service to Digital customers. This objective is being supported by material distribution/repair centers (located in Andover, Massachusetts, Nijmegen, Holland, and Hong Kong), and a repair/refurbishment/new build manufacturing plant (located in Salem, New Hampshire).

The distribution/repair facilities provide the administration and physical systems for the receipt, repair, storage, and shipment of service parts worldwide.

The manufacturing facilities provide product retrofit, conversion, and refurbishment capabilities; repaired and end-of-life service parts; and new build diagnostic equipment.

Field Service Logistics is connected to other corporate groups such as Distribution, Engineering, and Materials working in partnership with them to advance Field Service Logistics goals in the areas of Level of Service, Repair Technology, and Inventory Management.

21.9.2 Field Service Business Development

Manager: Open (OGO1-2/L11, 276-9630)

The Business Development Group (BDG) assists FSMC in establishing and communicating business direction, policy, business practices, and strategies, ensuring geographic consistency where appropriate. The group also represents Corporate Field Service at various forums/ committees/taskforces.

- *Headquarters Operations*
Manager: Orson Niederhauser (OGO1-2/L11, 276-9629)

The group manages development and ongoing application of the FS Management Operating System (FSMOS). FSMOS provides a common working mechanism for the FS Strategic and Operational Planning Process and assures it is dynamic and flexible, provides for ease of integration between the individual groups, and is manageable. It also provides HQ operations support to FSBDG.

- *Strategic Marketing*
Manager: Will O'Brien (OGO1-2/M13, 276-9626)

The Strategic Marketing Group is responsible for:

- Increasing awareness of Field Service capabilities both internally and in the marketplace.
- Ensuring consistency of service messages across all product families and geographies by working through CSSE with Base Product Marketing and with Geography Marketing.
- Providing strategic marketing leadership for Field Service to achieve Worldwide Strategic Market Share Goals (HPS & SPS).

- *Software Product Services*
Manager: Rich Maxwell (OGO1-2/M13, 276-8996)

The Software Product Services (SPS) Business Management Group provides leadership for FS/SPS worldwide programs so that Field Service goals of customer satisfaction and profitability are achieved. Specifically, they manage to achieve:

- One worldwide SPS Portfolio and a consistent Software Warranty Program.
- Consistent worldwide SPS Pricing and Business Policies.
- Identification and introduction of new SPS businesses.
- Coordinated SPS Service Delivery Strategies.
- High quality worldwide SPS LRP and BOD.
- SPS leadership on all strategic Corporate committees.

- *Self-Maintenance Services*
Manager: Dave Starratt (WFR1/B9, 268-3262)

The Self-Maintenance Services (SMS) Business Management Group is chartered to integrate all of Digital's self-maintenance and environmental products into a quality service offering. They develop and communicate the SMS strategic plans and support the implementation of those plans. Implementation of the SMS group business plan will be executed by the geographies. All SMS products and services are positioned to broaden the Field Service portfolio into a one company, one strategy, service organization.

The SMS group has continued its transition of shifting the revenue management and sales support activities to the geography level. The focus of the Headquarters Organization is to develop worldwide strategic programs associated with new product introductions and support of corporate products. The new product emphasis has been directed toward the expansion of the environmental products family to include uninterruptable power systems.

21.9.3 Field Service Business Ventures Group

Manager: Bud Keating (OGO1-2/J16, 276-9634)

Business Ventures Group (BVG) designs and develops new business programs for Field Service world-wide. BVG provides strategic direction and support to the field organizations for development and implementation of these new business programs through the following key contacts:

- *Integrated Service Management*
Manager: Ed Malone (OGO1-2/J16, 276-8231)
- *Integrated Logistics Support Services*
Manager: Dick DeBoalt (OGO1-2/J16, 276-8045)
- *Integrated Administration Support Services*
Manager: Bob Macolini (OGO1-2/J16, 276-8518)
- *Service Management Consulting*
Manager: Dan Loesel (OGO1-2/J16, 276-8383)
- *Geographic Consultant*
Manager: Ralph Harmon (OGO1-2/J16, 276-9921)
- *Operations Support*
Manager: Paul Ladden (OGO1-2/J16, 276-9887)
- *Business Support*
Manager: Marty Berke (OGO1-2/J16, 276-9723)
- *Planning*
Manager: Ed Deary (OGO1-2/J16, 276-8535)

21.9.4 Customer Service Systems Engineering (CSSE)

Manager: Steve Davis (OGO1-2/C17, 276-9154)

Customer Services Systems Engineering (CSSE) has the following basic functions.

- Reliability
- Serviceability
- New Product Introduction
- Support
- Product Management/Marketing

CSSE manages the planning, development, introduction, and retirement phases of Digital's products for Customer Services.

21.9.4.1 CSSE Operations

Manager: Bob Barnard (OGO1-2/E16, 276-9914)

- Management of strategic and business planning activities.
- Ensure consistency and quality of administrative tools and services in support of CSSE Mission.
- Assist CSSE Manager with tactical operations of function.

Operations groups and their responsibilities consist of the following:

- *CSSE Process Development*
Manager: Steve Hoyt (OGO1-2/J13, 276-9236)

Responsible for development of cross-organizational processes that support Field Service programs throughout CSSE.

- New Product Planning/Pricing/Announcement
 - Phase Review Process
 - Development of requirements for Service Business Model (improved pricing model)
 - CSSE FCO process
 - CSSE Pricing Process
 - Development of a Corporate Software Security/Liability process
 - Technical Information Distribution to the Field
 - Product Safety incident investigations, worldwide and maintenance of DEC STD 132-0.
 - Management of the F.S. Library, which provides technical and engineering information support to all Stow organizations.
- *CSSE Administration*
Manager: Bob Brown (OGO1-2/J13, 276-8633)

Responsible for development and maintenance of systems and tools that provide the informational requirements to support CSSE major programs. These systems are networked for information from cross-organizational/cross-functional, and worldwide sources.

- Maintenance of Problem Management Systems (PRISM/TIME/CLD)
- Development of new Problem Management System to replace PRISM and TIME
- New Product Introduction tools
- F.S. Corporate Competitive Analysis database
- CSSE Costing Models (including documentation and training)
- Algorithm/metric development for measurement of all CSSE products
- Management of CSSE computing resources/cluster for OGO

21.9.4.2 Customer Satisfaction Group

Manager: Hank Watkins (OGO1-2/E16, 276-8115)

The CSSE Customer Satisfaction Group provides a focus to external organizations for systems (hardware and software) problem management, problem escalation, solution development and delivery processes, and technical information in support of Field Service's customer satisfaction goals.

Also provided is a program management focus for CSSE selected functions, including:

- Systems focus for Installation Quality
- Revision Management
- Technical Information
- H/W and S/W Support Processes

The following managers can help you determine if the CSSE Customer Satisfaction Group can be of assistance to you.

- *H/W and S/W Support, Revision Management*
Carl Cline (OGO1-2/E16, 276-9844)

- *Central Log Desk (Critical Customer Problems) Problem Management*
Ron Miller (OGO1-2/E16, 276-8422)
- *PRISM (H/W Problems) Problem Management*
Bruce Judson (OGO1-2/F17, 276-9232)
- *S/W Problem Management, Customer Dispatches*
Dick Waite (PKO2-1/G10, 223-9309)
- *Installation Quality, Field Service Technical Information*
Brian McKeown (OGO1-2/E16, 276-8390)

21.9.4.3 Maintainability Engineering

Maintainability Engineering is the Engineering and Manufacturing interface for Customer Services. Maintainability Engineering ensures that Digital's products can be serviced by our field organization, by working closely with manufacturing and engineering. This group also leads Customer Services' new products introduction team, coordinating efforts to ensure that the tools spares, and training are available to service a new product, and that field introduction happens smoothly. Additionally, this group manages the Field Service support of the product throughout its product life cycle.

CSSE works with the PBUs to ensure integrated goals. We have a Service Product Management function, that establishes a service product family strategy, produces service product pricing proposals, and ensures we have competitive service products.

Contact Maintainability Engineering gets involved early in Phase 0 while product requirements are first being defined. Early consideration of service requirements is critical to the economical design of a product. If you do not know the contact in Maintainability Engineering, call the appropriate manager listed below.

Systems and Clusters

Manager: Ron Howington (OGO1-2/F16, 276-9720)

- *High Performance Systems and Clusters*
John Earnshaw, (MRO1-1/S35, 297-4461)
- *Mid-Vax Systems*
Bill Freeman (VWO1-1/C05, 285-6124)
- *Decwest Coast*
Bill Hilton (ZSO)
- *Base Software Systems*
Al Legerlotz (ZKO2-1/N71, 381-2814)
- *Product Management*
Cliff Pitz (OGO1-2/F16, 276-9365)
- *Consultant Group*
Mike Robey (MRO1-1/S35, 297-5067)

Peripherals

Manager: Max Weinfuss (OGO1-2/F16, 276-9152)

- *Mid to Large Disks*
Al Snyder (CXO2-1/K97, 522-2370)
- *Low End Disks Products*
Steve Dail (NKS1-2/F4, 291-7168)
- *Data Bases Products*
Rick Ellison (OGO1-2/F4, 276-8379)

- *Memory Products*
Jean Hoxie-Wasko (SHR1-4/D16, 237-3333)
- *Storage Marketing*
(Open)
- *Operations*
(Open)
- *Tape and Optical Products*
Renee Kahlau (SHR1-4/D16, 237-3331)
- *Quality*
Dick Leonhardt (OGO1-2/F16, 276-9159)

GIA CSSE, CSS/VES/Government

Manager: John Florentine (OGO1-2/F16, 276-8056)

- *GIA*
Ralph Gilbert (EWB/F7, 207-2612)
- *Computer Special Systems*
Phil Dudziak (MKO1-2/J7, 264-7988)
- *Vendor Equipment Services/Gov't Sys/Pow. & Environment*
Lee Spector (OGO1-2/E13, 276-9757)

Network and Site Services

Manager: Bill Lahtinen, (LKG2-A/AA3, 226-7327)

- *Service Development Groups*
 - *Local Area Communications*
Dick Russell
 - *Wide Area Communications*
Bob Howell (LKG1-1/B19, 226-7461)
 - *Network Management Services*
Gail Blizzard
 - *Network Service Development*
Barbara Cochrane
- *Functional Support Groups*
 - *Network Service Product*
Al Schatzel (LKG1-1/D12, 226-7507)
 - *Networks and Communications*
Fred Larson
 - *Network Services Technology*
Mark Hald (LKG1-1/B19, 226-7449)
 - *Marketing Services*
Alan Brind

Market Applications Systems

Manager: Henry Adleman, (OGO1-2/F16, 276-9381)

- *Corporate & Office Applications*
Bill Taylor (MKO1-2/K13, 264-5938)
- *Manufacturing & Sciences Applications*
George Evans (MRO3-2/R13, 297-5479)
- *PCs and Terminals*
Bob Bills (LJ02-1/H11, 226-2277)
- *Workstations and Industry Applications*
Ron Bogue (OGO1-2/G16, 276-9743)
- *Micro and PDP-11 Systems*
Herman Millet (ML21-2/P62, 223-8632)
- *Marketing and Information Support*
Bruce Marier (OGO1-2/J13, 276-9602)
- *PC Integration Program*
Hank Spencer (LJ02-1/H11, 268-3430)

Large Systems Business Unit

Manager: Gary Blenis, (MRO1-1/S35, 297-4425)

- *Large Systems Group Manufacturing*
Tom Abel (MRO1-3/P76, 297-5145)
- *Large Systems Group Engineering*
David Braithwaite (MRO1-2/L14, 297-4400)
- *Large Systems Group Service Product Management*
Joe Holewa (MRO1-1/S35, 297-4423)
- *Large Systems Group Service Delivery Support*
Ernie Racine (MRO1-2/L14, 297-4428)

European Maintainability Engineering

Manager: Harry Fleury (REO2-G/H9, 830-3620)

- *European CSS, Terminals and Local Maintainability Engineering*
Ken Parker (REO1-G/6-1, 830-3736)
- *European Commercial Systems*
John Beecher (REO2-G/F9, 830-3630)

21.9.4.4 Reliability and Maintainability Program Office (RAMP)

Manager: John P. Shebell (OGO1-2/E13, 276-9595)

RAMP provides technical support functions and general technology liason to Customer Services and Digital's Product Development community in the following areas.

- Maintainability Engineering for "cross product" power supplies and controllers, mechanical packaging, thermal management and control systems, and physical interconnect.
- Corporate Environmental support and training for the line Service organizations for both remedial escalation and in support of the Site (planning) Services activity.
- Maintainability Engineering support and technical vendor liason for power conversion, distribution, and conditioning products.

- Base technology consulting to Customer Services on component, physical interconnect, power conversion, and process technologies; designing for environmental compatibility: and CSSE representation to the Engineering community in these domains.
- Long-range technology appraisal and planning in support of the Field Service long range planning process.
- General consulting on reliability and maintainability technologies.
- Service representation to a number of Corporate bodies including:
 - Research and Development Committee (RAD)
 - Corporate Process Task Force (CPT)
 - Corporate Research (CRA)
 - Technology Strategy Committee (TSC)
 - The Reliability Advisory Committee (RAC)
 - The Contact Physics Committee
 - Related DEC Standards bodies.

The group also facilitates dialogue among the Service, Manufacturing, and Engineering communities in areas that are technology rather than product development intensive. This includes support for a variety of Service and Engineering seminars, briefings, and task groups. In general, they are the people to call within Services when you don't know whom to call.

The following managers within RAMP can help you determine if their group can be of assistance to you.

- *Physical and Power Conversion Technologies*
Steve Zabinski (OGO1-2/E13, 276-9596)
- *Environmental Support and Site Services*
George Yacubovich (OGO1-2/E13, 276-9295)

All other functions are handled by consulting staff that reports directly to John Shebell. Richard Lang (OGO1-2/F13, 276-9600) is the Consulting Engineer responsible for the Technology Appraisal process.

21.9.5 Advanced Service Delivery Systems (ASDS)

Manager: Tom Karpowski (OGO1-1/G17, 276-9637)

Advanced Service Delivery Systems is a Field Service organization responsible for facilitating the implementation of a worldwide Digital service network and value added services to our customers. Inclusive within this objective is the definition of Field Service Business and Information Architectures, and the development and integration of our system and network tools in support of the Field Service delivery system.

- *Program Management Office*
Manager: Harold Long (OGO1-1/G17, 276-9623)
- *Architectures/Engineering Development Office*
Manager: Steve Teicher (OGO1-1/F17, 276-9901)
- *Information Management Business Architecture Office*
Manager: Ken Harris (OGO1-1/G17, 276-9901)

21.10 STRATEGY AND PLANNING

Manager: Ken Senior (OGO1-2/R12, 276-9893)

21.10.1 Management Sciences in Field Operations

Manager: John Wetmiller (OGO1-1/G13, 276-9089)

Management Science provides analytical business consulting and systems support for management decisions.

This group works proactively to provide general business and systems consulting to all of Digital in order to facilitate the development and implementation of management strategies and operational practices.

A primary goal of this group is to form business partnerships with the organizations it supports, allowing greater effectiveness in identifying and addressing key client issues and problems.

Management Sciences considers itself a Corporate resource and strives to bring a cross-functional, cross-organizational, and objective approach to its projects. All analyses, conclusions, and recommendations are based on what is best for the entire Corporation rather than any particular organization within it.

The following is a list of the groups within Management Sciences.

- *Models and Database Management*
Senior Manager: Joy Abraham (OGO1-1/G13, 276-9040)
- *Field Service*
Senior Manager: Andy Weigl (OGO1-1/G13, 276-9119)
- *Corporate Manufacturing*
Senior Manager: Eric Humphrey (OGO1-1/G13, 276-8415)
- *Sales, Services, Marketing, and International Strategy and Planning*
Senior Manager: Sally Harvey (OGO1-1/F13, 276-9095)
- *Industry Marketing, GIA Sales and Marketing, U.S. Sales, and U.S. Finance*
Senior Manager: Steve Frigand (OGO1-1/F13, 276-9067)
- *Software Services, Educational Services, Computer Special Systems, Sales Support, Product Marketing, SSMI Finance, and Communications*
Senior Manager: Bill Scott (OGO1-1/F13, 276-9097)

CHAPTER 22

COMPUTER SYSTEMS MANUFACTURING ENGINEERING AND TECHNOLOGY GROUP (CSME&T)

Manager: Bill Kent (TWO/B21, 247-2585, CSMADM::KENT)

Computer Systems Manufacturing Engineering and Technology Group (CSME&T) is a component of Computer Systems Manufacturing (CSM), and is responsible for Product Support and Enhancement and Manufacturing Process Development, Support, and Enhancement. CSME&T is composed of six Engineering Departments.

System and Support Engineering (SASE), managed by John Sofio (SASE::SOFIO), is responsible for design support from FRS through EOL, in terms of design integrity, system integrity, and VE/enhancements.

Systems Integration Engineering (SIE) is managed by Glenn Rosander (VICKI::ROSANDER). The SIE mission is to find and resolve on site product integration and installation problems, in a manner not visible to the customer, through systems verification testing.

Systems Reliability Engineering (SRE), managed by Tom Weyant (CSMSRE::WEYANT), is responsible, as a company-wide resource, for providing the means and measurements to drive and improve Digital System Reliability, and to make reliability a profitable attribute to the company and Digital's customers.

Product Information Management (PIM) is managed by Bill Moran (PARITY::MORAN). The PIM mission is to identify, define, and apply the appropriate computer technology; to optimize the way work gets done; and to deliver the process for information transformation into the product process domain, in order to ensure compliance to the Computer Integrated Enterprise (CIE) environment.

Process Development Line (PDL), managed by Dave Beveridge (PARITY::BEVERIDGE), is responsible for delivering to volume manufacturing a certified, predictable process incorporating new technologies that support the corporation's module requirements. PDL's Technical Service Organization services system manufacturing plants by supplying and supporting them with soft tools and programs and special equipment used in the assembly and testing of modules, backplanes, power supplies and subassemblies, units and systems.

Manufacturing Process and Materials Engineering managed by Rich Powers (PARITY::POWERS) provides designers and manufacturers of CSM products with integrated manufacturing processes for the transformation of material into product.

22.1 SYSTEM AND SUPPORT ENGINEERING (SASE)

Manager: John Sofio (TWO/A14, 247-2250, SASE::SOFIO)

This group has the design and system support responsibility for currently shipping CPU/systems, communication devices, and network and cluster interfaces.

Design support connotes ownership of the hardware and firmware design, the documentation and design data bases, diagnostics, etc. This support applies to modules, backplanes, power supplies, boxes and cabinet level packaging, and system configurations. The scope is CPU and related internal options (such as floating point processor and bus adapter), various communications and system interconnect products, and a limited number of storage controllers (usually those developed by a CPU design group).

SASE engineering is responsible for design maintenance of the products they own, such as supplying product-specific technical support to manufacturing and the field, problem correction/ECO generation, design and implementation of value-engineering and reliability enhancement modifications, and integration of new peripheral options into supported CPU systems. SASE may also initiate system enhancement, technology-upgrade, or "mid-life kicker" design activity where there is PBU agreement that it is appropriate from business and product-strategic standpoints.

SASE administers and operates "Problem Central," a one-stop system technical problem resolution function that is jointly managed by SASE and Customer Service Systems Engineering (CSSE). Technical problems (suspected hardware design problems) reported into Problem Central are addressed on a prioritized basis. SASE performs system level troubleshooting and fault isolation as required, the problem cause is identified, the ownership for problem resolution is assigned to the appropriate support engineering group, and the problem is tracked through fix evaluation/implementation, ending finally with root-cause analysis and loophole elimination. Where problems are found to be caused by products that are not supported directly by SASE, hand-off and liaison is established with the appropriate support group (e.g. Storage Systems Support Engineering, Software Engineering), and Problem Central continues to track the problem through resolution and corrective action. Problem Central also serves as a technical information service and an entry point for getting customer problems or special needs serviced.

SASE provides system level support for its products. A system engineering view of the product set is maintained, and hardware, software, and architectural knowledge of the product is integrated into an understanding of the system as a functional entity being used in a real-world environment to perform a customer's application. Performance, functional compatibility, migratability, and upgradability are important considerations to the system engineer.

In addition to providing problem-solving system support, the system support role also calls for technical consultation on supported products over a wide set of demands, ranging from technical support (as requested) to marketing and sales efforts, to technical explanation for users (internal and external), to DECUS sessions and customer interface, to special projects. SASE supports the various "DR"-type options, and often finds itself involved with customer support in "roll-your-own" applications of these devices in their systems.

Customer Project Support Group (CPSG) provides system design/documentation and system introduction/support program management services to marketing and sales organizations dealing with customers who purchase non-standard systems in volumes that require project treatment. Various other groups within SASE can assist with specials that do not meet CPSG's project selection criteria.

SASE becomes involved with new products as early in the design cycle as possible, with the object of providing design input based on support experience with predecessor options, learning the new product and its related CAD tools, and preparing to assume design ownership when its transfer to support engineering is appropriate. This also helps identify value-engineering and reliability enhancement opportunities.

SASE is also interested in early involvement with new system options when its system support experience can be of value in establishing product specifications and system integration characteristics, and is interested in providing a system level design critique for major new peripheral options. The VAX New Products Committee (VNPC) is managed by the SASE Program Management group, which also maintains close liaison with its counterpart MSD New Products Committee.

For each of the supported development engineering organizations (PBUs), there is a corresponding Engineering Support Unit (ESU).

- *High Performance ESU Manager*
Doug Rothenberg (MED::ROTHENBERG)
- *VAX Cluster ESU Manager*
Don Reczek (AMUCK::RECZEK)
- *Large Mid-Range ESU Manager*
Ron Nickerson (DELI::NICKERSON)
- *Small Mid-Range ESU Manager*
Howard Janke (SASE::JANKE)
- *Micro Systems ESU Manager*
John Bressler (MORGAN::BRESSLER)
- *Network & Communications ESU Manager*
John Morgan (WORDS::MORGAN)
- *Program and Problem Manager*
Angela Smith (SASE::ANGELA)
- VNPC
Yvonne Chen (SASE::CHEN)

The goals of the VAX New Product Committee are to provide a uniform method and common process for test and qualification of VAX Systems and Clusters; to provide an objective evaluation to PAC and PBU of system level test and qualification plans and results; and to improve the internal system level qualification to ensure integrity.

- *Problem Central*
Doug Myer (SASE::MYER)

SASE administers and operates "Problem Central," a technical problem resolution function that is jointly managed by SASE and Customer Services System Engineering (CSSE). Includes PMS, an automated Problem Management System for QARS.

- *Customer Project Support Group (CPSG) Manager*
John Galbraith (AURVAX::GALBRAITH)

CPSG provides system design/documentation & system introduction/support program management services to marketing and sales organizations dealing with customers who purchase non-standard systems in volumes that require project treatment. If project does not meet CPSG's project selection criteria, it is referred to appropriate organization.

- *CSSE Liaison*
Carl Cline (COIN::CLINE)

When to call:

Contact this group for technical assistance with one of its options; the "Option/Module List" indicates the responsible engineer and manager on a per-item basis. SASE must be consulted (and have approval authority) on any value-engineering and reliability enhancement plans for its products, and is interested in suggestions for such projects, either on specific products or about enabling technology developments.

Call SASE anytime there is a need for technical assistance on a system question. Performance and/or functional queries are handled. In particular, if you suspect a functional or performance system problem to be a design problem (or if it's just not clear what's happening), contact Problem Central (IMGAWN::PMS OR SASE::PMS)—DON'T DELAY, YOU DON'T HAVE TO HAVE PROOF!—we're anxious for the earliest possible awareness of potential problems.

Designers developing new CPUs and options can avail themselves of the system expertise in this group to review their new products as good system elements.

Product managers of new VAX CPUs and options MUST come to the VNPC and outline their product and program plans.

If you are looking for help with a special customer project or a non-standard system, we may be able to help. In general, various internal and customer special projects end up here when another home can't be found. SASE is oriented toward technical support that promotes customer satisfaction.

22.2 SYSTEM INTEGRATION ENGINEERING

Manager: Glenn Rosander (NIO/B18, 247-2856)

System Integration Engineering (SIE) provides a system testing service located in Salem, NH (NIO). Tests are performed on shippable, manufactured products, rather than engineering prototypes. SIE verifies that products, as designed and manufactured, are functionally correct, achieve the criteria for POM-shipment system integration, and meet customer expectations.

The SIE system testing service has four major areas of responsibility. These include three test activities and an additional site responsibility.

- **POM Verification:** Standard system packages, new systems, and new peripherals are reviewed and tested from a customer's perspective and for suitability for POM shipment. Product installation, documentation, diagnostics, as well as the functionality and installability of the products within systems, are examined and validated. This testing is performed on the entire range of Digital's product line. Testing continues on traditional products to ensure compatibility with new hardware and software releases. (POM Verification is the technical hurdle associated with qualifying a system and/or option for POM shipment. Various other quality and process control criteria must also be satisfied.)
- **Cluster Verification:** This verification encompasses the testing of large VAXClusters using fresh lot inventory from manufacturing. After Cluster Qualification (performed by engineering on prototypes and capitalized equipment), verification testing is done. This phase focuses on installation methods of the hardware and software, time to install, order completeness, and maximum configuration testing. Two large clusters are maintained in test mode. The configurations evolve to obtain homogeneous and heterogeneous mixes of various VAX processors and cluster peripheral nodes. The clusters are exercised according to test plans to achieve the best possible validation of the system functionality of the cluster.
- **Distributed Systems Verification:** Like Cluster Verification, this testing uses fresh lot inventory from manufacturing to test large distributed systems. Verification is performed after Distributed System Qualification and focuses on those areas of perceived high risk for Digital. Verification may be in terms of size, complexity, new products, or the inclusion of third party gear on Digital's Distributed Systems. This testing also focuses on time-to-install metrics, maximum configuration testing, completeness of the manufactured product, effectiveness of the order administration process, and functionality as perceived by the customer.

- System Test Technology Center Host: SIE manages the system laboratories used jointly by SIE, MSEE (Mid-Range System Evaluation Engineering), CQG (Cluster Qualification Group), and DSTEg (Distributed Systems Test Evaluation Group). SIE acts as the representative of the Technology Center to NIO plant staff, and provides specific services to the other tenant organizations, such as specialized office automation and material acquisition support.

SIE also includes three advanced development groups. These three groups research future industry direction, develop new methods, tools, and processes that enable test organizations to function effectively within the future technology environments. They also develop processes and tools to analyze, manage, and distribute test data and systems- or product-level rules and information.

22.2.1 System-Level Design Analysis Program - Systems Evaluation Engineering

Manager: Bruce Smith (MLO3-3/E67, 223-6740)

System-Level Design Analysis Program - Systems Evaluation Engineering (SLDA/SEE) is a development organization staffed with highly-skilled personnel in system/cluster test methodologies. The group is developing the System-Level Design Analyzer (SLDA), a computer-based tool aimed at early identification and analysis of system interaction problems. SLDA uses artificial intelligence and expert systems techniques to provide key system data throughout the design and manufacturing stages of a new product.

Present system test methods are capital intensive, expensive, time consuming, and test engineer knowledge-dependent. The multi-stage SLDA development program will improve system test efficiency and effectivity by putting process, priority, and method into the complex system interaction domain.

SEE also consults on state-of-the-art system testing issues, the technology of testing systems, and special testing problems.

22.2.2 Methods, Strategies, and Tools

Manager: Roland Ramponi (NIO/B18, 261-2767)

This advanced development group studies industry trends and future technology directions to determine what testing methods need to be devised to test these future computer environments. We analyze present and future customer, sales, Engineering, Manufacturing, and Field Service requirements and goals. From these studies we identify what attributes of systems need to be tested and measured in order to provide the necessary information, to both the consumer and the producer, to make informed technical and business decisions.

MST defines, quantifies, and documents these key system attributes. We develop testing and analysis methods to ensure that these system attributes are within expected tolerances. We develop, document, and implement these methods in hardware and software for use by operational test groups to test for, and measure, those attributes.

MST also designs and develops the infrastructure needed by a test facility to automate the data collection, data reduction, data analysis, and the reporting of test results.

22.2.3 Configuration Management Office (CMO)

Manager: Dick Caruso (TWO/A10, 247-2644)

The Configuration Management Program is concerned with the design, development, and ongoing support and management of system-level products, processes, base-systems, clusters, and networks via the establishment, recognition, and control of the knowledge or information by which these are regulated or coordinated.

The Program covers the development and/or implementation of the following, and establishes the ongoing responsibilities of the CMO:

- A Configuration Information Specification
- DEC Configuration Information System (DECCIS...pronounced "deck-sis").
- Integration of DECCIS into DIGITAL via appropriate process linkages and ongoing administration and updating of DECCIS and process use

The key element of the Program is the DECCIS database, which enables the management of systems and products via the "rules" and "data" (i.e., both System and Product Level Configuration Information) required to plan or upgrade system configurations.

A usable version of DECCIS is available; the process covering its use is being worked and the first planned use will occur in late FY88/early FY89.

The information originates during the design cycle and is verified during the various stages of testing. Therefore the process covering the use of DECCIS includes loading, updating, and managing the access of systems and product configuration information by the responsible Engineering group till the responsibility has transferred to a support organization, which then assumes responsibility for it. The process extends into the systems/product test cycle (i.e., SIE Verification Testing), and includes information access by Corporate organizations needing it.

The information includes the systems-level, generic, or macro-level knowledge necessary to plan, manage, or update systems (i.e., Networks, Clusters, Packaged/Standard/SBB Systems, Base Computers, etc), as well as product- or option-specific rules and data.

DECCIS is a database for the online acquisition, storage/retrieval, and control of a common set/formally recognized body of configuration information for corporate use). With the use of DECCIS, the program realizes major positive effects across the various functional areas of the corporation (i.e., Sales/Service, Marketing, Engineering, and Manufacturing), by significantly improving the development, introduction, and support of systems, products, and processes, and by dramatically lessening associated overhead.

Additionally, the program, through the Configuration Management Office, establishes a control point and administrative responsibility for DECCIS, as well as a configuration expertise for consultation or coordination of configuration issues.

When to call:

Contact SIE with questions regarding system, cluster, or distributed system functional testing; when systems or new options require POM certification; or when problems are being experienced with the integration of POM-Verified products in systems, clusters, or distributed systems.

22.3 Systems Reliability Engineering (SRE)

Manager: Tom Weyant (VWO/C06, 285-6081, CSMSRE::WEYANT)

This group's strategic objective is to achieve higher levels of reliability and availability in Digital's products and systems. The SRE group performs tasks including the following: system reliability and availability modeling, allocation of reliability requirements, design for reliability, qualification testing, reliability tracking and data analysis, and assessment of the impact on reliability of new manufacturing processes and new technologies. Moreover, the SRE group develops new computer tools for use by reliability analysts Digital-wide, and reviews the applicability of tools developed in the industry. The group is comprised of six subgroups.

22.3.1 Reliability Programs Office, SRE

Manager: Norm Smith

The functions of the Reliability Programs Office include program management, and development of the SRE charter statement, budget roll-ups, and assessment and performance measures.

22.3.2 Advanced Development Group

Manager: Tom Weyant

The activities of the Advanced Development Group currently include development of crash rate predictive modeling and data analysis techniques, management of the CSM Reliability University (RU), and research in the area of advanced statistical analysis techniques.

22.3.3 Advanced Systems Engineering

Manager: Rick Howe

ASE performs reliability and availability modeling of Digital networks, clusters, and standalone equipment, cost of ownership economic modeling, and research in the area of stochastic modeling of computer systems.

22.3.4 Design Reliability Engineering

Manager: Bob Shelton

DRE conducts a reliability program for new products from initial concept through product retirement. The focus is on early design review and analysis to detect and correct design problems prior to commitment to fabrication. The tasks include reliability and availability modeling, prediction of failure rate and allocation to lower level assemblies, analysis of system and circuit design, failure modes and effects analysis, and qualification test strategy and management.

22.3.5 Reliability Assessment Engineering

Manager: David Jones

RAE maintains a qualification laboratory for reliability demonstration testing of new products (RQT). This group also performs a tracking function by gathering reliability data on computer systems and their components, from multiple sources including vendor new product qualification, manufacturing, and field use. Information gathered will be used in future new product development efforts and to identify current performance and opportunities.

22.3.6 Process Reliability Group

Manager: J.P. Keller

PRG provides the means, procedures and technical expertise to define and relate process and reliability goals. The group aims at providing tools and procedures for process control and monitoring, thereby assessing process practices and maintaining process integrity. It will also participate in developing test and control plans for new processes, materials and help to assess risks associated with their use.

22.3.7 Reliability University

RU plans and staffs an internal education program aimed at developing more in-house reliability expertise. The objective is to identify qualified candidates within Digital's current technical ranks and provide them with a cooperative program of in-depth academic and practical training in a broad spectrum of reliability topics.

When to call:

- For any reliability question or related problem.
- For involvement in new system design, for reliability consultation and/or design team participation. Also RQT.
- For interest/needs/inputs/information on system reliability and availability characterization and modeling.
- For any consultation or involvement in the manufacturing process and materials.
- For interest in reliability training.

CHAPTER 23

PRODUCT MARKETING GROUP

Manager: Peter J. Smith, V.P. (MRO3-1/E8, 297-5160)

The role of the Product Marketing Groups (PMGs) is to support Digital's mission to provide enterprise-wide information systems. By providing the layered software environment needed to reach the potential of Digital's base systems and networking technologies, Product Marketing leverages Digital's investment in base distributed computing technology. We add systems engineering, application integration, and an extensive portfolio of worldwide applications to develop Digital's products into enterprise-wide solutions.

To accomplish this, Product Marketing maintains strong technology partnerships with strategic customers and applications partners in key areas. We use the knowledge we gain from these relationships to build a strong Product Marketing systems engineering focus. Systems engineering complements Digital's base product and technology investments. It is the means by which Product Marketing develops and drives high-quality information regarding product requirements into the Product Business Units (PBUs). It enables Product Marketing to provide an increased level of product integration so that it is easier for the sales force to match a Digital-based solution to a customer problem.

In addition, Product Marketing works with Software Services to position Digital as the complete systems integrator for our worldwide industry customers.

Product Marketing continues to provide expertise directly to the Sales Support organization, the Application Centers for Technology (ACTs), the Customer Solutions Center, and to the Field through its close ties with the geographies' Industry Marketing Groups.

PRODUCT MARKETING GROUPS

- *Corporate Systems*
Manager: Bill Steul, V.P. (PDM1-2/C2, 291-0550)
- *Engineering Systems*
Manager: Don McInnis, V.P. (MRO3-1/Q17, 297-4383)
- *Business and Office Information Systems*
Manager: Henry Ancona, V.P. (TTB1-2/G10, 264-3700)
- *Laboratory Data Products (LDP) Marketing*
Manager: Gary Eichhorn (MRO2-4/F19, 297-4300)
- *CIM Marketing and Product Development*
Manager: Dave Copeland (MET-2/C7, 291-7702)
- *Group Marketing Programs*
Manager: Linda Moore (UPO1-3, 296-4564)
- *Product Marketing Personnel*
Manager: Willow Shire (MRO3-1/E8, 297-7827)
- *Finance and Planning*
Manager: Pat Spratt (MRO3-1/E8, 297-7611)

- *Independent Software Vendor Group*
Manager: Mike Mancuso (MET-1/H3, 291-7502)
- *Marketing Communications*
Manager: Pete Zotto (CFO1-1/M38, 251-1174)
- *Systems Engineering*
Manager: Mike Taylor (MRO3-1/E8, 297-4525)

PRODUCT MARKETING CONTACTS

Corporate Systems

Vice President: Bill Steul (PDM1-2/C2, 291-0550)

- *Financial Industry Systems Group*
Manager: Norm Goldberg (PDM1-2/L11, 291-0200)
- *IS Product Marketing*
Manager: Patrick Zilvitis (PDM1-2/F2, 291-0402)
- *Telecommunications Systems Group*
Manager: Bill Kania (PDM1-2/L11, 291-0320)
- *Marketing Programs/Travel Applications*
Manager: Bob Weiner (PDM1-2/F2, 291-0474)
- *Marketing Communications*
Manager: Barbara Watterson (PDM1-1/F2, 291-0440)
- *Systems Engineering*
Manager (Acting): Bill Steul (PDM1-2/C2, 291-0550)
- *Finance and Planning*
Manager: Terry Fink (PDM1-2/B2, 291-0495)
- *Personnel*
Manager: Barry Moore (PDM1-2/B2, 291-0431)
- *Cullinet Strategic Alliance*
Manager: Deborah Nicholls (PDM1-1/F2, 291-0346)

Engineering Systems Group

Vice President: Don McInnis (MR03-1/Q17, 297-4383)

- *Business Groups*
 - *Marketing*
Rakesh Kumar (MRO3-1/Q17, 297-7166)
 - *Systems Engineering*
Prakash Bhalerao (MRO3-1/Q17, 297-6246)
 - *UNIX Program Office*
 - *PRISM Workstation Program Office*
 - *ULTRIX Group*
Glenn Johnson (ZKO3-3/W16, 381-0411)
 - *Systems Software Base Product Marketing*
Manager: Gail Holland (ZKO3-3/Y25, 381-2345)
- *Support Groups*
 - *Finance*
Larry Rosenberg (MRO3-1/Q17, 297-6774)

- *Operations*
Bryan Marler (MRO3-1/Q17, 297-7473)
- *Personnel*
Rich McNeal (MRO3-1/Q17, 297-4336)

Business and Office Information Systems (BOIS)

Vice President: Henry Ancona (TTB1-2/G10, 264-3700)

- *Distribution, Marketing, Sales and Service Business Systems*
Jim Willis (TTB1-4/E03, 264-5487)
- *Financial and Administrative Business Systems*
Michael Carabetta (TTB1-2/C02, 264-8255)
- *Electronic Publishing Systems*
Howard Woolf (TTB1-2/B05, 264-3901)
- *Office Information Systems*
Gene Hodges (TTB1-2/F03, 264-3734)
- *Market Development and Programs*
Tom Richardson (TTB1-3/F10, 264-3961)
- *Systems Engineering*
Dick Loveland (TTB1-3/F09, 264-6800)
- *Finance and Business*
John Doherty (TTB1-2/B06, 264-3995)
- *Planning*
Claire Messier (TTB1-2/G10, 264-2293)
- *Personnel*
Leigh Bodington (TTB1-2/C05, 264-3907)
- *Business and Office Systems Engineering*
Pamela Johnson (ZKO3-2/X37, 381-0733)

Laboratory Data Products (LDP) Marketing

Manager: Gary Eichhorn (MRO2-4/F19, 297-4300)

- *Laboratory Applications Marketing*
Ty Rabe (MRO2-3/M84, 297-4198)
- *Scientific Applications Marketing*
Larry Kruger (MRO2-3/M91, 297-7118)
- *Business Development Programs*
Brian Wade (MRO2-3/M38, 297-2590)
- *Product Marketing and Planning*
Randy Levine (MRO2-3/M91, 297-6255)
- *Systems Engineering*
Herve Lavoie (MRO2-4/E14, 297-6938)
- *LDP Engineering*
Herve Lavoie (MRO2-4/E14, 297-6938)
- *F&A/MIS*
Hank Soboski (MRO2-4/F19, 297-5512)

- *Personnel*
Jim Fleming (MRO2-3/M78, 297-6845)

CIM Marketing and Product Development

Manager: Dave Copeland (MET-2/E7, 291-7702)

- *Systems Engineering*
Dee Stewart (MET-1/E1, 291-7657)
- *Product Development*
Bob Andersen (MET-2/E2, 291-7758)
- *Systems and Applications Support Group*
Val Patel (MET-1/E5, 291-7511)
- *Market Development*
Peter Graham (MET-2/A4, 291-7475)
John Ardini - Acting (MET-1/F6, 291-7591)
- *Product and Services Marketing*
Don Jenkins (MET-2/E7, 291-7726)
- *Applications Marketing*
Don Bell-Irving (MET-2/H2, 291-7704)
- *Finance*
Marty Scarpati (MET-2/C5, 291-7539)
- *Personnel*
Austin Moss (MET-1/F3, 291-7855)

Digital groups are encouraged to contact Product Marketing when they can benefit from their expertise. This group can provide the following information.

- Market requirements and trends in all of Digital's markets
- Contacts with industry consultants, trade groups, and standards organizations.

Product Marketing would like to capitalize on the expertise of Digital's engineers to strengthen our marketing efforts. Engineers who feel that the work they are doing could contribute to marketing efforts are encouraged to contact the appropriate people. The following are some examples of the activities Product Marketing would like to know about.

- Development (or identification) of a new product or application suitable to any of our markets
- Unique or interesting applications of computer technology to solve science, engineering, corporate information, office, and manufacturing problems
- Willingness to be a reference site or provide pre-sales support to the Digital sales force

23.1 CORPORATE SYSTEMS GROUP

Manager: Bill Steul, V.P. (PDM1-2/C2, 291-0550)

The Corporate Systems Group (CSG) is organized to increase Digital's focus and market penetration in the corporate information systems, telecommunications, travel, and financial services markets. CSG is one of the five strategic product marketing groups reporting to Peter Smith, V.P., Product Marketing.

CSG focuses on enterprise computing and networking. CSG is also responsible for the acquisition and integration of applications and the development of production application strategies and programs for corporate computing across all industries. CSG's goal is to have Digital recognized as number one in distributed production systems.

- *Financial Industry Systems Group*

258 PRODUCT MARKETING GROUP

Manager: Norm Goldberg (PDM1-2/L11, 291-0200)

- *IS Product Marketing*
Manager: Patrick Zilvitis (PDM1-2/F2, 291-0402)
- *Telecommunications Systems Group*
Manager: Bill Kania (PDM1-2/L11, 291-0320)
- *Marketing Programs/Travel Applications*
Manager: Bob Weiner (PDM1-2/F2, 291-0474)
- *Marketing Communications*
Manager: Barbara Watterson (PDM1-1/F2, 291-0440)
- *Systems Engineering*
Manager (Acting): Bill Steul (PDM1-2/C2, 291-0550)
- *Finance and Planning*
Manager: Terry Fink (PDM1-2/B2, 291-0495)
- *Personnel*
Manager: Barry Moore (PDM1-2/B2, 291-0431)
- *Cullinet Strategic Alliance*
Manager: Deborah Nicholls (PDM1-1/F2, 291-0346)

23.1.1 Financial Industry Systems Group

Manager: David Stroll (PDM1-2/L11, 291-0200)

Financial Industry Systems Group (FISG) is chartered to develop, market, and deliver a superior set of complete solutions for the banking, investment, and insurance sectors of the financial services industry worldwide. FISG also works closely with the Financial Industry Marketing Group.

23.1.2 Information Systems Product Marketing

Manager: Patrick Zilvitis (PDM1-2/F2, 291-0402)

IS Product Marketing develops and markets integrated, enterprise-wide IS solutions and platforms to meet commercial computing needs. These solutions and platforms include databases, CASE/IS, migration tools to compete for replacement of selected architectures, multivendor networks, OLTP, and integrated AI solutions. These solutions will position Digital to increase market share and to be recognized as the standard for distributed production systems.

23.1.3 Telecommunications Systems Group

Manager: Bill Kania (PDM1-2/L11, 291-0321)

TSG develops and markets solution platforms and applications across the following areas:

- Intelligent Networks
- Value Added Networks
- Public Network Management
- Public Network Operations
- Customer Applications

The first four solution areas are focused on the telecommunications service providers with the last area focused primarily on corporate telecom departments.

23.1.4 Marketing Programs/Travel Applications

Manager: Bob Weiner (PDM1-2/F2, 291-0474)

Marketing Programs charter is to manage performance testing on Digital and competitive products and systems for CSG's markets and other special projects as they arise. In addition, it is responsible for travel related services startup on behalf of Product Marketing.

23.1.5 Marketing Communications

Manager: Barbara Watterson (PDM1-1/F2,291-0440)

This group develops and communicates Digital's corporate computing and networking messages. The group scrutinizes competitors' products, service, and marketing strategies to better direct Digital's corporate computing messages. This group works closely with High Performance Systems Marketing, with Rose Ann Giordano's Consultant and Information Systems Marketing group, and with the field marketing programs groups to package and deliver the product applications and solution systems content of Digital's corporate computing strategy.

23.1.6 Finance and Planning

Manager: Terry Fink (PDM1-2/B2, 291-0495)

Finance and Planning provides business support to the Corporate Systems Group in the areas of finance, control, planning, systems, and facilities.

23.1.7 Personnel

Manager: Barry Moore (PDM1-2/B2, 291-0431)

This group provides CSGs personnel administration and planning, recruiting, organizational development, and employee relations.

23.1.8 Cullinet Strategic Alliance

Manager: Deb Nicholls (PDM1-1/F2, 291-0346)

Management of the relationship with a major software vendor, influencing Cullinet's investment in developing applications for the VAX platform, including joint development efforts.

23.2 ENGINEERING SYSTEMS, ULTRIX, PRISM

Manager: Don McInnis, V.P. (MRO3-1/Q17,297-4383)

This group's charter is to specify, build, and market complete computing solutions to engineering organizations in targeted industries through all channels, worldwide.

BUSINESS GROUPS

- *Marketing*
Rakesh Kumar, 297-7166

Responsible for all marketing activities focused on engineering organizations at all levels, and includes: market research, product strategy, third party applications, pricing, promotion, field programs, and distribution strategy.

- *Systems Engineering*
Prakash Bhalerao, 297-6246

Responsible for development and delivery to sales and sales support of application modules and complete solutions designed to meet the needs of the customer's engineering organization at all levels: Work group, Department, and Corporate.

- *ULTRIX Group*
Manager: Glenn Johnson (ZKO3-3/W16, 381-0411)

The ULTRIX Group is responsible for specifying an ULTRIX strategy that creates a world class UNIX offering. The group performs both development and product management functions.

The Development effort has four major areas of focus: hardware systems support; user interfaces; networks and communication; and the integration of UNIX with VMS through software products. It provides a full range of engineering activity from basic operating system support of the VAX hardware architecture to state-of-the-art graphic interfaces (including DECwindows and the X windowing system), direction and support for industry standards (such as POSIX, SVID, and X/Open), file systems, system security, networking and distributed computing capabilities, system management, utilities. Documentation, performance, and quality groups complement the development functions.

The Product Management group is the interface between the Development Group and the customer base as well as other groups within Digital. This group manages the phase review process, helps define product requirements, creates a business plan, and orchestrates DECUS activities. ULTRIX Product Management is also responsible for management of Digital's licensing agreement with AT&T and ULTRIX third party applications activities.

The major portion of the ULTRIX Group resides at the Spitbrook Road facility in Nashua, NH. The group also includes the Western Software Lab (WSL) in Palo Alto, CA and the European ULTRIX Engineering Group (EUEG) in Reading England.

The following lists the ULTRIX Group contacts:

- *Hardware Systems Support*
Manager: Dave Cardos (ZKO3-3/T79, 381-0376)
- *User Interface*
Manager: Ken Reilly (ZKO3-3/W17, 381-0404)
- *Networks and File Systems*
Manager: Kent Ferson (ZKO3-3/T79, 381-0389)
- *Documentation*
Manager: Bob Amber (ZKO3-3/T13, 381-0463)
- *Product Management*
Manager: Gary Oden (ZKO3-3/V06, 381-0529)
- *Licensing*
Manager: Jim Despathy (ZKO3-3/V06, 381-0521)
- *Technical Director*
Manager: Jim McGinness (ZKO3-3/W16, 381-0407)
- *System Quality and Performance*
Manager: Tom Hayden (ZKO3-3/T13, 381-0311)
- *Western Software Lab*
Manager: Smokey Wallace (UC0-3, (415) 853-6651)
- *European ULTRIX Engineering Group*
Manager: Vic Goddard
- *UNIX Program Office*
Responsible for developing, supporting, and marketing ULTRIX operating systems.
- *PRISM Workstations Program Office*

Responsible for the high performance ULTRIX workstations business which includes: system architecture, engineering, manufacturing, service, marketing, and product management.

- *Systems Software Base Product Marketing*
Manager: Gail Holland (ZKO3-3/Y25, 381-2345)

SUPPORT GROUPS

- *Finance*
Larry Rosenberg, 297-6774
- *Operations*
Bryan Marler, 297-7473
- *Personnel*
Rich McNeal, 297-4336

23.3 BUSINESS AND OFFICE INFORMATION SYSTEMS (BOIS)

Manager: Henry Ancona, V.P. (TTB1-2/G10, 264-3700)

Business and Office Information Systems (BOIS) provides complete business and office solutions for customer needs in all industries worldwide. BOIS consists of four major businesses:

- Distribution, Marketing, Sales, and Service Business Systems (DMSS)
- Finance and Administrative Business Systems (FABS)
- Electronic Publishing Systems (EPS)
- Office Information Systems (OIS)

Supporting these four major business segments are five functions: Market Development and Programs, Systems Engineering, Finance, Strategic Planning and Personnel.

In addition to the four businesses and five supporting functions, the Business and Office Systems Engineering (BOSE) group reports jointly to BOIS and to the Software Development Technologies group in Engineering managed by Bill Keating.

23.3.1 Distribution, Marketing, Sales, and Service Business Systems (DMSS)

Manager: Jim Willis (TTB1-4/E03, 264-5487)

The DMSS group provides a worldwide product portfolio and marketing strategy to penetrate and gain market share in distribution/logistics, transportation, marketing, sales, service and retail stores.

The DMSS solutions position Digital as the leader and preferred supplier of distributed systems and networks—the fastest growing segment.

23.3.2 Finance and Administrative Business Systems (FABS)

Manager: Michael Carabetta (TTB1-2/C02, 264-8255)

The FABS group satisfies the computing needs of the accounting, finance and administration functions of large companies and governments worldwide.

FABS works closely with Industry Marketing to develop a product portfolio and marketing strategy to gain market share within these functions.

23.3.3 Electronic Publishing Systems (EPS)

Manager: Howard Woolf (TTB1-4/B05, 264-3901)

The EPS group provides enterprise-wide word/document processing and electronic publishing systems across all industries, functions, channels and geographies worldwide.

EPS works closely with Product and Industry Marketing (particularly Media Industry) on requirements for a competitive publishing architecture and product set which is well-integrated into application solution systems.

23.3.4 Office Information Systems (OIS)

Manager: Gene Hodges (TTB1-2/F03, 264-3734)

OIS meets the needs common to every office in large enterprises for all industries, worldwide. These common needs are business communications, applications integration and end user computing.

The business communications segment includes Mail, EDI, Videotex, information sharing, and voice applications. The applications integration segment includes a standard end user integration platform (ALL-IN-1), user interface standards and office system administration and management. The end user computing segment includes desktop integration, professional decision support, executive information systems, procedural automation and simple project management.

23.3.5 Market Development and Programs (MD&P)

Manager: Tom Richardson (TTB1-3/F10, 264-3961)

The MD&P group provides two services for BOIS:

- Communicates and promotes to internal and external audiences the messages and strategies of the major business segments.
- Gets the BOIS products and solutions to market using a well-staffed, well-trained, well-motivated field force selling to targeted, predisposed customers and prospects.

23.3.6 Systems Engineering

Manager: Dick Loveland (TTB1-3/F09, 264-6800)

The mission of BOIS Systems Engineering is to define and drive the development of complete solutions for business and office information systems through integration of Digital and third party products on standard Digital platforms, characterize and test solutions, and sponsor technical partnerships to accelerate the definition and delivery of new solutions.

This group is organized to align with the four business segments.

23.3.7 Finance and MIS

Manager: John Doherty (TTB1-2/B06, 264-3995)

The BOIS Finance and MIS group provides financial management and analysis, business analysis and information systems for BOIS.

23.3.8 Strategic Planning

Manager: Claire Messier (TTB1-2/G10, 264-2293)

The BOIS Strategic Planning function manages the major business planning activities for BOIS.

23.3.9 Personnel

Manager: Leigh Bodington (TTB1-2/C05, 264-3907)

The BOIS Personnel group provides recruiting, organizational development and employee relations functions for BOIS.

23.3.10 Business and Office Systems Engineering (BOSE)

Manager: Pamela Johnson (ZKO3-2/X37, 381-0733)

The BOSE group, reporting jointly to BOIS and to SDT Engineering, has two responsibilities:

- To deliver leadership ALL-IN-1 office systems and business communications applications in support of the BOIS strategy.
- To drive Digital's corporate mail program and to contribute components, consultation and development resources to help other application development groups in Engineering.

23.4 LABORATORY DATA PRODUCTS/SCIENCE GROUP

Manager: Gary Eichhorn (MRO2-4/F19, 297-4300)

The Laboratory Data Products Group (LDP) provides Digital's marketing focus on the scientific research and laboratory marketplaces. The charter of LDP is to provide integrated computing solutions to scientists within research and laboratory organizations worldwide, to understand the computing needs of scientists and develop strategies for meeting those needs, and to provide strategies, positioning, and technical information to Industry Marketing and Sales Support groups to assist in maximizing Digital's market share in scientific and laboratory computing.

Typical customers in this market include industrial R&D laboratories, educational departments and laboratories, non-profit institutions, government research organizations, medical research organizations, sample handling laboratories. The industries where these customers are concentrated include the Process Industries, Discrete Manufacturing Industries such as Aerospace, Automotive, and Electronics, Government, and Education.

LDP is one of the strategic product marketing groups reporting to Peter Smith, V.P., Product Marketing.

23.4.1 Laboratory Applications Marketing

Manager: Ty Rabe (MRO2-3/M84, 297-4198)

Both LDP marketing groups, Laboratory Applications Marketing and Scientific Applications Marketing, concentrate on defining and marketing complete, worldwide solutions for science and research that clearly differentiate Digital from its major competitors.

The Laboratory Applications Marketing group concentrates on science and research activities within larger organizations. Applications of interest to this group include data analysis, laboratory information management, instrument control, real time control, signal processing, time-critical computing, bioresearch, and scientific office.

23.4.2 Scientific Applications Marketing

Manager: Larry Kruger (MRO2-3/M91, 297-7118)

Both LDP marketing groups concentrate on defining and marketing complete, worldwide solutions for science and research that clearly differentiate Digital from our major competitors.

The Scientific Applications Marketing group concentrates on organizations devoted to science and research. Applications of interest to this group include simulation and modeling, image processing and scientific visualization, program development, and supercomputing.

23.4.3 Business Development Programs

Manager: Brian Wade (MRO2-3/M38, 297-2590)

The Business Development group is LDP's focus on Digital's field organization. It provides strategic links with key Industry Marketing groups, with Sales and Sales Support, and with Channels Marketing. This group is also responsible for field training and Marketing Communications Activities.

23.4.4 Product Marketing and Planning

Manager: Randy Levine (MRO2-3/M91, 297-6255)

The Product Marketing function provides requirements to Digital engineering groups and works with them to bring products to market and to incorporate them into LDP marketing programs. The planning function maintains LDP's strategic plan and participates on behalf of LDP in corporate planning and forecasting activities. This group also conducts the LDP Consultant/Analyst relations program.

23.4.5 Systems Engineering

Manager: Herve Lavoie (MRO2-4/E14, 297-6938)

The mission of LDP Systems Engineering is to define and drive the development of complete solutions for scientific and research customers through integration of Digital and third-party products on standard Digital platforms, to characterize and test solutions, and to sponsor technical partnerships to accelerate the definition and delivery of new solutions.

The group is organized to align with the the two LDP marketing groups, Laboratory Applications Marketing and Scientific Applications Marketing.

23.4.6 LDP Engineering

Manager: Herve Lavoie (MRO2-4/E14, 297-6938)

The major product development areas of LDP Engineering are scientific and technical information management systems, real-time data acquisition and control for research and scientific applications, graphing and display of scientific data, and libraries for scientific computing.

Products include LABSTAR software and I/O library for the researcher and LIMS/SM as an applications software tool for automating laboratory processes and management of tested data.

LDP Engineering provides consulting on real-time applications, instrument interfacing (especially IEEE-488 bus), and laboratory automation.

23.4.7 Finance and Administration/MIS

Manager: Hank Soboski (MRO2-4/F19, 297-5512)

This group is responsible for financial management and analysis, and for LDP's financial and business information systems.

23.4.8 Personnel

Manager: Jim Fleming (MRO2-3/M78, 297-6845)

This group is responsible for personnel functions, recruiting, organizational development, and employee relations.

23.5 CIM MARKETING AND PRODUCT DEVELOPMENT GROUP

Manager: Dave Copeland (MET-2/E7, 291-7702)

The CIM Product Development and Marketing Group is responsible for the following functions:

- Defines and maintains the strategies for the worldwide manufacturing market (marketing, products, services, and channels).
- Implements programs and plans, with others, to achieve the market strategies.
- Ensures that all strategies are based on the corporate product plan.
- Develops expertise in systems engineering and product development for CIM.
- Directs marketing and planning efforts through all channels.
- Targets manufacturing departments and all areas of the enterprise which influence the use of computing in manufacturing.

The manufacturing market is commonly segmented into levels shown below. The system target market or CIM is Levels I, II and III.

Level	Description	Application
IV	Corporate-wide System	Payroll, Accounting, Corporate MRP, Corporate Distributing, etc.
III	Plant-wide systems	MRPII, distribution, manufacturing decision support, maintenance, energy, and resource management
II	Area Control	Shop floor scheduling and control, process control, quality management, supervisory cell control
I	Direct machine or unit control	Machine control, distributed process control, factory data collection devices
0	Machine or process	

Level 0 is the machine or process being controlled by computers at a higher level. The CMPD group will address Level IV computing when applications are manufacturing oriented and will support the Information Systems Business Group (ISBG) in representing our manufacturing solutions to IS executives.

The CIM group is also responsible for maintenance and applications across all basic and service industries.

CIM Product Development and Marketing contacts are as follows:

- *CIM Marketing and Product Development*
Manager: Dave Copeland (MET-2/E7, 291-7702)
- *Systems Engineering*
Dee Stewart (MET-1/E1, 291-7657)
- *Product Development*
Bob Andersen (MET-2/E2, 291-7758)
- *Systems and Applications Support Group*
Val Patel (MET-1/E5, 291-7511)
- *Market Development*
Peter Graham (MET-2/A4, 291-7475)
John Ardini - Acting (MET-1/F6, 291-7591)
- *Product and Services Marketing*
Don Jenkins (MET-2/E7, 291-7726)

- *Applications Marketing*
Don Bell-Irving (MET-2/H2, 291-7704)
- *Finance*
Marty Scarpati (MET-2/C5, 291-7539)
- *Personnel*
Austin Moss (MET-1/F3, 291-7855)

NAME INDEX

A

Abel, Norma, 127
Abel, Tom, 243
Aberdale, Liz, 120
Abernathy, Charles, 86
Abraham, Joy, 245
Abrahamsen, Tom, 86
Adams, Barbara, 214
Adams, John, 120
Adleman, Henry, 243
Ahern, Camille, 43
Aitken, Jim, 236
Ajgaonkar, Kami, 76
Alexanderson, John, 208
Alissi, Geno, 128
Allan, Joe, 207
Allison, Lee, 183
Alumbaugh, Clark, 112
Amber, Bob, 261
Ancona, Henry, 262
Andersen, Bob, 266
Anderson, Bruce, 189
Anderson, Dave, 210
Anderson, Dee, 147
Anderson, Dick, 180
Anderson, Duncan, 90
Anderson, Steve, 178, 194
Anderson-Khleif, Susan, 116
Andrews, Don, 48
Angel, Dick, 93
Anketell, Winni, 203
Annesi, Bill, 196
Anthony, Charlie, 198
Aori, Yoshi, 108
Aramati, Victor, 69
Arayas, Joe, 219
Archambault, Bruce, 79
Archambeault, Bruce, 210
Ardini, John, 266
Arker, Joel, 128
Armbruster, Glenn, 133
Armour, Jon, 174
Arnold, Phil, 116

Aronoff, Sheldon, 119
Ashley-Sack, Marilyn, 214
Askins, Bill, 102
Atkinson, Lloyd, 129
Atlas, Jay, 219
Atter, Frank, 190
Auman, Craig, 201
Austin, Dick, 49
Avakian, Carine, 147
Azar, Issa, 139

B

Bagley, John, 87
Bailey, P., 233
Bajwa, S.S., 185
Baldessari, Dave, 46
Balfour, Fred, 132
Ball, C., 234
Balladelli, Piero, 145
Ballou, Joe, 172
Barbas, Charlie, 26
Barbett, Dick, 156
Barilone, Virginia, 171
Barker, Jeff, 183
Barker, John, 96
Barker, Steve, 78
Barnabe, Don, 209
Barnard, Bob, 239
Barnum, Susan, 211
Barrett, John, 237
Barrett, Jon, 143
Barron, Ed, 115
Batten, Jack, 191
Baudelaire, Patrick, 60
Bauer, Alfred, 139
Bauer, Diane, 226
Bausha, Bill, 211
Beane, Dick, 66
Beaudet, Tom, 209
Becker, Phil, 210
Beckner, George, 46
Beecher, John, 243
Behuniak, John, 184

Beirne, John, 57
Belanger, Dick, 76
Bell, David, 143
Bell, Linda, 229
Bellanca, Steve, 79
Bell-Irving, Don, 267
Benfey, Tom, 232
Benigni, Paul, 85
Bennett, Dick, 73
Benton, Renate, 110
Berger, Bill, 171
Berger, Ken, 174
Berke, Marty, 239
Berman, Ajay, 225
Bernstein, Dan, 220
Bertetti, Dave, 87
Best, Dick, 16
Bettels, Jürgen, 143
Beveridge, Dave, 247
Bhalerao, Prakash, 260
Bhalla, Sunil, 185
Bills, Bob, 82, 243
Binder, Hermann, 221
Bitto, Joe, 80
Black, Bob, 137
Blackledge, Bob, 110
Blair, Joan, 214
Blenis, Gary, 243
Blizard, Gail, 242
Blomgren, Roger, 225
Blume, Steve, 175
Bodington, Leigh, 264
Boers, Peter, 79
Boers, Robert, 135
Bogue, Ron, 80, 243
Bourne, Steve, 80
Bourque, J., 233
Bowen, Hugh, 75
Bowles, Chet, 224
Bowman, Chris, 38
Bowman, Robert, 211
Boyd, Drew, 229
Brabitz, Ken, 78
Bradley, Dick, 189
Brait, Denice, 41
Braithwaite, David, 243
Braley, Jon, 189
Brandwein, Louise, 209
Brauner, Raul, 77
Breest, Carol, 181
Bressler, John, 249
Bright, Patricia, 182
Brind, Alan, 242
Brommelhoff, Jurgen, 96
Brooks, Gary, 13
Brown, Bill, 109
Brown, Bob, 240

Brown, David L., 13
Brown, David W., 105
Brown, Peter, 56
Brown, R., 234
Brown, Ron, 231, 232
Browne, Peter, 230
Brownson, Bob, 225, 228
Bryan, Tony, 76
Buddenhagen, Will, 223
Burckhardt, Werner, 191
Burke, Bill, 134
Burniece, Tom, 112
Burnley, Stuart, 151
Burns, John, 229
Burr, Geoffrey, 81
Busiek, Don, 220
Butler, Ollie, 189
Butler, Rich, 93
Byrne, Bruce, 228

C

Cabrinety, Larry, 82
Cacioppo, George, 84
Caine, Paul, 174
Caldwell, Jim, 121
Camber, Sue, 78
Camelio, Bob, 140
Cann, George, 229
Cannizzaro, Joe, 77
Cappello, Nick, 96
Carabetta, Michael, 262
Carchidi, Joe, 81
Cardon, Dennis, 209
Cardos, Dave, 261
Carpentier, Sandy, 80, 90
Carrado, Ray, 229
Carty, Bob, 132
Caruso, Dick, 252
Castellano, Rich, 87
Cataldo, Pat, 221
Caulfield, John, 176
Cavanaugh, Tom, 54, 200
Cefalo, Al, 35
Chace, Don, 191
Chaplin, Bill, 228
Chapman, Drum, 97
Chen, Mimi, 96
Chen, Yvonne, 249
Chevalier, Irene, 224
Chosiad, Dave, 236
Chow, Peter, 121
Christensen, Mike, 228
Chubachi, Takao, 108
Ciannavei, Guido, 190
Ciorciari, Tony, 178
Clapp, Gary, 36
Clark, Ron, 36

Clarke, John, 80
Cline, Carl, 240, 249
Cline, Warren, 189
Clockedile, Art, 46
Cochrane, Barbara, 242
Cohen, Bob, 219
Cohen, Lou, 99
Colaianni, Ron, 49
Collins, Lois, 234
Colon-Osorio, Fernando, 98, 100
Comstock, Betsy, 86
Conklin, Peter, 83
Conn, Alex, 161
Conn, Charles, 86
Connors, Agnes, 66
Conrad, Don, 76
Cook, Richard, 115
Cope, George, 231, 232
Copeland, Dave, 266
Cordeiro, Steve, 232
Corke, Malcolm, 137
Corley, Dick, 217
Cormier, Terry, 171, 200
Cox, Patricia, 8, 9
Cray, Bill, 36
Crespo, Jose, 78
Creux, Jean-Jacques, 146
Crimmin, Dave, 227
Crosby, Dick, 122
Crosby, Leo, 182
Crosier, Dave, 191
Crossman, Red, 132
Crouse, Henry, 165
Cudmore, Jim, 11
Cullen, Steve, 114
Cullinane, Marcia, 225
Culverwell, Ken, 97
Curran, Deane, 82, 90
Curtin, Paul, 166
Cutler, Dave, 93
Cyr, John, 26
Czekalski, Martin, 114

D

Dahlstrom, Carole, 198
Dail, Erle, 196
Dail, Steve, 241
Daley, Bob, 119
Daley, Mark, 171
Dandage, Subhash, 78
Dane, Josh, 97
Dangelmayer, Bob, 179
Daniels, Gail, 131
Daniels, Rick, 173
Darnell, Dale, 214
Dauphinais, Dave, 55
Davenport, Carlton, 13

Davidson, Scott, 123
Davies, Bill, 89
Davis, Don, 49
Davis, John, 83
Davis, Steve, 239
DeAmicis, Don, 172
Deary, Ed, 239
DeBlois, Dana, 175
DeBoalt, Dick, 239
Deknis, Dan, 78
DeLaTorre, Sonia, 176
DelVecchio, Nick, 172
Dement, Ralph, 132
Demmer, Bill, 93
Dermody, Chuck, 156
Derome, Don, 72
Deschamps, Jules, 46
Despathy, Jim, 261
Diaz, Mike, 111
Dickhut, Duane, 69
Difinzio, Lou, 204
Digilio, Frank, 85
Dillingham, Bruce, 179
DiRico, Jim, 156
Dischinger, John, 228
Dixon, Clarence, 198
Dobberpuhl, Dan, 63
Dockser, Bob, 159
Doherty, Alison, 170
Doherty, Carolyn, 211
Doherty, Dan, 156
Doherty, John, 263
Dormitzer, Ralph, 84
Double, David, 36
Doucet, Peggy, 127
Dougherty, Mike, 56
Doumani, George, 87
Dray, Bob, 150
Dresen, T., 234
Dudziak, Phil, 242
Duffy, Chase, 223
Dufresne, Martha, 186
Dundon, Tom, 83
Dunham, Walt, 166
Dunn, Guilford, 48
Dunn, Tom, 196
Duvivier, Christine, 204
Dye, Cecil, 206, 228

E

Earnshaw, John, 241
Eaton, Mike, 189, 195
Eckert, Alison, 38, 43
Egolf, John, 187
Eicher, Charlie, 229
Eichhorn, Gary, 264
Eifrig, Janice, 38, 49

Eisele, Dan, 210
Elias, Don, 232
Elkins, Mike, 111
Ellis, Cynthia, 203
Ellis, Dave, 180
Ellis, Ed, 112
Ellison, Rick, 241
Endry, Mark, 57
Englund, Glenn, 110
Epps, Harold, 178
Erickson, Bob, 51
Ericsson, Eric, 199
Esling, Paul, 109
Esselstyn, Jim, 95
Evans, George, 243
Everson, Sue, 228

F

Fabrizio, Joe, 225
Fagerquist, Ulf, 119, 166
Farquhar, Bob, 212
Farrahar, Dick, 7
Faucher, Cornel, 129
Faulconer, Bob, 189
Feir, Hank, 8
Feltas, Eleanor, 15
Ferrone, Bob, 204
Ferson, Kent, 261
Fields Tamker, Susan, 230
Fineman, Howard, 167
Fink, Al, 215
Fink, Terry, 260
Finn, Libby, 10
Finnegan, Jim, 121
Fisher, David, 139
Fisk, Owen, 236
Fitzgerald, Brian, 25, 72
Flaherty, Mike, 189
Flaig, Scott, 119
Flakes, Rod, 132
Flanagan, Pat, 53
Fleet, Neville, 120
Fleisner, Paul, 211
Fleming, Jim, 265
Fleming, Shirley, 36
Fleury, Harry, 243
Florentine, John, 242
Flynn, Dave, 146
Flynn, Ed, 189, 191
Ford, Joseph, 205
Forde, John, 91
Foreman, Judy, 97
Forsyth, Fred, 176
Fowler, Charles, 196
Fox, Les, 63
Frampton, Lois, 127
Franks, Charlie, 74

Frederick, Tom, 113
Freeman, Bill, 241
Friedman, Alan, 231
Friedrich, Donna, 56
Friedrich, Kurt, 156
Frigand, Steve, 245
Frongillo, Mike, 133
Fry, Françoise, 153
Fuller, Royce, 179
Fuller, Sam, 59, 65, 66
Funk, Joe, 36

G

Gaffney, Joe, 237
Gagne, Roger, 73
Gagnon, Trish, 159
Galbraith, John, 249
Galloway, Bill, 198
Gannon, Tom, 64, 65
Gardner, George, 231
Garge', Yash, 109
Gasser, Morrie, 162
Gat, Israel, 25
Gaubatz, Don, 63, 71
Gault, Sue, 158
Gaviglia, Lou, 169
George, Susan, 227
Gephart, Sara Ann, 53
Gerelds, George, 170
Gibson, Carl, 95
Giddens, Nancy, 225
Gilbert, Ralph, 242
Gillespie, Ralph, 189
Gilman, Abbot, 91
Giordano, Rose Ann, 212
Glantz, Richard, 84
Glass, Brad, 156, 160
Gleeson, John, 211
Glorioso, Bob, 95
Glowacz, Michaelene, 184
Gobeille, Lou, 231
Goddard, Vic, 151, 261
Goff, Mark, 198
Goldberg, Helen, 228
Goldhush, Doug, 26
Goldman, Sue, 130
Gonzales, Dick, 87
Good, Bob, 237
Gordon, Brian, 180
Gordon, Bruce, 106
Gordon, Ken, 51
Gordon, Scott, 65
Gormley, Steve, 130
Gotthardt, Jeanne, 170
Gottschalk, Gary, 124
Goyal, Deepak, 129
Goza, Cynthia, 227

Grablick, Tom, 196
Graham, Bob, 189
Graham, Peter, 266
Grainger, Dave, 236
Greene, Larry, 216
Greenfield, Hope, 190
Greenlee, Dave, 178, 189
Grenier, Ray, 131
Griep, Jonathan, 77
Griffin, Ed, 200
Grimaldi, Frank, 88
Grochmal, Jim, 63
Grose, John, 76
Grossimon, Herb, 236
Grove, Rich, 63
Gruhnwald, Winfried, 139
Gullotti, Russ, 235

H

Haefner, Fred, 181
Hager, Harold, 84
Hald, Mark, 242
Hall, Judy, 63
Hallgren, Christopher, 42
Hamel, Dan, 67, 189
Hamilton, Dave, 12
Hannemann, Rob, 68
Hansmire, Steve, 80
Hanson, Bill, 169
Harbert, Don, 93
Harbison, D., 233
Harmon, Ralph, 239
Harper, John, 127
Harris, Ken, 244
Harris, Tom, 158
Hart, Jim, 133
Hartwell, Bill, 198
Hartzband, David, 127
Harvey, Dave, 151
Harvey, Sally, 245
Hassett, Frank, 155
Hawe, Bill, 127
Haxby, April, 153
Hayden, Tom, 261
Heaton, Dick, 219
Hebenstreit, Mark, 125
Hebert, Janet, 38
Hedin, Marianne, 117
Heffner, Bill, 155
Heisler, Henry, 207
Herring, Barry, 74
Hess, Bob, 111
Hesseltine, Bob, 178
Higgins, James, 212
Higgins, Ron, 128
Hiller, Dan, 231
Hilton, Bill, 241

Hitz, George, 72
Hodges, Gene, 263
Hoff, George, 93
Hoffman, R.A., 82
Hoffman, Sandy, 189
Holewa, Joe, 243
Holland, B., 233
Holland, Gail, 159
Hollingsworth, Rich, 26, 68
Holt, John, 170
Holz, John, 161
Hopkins, John, 56
Horesta, George, 223
Horne, Robert, 216
Horner, Mike, 134
Hornor, Joella, 61
Horsnell, Verena, 138
Houtz, Neal, 213
Hovey, Richard, 122
Howe, Rick, 253
Howell, Bob, 242
Howington, Ron, 241
Howland, Bob, 73, 79
Hoxie-Wasko, Jean, 242
Hoyt, Steve, 239
Hughes, Bob, 211
Hughes, George, 179
Hughes, Richard, 137
Hult, Bob, 237
Humm, Mike, 150
Humphrey, Eric, 245
Hunt, Claudette, 12
Hunt, Don, 179
Hunt, Laura, 42
Hurd, John, 143
Hurd, Peg, 232
Hurley, Marty, 162
Hurley, Peter, 120
Hymes, Bob, 231, 232

I

Infante, Don, 180
Ingalls, Earl, 125
Irvin, Dan, 49
Israel, Sonja, 66

J

Jackson, Jim, 120
Jackson, Stew, 78, 79
Jacques, Lou, 97
Jaferian, Jan, 98, 166
Jaillet, Roger, 176
James, Craig, 82
James, Nancy, 40
Jamieson, Kathy, 232
Janke, Howard, 249

Jansen, Ron, 54
Jardin, Pierre, 138
Jenkins, Don, 266
Jenkins, Steve, 93
Jennings, Dan, 93
Johns, Al, 82
Johnson, Bill, 119
Johnson, Bob, 230, 231
Johnson, Fred, 178
Johnson, Glenn, 261
Johnson, L., 233
Johnson, Maureen, 74
Johnson, Pamela, 264
Johnson, Richard, 86
Johnson, Ron, 112
Johnson, Ryan J., 111
Jones, David, 253
Jones, Peter E., 138
Jones, Wilt, 200
Jorgensen, Odd, 143
Joseph, Lee, 231
Judson, Bruce, 241
Juergen Schrader, Ernst, 139
Juergensen, Michael, 147
Jurgen, Bob, 73
Jurras, Jack, 231

K

Kaepplein, Howard, 87
Kahlau, Renee, 242
Kalin, Rich, 128
Kamins, Ed, 207
Kanady, Ken, 179
Kania, Bill, 259
Kappler, John, 148
Karchen, Gisele, 60
Karpowski, Tom, 119, 244
Kasten, Jerry, 231
Katzif, Jeff, 75
Kaufman, Peter, 166
Kaufman, Regis, 198
Kawamoto, Key, 108, 155
Kawamura, Yoshi, 108
Keating, Bill, 157
Keating, Bud, 239
Keefer, Brian, 25
Keiran, Bill, 201
Kell, John, 124
Keller, Barbara, 80
Keller, J.P., 254
Kelley, Bill, 13
Kelly, Bill, 26
Kelly, Pierrette, 189
Kelmanson, Martin, 232
Kempf, Mark, 63
Kempself, Trevor, 157
Kenah, Larry, 63

Kennedy, Bob, 204
Kent, Bill, 247
Kent, Paul, 231
Keresey, Paul, 120
Kershaw, Lynne, 122
Kerylow, Chris, 196
Ketonen, Jan, 198
Kiang, Lindsey, 36
Killelea, Dave, 231
Kilmartin, Fred, 156
King, Ed, 156
King, Jim, 25, 75
Kirby, Alan, 126
Kitchin, John, 70
Klein, Barbara, 38
Klein, Leslie, 157
Klinker, Gary, 121
Knapp, Dave, 214
Knapp, Jean, 132
Knibbs, Jeff, 146
Knoll, Dave, 189
Kobayashi, Tom, 107
Koch, Peter, 197
Kochan, Joerg, 146
Kochan, Matt, 90
Koester, Bill, 236
Korf, Dave, 131
Kostetsky, Oleh, 101
Koteff, Bill, 11
Kotok, Alan, 116
Kotsch, Leszek, 146
Kreidermacher, Len, 90
Krisstofy, Ivan, 25
Krueger, Bob, 121
Kruger, Larry, 264
Kruger, Paul, 80
Kuchun, Steve, 185
Kuenzel, Ken, 74
Kumar, Rakesh, 260
Kumar, Sujit, 83
Kur, Mitch, 47
Kurimura, Shin-ichiro, 108
Kurta, Joe, 236
Kusekowski, Gene, 53

L

Laba, Paul, 74
LaCava, Dom, 71
Lacey, Jim, 107, 108
Lachance, Al, 230
Lackey, Murvin, 201
Ladden, Paul, 239
Lafleur, Linda, 170
Lahtinen, Bill, 242
Laine, Michael, 184
Lambarth, Dave, 187
Lampson, Butler, 63

Landau, Rick, 84
Landry, Lynn, 173
Lane, Jeff, 80
Lang, Richard, 244
Lange, Joyce, 24
Lanigan, Lynn, 49
Larson, Fred, 242
Larson, Ralph, 88
Latham, Dan, 212
Lauck, Tony, 126
Lavoie, Herve, 265
Lawrence, Dave, 178
Learoyd, Cathy, 93
LeBlanc, Mel, 172
Lee, Ed, 114
Lee-Bennette, Nancy, 153
LeFlore, Sandra, 197
Legerlotz, Al, 241
Lenhoff, Gunter, 220
Leonhardt, Dick, 242
Lester, Jerry, 36
Levine, Randy, 265
Levy, Len, 133
Lewandowski, Mary Ellen, 120
Lignos, Demetrios, 106
Lind, Don, 75
Lindblad, Goran, 143
Lindenberg, Bob, 155
Lionetta, Bernadette, 189
Lipcon, Eli, 219
Lipcon, Jesse, 90
Lipner, Steve, 63, 161
Lipp, Sharon, 62
Lisee, Remi, 72
Litchfield, Jan, 15
Litsios, Ken, 134
Llorca, Brigitte, 145
Loesel, Dan, 239
Lofgren, Tom, 101
Logan, Bob, 130
Lombardo, Joe, 178, 216
Long, Harold, 244
Lorence, Barney, 96
Lorusso, Paul, 87
Lotz, Bob, 88
Loveland, Dick, 263
Low, Jeff, 129
Lowe, Bill, 166
Lucey, Jim, 172
Lynch, William, 205

M

Maas, K., 233
MacCormack, Bill, 103
MacKeen, Jack, 218
MacKenzie, Doug, 106
MacKenzie, Stuart, 143

MacLean, Doug, 209
Macolini, Bob, 239
Madore, Ken, 156
Magaldi, Jim, 47
Maguire, Linda, 38
Mahany, Dianne, 98
Maher, Tom, 87
Mahoney, Dick, 157
Maillard, Janet, 135
Major, Bill, 111
Malanson, Jim, 226, 234
Maldonis, Bob, 185
Malone, Ed, 239
Mancuso, Mike, 256
Mandelbaum, Jack, 130
Mann, Bruce, 161
Mann, Gail, 166
Manter, Walter, 106
Manzo, John, 99, 100
Marchand, Don, 146
Marchetti, Ron, 178
Marconis, Joe, 156
Mardirosian, Ginny, 55
Mari, Lee, 186
Marianelli, Emilio, 126
Marier, Bruce, 243
Marino, Diane, 147
Markoff, Eliane, 66
Marler, Bryan, 262
Marmen, Tom, 114
Marshall, Barry, 25
Marshall, Linda, 181
Martin, Clayton, 180
Martin-Kail, Myriam, 146
Masand, Suresh, 209, 211
Masland, Andy, 214
Matranga, Paul, 69
Maudlin, Judy, 178
Maxfield, Richard, 38
Maxwell, Rich, 238
May, Dana, 15
Mayall, Ed, 171
Mayes, Bob, 36
McAfee, Sharon, 70
McBride, Brian, 89
McCabe, Frank, 203
McCarron, Angela, 204
McCarthy, Martin, 134
McCauley, Bob, 56
McCoy, John, 210
McCredie, John, 61
McDermott, John, 61
McDonough, Ed, 193
McEnroe, Paul, 102
McGaunn, Paul, 204
McGill, Chris, 103
McGinness, Jim, 261

McHale, William, 205
McInnes, George, 48
McInnis, Don, 260
McKeown, Brian, 241
McKinney, Tom, 128
McKinnon, Linda, 13
McLaren, Keith, 120
McNaughton, Bruce, 152
McNeal, Rich, 262
Meany, Joe, 90
Meehan, Mike, 223
Mehaffey, Don, 15
Melia, Kevin, 189
Melle, Terry, 227
Melvin, Jim, 194
Menendez, Maria, 70
Merewood, Richard, 156
Merriam, Fran, 183
Messenger, Dale, 125
Messier, Claire, 263
Micalizzi, Guy, 225
Miller, Bert, 109
Miller, Jack, 115
Miller, Jim, 131
Miller, Ron, 241
Millet, Herman, 243
Mills, Jim, 140
Minnich, Dennis, 170, 173
Mirkovic, Lee, 15
Mitchell, John, 174
Mjos, Bob, 222
Moffa, Mike, 230
Mollin, Richard, 72
Moloney, S., 233
Mongillo, Tony, 178
Moniz, Wayne, 182
Montague, Jerry, 236
Mooney, Bill, 26
Mooney, Kevin, 214
Moore, Barry, 260
Moore, Linda, 255
Moore, Martha, 38
Moran, Bill, 247
Moran, Hank, 73
Moran, Maura, 35
Morency, Dick, 209
Morency, Jane, 120
Morey, B., 233
Morgan, Gale, 206
Morgan, John, 134, 249
Morris, Ira, 46
Morvay, Ronnie, 90
Moss, Austin, 267
Mottershead, Brian, 146
Mudgett, Christine, 181
Muhm, Claire, 206
Mulkey, Bob, 8

Mullen, Pat, 213
Mulvey, Joe, 74
Murphy, Bob, 76
Murray, Robert G., 131
Myer, Doug, 249
Myrick, Ron, 35

N

Nagamine, Toshio, 109
Napp, Duane, 176
Nation, Mike, 155
Nealon, Robert, 205
Nelsen, Don, 63
Nelson, Paul, 82, 83
Nicholls, Deb, 260
Nichols, Jay, 90
Nickerson, Dana, 183
Nickerson, Ron, 249
Niederhauser, Orson, 237
Nielsen, Larry, 89
Noren, Nils, 166
Norman, Les, 53
Norquay, Gordon, 117, 190
Norton, Cal, 38
Novak, Frank, 209

O

O'Brien, Bill, 26
O'Brien, Clem, 102
O'Brien, Ellen, 225
O'Brien, Will, 238
O'Connell, Mark, 91
O'Donnell, Art, 190
O'Donnell, Hilary, 134
O'Donnell, Louise, 227
O'Hern, Brian, 222
O'Keefe, John, 219
O'Keefe, Rob, 191
O'Leary, Kay, 134
O'Leary, Marian, 176
Oden, Gary, 261
Ohri, Anil, 88
Oka, Kenji, 108
Oldfield, Fred, 169, 171
Oliver, Peter, 36
Olivotto, Nino, 139
Ono, Kaz, 108, 109
Onorato, Joseph, 115
Osborn, John, 223
Osborne, Brian, 225
Ota, Brian, 197
Oughton, Mike, 146
Owaga, Yoshiko, 231
Owen, Brian, 132
Oyama, Ken, 108

P

Paciulan, Dick, 35
Pacy, John, 52
Palmer, Robert, 67
Parikh, Bharat, 181
Parker, Ken, 243
Parm, Bill, 74
Parmelee, Bob, 189
Parnell, Don, 185
Parris, Erv, 46
Parry, Ray, 109
Patane, Rozanna, 197
Patel, Mahendra, 126
Patel, Val, 266
Paul, Bob, 191
Paul-Emile, Serge, 25, 77
Paxton, Jerry, 215
Payne, June, 16
Payne, Mary, 60
Payne, Ron, 195
Pearson, Stan, 103
Pendleton, George, 57
Penney, Bruce, 183
Penney, Vic, 73
Pepper, Al, 182
Percy, Laura, 13
Perkins, Bill, 120
Perkins, Jim, 36
Perry, Bob, 197
Perry, John, 68
Peters, Carol, 80
Peters, Chris, 174
Phalen, Alice, 120
Pherson, Karen, 110
Philippon, Lou, 90
Phillips, Jan, 198
Picardi, Tony, 8, 93
Picott, Bill, 74
Pierce, Jerry, 230
Pieters, Fred, 136
Piggford, Carole, 38
Pigman, Dick, 119
Pitochelli, D., 233
Pitruzzella, Vince, 36
Pittenger, Russ, 53
Pitts, Jim, 204
Pitz, Cliff, 241
Plakias, Greg, 190
Pledger, Carter, 35
Plotkin, Charlene, 56
Poe, Chuck, 160
Poe, Ken, 196
Polay, Charlie, 189
Porter, Trevor, 160
Posey, Frank, 205
Post, Debbie, 172
Potter, Harold, 26

Powderly, Charlie, 182
Powell, Bob, 228
Powers, Rich, 247
Provencher, Dick, 207
Pursel, David, 36

R

Rabe, Ty, 264
Racine, Ernie, 243
Rae, Paul, 47
Raibley, Rebecca, 204
Ramcharan, Fiona, 153
Ramirez, Al, 211
Ramos, Al, 183
Ramponi, Roland, 251
Randall, Phil, 227
Rappaport, Phyllis, 227
Ravan, Jim, 63
Rawa, Ruth, 68
Raymond, Bob, 116
Reczek, Don, 249
Redfield, Carl, 191
Reeg, L., 233
Rees-Lewis, Bill, 146
Regli, Keith, 123
Rehill, Michelle, 38
Reiling, Ron, 36
Reilly, Ken, 261
Rennick, Bob, 110
Reuthe, Beth, 134
Reynolds, Jim, 122
Rezac, Roy, 101
Rhee, Kyu Sun, 232
Ricci, Larry, 166
Richardson, Tom, 263
Riddle, Brian, 44
Riddle, Harry, 225
Ridgley, John, 232
Riedl, John, 19
Riesgaard, Serena, 38
Riggle, Mike, 106, 109
Riley, J., 233
Rinaldi, Mike, 134
Rines, Tom, 133
Riordan, Dan, 219
Rivera Oyola, Luis, 134
Robbins, Worth, 51
Robey, Mike, 241
Robinette, Bill, 67
Robinson, Fred, 156
Robinson, Gary, 162
Robinson, Kathy, 49
Robohm, Peter, 212
Rodabaugh, Lee, 147
Rodock, Mary, 166
Roessler, Brigitte, 136
Roettjer, Phil, 110

Rogers, Ana, 198
 Rojcewicz, Peter, 115
 Roller, Bob, 207
 Roney, Bob, 210
 Rosander, Glenn, 250
 Rosch, Raymond, 198
 Roscoe, Ron, 172
 Rose, John, 81
 Rose, Vicki, 228
 Rosenberg, Larry, 262
 Ross, Ron, 75
 Rossini, Larry, 8
 Rossiter, Dennis, 131
 Rothberg, M., 233
 Rothenberg, Doug, 249
 Rottmayer, Bob, 63
 Rozett, Bruce, 75
 Rubinson, Barry, 161
 Rubinstein, Dick, 65
 Rudy, Jeff, 158
 Russell, Dick, 242
 Rutland, Marilyn, 207

S

Salmi, David, 206
 Salvaggio, Paul, 196
 Samet, Bonnie, 231
 Sanders, Rufus, 190
 Sandford, Ann, 190
 Sands, Jeff, 215
 Sannicandro, John, 173
 Sansing, Bob, 225
 Santos, Charlie, 75
 Satow, Clay, 26
 Saviers, Grant, 105
 Scanlan, Jem, 144
 Scarborough, Dick, 236
 Scarpati, Marty, 267
 Scarsdale, Lloyd, 175
 Schaefer, Dan, 116
 Schaefer, Ron, 157
 Schatz, Joseph, 122
 Schatzel, Al, 242
 Scherpenhuizen, Jan, 136
 Schmidt, Ed, 132
 Schmidt, Emilie, 230
 Schmidt, Rod, 175
 Scholes, Gillian, 80
 Schriesheim, Jeff, 120
 Schuette, Rick, 35
 Schulman, Andrea, 38, 41
 Scontsas, G., 233
 Scott, Bill, 245
 Scott, Jim, 73, 170
 Seaver, Bill, 132
 Sebring, Jeff, 162
 Segal, Bill, 159

Segal, William, 26
 Seidner, Connie, 234
 Senior, Ken, 245
 Shaller, Roger, 197
 Shanklin, John, 110
 Shaw, George, 184
 Shebell, John, 63, 243
 Sheehan, Claudia, 120
 Shelton, Bob, 253
 Shepard, Bob, 190, 194
 Sherman, Stan, 26
 Sherwood, John, 79
 Shields, Jack, 205
 Shimkin-Oberai, Rachel, 98
 Shipman, Janet, 207
 Shire, Willow, 255
 Shishov, Andrei, 76
 Shopbell, Marlin, 68
 Shue, Charles, 205
 Shumway, Herb, 189
 Shusterman, Jerry, 45
 Siffleet, Jean, 128
 Sills, Ken, 166
 Silverman, Sharon, 70
 Simensen, Jac, 122
 Simkins, Nelson, 89
 Sisakhti, Reza, 232
 Sistare, John, 194
 Sites, Dick, 63
 Slayback, Jeff, 74
 Sloan, Cathy, 38
 Smart, Ron, 63
 Smith, Angela, 249
 Smith, Bruce, 251
 Smith, Dick, 237
 Smith, Doug, 216
 Smith, Joe, 236
 Smith, Joseph, 25
 Smith, Kathryn, 91
 Smith, Norm, 253
 Smith, Penny, 36
 Smith, Peter, 255
 Smith, Phil, 117
 Smits, Stan, 154
 Smyth, Gerry, 68
 Snyder, Al, 113, 241
 Soboski, Hank, 265
 Soderquist, Karl, 223
 Sofio, John, 248
 Sowers, Mike, 155
 Spalding, Nick, 138
 Spector, Lee, 242
 Speight, Alan, 154
 Spence, Marty, 124
 Spence, Rob, 120
 Spencer, Hank, 243
 Spinney, Dave, 80

Spitz, Rick, 157
Spratt, Pat, 255
St.Vrain, Kent, 207
Stahl, Shirley, 9
Starratt, Dave, 238
Steele, Bob, 176, 189, 196
Steele, Bruce, 178
Steele, Roy, 226
Steiner, Toni, 220
Steul, Bill, 258
Stevens, Derek, 122
Stewart, Bob, 62, 63
Stewart, Dee, 266
Stewart, Jim, 222
Stewart, Jon, 147
Stewart, Robbie, 201
Stith, Arline, 231
Stockebrand, Tom, 84
Stoeckelmann, Ulf, 196
Stolle, Steve, 189
Stone, David, 134
Stone, Dick, 231, 232
Stone, Kathy, 189
Stone, Oliver, 185
Storey, I., 233
Stout, Mike, 49
Straight, Robert, 181
Strecker, William, 161
Stroll, David, 259
Sudan, Lee, 131
Suenaga, Masahide, 107
Swan, Richard, 61
Swanton, Ken, 93
Sweeney, Dave, 26, 83
Sweeney, Dick, 120
Swinand, Lou, 228
Symula, George, 81

T

Tabor, Maureen, 207
Takahashi, Kokichi, 109
Tallo, Paul, 210
Tang, Ed, 183
Tartaglia, Lorraine, 73
Tata, Carmine, 176
Taylor, Bill, 243
Taylor, Bob, 60
Taylor, Donna, 8
Taylor, Mike, 256
Teicher, Steve, 166, 244
Temmallo, Carolyn, 228
Tereshko, Jim, 125
Tervalon, Al, 191
Tharp, Charles, 228
Theberge, Henry, 51
Thibeau, Richard, 88
Thomas, Sandy, 212

Thomas, Tony, 54
Thompson, J., 233
Thompson, Mike, 184
Thorpe, Dave, 178
Thurk, Mike, 128
Timura, Wayne, 25
Titcomb, Allan, 102
Tobin, Dan, 131
Torres, Hector, 77
Towle, Doug, 207
Towne, Roger, 225
Traversi, Fred, 189
Trocchi, Bob, 213
Tucker, Joy, 183
Turi, A., 233
Turley, Chuck, 74
Turner, Nigel, 157
Turner, Pam, 224
Tuttle, Jim, 191
Tuttle, Tom, 79

U

Upton, David, 82

V

Valet, Isabelle, 138
Vanatten, William, 206
Vancollie, Guy, 147
Vanderhooft, Joluut, 229
Vanderpot, Maurice, 8
van Roekens, Peter, 116
Vaskas, Al, 132
Velez, Lydia, 147
Vernaza, Joe, 204
Vyssotsky, Victor, 60

W

Wade, Brian, 265
Waite, Dick, 241
Wallace, Greg, 128
Wallace, Smokey, 261
Walls, Jim, 87
Walsh, Bill, 75
Walsh, Ron, 173
Walsh, Tim, 222
Ward, G., 234
Ward, Graham, 231, 232
Ward, Joyce, 54
Warfield, Larry, 88
Warshawsky, R., 233
Watkins, Hank, 240
Watson, Bristow, 228
Watson, Jenny, 66
Watterson, Barbara, 260
Weeks, Barry, 189
Weger, Pat, 231

Wehring, Bill, 180
Weigl, Andy, 245
Weinbrenner, Harry, 111
Weiner, Bob, 260
Weinfuss, Max, 241
Wells, Nick, 182, 183
Wentzell, Steve, 219
Wesche, Dick, 49
Wetmiller, John, 245
Weyant, Tom, 253
White, Andy, 236
White, Bill, 36
White, Mary, 162
Whitman, Rich, 99, 101
Whitman, Richard, 102
Whitney, Susan, 178
Wilcox, Judy, 207
Wilhelm, Fred, 218
Wilkes, Ray, 220
Williams, Art, 80
Williams, Eric, 15
Willis, Jim, 262
Wilson, Don, 188
Wilson, Tim, 49
Winters, Gayn, 161
Witmore, Jerry, 213
Woelbern, John, 114
Wong, C.K., 191

Wood, Ray, 205
Woodburn, Laura, 100
Woods, Susie, 54
Woolf, Howard, 263
Woosley, Ed, 110
Workman, Ted, 68
Wulf, Sharon, 70, 166

Y

Yacubovich, George, 244
Yeaton, Tim, 127
Yedavalli, Rao, 172
Yelton, Don, 180
Yen, Dick, 193
Yocom, Tom, 228
Young, Donald, 139

Z

Zabinski, Steve, 244
Zeh, Joe, 25, 95
Zercoe, Joseph, 205
Zereski, Don, 236
Zia, Sultan, 119
Zilvitis, Patrick, 259
Zotto, Pete, 256

SUBJECT INDEX

A

ABS/JRD
 See Asian Base Systems Software
Account Management Services, 52
ACT
 See Application Centers for Technology
Ada, 157
Advanced
 Architectures, 98
 Data Base Systems, Colorado, 107
 Development, 51
 Manufacturing Technology, 117
 Materials and Processes, 88
 Networking, 209
 Semiconductor Development, 68
 Service Delivery Systems, 244
 Technology Engineering and Manufacturing,
 102
 Text Solutions, 54
Advisory Services, 220
Aerospace Marketing, 215
AFL
 See Architecturally Focused LSI
AIMT
 See Application of Integrated Manufacturing
 Technology
AITG
 See Artificial Intelligence Technology Group
AMG
 See Area Marketing Group
AMT
 See Advanced Manufacturing Technology
ANSI, 163
ANSI COBOL, 158
APL, 157
APPIX, 16
Apple Macintosh, 81
Application
 Centers for Technology, 220
 Integrated Manufacturing Technology, 184
 Systems Development, 185
Applications

Applications (cont'd.)
 Engineering, 125
 Engineering, Valbonne, 144
Applied
 Fabrication, 46
 Module/PWB Technology, 46
Aquarius, 95
Architecturally Focused LSI, 69
Architectural Systems, 83
Architecture
 Advanced Development, 83, 126
 Engineering Development Office, 244
Area Marketing Group, 219
Aridus, 95
Artificial Intelligence
 Research Group, 61
 Technology Group, 127
ASD
 See Advanced Semiconductor Development
 See Application Systems Development
ASDS
 See Advanced Service Delivery Systems
Asian Base Systems Software, 108, 160
AT&T, 261
ATEAM
 See Advanced Technology Engineering and
 Manufacturing
Atlanta Media Operation, 234
Automotive Marketing, 215

B

BA200, 72
Bandwidth Management, 57
Base Software Systems, 241
BASIC, 158, 163, 187
BASIC+2, 74
Basic Industries Marketing, 213
BASIS, 187
BEITA
 See Business Equipment & Information
 Technology Association
BLISS, 157, 187
BOIS

BOIS (cont'd.)

See Business and Office Information Systems

Books, 39

BOSE

See Business and Office Systems Engineering

Bridges & Terminal Server Hardware, 121

Business

Development, Field Service, 237

Equipment & Information Technology Association, 137

Fellowship Program, 224

Strategy and Planning, 159

Ventures Group, 239

Business and Office

Information Systems, 262

Systems Engineering, 264

BVG

See Business Ventures Group

C

C, 157

C/FM

See Cable/Facilities Management

Cable/Facilities Management, 123

Cable/Harness/Sub-Assembly/PROM Program Area, 171

CAD, 121

Detailed Drafting Program, 182

Environment Group, 180

Support, Test, And Release, 181

Systems Engineering, 180

CAD/CAE, 88

CAD/CAM

DECnet, 170

Engineering Services, 115

Technology Center, 180

CAD/CAM/Diagnostics, 96

CADSE

See CAD Systems Engineering

CADSTAR

See CAD Support, Test, And Release

CAE, 121

CAE/CAD/CAM, 115

CALLIOPE, 187

Cambridge Research Lab, 60

Cartridge Tape Development, 106

CAS

See Customer Administrative Services

CBS

See Content-Based Systems Group

CCITT, 163

See International Telegraph and Telephone Consultative Committee

CDDP

See CAD Detailed Drafting Program

CD Reader, 105

CDROM Services, 232

CEN/CENELEC, 138

Centaurus, 95

Central Engineering DECUS Administration, 159

Central Massachusetts Administrative Services, 47

Central Quality Group, 8

CEPT, 138

Channel Products, 121

Channels Marketing Group, 218

Chemical Industry Marketing, 216

Chief Engineer's Office, 16

CIE

See Computer Integrated Enterprise

CIG

See Customer Information Group

CIM

See Computer Integrated Manufacturing

CIMG

See Consultant and Industry Marketing Group

CIMIE

See Computer Integrated Manufacturing International Engineering

Circulation of Materials, 39

CIRRUS Systems Engineering, 100

CIS

See Competitive Information System

CISM

See Consultant and Information Systems Marketing

Cluster Verification, 250

CMAS

See Central Massachusetts Administrative Services

CMG

See Channels Marketing Group

CMO

See Configuration Management Office

CMOS

See Semiconductor Manufacturing and Technology

COBOL, 158, 163, 187

COBOL-81, 74

COBOL Program Generator, 158

CODASYL, 163

CODASYL COBOL, 158

Colorado

Free Field Test Site, 79

Springs Media Operation, 234

Storage Systems Engineering, 109

Commercial Languages and Tools, 158

Commodity Business Plans, 196

Common LISP, 127

Communications

Act of 1934 (RFI/EMI), 23

- Communications (cont'd.)
 - SSMI Team, 207
 - Strategy Committee, 207
- Communication Systems Engineering, 121
- Compensation/Benefits, 7
- Competitive Information System, 41
- Competitors' Publications, 39
- Complementary Solutions Organization, 223
- Component Engineering, 172
- Computational Quality Group, 60
- Computer
 - Integrated Telephony, 123, 129
 - Resources, 69
 - Services, 220
 - Special Systems, 235, 242
- Computer Aided Design
 - See CAD
- Computer Integrated Enterprise, 247
- Computer Integrated Manufacturing
 - International Engineering, 139
 - Marketing and Product Development, 266
 - Semiconductor Operations, 68
 - Services, 175
- Computer Systems Manufacturing, 169
 - Engineering and Technology Group, 247
- CONbase, 199
- Configuration Management Office, 252
- Consultant
 - Acquisition & Programs, 197
 - and Industry Marketing Group, 212
 - and Information Systems Marketing, 212
- Consumer Product Safety Act, 23
- Content-Based Systems Group, 37
- Controllers, 110
- Copyright, 19
- Core Applications Group, SSG, 158
- Core Products Development, 127
- Corporate
 - Administrative Purchasing, 196
 - Communications, 207
 - Design Group, 85
 - Export Reference Manual, 24
 - Forms Administration, 44
 - Market Applications, 243
 - Marketing, 222
 - Marketing—CSO Training, 223
 - Market Research Centers, 38, 43
 - Phase Review Process, 11
 - Power Conversion R&D, 88
 - Printed-Wiring Boards, 175
 - Product Safety and Regulations, 14
 - Proprietary Information Disclosure, 19
 - Purchasing, 195
 - Purchasing Reference Systems, 199
 - Quality Group, 203
 - Research and Architecture, 59
 - Sales Accounts, 205
- Corporate (cont'd.)
 - Software and Consultant Acquisition Support, 199
 - Standards, 162
 - Systems Group, 258
 - User Publications, 158
- COSIMA/CIM-OSA
 - See Esprit CIM Software
- Course Development, 231
- Courseware Authoring System, 187
- CPRS
 - See Corporate Purchasing Reference Systems
- CPS&R
 - See Corporate Product Safety and Regulations
- CPSG
 - See Customer Project Support
- CPU Engineering Group, 96
- CRA
 - See Corporate Research and Architecture
- CRL
 - See Cambridge Research Lab
- CRS
 - See Customized Research Service
- CSG
 - See Corporate Systems Group
- CSM
 - See Computer Systems Manufacturing
- CSM Component/Subsystem Technology, 46
- CSME&T
 - See Computer Systems Manufacturing Engineering and Technology Group
- CSM Support, 200
- CSO
 - See Complementary Solutions Organization
- CSP
 - See Customer Support Programs
- CSS
 - See Computer Special Systems
- CSSE
 - See Customer Service Systems Engineering
- CTC
 - See CAD/CAM Technology Center
- CUE, 187
- Cullinet Strategic Alliance, 260
- CUP
 - See Corporate User Publications
- Customer
 - Administrative Services, 52
 - Center, 53
 - Information Group, 130
 - Project Support, 248
 - Satisfaction, 69, 240
 - Service Center, 173
 - Support Programs, 226
 - Visits, 222

Customer Satisfaction, 204
Customer Service Systems Engineering, 80,
113, 239, 248
Customized Research Service, 38, 41
CVAX, 90

D

D&PE

See Design and Process Engineering

Data

Bases Products, 241
Flow Applications, 181
Switching, 122
Telecommunications, 49

DATABUS, 101

DATATRIEVE, 158, 187

DBMS, 187

DCE

See Design-Component Engineering

DCG

See Direct Channels Group

DDCT, 187

DDXF

See DISOSS Document Exchange

DEC/CMS, 158

DEC/Macintosh Integration, 81

DEC/MMS, 158

DEC/TEST, 158

DECcalc, 158

DECcalc-PLUS, 158

DECconnect, 129

DEC Culture, 6

DECdirect, 52

DECdirect Plus Catalog, 208

DEC-FDDI, 121

DECgraph, 158

DECnet

Architecture, 163
Software Engineering, 124
Technology, 81
VAX, 156, 157

DECnet/OSI, 129

DECpage, 158

DECrouter 200, 124

DECserver 200, 121

DECserver 500, 121, 129

DECslide, 158

DEC Standard Price List, 16

DECsystem-10, 2

DECSYSTEM-20, 2

DECUS, 3, 157

DECwest Engineering, 93

DECwindows, 81, 156

DECWORLD, 207

DEES

See DECUS

DELQA, 129

Design

and Process Engineering, 74
and Reliability Assurance, 69
Reliability Engineering, 253

Design-Component Engineering, 172

Desktop

Communications, 90
Publishing, 158
Systems Development, 73
Systems Group, 82

DESNIC

See Ethernet Security

DETCI (Israel), 69

Development and Publishing, 229

Diagnostic

Engineering, 75

Dictionary Services (CDD and CDD+), 157

Digital

BASIC, 158
Business Fellowship Program, 224
Copyright, 19
Engineering Notebook, 25
Information Systems Training, 229
Interconnect SBU, 129
Library Network, 37
Management Education, 226
Marketed Software, 81
Network Architecture, 126
Philosophy, 3
Press, 223
Publications, 39
Publications, Legal Guidelines, 20
Software Products, 222
Standards, 15
Technical Journal, 66
Telecommunications, 56
Telecommunications Engineering, 57
Telephone Directory, 44
Telephone Network, 56
Video Network, 57, 233

Direct Channels Group, 219

DIS

See Digital Information Systems

DIS/ECP

See Executive Contact Program

Discrete Industry Marketing, 215

DISHRM

See Human Resource Management

Disk Drive Development, 109

DISOSS Document Exchange, 123

Display Team, 82

DIS Strategy, Technology, and Architecture,
51

Distributed

Information Systems Toolkit, 187
Name Service, 54
Realtime, 73

Distributed Systems, 200
 Architecture and Advanced Development, 126
 Group, 119
 Manufacturing, 133
 Services, 120
 Technical Evaluation, 126
 Test Evaluation Group, 251
 Verification, 250
 Distribution, Marketing, Sales, and Service Business Systems, 262
 DLN
 See Digital Library Network
 DME
 See Digital Management Education
 DMS
 See Digital Marketed Software
 DMSS
 See Distribution, Marketing, Sales, and Service Business Systems
 DNA
 See Digital Network Architecture
 DNS
 See Distributed Name Service
 Documentation
 and Standards, 176
 and Training Services, 186
 Services, 15, 111, 120, 230
 DRAM, 109
 DRE
 See Design Reliability Engineering
 DSM
 See Distributed Systems Manufacturing
 DSM-11, 74
 DSS
 See Distributed Systems Services
 DSTAR
 See DIS Strategy, Technology, and Architecture
 DSTEG
 See Distributed Systems Technical Evaluation
 See Distributed Systems Test Evaluation Group
 DTN
 See Digital Telephone Directory
 DW88/TELCOM Special Events, 132

E

Eastern Massachusetts Administrative Services, 47
 EASYNET, 56
 ECMA, 163
 See European Computer Manufacturers Association
 ECO
 See Product Change Process

Economic Programs Marketing, 214
 ECS
 See Equipment Control Systems
 EDE/Wang, 124
 EDI
 See Electronic Data Interchange
 EDI/DISOSS, 124
 EDI-EII
 See Electronic Data and Information
 Editing, Illustrating, and Publishing, 232
 Editing Software, 158
 EDT
 See Editing Software, 158
 Education
 Advisory Board, 8
 Corporate Quality, 203
 Marketing, 213
 Education, Corporate Quality, 204
 Educational Services, 221
 EERP
 See European External Research Program
 EIA, 163
 EIP
 See Engineering Interface Program
 EL-Class Document Directory, 15
 Electrical Design Technology, 210
 Electro/Mechanical Design and Support, 84
 Electromagnetic Compatibility, 79
 Electronic
 Data and Information, 53
 Data Interchange, 199
 Publishing Systems, 263
 Storage Development, 113
 Electronic Data Interchange, 187
 Electronics Marketing, 215
 11/73, 72
 11/83, 72
 11/53, 72
 ELF
 See Employee Locator Facility
 EMAS
 See Eastern Massachusetts Administrative Services
 EMC, 112
 See Electromagnetic Compatibility
 EMD&S
 See Electro/Mechanical Design and Support
 EMDS
 See External Market Data System
 Employee Locator Facility, 45
 ENET
 See Ethernet
 Engineering
 CAD, 75
 Design Support, 121
 Interface Program, 66
 Legal Services, 17

Engineering (cont'd.)

- Model Shops, 170
- Newsletter, 16
- Notebook, 25
- Personnel, 7
- Process and Technology, 77
- Product Operations, 11
- Product Planning, 11
- Projects, 9
- Stockroom, 171
- Support, GIA, 193
- Support Unit, 249
- Systems, ULTRIX, PRISM, 260
- Technical Training, 182
- Engineering/New Products Purchasing, 199
- ENPP
 - See Engineering/New Products Purchasing
- Enterprise Network Program, 122
- Environmental
 - Engineering, 88
 - Marketing, 214
 - Support and Site Services, 244
- Environment and Workstation Systems, 181
- EP&T
 - See Engineering Process and Technology
- EPIC, 158
- EPS
 - See Electronic Publishing Systems
- Equipment Control Systems, 187
- ERP
 - See External Research Program
- ESD
 - See Electronic Storage Development
- ESD Advanced Development, Shrewsbury, 107
- Esprit CIM Software, 140
- ESU
 - See Engineering Support Unit
- Ethernet
 - Security, DESNC and KDC, 161
 - 802.3 Technology Center, 121
- Ethernet 802.3, 124
- ETSI
 - See European Telecommunication Standards Institute
- ETT
 - See Engineering Technical Training
- EUEG
 - See European ULTRIX Engineering Group
- European
 - Area Training, 221
 - Channels Marketing, 220
 - Commission, 138
 - Computer Manufacturers Association, 137
 - Digital Competence Center, 136
 - Digital Library Network, 40
 - Engineering Support, 201
 - External Research Program, 135

European (cont'd.)

- Field Service, 237
- Interface, Small Systems, 178
- Maintainability Engineering, 243
- Media Operations, 234
- PC Clone Testing, 81
- Product Safety, 137
- Telecommunication Standards Institute, 138
- ULTRIX Engineering Group, 261
- VLSI Semiconductor Operations, 68
- Workshop on Open Systems, 138
- EWOS
 - See European Workshop on Open Systems
- Executive and Information Systems Marketing, 213
- Executive Contact Program, 55
- Export Control Laws, 23
- External
 - Boards Business, 176
 - Market Data System, 42
 - Research Program, 61
 - Resource Management, 195

F

- FABS
 - See Finance and Administrative Business Systems
- Facts About Digital, 1
- Far East Operations, 193
- FCC, 112
- FCC Approval, 78
- Federal Hazardous Substances Act, 23
- Federal Sales Accounts, 205
- Fiber Optics, 77
- Field Service, 236
 - Management Sciences, 245
 - Training, 228
- Finance and Administrative Business Systems, 262
- Financial Industry Systems Group, 259
- Finishes Technology and Development, 46
- Finishing Service Center, 174
- Firmware/Software Product Development, 84
- FISG
 - See Financial Industry Systems Group
- FMS, 187
- Font Engineering, 82
- Food and Beverage Industry Marketing, 216
- Forge Road Media Operation, 116
- FORTTRAN, 157
- Fortune 100, 2
- Fortune 500, 2
- FTSV, 187

G

- GDS Facilities/Plant Layout, 183

General Business Engineering, 74
General Government Marketing, 214
General International Area
 See GIA
GIA
 Channels Marketing, 220
 CSSE, CSS/VES/Government, 242
 Educational Services, 225
 Field Service, 236
 Interface, 178
 Manufacturing and Engineering, 193
Government Systems Group, 209
Graduate Engineering Education Program
 (GEEP), 9
Graphic Design, 86
Graphics Software, 158
Greenville Board Shop, 176
GSG
 See Government Systems Group

H

Hardcopy
 Buyout Support, 109
 CSSE, 82
Hardware
 Engineering, 72
 Maintenance Training, 222
 Systems Support, 261
HAZnet, 187
Heads and Components Advanced
 Development, Shrewsbury, 107
Health Care Industry Marketing, 217
High End VAX Marketing, 102
High Performance
 PRISM Worksystems, 93
 Systems, 95
 VAX Workstations and Graphics, 80
Housing Marketing, 214
HPS
 See High Performance Systems
HSC50, HSC70, 110
Human Factors Engineering, 86
Human Resource Management, 54
Human Services Marketing, 214

I

I/O Library, 265
IAPD
 See International Advanced Product
 Development
IAS
 See Information Access Services
IBM
 Interconnect Engineering, 123
 RDB/VMS Transfer, 186
IBM SNADS and PROFS, 124
ICG

ICG (cont'd.)
 See Indirect Channels Group
IDECUS, 187
 See Internal DECUS
IE
 See International Engineering
IEC, 162
 See International Electrotechnical
 Commission
IECG
 See International Engineering Consultancy
 Group
IEEE, 163
IEG
 See Internal Equipment Group
Image Systems Group, 128
Indirect Channels Group, 219
Individual Validated License, 23
Industrial Design, 86
Industry
 Market Applications, 243
 Marketing Services, 211
Industry-Compatible Tape Development, 106
Information
 Access Services, 42
 and Library Purchasing, 40
 Management Business Architecture, 244
 Operations, 53
 Resource Center, 115
 Services, 39, 48
 Supply Base Management, 40
Information Systems
 Engineering, 186
 Product Marketing, 259
Input/Output Engineering, 83
Instructional
 Design and Consulting, 232
 Media Services, 39
Integrated
 Manufacturing Technology, Application,
 184
 Personal Computing, 90
 Program Support Environment, 157
 Services Digital Networks, 138
Intellectual Property
 Competitive Advantage, 17
 Protection Program, 66
 Rights Protection, 27
Interconnect
 Product Development, 210
 Technology, 108
Interlibrary Loan, 39
Internal
 DECUS, 55
 Equipment Group, 52
 Special Systems, 187
 Videotex System, 57
International

International (cont'd.)

- Advanced Product Development, 140
- Electrotechnical Commission, 137
- Products Group, 148
- Products Office, 13
- Standards and Regulations, 136
- Team, 82
- Telegraph and Telephone Consultative Committee, 138

International Engineering, 134

- Computer Integrated Manufacturing, 139
- Consultancy Group, 146
- Development, 140
- Process and Quality, 152

Internship Program, 56

IPE

- See Industrial Design

IPG

- See International Products Group

IPO

- See International Products Office

IPSE

- See Integrated Program Support Environment

IS&R

- See International Standards and Regulations

ISDN, 129

- See Integrated Services Digital Networks

ISE

- See Information Systems Engineering

ISG

- See Image Systems Group

ISO, 163

ISO/IEC, 138

ISO/OSI, 125

ISS

- See Internal Special Systems

J

J-11 CPU, 72

Janus, 76

Japan Engineering Support, 201

Japan R&D Center, 107

JEDEC, 163

JRDC Advanced Development, Tokyo, 107

Judicial/Public Safety Marketing, 214

K

KDA50, KDB50, 110

KDC

- See Ethernet Security

KEEP, 101

Keyboard Arrangements, 163

L

LA50, LA75, LA85, 109

Laboratory Data Products/Science Group, 264

LABSTAR, 265

LACE SBU, 130

Languages, 74

Language Sensitive Editor, 157

Large Mid-Range Systems, 93

Large Systems, 209

Business Unit, 243

Large VAX Engineering, 95

LAVC

- See Local Area VAXclusters

LDP

- See Laboratory Data Products/Science Group

LEDS

- See Low End Disk Systems

Legal Guidelines for Digital Publications, 20

Legal Services for Engineering/Manufacturing, 17

Legislative/Executive Administrative Marketing, 214

LENS

- See Low End Network Systems

LERE

- See Low End Regulatory Engineering

LES

- See Low End Systems

Libraries Marketing, 214

Library

- Network, 37

- Purchasing, 40

- Start-Up Consulting, 40

LIMS/SM, 265

Literature Order Fulfillment, 44

LLV

- See Local Language Variants

LN02, LN03, LN04, 109

Local Area

- Networks, 121

- VAXclusters, 73, 156

Local Area Communications, 242

- Engineering, 120

- Product Management, 129

Local Government Marketing, 214

Local Language

- Assistance, 151

- Variants, 144

LOF

- See Literature Order Fulfillment

Logistics, Field Service, 237

LOLA

- See Local Language Assistance

Low End

- Communications and Transmission, 129

- Disks Products, 241

- Disk Systems, 115

- Mid-Range Systems, 93

Low End (cont'd.)

- Network Systems, 76
- Power Supply Engineering, 87
- Regulatory Engineering, 78
- Systems, 71
- Systems Industrial Packaging, 89
- Systems Manufacturing, 173
- VAX Workstations, 80

Low Volume Manufacturing, 172

LPS20, LPS40, 109

LSE

- See Language Sensitive Editor

LSI-11, 2

LSI Design, 108

M

M/E and Technology, 178

Machining Service Center, 174

MACRO, 187

MAET

- See Maynard Area Engineering Training

Mail/Document Interchange, 129

Mail/Interchange Engineering, 124

MAILbus, 124

Mailing Services Operation, 44

Maintainability Engineering, 241

Management

- Control Center, 125
- Development Program, 56
- Information Systems, 48
- Sciences in Field Operations, 245
- Systems Research, 63

Manufacturing

- Business Unit, 103
- Corporate Quality, 204
- Customer Integration Group, 179
- Data Integration, 139
- Distributed Systems, 133
- Information and Technology, 180
- Legal Services, 17
- Management Sciences, 245
- Market Applications, 243
- Material/External Resources, 189
- Operations, 169
- Personnel, 7
- Process and Materials Engineering, 247
- Quality Control, 69
- Support, GIA, 193

Market

- Applications Systems, 243
- Development Group, 219
- Information Resources Management, 43
- Information Services Group, 40
- Research Centers, 38, 43

Marketing

- Communications, Corporate Quality, 203
- Field Service, 242

Marketing (cont'd.)

Industry, 211

Service Group, 219

SSG, 159

VAX Systems Software, 159

Marlboro Anechoic Chamber, 79

Marlboro Free Field Test Site, 79

Mask Works, 20

Mass Storage, 209

Materials

and Purchasing, GIA, 193

Board of Directors, 189

Planning, 68

Research Laboratory, 175

MAXCIM, 187

Mayfair/GPX, 176

Maynard Area Engineering Training, 78

MBOD

See Materials Board of Directors

MBU

See Software Manufacturing Business Unit

MCC

See Management Control Center

See Microelectronics and Computer
Technology Corporation

MCESS

See Mechanical Component Engineering
Support Services

MCG

See Media Communications Group

MDG

See Market Development Group

MDI

See Manufacturing Data Integration

Mechanical

Component Engineering Support Services,
173

Design, 111

Packaging Design Engineering, 111

Technology Development, 88

Media

Advanced Development, Forge Road, 107

Communications Group, 232

Industries, 212

Memories, GIA, 194

Memory Products, 242

MEM Security, 12

Message Transport System, 57

Methods, Strategies, and Tools, 251

Microelectronics and Computer Technology
Corporation, 62

Micromedia Publishing, 233

MicroPDP-11, 72

MicroPower/Pascal, 74

Microserver Program, 129

Microsystems

Marketing and Planning, 90

Micro Systems
 Development, 71
 Market Applications, 243
MicroVAX, 72, 90, 127, 176
 Program Group, 90
MicroVAX 2000, 90
MicroVAX 3000-Based Products, 209
MicroVAX 3500/3600, 90
MicroVAX I, 2
MicroVAX II, 2, 90
MicroVMS, 156
Mid-Range
 System Evaluation Engineering, 251
 Systems Business Group, 93
 VAX Workstations, 80
Mid to Large Disks, 241
Mid-Vax Systems, 241
MIRM
 See Market Information Resources
 Management
MISG
 See Market Information Services
Models and Database Management, 245
Model Shop, 111
Modules and Subassemblies, 173
MS/DOS, 124
MSD
 See Micro Systems Development
MS-DOS Integration, 81
MSEE
 See Mid-Range System Evaluation
 Engineering
MSG
 See Marketing Service Group
MTS
 See Message Transport System
Multivendor Interconnect SBU, 129

N

NAC
 See Networks and Communications
NACM
 See Networks and Communications
 Marketing, 131
NAS
 See Network Application Support
NBS, 163
Network
 Application Support, 81
 Diagnostic Strategy, 125
 Engineering Technical Services, 120
 Management and Systems Evaluation, 124
 Management Product Management, 129
 Services, 242
 Standards Program, 122
 Training, 55
 Ventures Group, 130

Networks and Clusters, SSG, 156
Networks and Communications, 120, 209
 Europe Product Management, 129
 Field Service, 242
 Marketing, 131
 PBU Management, 128
New Computing Structures, 166
New England Storage Systems, 115
New Products
 Services, 171
New Products Operations, 169
901 - 90 & 91 Class Materials, 171
NMSE
 See Network Management and Systems
 Evaluation
Non-Disclosure Agreement, 31
NPO
 See New Products Operations
NPS
 See New Products Services

O

Office
 Applications Training, 227
 Information Systems, 263
 Market Applications, 243
 of the Chief Engineer, 16
 Productivity Training, 227
Oil and Gas Industry Marketing, 216
OIS
 See Office Information Systems
OLTP
 See On-Line Transaction Processing
On-Line Publishing, 54
On-Line Transaction Processing
 Marketing, 102
 Primitives, 157
 Software Engineering, 100
Operator Training Program, 56
OPT
 See Office Productivity Training
Optical Disk Development, 106
Option/Module List, 16
OS/2 Integration, 81
OSI, 129

P

P&CS
 See Publishing and Circulation Services
P&DS
 See Process and Design Support
P/FM
 See PBX/Facilities Management
P/OS, 74
PAC
 See Public Access Terminal

Paperless ECO, 187
 Paris Research Laboratory, 60
 PASCAL, 157, 163, 187
 Patent, 18
 Committees, 25
 Office, 77
 PBX/Facilities Management, 123
 PCA
 See Performance and Coverage Analyzer
 PCB Engineering, 76
 PC Integration Program, 243
 PCPD
 See Power Conversion Product Development
 PCs, 81, 209, 243
 PCSG
 See Personal Computing Systems
 PDL
 See Process Development Line
 See Program Design Language
 PDP-8, 2
 PDP-11, 72, 74, 176
 PDP-11/20, 2
 PDP-11/70, 2
 PDP-11/84, 72
 PDP-11 Systems Market Applications, 243
 Performance
 and Stress Characterization, 126
 Measurement and Analysis, 155
 Periodicals, 39
 Peripherals, 241
 Peripherals and Supplies Group, 208
 Personal Computing Systems, 81
 Personalized Training Plans, 227
 Personnel
 Engineering/Manufacturing/Product
 Marketing, 7
 PFR
 See Product Financial Reporting
 Pharmaceutical Marketing, 218
 Phase Review Process, 11
 Physical and Power Conversion Technologies,
 244
 Physical Technology, 68
 PID
 See Proprietary Information Disclosure
 PIM
 See Product Information Management
 PL/I, 157
 Placement and Engineering Applications, 180
 Planning and Standards, Corporate Quality,
 204
 Plastic Service Center, 174
 Plastics Technology and Development, 46
 PMF
 See High Performance Systems
 POISD

POISD (cont'd.)

 See Principles of International Software
 Design
 POM Verification, 250
 POSIX, 157
 Post, Telephone, and Telegraph Bureau, 138
 Power Conversion Product Development, 87
 PowerHouse, 187
 Power Systems Engineering, 111
 PREP
 See Professional Resource Exchange Program
 PRG
 See Process Reliability Group
 Principles of International Software Design,
 146
 Printed Circuit Design Services, 111
 Printed-Wiring Boards, 175
 Printers, 90, 209
 Printing Media Services, 44
 PRISM, 241
 Workstations Program Office, 261
 Worksystems, 93
 PRL
 See Paris Research Laboratory
 Problem Central, 248
 Problem Solving Systems Development, 127
 Process
 and Design Support, 200
 Development Line, 247
 Industry Marketing, 216
 Processor Specific Software, 101
 Process Reliability Group, 254
 Producibility, 172
 Product
 Acoustics, 88
 Change Process, 13
 Financial Reporting Information Center, 45
 Information Management, 247
 Liability, 23
 Management, 209
 Marketing Personnel, 7
 Marketing Group, 255
 Safety and Regulations, 14
 Safety Engineering, 211
 Safety Europe, 137
 Strategy and Architecture, 161
 Professional Resource Exchange Program, 55
 Professional Software Services, 220
 Program Design Language, 157
 Program Engineering, 211
 Project and Process Engineering, 157
 Project Materials Management, 200
 PROM, 170
 Proprietary Information
 Disclosure, 19
 Protection, 31
 Prototype Module Assembly, 170
 PSG

PSG (cont'd.)

- See Peripherals and Supplies Group
- PSI Program, 129
- PSS
 - See Processor Specific Software
- PTG
 - See Physical Technology Group
- PTP
 - See Personalized Training Plans
- PTT
 - See Post, Telephone, and Telegraph Bureau
- Public Access Terminals, 37
- Publications
 - Approval, 26
 - Legal Guidelines, 20
- Publishing
 - and Circulation Services, 44
 - Production Services, 233
- Purchasing, 195
- PWB
 - See Printed-Wiring Boards

Q

- QA
 - See Quality Assurance
- Q-bus, 72
- Quality and Reliability, 69
- Quality Assurance, 234
- Quality Development Program, 9
- Quick Turn Around (QTA) Business, 176

R

- RAD
 - See Research and Advanced Development
- Radiation Control for Health and Safety Act, 23
- Radio Frequency Interference, 79
- RAE
 - See Reliability Assessment Engineering
- Rally, 158
- RAMP
 - See Reliability and Maintainability Program Office
- Rdb, 187
- Reading WASE Communications, 122
- Realtime, 90
- Record of Invention, 24
- Reference Information Systems Development, 54
- Regulatory and Component Engineering, 112
- Reliability
 - and Design Assurance, 112
 - and Maintainability Program Office, 243
 - Assessment Engineering, 253
 - Programs Office, 253
 - University, 253
- Remote

Remote (cont'd.)

- Job Entry, 123
- Management Tools, 187
- Research and Advanced Development, 62
- RFI
 - See Radio Frequency Interference
- RISC, 80
- RISD
 - See Reference Information Systems Development
- RJE
 - See Remote Job Entry
- ROI
 - See Record of Invention
- ROM, 170
- Routing Applications, 180
- RPG, 158
- RSTS/E, 74
- RSX, 74, 124
- RT-11, 74
- RU
 - See Reliability University

S

- Salem Anechoic Chamber, 79
- Sales, Services, Industry/Channels Marketing, and International, 205
- Sales, U.S., 205
- Sales and Software Training, 228
- San German Board Shop, 176
- SASE
 - See System and Support Engineering
- SBG
 - See Semicustom Business Group
- S-BOX Development, 72
- SCA
 - See Source Code Analyzer
- SCALD, 183
- SCAN, 158
- Sciences Market Applications, 243
- SCMT
 - See Semiconductor Operations
- SCO
 - See Semiconductor Operations
- Secure
 - Software Development, 211
 - Systems Development, 161
- SEG
 - See Semiconductor Operations
- Self-Maintenance Services, 238
- Semiconductor
 - Engineering, 108
 - Operations, 67
 - Protection Act, 20
- Semicustom Business Group, 69
- Seminar Programs, 225
- Service Industry Marketing, 212

SFI

See Shop Floor Integration

Sheet Metal/Machine Shops, 171

Sheet Metal Service Center, 174

Shop Floor Integration, 139

Shrewsbury Information Resource Center, 115

SIE

See System Integration Engineering

Simultaneous Development Process, 78

Site Information Centers, 38

Skills Assessment Software, 187

SLDA/SEE

See System-Level Design Analysis Program -
Systems Evaluation Engineering

SLS

See Storage Library System

Small Systems, 209

Manufacturing, 176

SMC

See Standards and Methods Control

SMG

See Systems Marketing Group

SOFTbase, 199

Software

Acquisition, 197

Development Technology, 157

Distribution Center, 52

Manufacturing Business Unit, 160

Product Services, Field Services, 238

Quality Management, 155

Services, 220

Supply Base Intelligence, 198

Solids Mechanics, 88

SORT Packages, 158

Source Code Analyzer, 157

Southwest Engineering, 84

Sowers, Mike, 155

SPAG

See Standards Promotion and Application
Group

SPG

See Software Services

Spit Brook Facility Management, 156

SPS

See Software Product Services

SPT

See Systems Productivity Tools Program

SRC

See Systems Research Center

SRE

See Systems Reliability Engineering

SSE

See Systems Software Engineering

SSM

See Small Systems Manufacturing

SSMI - Corporate Communications, 207

Standards

Standards (cont'd.)

and Methods Control, 15

and Waivers Process, 15

Promotion and Application, 138

STARS

See Strategic Acquisition Resources and
Software

State Government Marketing, 214

Storage

Advanced Development, 106

Library System, 105

Marketing, 242

Storage Systems, 200

East, 114

Engineering, 116

Engineering and Manufacturing, 105

GIA, 194

Manufacturing, 190

Strategic

Acquisition Resources and Software, 197

Marketing, Field Service, 238

Program Office, 70

Sales and Executive Partnership Program,
205

Strategic Relations Group, 165

Strategy and Planning, 245

Subsystems Engineering, 110

Subsystem Testing, 126

SWS

See Software Services

Synchronous Communications, 129

System

and Support Engineering, 248

Integration, 234

Integration Engineering, 211, 250

Simulation, 76

Test Technology Center, 251

System-Level Design Analysis Program -
Systems Evaluation Engineering, 251

Systems

and Clusters, 241

and Communications Software, 185
Engineering, 93

Management and Operations, 157

Marketing Group, 219

Materials Engineering, 46

Productivity Tools Program, 101

Reliability Engineering, 253

Research and Engineering, 98

Research Center, 60

Software Engineering, 100

T

TA79, TA81, 105

Tactical Support Purchasing, 200

TAEC

See Telecom Application Engineering Center

Tape and Optical
 Product Development, 105
 Products, 242
TBD
 See Technical Business Development
TDP
 See Technology Development Programs
Technical
 Business Development, 166
 Domains and Country Requirements, 14
 Information Engineering, 182
 Languages and Environments, 157
 Management Education Program, 10
 Reports, 39
 Standards and Related Documentation, 15
 Support, Corporate Quality, 204
 Systems Group, 188
Technology
 and New Ventures Group, GIA, 194
 Development Programs, 62
 Exchange, 78
 Research and Engineering, 95
 Resource Group, GIA, 193
 Strategy Council, 65
Telecom Application Engineering Center, 154
Telecommunications, 57, 212, 259
TEMPEST
 Diagnostics, 187
 Product Development, 210
TEMPEST/EMI/Encryption Technology Center,
 210
Terminal
 Interconnect and Communications Servers,
 129
 Servers, 121
 Switching Network, 56
Terminals, 90, 209, 243
 and Printed Circuits, 200
 Business/Small Systems, GIA, 194
 Product Manufacturing, 178
 Team, 82
Test
 Sites, 79
 System Development, 156
 Technology and Applications, 172
Text and Information Management, 187
Thermal Engineering, 88
Third Party
 Software, 222
 Transmission, 125
3270 Terminal Server, 121
TIE
 See Technical Information Engineering
TK50, 105
TK70, 106
TMEP

TMEP (cont'd.)
 See Technical Management Education
 Program
Tooling Service Center, 174
TOPS Advanced Development, Shrewsbury,
 Boulder, 107
TP&D
 See Technology Development Programs
TPG
 See Technology Development Program
TPU
 See Editing Software, 158
Trademarks, 21
Trade Regulation, 22
Trade Secrets, 17
Transaction Processing Systems Engineering,
 99
Transmission and Controllers, 129
TSC
 See Technology Strategy Council
TSG
 See Telecommunications Systems Group
TSN
 See Terminal Switching Network
TU80, TU81, 105
TYMNET, 56

U

U.S.
 Area Customer Training, 225
 Copyright Office, 19
 Export Control Laws, 23
 Field Service, 236
 IBM Competitive Sales, 213
 Manufacturing, Semiconductor Operations,
 68
 Sales, 205
 Volume Sales, 219
UDA50, 110
ULTRIX, 124, 159, 261
ULTRIX LISP, 127
UNIBUS, 73
Uniform Deceptive Trade Practices Act, 23
Unigraphics, 182
UNIX, 261
Utilities, 212

V

Valbonne Engineering Support, 141
Vantage Development Group, 180
VAX, 2
 ADE, 187
 Debugger, 157
 DSM, 74
 Encrypt, 162
 Languages, 163
 Layout System, 180, 182

VAX (cont'd.)
LISP, 127
New Products Committee, 249
NOTES, 158
OPS-5, 127
Prolog, 127
RTL Standards, 158
System Software Marketing, 159
Workstations PBU, 80
VAX/VMS, 155, 187
VAX-11, 158
VAX-11/780, 2
VAX 8600 AND 8650 Systems, 101
VAXcluster
Software, 157
Systems Engineering and Marketing, 100
VAXELN, 74
VAXlink, 186
VAXstation Software, 157
VDE, 112
VDE Approval, 78
VDG
See Vantage Development Group
Vendor Equipment Services, 242
Video Engineering, 82
Videotex, 57
VLS
See VAX Layout System
VLSDG
See CAD Environment Group
VLSI
Development Engineering, 110
European Semiconductor Operations, 68
VMS, 156
VMS/SNA, 123
VNPC
See VAX New Products Committee
VNX, 158
Vocabulary and Indexing System Development,
54
Voice Network Management, 125
Voice Telecommunications, 48
Volume Shadowing, 156

W

WAC
See Wide Area Communications
WACE SBU, 130
Waivers to Digital Design Standards, 15
WASE
See Wide Area Systems Engineering
WASE/CIT
See Computer Integrated Telephony
Western Hemisphere Operations, 193
Western Research Laboratory, 61
Western Software Lab, 261
Wide Area Communications, 122, 242

Wide Area Communications (cont'd.)
Product Management, 129
Wide Area Systems Engineering, 122
Winchester-type Disk Drives, 109
Workstations, 90, 209
Market Applications, 243
WPS-PLUS, 158
WSL
See Western Software Lab

X

X.21, 129
X.400 Gateway, 124
XI Program, 121

Z

ZKO Personnel, 160

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