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A Computer Integrated Manufacturing System for Small Scale Production of Electronic Units

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Abstract

This research project concerns the design of a rapid response, computer integrated Printed Circuit Board (PCB) Component Assembly System (CAS). The CAS system forms an integral part of a commercially viable Manufacturing Pilot Plant (MPP) for the design, production, and assembly of high quality special purpose PCBs in low volumes.

The design of the CAS system begins with the identification of the characteristics and deficiencies of conventional low volume, high variety PCB manufacturing systems.

Next, a vision for the MPP as a whole is presented, with particular emphasis on the CAS system.

A Generic Manufacturing System Design Methodology (GDM) is then derived, and is applied to the design of the CAS system.

Through the GDM a working CAS system is constructed, based around a central CAS Master and 3 assembly workstations.

The working CAS system is then analysed through a comparison with a typical conventional low volume manual assembly system. The results support the expectation of superior performance from the envisioned system.

Finally, areas requiring further work are identified.

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Contents

<i>Title</i>	<i>Page</i>
Abstract	ii
Acknowledgements	iii
Contents	iv
List of Figures	xviii
List of Tables	xix
List of Exhibits	xx
Chapter 1: Introduction	1
1.1 Research Project Overview	1
1.2 Thesis Overview	2
Chapter 2: A Vision for the MPP	5
2.1 Introduction	5
2.2 Conventional Low Volume - High Variety PCB Production Systems	5
2.3 The Vision	6
Chapter 3: Manufacturing System Design Methodologies	9
3.1 Introduction	9
3.2 Investigation of Existing Design Methodologies	10

3.2.1	The Focused Factory	10
3.2.2	Reengineering	11
3.2.3	World Class Manufacturing Action Agenda	11
3.2.4	Guidance for the Development of World Class Manufacturing Systems	12
3.2.5	Principles of Action Linking Strategy to Technology	13
3.2.6	Manufacturing Systems Engineering	14
3.2.7	Structured Techniques	14
3.3	Evaluation of Existing Design Methodologies	15
3.4	A Generic Manufacturing System Design Methodology	16
3.4.1	Stage 1: Define the Characteristics of the Target Market	16
3.4.2	Stage 2: Define the Objectives	17
3.4.3	Stage 3: Examine and Analyse Existing Manufacturing Systems	17
3.4.4	Stage 4: Develop Conceptual Models	18
3.4.5	Stage 5: Develop Functional Models	18
3.4.6	Stage 6: Implement the Design	18
3.4.7	General Considerations	18
3.4.8	The GDM in Perspective	19
Chapter 4:	Traditional Manufacturing Systems	21
4.1	Introduction	21
4.2	The Traditional Job Shop	22
4.2.1	Market Demands	22
4.2.1.1	A Typical Customer	22
4.2.1.2	Product Related Attributes	23
4.2.1.3	Planning and Marketing	23
4.2.2	Process Selection	23
4.2.2.1	Equipment and Layout	23
4.2.2.2	Labour	23
4.2.2.3	Stock	24
4.2.2.4	Production	24
4.2.3	Common Problems	24
4.2.4	Potential Solutions	25
4.3	The Traditional Batch Production System	25

4.3.1	Market Demands	25
4.3.1.1	A Typical Customer	25
4.3.1.2	Product Related Attributes	26
4.3.1.3	Planning and Marketing	26
4.3.1.4	Distribution	26
4.3.2	Process Selection	27
4.3.2.1	Equipment and Layout	27
4.3.2.2	Labour	27
4.3.2.3	Stock	27
4.3.2.4	Production	27
4.3.3	Common Problems	28
4.3.4	Potential Solutions	28
4.4	The Traditional Mass Production System	29
4.4.1	Market Demands	29
4.4.1.1	A Typical Customer	29
4.4.1.2	Product Related Attributes	29
4.4.1.3	Planning and Marketing	29
4.4.1.4	Distribution	30
4.4.2	Process Selection	30
4.4.2.1	Equipment and Layout	30
4.4.2.2	Labour	30
4.4.2.3	Stock	31
4.4.2.4	Production	31
4.4.3	Common Problems	31
4.4.4	Potential Solutions	32
4.5	Selected Bibliography	33
Chapter 5: Modern Manufacturing Systems		34
5.1	Introduction	34
5.2	Integrated Manufacture and Computer Integrated Manufacturing	35
5.2.1	Introduction	35
5.2.1.1	Differing Views of CIM	36
5.2.2	Objectives of Integrated Manufacture and CIM	36

5.2.2.1	Objectives of Integrated Manufacture	36
5.2.2.2	Objectives of CIM	37
5.2.2.3	Potential Benefits	37
5.2.3	The Origin of Integrated Manufacture and CIM	37
5.2.3.1	Market Pressure	38
5.2.3.2	Growth of Organisations	38
5.2.3.3	Islands of Automation	39
5.2.4	A Typical Application	40
5.2.5	Implementation	40
5.2.5.1	The Implementation Strategy	40
5.2.5.2	The Need for Balance	40
5.2.5.3	Human Considerations	41
5.2.5.4	Quality	42
5.2.5.5	Simplification and Simplicity	42
5.2.6	Common Problems with CIM	43
5.2.6.1	Data Accuracy	43
5.2.6.2	Implementation Failure	43
5.2.6.3	Operational Difficulties	43
5.2.6.4	Resistance to CIM	44
5.2.6.5	The Futuristic CIM System	44
5.3	Just In Time	45
5.3.1	Introduction	45
5.3.2	Objectives of JIT	45
5.3.2.1	Potential Benefits	46
5.3.3	The Origin of JIT	46
5.3.3.1	The Toyota Production System	47
5.3.4	A Typical Application	47
5.3.5	Implementation	48
5.3.5.1	Product Manufacture	48
5.3.5.2	Supply	49
5.3.5.3	Planning	49
5.3.5.4	Technical Systems	50
5.3.5.5	Inventory	50

5.3.5.6	Quality	51
5.3.5.7	Human Considerations	51
5.3.5.8	Production Dynamics	52
5.3.5.9	Improvement	53
5.3.6	Common Problems with JIT	53
5.3.6.1	Definitions	53
5.3.6.2	Implementation	53
5.3.6.3	Supply	54
5.3.6.4	Technical Systems	54
5.3.6.5	Human Considerations	54
5.3.6.6	Production Dynamics	54
5.3.6.7	An Unbalanced Focus	55
5.4	Group Technology	56
5.4.1	Introduction	56
5.4.2	Objectives of GT	56
5.4.2.1	Potential Benefits	56
5.4.3	The Origin of Group Technology	56
5.4.4	A Typical Application	57
5.4.5	Implementation	57
5.4.5.1	Product Families	57
(i)	Classification and Coding Systems	57
(ii)	Standardisation	57
(iii)	Information Resource	58
5.4.5.2	Cellular Manufacturing	58
(i)	Physical Elements of a Cell	59
(ii)	Layout	59
(iii)	Quality	60
(iv)	Scheduling and Control	60
(v)	Cells and Batch Production	60
(vi)	Inventory	60
5.4.5.3	Non Group-Able Products	61
5.4.5.4	Human Considerations	61
5.4.6	Common Problems with GT	61

5.4.6.1	Product Families	61
5.4.6.2	Data	62
5.4.6.3	Cell Manufacturing	62
5.5	Material Requirements Planning and Manufacturing Resource Planning	63
5.5.1	Introduction	63
5.5.2	Objectives of MRP and MRP II	63
5.5.2.1	Potential Benefits	63
5.5.3	The Origin of MRP and MRP II	63
5.5.4	A Typical Application	64
5.5.5	Implementation	65
5.5.5.1	The Master Production Schedule	65
5.5.5.2	Independent and Dependent Demand Items	65
5.5.5.3	Data Requirements	65
5.5.5.4	The Explosion Process	66
5.5.5.5	Coverage of Net Requirements	66
5.5.5.6	Production Control	67
5.5.5.7	Modes of Operation	67
(i)	The Regenerative System	68
(ii)	The Net Change System	68
5.5.6	Common Problems with MRP and MRP II Systems	68
5.5.6.1	System Performance	68
5.5.6.2	The Model of the Production System	69
5.5.6.3	The Scope of MRP and MRP II	69
5.5.6.4	General Problems	70
5.6	Selected Bibliography	71
Chapter 6:	Design of the CAS System	72
6.1	Introduction	72
6.2	Stage 1: Define the Characteristics of the Target Market	73
6.3	Stage 2: Define the Objectives of the MPP	74
6.3.1	Broad Objectives	74
6.3.2	Operational Objectives	74
6.3.3	Technology-Based Objectives	76

6.3.4 Objectives Common to Many Manufacturers	76
6.4 Stage 3: Examine and Analyse Existing Manufacturing Systems	78
6.4.1 A Review of Traditional and Modern Manufacturing Systems	79
6.4.1.1 Job Shop Principles and the MPP	79
6.4.1.2 Batch Production Principles and the MPP	80
6.4.1.3 Mass Production Principles and the MPP	80
6.4.1.4 Clarification Regarding Flexibility and Efficiency	81
6.4.1.5 Integrated Manufacture and Computer Integrated Manufacturing Principles and the MPP	82
6.4.1.6 Just in Time Principles and the MPP	82
6.4.1.7 Group Technology Principles and the MPP	84
6.4.1.8 Material Requirements Planning and Manufacturing Resource Planning Principles and the MPP	85
6.4.2 PCB Assembly System Case Studies	86
6.4.2.1 Case Study 1: The Unisys PCB Assembly Facility	86
(i) The Computer System	87
(ii) The Assembly Process	88
(iii) Application to the CAS System	88
6.4.2.2 Case Study 2: A Typical Conventional Low Volume Manual Assembly Facility	90
(i) Application to the CAS System	90
6.5 Stage 4: Develop Conceptual Models	91
6.5.1 A Conceptual Model of On-Line Processes	91
6.5.1.1 Initial Contact with Customer	91
6.5.1.2 Product Design	91
6.5.1.3 Checking Stock Levels and Allocating Stock	93
6.5.1.4 Scheduling and Estimation	93
6.5.1.5 Production of the Bare Board	94
6.5.1.6 Generation of Assembly Support Information	94
6.5.1.7 Assembly	94
6.5.1.8 Testing	94
6.5.1.9 Billing	95
6.5.1.10 Planning Delivery	95

6.5.1.11	Contacting the Customer	95
6.5.2	Conceptual Models of Off-Line Processes	95
6.5.2.1	Stock Ordering	95
6.5.2.2	Miscellaneous Stock Usage	96
6.5.2.3	Inward Goods	96
6.5.2.4	Update of Stock Records	97
6.5.2.5	Income	97
6.5.2.6	Expenditure	97
6.5.3	Ranking Processes on the Basis of Importance	97
6.5.3.1	Identification of the Critical Path	98
6.5.3.2	Identification of the Core Processes	99
6.5.3.3	Overall Ranking	100
Chapter 7:	Implementation of the CAS System	103
7.1	Introduction	103
7.2	Stage 5: Develop Functional Models	104
7.2.1	Overview of the CAS System	104
7.2.1.1	CAS System Hardware and Software	106
(i)	The CAS Master	106
(ii)	Assembly Workstations	107
(iii)	Support Systems	108
7.2.1.2	Advantages and Limitations of a Computer-Based System	108
7.2.2	Detailed Design: On-Line Processes	109
7.2.2.1	The CAS Database	109
7.2.2.2	Initial Contact with the Customer	109
7.2.2.3	Product Design	111
7.2.2.4	Design Data Requirements	112
7.2.2.5	Quotation of Cost and Delivery Date	113
7.2.2.6	Checking Stock Levels and Allocating Stock	114
7.2.2.7	Scheduling	114
7.2.2.8	Generation of Assembly Support Information	115
7.2.2.9	Production of the Bare Board	116
7.2.2.10	Assembly	116

(i) Stage 1: Surface Mount Components	116
(ii) Stage 2: Small Through-Hole Components	117
(iii) Stage 3: Large Through-Hole Components	117
(iv) Stage 4: Uncommon Components	117
7.2.2.11 Updating the CAS Database	118
7.2.2.12 Testing	118
7.2.2.13 Planning Delivery	119
7.2.2.14 Contacting the Customer	119
7.2.2.15 Billing	120
7.2.2.16 Shipment	120
7.2.3 Detailed Design: Off-Line Processes	120
7.2.3.1 Off-Line Stock Transfers	120
7.2.3.2 Income and Expenditure	121
7.3 Stage 6: Implement the Design	122
7.3.1 The CAS Database	122
7.3.2 Graphic Overlay Data Filter	122
7.3.2.1 Functional Properties of the Filter	124
(i) Task 1: Offset Data to New Origin	124
(ii) Task 2: Scale Data	124
(iii) Task 3: Identify and Interpret HPGL Instructions	124
(iv) Task 4: Identify Border Data	125
7.3.3 Graphic Overlay Viewer / Editor	125
7.3.3.1 Graphic Overlay Viewer	126
7.3.3.2 Graphic Overlay Editor	126
7.3.4 INSERT File Editor / Generator	126
7.3.4.1 Functional Properties of the Editor	127
(i) Database Listing	127
(ii) Mouse Control	127
(iii) Edit-Able Data	129
7.3.4.2 Modes of Operation	130
(i) Mode 1: Random Selection	130
(ii) Mode 2: Step-Through	130
7.3.5 Setting an Order in Progress	131

7.3.5.1 Stock Level Checking and Allocation Procedure	132
(i) Functional Properties of the System	133
7.3.5.2 Assembly Order Information Generation Procedure	134
(i) Functional Properties of the System	135
7.3.6 Merge Data	135
7.3.6.1 Functional Properties of the Data Merger	136
7.3.7 Production of the Bare Board	136
7.3.8 Assembly	137
7.3.8.1 The Stages of Assembly	137
7.3.8.2 Functional Properties of the Assembly System	138
(i) Basic Operation	138
(ii) Interpretation of Highlight Colours	140
(iii) Multiple Components	140
(iv) Re-Drawing, Auto-Centring, and Auto-Scaling	140
(v) Rotation	141
(vi) Recording of Stock Usage	141
7.3.9 Stock Management	141
7.3.9.1 Component Pick-List	142
7.3.9.2 Stock Transfer Between Stores	142
7.3.9.3 Inward Goods and Miscellaneous Stock Usage	144
7.3.9.4 Stock Take	144
7.3.10 Updating the Databases	145
7.3.10.1 Updating the CAS Database	145
7.3.10.2 Updating the Allocated-Stock Database	146
7.3.11 Completion of an Order	146
7.3.12 The CAS Shell	147
7.3.13 CAS Configuration	148
Chapter 8: Analysis of the CAS System	150
8.1 Introduction	150
8.2 Scope of Experiment	150
8.3 Hypothesis	151
8.3.1 Basis of Hypothesis	151

8.4	Structure of the Experiment	152
8.4.1	Constitution of the Product	152
8.4.2	Setup	153
8.4.3	Experiment Execution and Expected Results	153
8.4.3.1	Stage 1: Stock Level Checking	154
8.4.3.2	Stage 2: Setup	154
8.4.3.3	Stage 3: Assembly (1)	154
8.4.3.4	Stage 4: Soldering (1)	155
8.4.3.5	Stage 5: Assembly (2)	155
8.4.3.6	Stage 6: Soldering (2)	155
8.4.3.7	Stage 7: Lead Clipping	156
8.5	Results and Analysis	156
8.5.1	Trial 1	156
8.5.2	Trial 2	157
8.6	Further Analysis of Results	161
8.7	Conclusions	162
Chapter 9:	Summary and Conclusions	163
9.1	Summary	163
9.2	Conclusions	165
9.2.1	Commercial Viability	165
9.2.2	Rapid Response	166
9.2.3	High Quality	167
9.2.4	Low Volume - High Variety Production	167
9.3	Future Work	167
9.3.1	Supply of Components	167
9.3.2	Design	168
9.3.3	Assembly	168
9.3.4	General	168
9.3.5	The Benefits of Manufacturing Experience	169
Appendices	170
	Appendix A General Characteristics and Standard Features of the CAS System	170

A1	The CAS Database	170
A2	File Names and Extensions	171
A3	The Configuration File	173
A4	Standard Format for Data Files	173
Appendix B	Graphic Overlay Data Filter	175
B1	Operation of the Filter	175
B2	Commonly Used Instructions in Hewlett Packard Graphics Language	175
B2.1	The <i>Input Window</i> Instruction	175
B2.2	The <i>Pen Up</i> Instruction	175
B2.3	The <i>Pen Down</i> Instruction	176
B2.4	The <i>Plot Absolute</i> Instruction	176
B2.5	The <i>Arc Absolute</i> Instruction	176
B2.6	The <i>Circle</i> Instruction	176
B3	Turbo Pascal Graphics Procedures	176
B3.1	Data Types in Turbo Pascal	176
B3.2	The <i>MoveTo</i> Procedure	177
B3.3	The <i>LineTo</i> Procedure	177
B3.4	The <i>Arc</i> Procedure	177
B3.5	The <i>FloodFill</i> Procedure	177
B4	Characteristics of the Output File	177
B4.1	Section One: Five Special Purpose Longints	178
B4.2	Section Two: Pairs of Longints	178
Appendix C	INSERT File Editor / Generator	179
C1	Operation of the Editor	179
C2	Characteristics of the Output File	180
C3	Magnification and Navigation Facilities	182
Appendix D	Operation of CASMAIN.EXE	183
D1	Stock System	183
D1.1	Add New Component	183
D1.2	Modify Existing Component	184
D1.3	Delete Existing Component	184
D1.4	Display CAS Database	184
D1.5	Print WStn Loading Report	185

D1.6	Return to Main Menu (Esc)	185
D2	Assembly Planning System	185
D2.1	View Work In Progress (WIP)	186
D2.2	Activate New PCB	186
(i)	The Assembly Order Database	186
(ii)	The Allocated-Stock Database	187
(iii)	Stock Level Checking	187
(iv)	Assembly Order Information Generation	188
(v)	Add Order to List of WIP	188
D2.3	De-activate PCB	189
D2.4	Display Partial PCB Data	189
D2.5	Display Complete PCB Data	189
D2.6	Print Partial PCB Data	190
D2.7	Print <PCB>.ODR File	190
D2.8	Return to Main Menu (Esc)	190
D3	Utilities	190
D3.1	Backup Files	190
D3.2	Restore Files	191
D3.3	Re-index CAS Database	191
D3.4	Setup	191
D3.5	Return to Main Menu (Esc)	191
D4	Exit	191
Appendix E	Assembly Order Information Generation	192
Appendix F	Merge Data	193
F1	Operation of Data Merger	193
Appendix G	Assembly	194
G1	Operation of the Assembly System	194
G1.1	Effect of Menu Options	194
G2	Magnification	195
Appendix H	Stock Management System	196
H1	Operation of the Stock Management System	196
H1.1	Stock Transfers Within the Manufacturing Pilot Plant	197
H1.2	Miscellaneous Stock Usage	197

H1.3	Inward Goods	197
H1.4	Stock Take	197
H1.5	General Features of the Pick-List	197
H2	Manual Control of Storage Device	198
H3	Characteristics of Output Files	198
Appendix I	Data Sheets for Experiment	199
I1	Test Product Parts List	199
I2	Main Store Records	200
I3	Data Entry Sheet	201
I4	Component Order Form	202
I5	Complete Results for Trial 1	203
I6	Complete Results for Trial 2	203
Appendix J	CAS System Source Code	204
References	205

List of Figures

<i>Figure</i>	<i>Page</i>
Figure 5-1 Kanban shop floor control logic	52
Figure 5-2 MRP II shop floor control logic	67
Figure 6-1 A perspective on time-based manufacturing	77
Figure 6-2 The computer system at the Unisys PCB assembly facility	87
Figure 6-3 A conceptual model of the minimum necessary on-line processes	92
Figure 6-4 Conceptual models of off-line processes, Part I	96
Figure 6-5 Conceptual models of off-line processes, Part II	96
Figure 7-1 The elements of the CAS system	106
Figure 7-2 A functional model of on-line processes	110
Figure 7-3 A functional model of off-line processes	121
Figure 7-4 The implementation of on-line processes	123
Figure 7-5 The implementation of stock transfers between stores	143
Figure 7-6 The implementation of inward goods and miscellaneous stock usage processes	144
Figure 7-7 The implementation of stock take	145
Figure 8-1 Prediction of relative performance	152
Figure 8-2 Process time versus batch size for each operation in Trial 1	158
Figure 8-3 Process time versus batch size for each operation in Trial 2	160

List of Tables

<i>Table</i>	<i>Page</i>
Table 4-1 The Product-Process matrix	21
Table 8-1 Average process-time results for Trial 1	156
Table 8-2 Errors made during Trial 1	157
Table 8-3 Average process-time results for Trial 2	159
Table 8-4 Errors made during Trial 2	159
Table 8-5 Assembly time as a percentage of production time	161
Table 8-6 Relative assembly times	161
Table A-1 The structure of the CAS Database	171
Table D-1 Structure of the Work In Progress (WIP) database	186
Table D-2 Structure of the Assembly Order database	187
Table D-3 Structure of the Allocated-Stock database	188
Table I-1 Complete process-time results for Trial 1	203
Table I-2 Complete process-time results for Trial 2	203

List of Exhibits

<i>Exhibit</i>	<i>Page</i>
Exhibit 7-1 <PCB>.INS file editor	128
Exhibit 7-2 The Wet Line	136
Exhibit 7-3 Assembly workstations	138
Exhibit 7-4 Assembly prompting system	139
