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Computer-aided Pattern Design and Product Development

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Preface

The computer is a very useful tool that when used correctly can increase accuracy and productivity, and manage information. This removes the time consuming tasks of cutting card patterns and planning and drawing markers by hand, and the duplication of hand-written instructions. This computer technology has enabled the clothing design, pattern construction and product development to be integrated into a more continuous process.

Computer design systems enable designers to illustrate and visualise their designs both two and three dimensionally. The pattern technologist can construct and grade the patterns simultaneously. The sample garment can be viewed three dimensionally in simulated fabric. The cost of the garment can be calculated from a computer lay plan of the pattern pieces on the fabric for fabric utilisation. Having an easy access to a database assists the clothing technologist to calculate the cost of the garment for their specifications.

However, it is essential that the preparatory work is based on knowledge of the principles and techniques of pattern construction, grading and pattern lay planning and marker making. Initially the preparatory work may appear somewhat time consuming, but once the correct data has been put into the computer it can be operated with confidence.

The definition of design in the context of this book is not the creation of fashionable styles but the procedure of developing a style suitable for production that is influenced by the body dimensions, the fabric and the production methods. Originally computer programs were developed to grade garment patterns into a range of sizes for lay planning and marker making. Today there are major systems that have the further facility for designing patterns and altering patterns to the size and fit for an individual customer.

The pattern construction and design in this book is based on well-trying and proven methods used in the past by well-respected pattern makers. These methods have been adapted for today's computer systems but can also be drafted manually and then digitised into the computer. All the patterns constructed for this book were developed using a computer pattern design system and are for women's garments. They have all been tested by producing sample garments.

The intention of this book is:

- To introduce and explain the wide range of computer programs available to the clothing industry for pattern design and product development.
- To give guidance to those operating or planning to use computer programs for pattern designing, grading and lay planning by combining a theoretical understanding with the practical application.
- To give a reference source to students following courses in Pattern Design, Clothing Technology and Clothing Management.
- To give knowledge and understanding of the principles for developing garments to those conversant with operating computers but lacking experience in clothing product development.
- To assist those experienced in clothing technology with the transition from manual methods to operating computer systems.

The book is divided into six parts for ease of reference:

INTRODUCTION: Developments within computer-aided apparel systems.

The clothing industry has changed profoundly in recent years. Globalisation, speed of information and communication has stimulated competition. While manufacturers offer unlimited designs, the problem is how to bring products to the market quickly and achieve up-to-date information that is easily obtainable. CAD systems are now the essential tools required to integrate and achieve success taking the role of the 'configurator' between manufacture and retail. Utilising a full range of electronic tools, from the ubiquitous internet to the new powerful CAD systems can deliver clothing at relatively short cycles. Integration and communication utilising the internet become the new systems designed to achieve this.

PART 1: Pattern construction

The obtaining of body measurements and how they are formulated into size charts is explained. These size charts are requisite to all the pattern designing, grading and customisation that follow in Part 2, Part 3, Part 4 and Part 5. The various techniques of constructing and manipulating patterns manually and by computer are compared. The drafting of basic block patterns is described and their adaptation into

secondary blocks. This knowledge assists in the calculation of grading increments discussed in Part 2. These block patterns are the foundation for designing pattern for styles described in Part 3.

PART 2: Computer pattern grading

The principles of pattern grading to produce a range of sizes are explained. How they are applied to computerised grading is covered in detail. This is illustrated by the grading of the block patterns constructed in Part 1. The benefits of grading block patterns prior to computer pattern design is that the size increments are transferred on to the new style. This eliminates grading as a separate process. Alternatively, the digitising and grading of manually produced patterns is also explained.

PART 3: Pattern designing and grading

This covers the pattern construction or adaptation of a variety of designs for skirts, bodices, collars and sleeves. Suitable methods of grading are suggested. Details for completing the pattern with seams, hems and facings for production are also given.

PART 4: Pattern modification for garment size and fit

This section gives an introduction to the assessing of the figure shape and garment fit related to the stature, posture, body size and contour. The identification of fitting faults is explained and the appropriate pattern corrections. This information is in preparation for pattern alteration systems and made-to-measure.

PART 5: Computerised marker making systems

It has long been recognised that improvements at the front end of cutting can show substantial fabric savings. Fabric and trim account for about half the total costs of goods manufactured, and in a compe-

titive situation, the first place that cost reduction can be achieved is in fabric utilisation. It is generally understood that 40% of the finished garment cost is fabric; it is also recognised that 90% of cutting room costs are fabric. Parameters relevant to lay planning and marker making will be identified.

PART 6: Product data management systems

Product data management (PDM) systems have been developed to improve the product and the process of the product development cycle. These systems provide an automated means to control and facilitate the flow of up-to-date information to authorised participants throughout the organisation.

PDM acts as a communication tool between design, retail and manufacture, containing details about patterns, garment construction, fabric and trims, packaging costs, quality and measurement specifications. It is the direct interface between CAD/CAM systems and management information systems.

APPENDICES

References and further reading are listed on p. 205. Appendix I gives a comprehensive index of technical terms and abbreviations related to the text. Appendix II shows reduced size basic block patterns for use as exercises in digitising, grading and pattern design. These are at 33.3% of the original and can be plotted full-scale.

Great improvements have been made to computer systems since the early 1990s. They are much more 'user friendly' today and are being continually updated. The content of this book is not specific to one specific system; the authors have used various systems for testing the illustrations. The reader should become conversant with the system they will be using, preferably by training from the supplier.

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Abbreviations and symbols

bk	back
BP	bust point
CB	centre back
CF	centre front
fr	front
FS	face side of the fabric
GRL	grade reference line
NP	neck point
R	grade rule
SS	side seam
UP	underarm point
WS	wrong side of the fabric

Construction line
Construction line (secondary) and alteration line	-----
Drill hole	✈
Grade direction	↗
Grain line	↔
Notch	┐
Pattern parameter	_____
Square corner at 90°	└┐
Stitch line
Style line	————
Zero point for grading	○

