

APPAREL TECHNOLOGY RESEARCH REPORT

by

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Introduction

This report is a database of knowledge on certain aspects of modern technology for the design and fabrication of textile products. Included is information on CAD systems, hardware applications, and contractors.

Research of CAD software is limited to ten companies: assyst, CAD CAM Solutions, Cadtex, Gerber, Karat, Lectra, Nedgraphics, PAD, Scanvec, and Tukatech. The selection of these companies is based on analysis of their web pages and brochures. Capabilities of the software include combinations of textile print design, knit and jacquard design, pattern making, grading, marking, and 3D draping. Some packages, such as Primavision by Cadtex, are capable of only print and knit design. Others, such as OptiTex by Scanvec, can do only pattern making, grading and marking. Still others, such as Gerber, Lectra, and assyst, are capable of both textile design and pattern making.

Knitting software available is also summarized in this report. Some of the CAD software packages used in the sewing domain can also be used for knitted products and manufacture.

The list of hardware manufacturers and distributors is based on companies listed in the Canadian Apparel Directory, as well as an Internet search. The hardware researched consists of cutters, plotters, digitizers, and knitting, jacquard and sewing machines.

Also included is a list of contractors, produced from the Canadian Apparel Directory and from an Internet search. These contracting companies are available to do one of, or some combination of, the following: pattern design, grading, marking, cutting, sewing, and knitting.

It should be noted that all the prices in this report are approximations and are subject to change. It is best to contact the company for the exact prices.

Technology Research Report

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Section 1: Terminology

Definitions of Apparel Industry and CAD Related Terms

AAMA (American Apparel Manufacturers Association): An organization that develops standards to facilitate manufacturing communication in apparel operations.

ANSI (American National Standards Institute): A voluntary organization, composed of over 1,300 members (including all the large computer companies), that creates standards for the computer industry. For example, ANSI C is a version of the C language that has been approved by the ANSI committee. To a large degree, all ANSI C compilers, regardless of which company produces them, should behave similarly.

Cut File: computer file format read by the cutter.

Cutter: a device that cuts out pattern pieces from the fabric; includes manual and automated, water-jet, laser, etc.

Digitize: to translate into digital form. The operator places a drawing or pattern piece on the surface of the digitizing tablet, and then traces over it with a puck (cursor) or pen (stylus). This converts positions (Cartesian x- and y-coordinates) into digital values that can be stored and modified on a computer. Graphic data collected in this manner can be accurately displayed on the screen. Digitizing is different from scanning in that a scanned image is input as a raster based image, while a digitized image is vector based.

Grading: the process of converting a pattern into a range of patterns in different sizes. The computerized systems take a vector-based pattern and mark certain node points as growth points. The scaling (grade rule) is applied only to these points.

Marker Making/Marking/Nesting: the process of tightly nesting or clustering pattern pieces to maximize fabric utilization for cutting. Computer marking programs may have algorithms for orienting pieces according to the pattern and/or weave of the fabric, and for minimizing fabric wastage. Computer marking can be either manual or automatic.

Marker: the area on which pattern pieces are nested.

Metafile: a list of commands that can be played back to draw a graphic. Typically, a metafile is made up of commands to draw objects such as lines, polygons and text and commands to control the style of these objects. A metafile can contain any mix of vector and/or raster graphics.

Pantone: leading developer and marketer of products for the accurate communication of color in the textile, plastics, graphic arts, and digital technology industries. Each Pantone color has an accompanying identification number.

Plot File: computer file format read by the plotter. i.e. HPGL

Plotter: a device that draws pictures on paper based on commands from a computer. Plotters differ from printers in that they draw lines using a pen. As a result, they can produce continuous lines, whereas printers can only simulate lines by printing a closely spaced series of dots. Plotters can be up to about 1.8 meters wide (72"), and can print very long markers since paper is roll-fed.

Raster File: contains images that are made up of pixels. They are essentially a two dimensional matrix (or grid) of colored squares. Raster images are used for digitizing images (scanning). They are also used by painting and manipulation programs like Photoshop.

Textile Colorway: color combinations or colorings on a fabric. A colorway is a small sample of a design that is large enough to contain all the colors of the design. Usually accompanying a colorway is an array of color tabs that are small, individual swatches of each color that are included in the colorway.

Textile Print: the print or pattern on a fabric.

Texture Simulation: the process of simulating the look of a weave, knit or other texture on a fabric.

3D Draping/Photo Draping: the process of mapping a fabric image onto a 3D object, to preview how the fabric would look.

Vector File: contains mathematical information that describes graphic elements. The primary graphic elements will at least consist of lines and arcs. More advanced formats can contain curves such as bezier and b-spline. Other elements include ellipsoids, parabolas - anything that can be plotted on a graph with a mathematical equation.

Section 2: Software

Summary of Ten Available Apparel CAD Systems

Gerber Technology makes a complete line of computer-aided design and manufacturing tools for the apparel industry. Modular packages are available for sketching, pattern design, product development, grading, marking, and production. These packages allow textile print and texture design, pattern design with grading and marking, texture simulation, and 3D draping.

Features:

- scan in images
- create vector-based patterns
- create complex prints with repeat patterns
- design knits, weaves, and jacquards
- make storyboards

Libraries:

- garment clip art
- woven patterns
- stitch types

Modules/Packages:

- Artworks Studio (by NedGraphics) for sketches, line drawings, colorways, fashion illustrations, draping, and textile and knitting design
- AccuMark 800: pattern-making, grading, marker-making, and plotting
- AccuMark 100 and 200: pattern-making, grading, marker-making, automatic marking, and plotting
- Accumark Silhouette 2000: pattern design by draping or full-scale drafting, grading, and marking
- Pattern Design 2000: Gerber's latest pattern design package, incorporating tools from the AccuMark, MicroMark, and Silhouette packages
- Product Data Management (PDM) system for tracking information on styles, costing, fabrics, sketches

Hardware:

- Runs on Windows
- Silhouette workstation

File Formats: Gerber, HPGL

Demo: None available.

Price:

Contact:

Gerber Technology, Inc.
North American Headquarters

P.O. Box 769
24 Industrial Park Road West
Tolland, Connecticut 06084 USA
Tel: (860) 871-8082
Fax: (860) 871-6007

Gerber Technology, Inc.
International Division
P.O. Box 769
24 Industrial Park Road West
Tolland, Connecticut 06084 USA
Tel: (860) 871-8082
Fax: (860) 872-6742

Email: webadministrator@gerbertechnology.com
Web: www.gerbertechnology.com

Lectra Systèmes makes products to enable the automation of all operations from design, product development, and manufacturing. Computer Design Inc (a subsidiary of Lectra) makes the package U4ia, which is capable of fabric, knit, and woven texture design and visualization. Other modular packages are available for pattern design, grading, marking, and 3D simulation.

Features:

- scan in images
- create vector-based patterns
- create complex repeat prints
- design knits, weaves, and jacquards
- direct interface with Stoll Sirix knit systems for digital output to Stoll knitting equipment
- unwrap three dimensional surfaces into 2D flat patterns

Libraries:

- garment components
- Pantone colors
- stitch types
- swatches

Modules/Packages:

- U4ia Graphic: painting, image-enhancement, recoloring, building custom Pantone palettes. Contains the core tools for the U4ia system, and is required to run the Premier, Prints, Production, Knits, and Wovens modules.
- U4ia Prints: create textile prints from original artwork by drop and repeat patterns
- U4ia Premier: apply fabrics and textures to photographs and line art, for visualization purposes

- U4ia Sketch: create technical drawings and design elements, using fabrics created in other
- 4ia modules
- U4ia Production: prepare print designs for color separation
- U4ia Knits: create and visualize knitted fabrics
- U4ia Wovens: create and visualize woven yard-dyed fabrics and custom dobbies
- U4ia 3D: 3D texture mapping, 3D sample visualization, pattern flattening, and pattern-development
- Modaris BasicMod: core module of the Modaris line. Pattern digitizing, design, and modification
- Modaris Styler: allows work on the entire garment simultaneously
- Modaris Expert: automates pattern modifications to increase consistency between garments
- Modaris Grader: creation and application of grade rules
- Modaris Prograder: complex grading
- Modaris Freeline: pattern design on digitizing table
- Modaris Manager: create custom display menus
- Diamino BasicMark: create markers, calculate fabric consumption, match prints
- Diamino ActiMark: maximize production of markers for production cutting
- Diamino FlashMark: automatic placement of all or part of the marker
- Diamino Repeat: automatically place marker pieces with matched print
- Diamino LogiCut: control start points and direction of the cut, and define shape of notches, for most efficient marker cutting
- APM (Advanced Pattern Modeling) - 3D/2D simulation

Hardware:

- runs on Unix or Windows 95/98/NT
- Silicon Graphics, Inc workstation

File Formats: DXF, IGES

Demo: None available.

Price:

Contact:

LECTRA SYSTEMES (Canada) Inc

Head Office

50 Bd Cremazie Ouest, Bur. 200

MONTREAL QUEBEC H2P1A2

Tel: +1 (514) 383 4613

Fax: +1 (514) 383 5270

LECTRA SYSTEMES (Canada) Inc

Branch Office

Humboldt Business

1120, Finch Avenue West

TORONTO ON M3J 3H7

Tel: +1 (416) 789 1030

Fax: +1 (416) 789 1029

Email: lectra-ca@lectra.com

Web: www.lectra.com

Assyst sells a line of computer-aided design and manufacturing tools for the apparel industry. Modular packages are available for textile design, pattern design, grading, and marking. These modules allow pattern design with marking and grading, textile print creation (no knits/weaves), texture simulation, and 3D draping.

Features:

- digitize existing patterns
- sketch silhouettes
- fabric design with repeat patterns
- drape fabric over drawings or photos
- darts, notches, pleats, seams, mirroring
- undo function
- made-to-measure: modify standard patterns to custom measurements
- automatic re-grading of modified pattern pieces
- marking process can be executed manually or automatically
- compatible with: Summit, WILD, JP, and all HPGL plotters, and any available cutters
- scan in fabrics

Libraries:

- standard patterns library

Modules/Packages:

- assyCAD: pattern design, digitizing, grading, manual marker making
- assyGRAPH: textile print design, texture simulation, 3D draping
- Nester: automatic marking

Hardware:

- runs on Unix or Windows 95/98/NT
- HP Unix workstation

File Formats:

- import/export: converts data to AAMA standard to read and output to other CAD systems
- DXF, HPGL, Gerber, foreign cut files, EPS

Demo: Acrobat download.

Price: \$39 750 for workstation with assyCAD software, digitizer, plotter, furniture, training, and installation.

Contact:

assyst, Inc.
Automation Software and Systems
5000 Aerial Center,
Suite 200
Morrisville, NC 27560
Tel: +1 919 4672211
Fax: +1 919 4672297

Email: info@assyst-intl.com
Web: www.assyst-intl.com

PAD System by **Infomax** makes CAD software and distributes hardware for the apparel industry. Modules are available for digitizing, pattern making, grading, marking, draping, and plotting. These modules allow pattern design, grading, marking, texture simulation, and 3D draping but no textile print or texture (knits, etc.) design.

Features:

- switch easily from a 2D pattern to a 3D model
- 3D draping simulates gravity and fabric tension
- change the model's measurements
- create vector-based patterns
- digitize existing patterns
- garment simulation includes cut, dart, pleat, shirring, collar, lapel, raglan sleeve, appliqué, pocket, button, screen print and embroidery
- recalculates seam allowances instantly
- automatically grades pleats and darts
- undo/redo options
- compatible with plotters Ioline, Zeta, Roland, Wild, Lectra, Gerber, Mimaki, Numonics, Graphtec, Drastem, HPGL, Mutoh, Cybrid, Plotter Technology, CalComp, Algotex, Investronica
- compatible with digitizers Numonics, Bidmate, Summagraphics (MicroGrid), Numonics (Gerber), Lectra, GTCO, CalComp

Libraries:

- garment components and bodies
- grading rules
- textile prints

Modules:

- Digit: digitizing
- Pattern: pattern-making, grading
- Automark: marking
- 3D Sample: draping
- Plot: plotting

Hardware:

- runs on Windows
- sold as modular system

File Formats:

- import DXF, AAMA, Lectra, HPGL, STD, ANSI, Gerber, NuMode, Cybrid, MDynamics, Investronica
- export files to any other CAD system with DXF - AAMA

Demo: Actual software demo download. Fairly easy to use.

Price: \$4000Cdn for pattern-making and grading software module

Contact:

Michel Zampa
International Sales, PAD
2100, rue Ste-Catharine ouest
Montreal, Quebec
H2T 2W5
Tel: 1-514-939-4430
Fax: 1-514-937-0517

Email: padinfo@padsystem.com

Web: www.padsystem.com

Scanvec sells the software package **OptiTex**. Modules are available for patterns, grading, and marking. These modules allow pattern design, grading, and marking, but no textile print design or 3D draping. No knits or other textures.

Features:

- scan in fabric images and sketches or import them as bitmap files
- create vector patterns
- tools include: dart, pleat, cut, notch, draft, flip, seam allowance
- made-to-measure grading
- manual or automatic marker-making
- match stripes and plaids when marking

Libraries:

- measurements and accompanying pictures, i.e. leg length, waist circumference

Modules:

- Digitize: digitizing
- PDS: pattern making by digitizing or drafting
- Grade: grading
- Custom Fit: make custom fit garments by entering body measurements for individual customers
- Mark: automatic or manual marking, match printed fabric marker pieces
- Nest++: automatically generates an extremely tight marker, and reworks markers for

- different material widths and proposes the best results
- Match++: optimizes pattern layout for matching striped or plaid fabric on marker pieces

Hardware:

- runs on Windows
- sold as modular system

File Formats: HPGL, DXF, DFT, IGES, CADL, GGT (Gerber), ANSI/AAMA file formats.

Demo: ScreenCam downloads show how to make pleats, seams, grades, etc. Can also call their office for a free demo CD.

Price: \$6500US for pattern making, grading, and marking software

Contact:

Anne Melanson
SGS General Manager
International Plaza Two, Suite 625
Philadelphia, PA
Tel: 19113610-521-6300
Fax: 188610-521-0111
Email: annem@optitex.com
Web: www.optitex.com

Tukatech makes plotters and cutters for the apparel industry, and also sells Scanvec's OptiTex PDS, Custom Fit, Grade and Mark modules under the name **TUKAcad**. The software allows pattern design, grading, and marking, but no textile print, knit design, or 3D draping.

Features:

- TUKAcad's software is by Scanvec, so its pattern design, grading, and marking are the same as OptiTex
- create vector-based patterns
- scan in fabric images or import them as bitmap files
- tools include: dart, pleat, cut, notch, draft, flip, seam allowance
- made-to-measure grading
- match stripes and plaids when marking
- compatible with Gerber, Lectra, Micro, Polygon, Investronica, Assyst, Pad Systems and more
- supports TUKAjet, HPGL, DMPL, IOLINE, NUMONICS, GERBER, SUMMO GRAPHICS, CALCOMP, WILD plotters
- supports TUKATECH, FK Systema, Gerber, Cutting Edge cutters

Modules:

- TUKAdesign: draft patterns from scratch or modify existing blocks with grading information to create new patterns

- TUKApattern: made-to-measure pattern based on a given pattern
- TUKAmark: grading and marking

Libraries:

- Pantone textiles
- measurements and accompanying pictures, i.e. leg length, waist circumference
- grading rules

Hardware:

- runs on Windows

File Formats:

- Merger 2000 software for import/export of DXF, HPGL, CADL, IGES, ANSI/AAMA, DFT, GGT (Gerber)

Demo: Actual software demo download fairly easy to use. Tutorial instructions on WordPad. ScreenCam demo same as OptiTex.

Price: \$7500US for software (all modules); \$29 500US for workstation, plotter, digitizer, furniture, installation, warranty, and training

Contact:

Ashraf Ally
 TUKAtech, Inc
 4210 Side Rd. 20 S.
 Puslinch, ONT, Canada
 N0B 2J0
 Tel: (519) 763-5561
 Fax: (519) 763-8772

Email: tukatech@earthlink.com

Web: www.tukatech.com

CAD CAM Solutions makes a CAD software package, **Fashion CAD**, for small or medium garment manufacturers. The software is capable of vector pattern design, grading, and marking, but no textile print or texture design or draping.

Features:

- scan or digitize old patterns or create new ones
- scan patterns from an original source and use the scanned image as an underlay to insert real lines and curves
- automatically scale and grade to any size
- set up personalized measurements files
- create any symbols (logos, buttons, zips, diagrams, etc.) and insert them onto pattern piece
- create any surface design to insert onto the pattern piece - "grain" indication to assist with pattern piece matching

- manual marking
- export to any Windows-based plotter

Modules:

- Pattern Design: pattern creation/import
- Pattern Grading: grading
- Pattern Detailing: insert seams, symbols, text
- Marker Layout: manual marker making

Libraries:

- standard ladies/men/kids pattern blocks
- garment components

Hardware:

- runs on Windows

File Formats: HPGL, DXF

Demo: ScreenCam download shows how to alter a pattern from the library

Price: \$650US for download (no taxes); \$750US + tax for CD-ROM (includes delivery).

Contact:

Cad Cam Solutions Australia Pty. Ltd.
P.O. Box 1042
SUBIACO, Western Australia 6008

Email: Info@cadcam.solutionsaustralia.com.au

Web: www.cadcam.solutionsaustralia.com.au

Karat makes software for basic pattern design and product data management. **KaratCAD** is capable of vector pattern design, but no marking or grading of patterns, no textile print or texture design, and no 3D draping.

Features:

- sketch silhouettes
- create storyboards
- draw vector shapes to create a pattern
- Autodesk technology
- scan in or import CAD-designed prints and textures to fill your pattern
- Karat Product Development compatible with Gerber PDM (Product Data Management)

Libraries:

- stitches
- trim details
- garment bodies
- snap-together components

Modules/Packages:

- Designer: patterns, silhouettes, storyboards
- Product Development: spec sheets, costing, product management

Hardware:

- runs on Windows

File Formats: DWG, DXF, DRW

Demo: Acrobat download showing basic system capabilities - product data management and product design.

Price: \$1500US for Design software

Contact:

Tel: 1-514-931-2616, ext. 238

Fax: 1-514-931-1106

Email: info@karat.com

Web: www.karat.com

Vision is a line of software products for the textile industry, created by **Info Design**, which is owned by **NedGraphics**. Modules are available for textile design, knits, and weaves. These modules allow print and texture design, but can not do patterns, marking or grading.

Features:

- scan in images
- sketch silhouette
- make storyboards
- create complex repeat prints, as well as knits, weaves, and jacquards
- automatically puts knits in a graph
- adjust knit gauge and tension
- weave card generation for most looms
- texture simulation and 3D draping
- print design on fabric with any textile printer

Libraries:

- Pantone colors
- Pantone textiles
- Mona textiles
- weaves
- jacquard weaves
- textural threads

Modules/Packages:

- Fashion Studio: sketching, textile print design, storyboards, knits, weaves, jacquards, 3D draping
- Printing Studio: sketching, textile print design
- Knitting Studio: knits, lace, jacquards

- Weaving Studio: weaves, dobby weaves, jacquards, carpets

Hardware:

- runs on Windows
- sold as a modular system

File Formats: TIF, TGA, BMP, DIB

Demo: PowerPoint download showing basic functions of each module.

Price: \$5000 for knit and print design module

Contact:

Cor J. van Stem
Director Professional Services
Textile CAD/CAM Division
Tel: 31 30 248-8000
Fax: 31 30 248-8088

Email: cvs@nedgraphics.com

Web: www.nedgraphics.com

Prima by **CADTEX** is a line of software products for fabric design and simulation, as well as product management. Modules are available for textile prints, knits, wovens, and color matching. These modules allow textile print and texture design, but no vector pattern design, and no grading or marking.

Features:

- scan in images
- convert scanned images into knitting graphs
- create complex repeat prints
- supports layers of vector and bitmapped print images
- simulate knits and weaves
- automatic production graph output for knit designs
- adjust knit gauge and tension
- sketch silhouettes
- apply any texture to the designed fabric
- 3D draping

Libraries:

- Pantone colors
- weaves
- knits
- textures
- silhouettes
- accessories

Modules/Packages:

- PrimaVision: textile print design, sketching, coloring
- PrimaVision-TCX: storyboards, 3D photo draping
- PrimaNova: less advanced Prima CAD package for smaller businesses
- Prima MPS: product information management
- Knit Expert: design and visualization of knit textures
- Weave Expert: design and visualization of woven yarn-dyed fabrics, dobbies, and jacquards
- MaskFilm: design and color separation of textile prints
- Super Spectrum: color matching with a hand-held spectrometer

Hardware:

- runs on Windows
- sold as modular system

File Formats: BMP, CAL, DCX, GIF, JPG, IFF, PCX, PSD, PCT, RAS, TGA, TIF, WMF, WPG, XBM, EMF

Demo: ScreenCam demo CD - shows how to use MPS module to store data on sizes, price, season, etc.

Price: \$8500US for knit or weave software module; \$20 000US for entire, stand-alone system.

Contact:

Cadtex Corporation
121 West 27th Street, Suite 204
New York, NY
10001
Tel: 212-255-4700
Fax: 212-463-7983

Email: Cadtex@Cadtex.com

Web: www.cadtex.com

CAD Software Summary Table

	KaratCAD	Vision by Info Design, NedGraphics	assyst	TUKAcad by TUKATECH	Lectra Systemes	Prima by CADTEX	PAD System by Infomax	Gerber Technology, Inc	OptiTex by Scanvec	Fashion CAD by CAD CAM Solutions
website	www.karat.com	www.idvision.com	www.assyst-intl.com	www.tukatech.com	www.lectra.com	www.cadtex.com	www.padsystem.com	www.gerberetechnology.com	www.optitex.com	www.cadcam.solutionsaustralia.com.au
demo	Acrobat download on C:\archive; free CD ordered over Internet	PowerPoint download on C:\archive	Acrobat download on C:\archive	software demo download on C:\archive		ScreenCam slideshow on CD sent by company	software download and user manuals on C:\archive; free CD ordered over Internet		ScreenCam download on C:\archive	ScreenCam download on C:\archive
computer	Pentium PC minimum 200 MHz	Pentium PC minimum 400 MHz (recommend 500)	HP Unix	100 MHz Intel-based Pentium computer	Silicon Graphics, Inc. hardware	Pentium	Pentium II Processor	Pentium Processor	Pentium Processor	PC Pentium System
operates on	Win 95/NT 4.0	Win 95/98/NT	Unix workstation, Win 95/98/NT	Win 95/NT	Silicon Graphics Unix OS	Win 95/98/NT	Win 95/98/NT	Win 95/NT	Win 95/98/NT	Win 95/98/NT 3.5 or later
RAM	32 Mb	128 Mb		16 Mb		32 Mb	64 Mb		16 Mb	32 Mb
hard disk space	30 Mb	9 - 14 Gb		1.0 Gb			32 Mb		150 Mb	35 Mb

CAD Software Summary Table

	KaratCAD	Vision by Info Design, NedGraphics	assyst	TUKAcad by TUKATECH	Lectra Systemes	Prima by CADTEX	PAD System by Infomax	Gerber Technology, Inc	OptiTex by Scanvec	Fashion CAD by CAD CAM Solutions
other requirements	SVGA video card, 17" monitor; 1.44 Mb floppy disk drive	1 graphics card (recommend 2), Wacom tablet with pressure sensitive pen, 17" monitor	digitizing table	15" monitor		Wacom tablet for sketching; cordless pen or 4-button mouse			15" monitor, 1 parallel and 1 serial port	sound card, speakers, 3-button mouse, 2 Mb graphics card, minimum 15" monitor
available libraries	Stitches; trim details; garment bodies; components	Pantone Colors; weaves; jacquard weaves; textural threads	standard patterns	Pantone Textiles; grading rules	Components; swatches; stitch types; Pantone Colors	Pantone Colors; weaves; accessories; textures; silhouettes; knits	garment components and bodies; grading rules	garment clip art; woven patterns; stitch types	standard measurements	standard pattern blocks for ladies/ men/ kids wear; garment components
file formats	DWG, DXF, DRW	TIF, TGA, BMP, DIB	AAMA, DXF, Gerber, HPGL, foreign cut files, EPS	DXF, DFT, GERBER, ANSI/ AAMA, IGES, HPGL, CADL	Gerber, DXF, IGES	BMP, CAL, DCX, GIF, JPG, IFF, PCX, PSD, PCT, RAS, TGA, TIF, WMF, WPG, XBM, EMF	DXF, Lectra, AAMA, foreign pattern, cut & plot files	HPGL, Gerber	DXF, IGES, HPGL, Gerber, ANSI/ AAMA	HPGL, DXF

CAD Software Summary Table

	KaratCAD	Vision by Info Design, NedGraphics	assyst	TUKAcad by TUKATECH	Lectra Systemes	Prima by CADTEX	PAD System by Infomax	Gerber Technology, Inc	OptiTex by Scanvec	Fashion CAD by CAD CAM Solutions
sketch silhouettes	T	T				T		T		
draw vector pattern	T		T	T	T		T	T	T	T
stitch/knit texture simulation		T	T		T	T	T	T		
3D draping		T	T		T	T	T	T		
complex textile prints		T	T		T	T		T		
knits		T			T	T		T		
weaves		T			T	T		T		
jacquards		T			T			T		
marking			T	T	T		T	T	T	T
grading			T	T	T		T	T	T	T
scan in textiles	T	T	T	T	T	T		T	T	T

CAD Software Summary Table

	KaratCAD	Vision by Info Design, NedGraphics	assyst	TUKAcad by TUKATECH	Lectra Systemes	Prima by CADTEX	PAD System by Infomax	Gerber Technology, Inc	OptiTex by Scanvec	Fashion CAD by CAD CAM Solutions
sold as	singular software system	modular system (jacquard, weave, knit, textile print design, sketch, coloring, and storyboard modules)	workstation with modules (textiles, draping in assyGRAPH; pattern- making, grading, and marking in assyCAD)	modular software system or workstations	Workstation with modules (textile design in U4ia; pattern design and grading in Modaris; marking in Diamino; 3D simulation in APM)	modular system (knit, weave, textile print design, draping, and color matching modules) or complete system	modular system (digitizing, pattern- making, grading, marking, draping, and plotting modules)	workstation with modules (pattern- making, grading, marking, sketching, storyboard, textile and knit design, draping)	modular software system (pattern- making, grading, and marking modules)	software download or CD ROM
price	\$1500US (software), training separate	\$5000US (knit, design & repeat module)	\$39 750 (workstation with assyCAD software, digitizer, plotter, furniture, training, installation)	\$7500US (all modules); \$29500US (workstation w/pattern design/mark/ grade, installation, plotter, digitizer, training)		\$8500US (knit or weave module); \$20000US (stand-alone workstation)	\$4000Cdn (pattern- making, grading modules)		\$6500US (pattern- making, grading, marking modules)	\$650US (download) or \$750US + tax (CD ROM delivery)

Section 3: Hardware

Definitions of Hardware Devices

Automated Cutter: a device that can cut one or more layers of fabric using a computer-generated cut file, without intervention by an operator. They generally work in the same manner as a plotter, except instead of moving a pen across paper, they move a cutting implement across fabric. The cutting can be on a flat bed or conveyor. Depending on the volume and speed the machine is designed for, and the type of fabric being cut, the cutting action may be performed by a straight knife, a wheel block, a laser, or a water jet. Some machines also use special tools for boring or notching. The cost of an automated cutter will vary with its size, the rate at which it processes fabric, and extra features for tasks such as material handling.

Automated Sewing Machine: a wide variety of programmable, electronic sewing machines are available. Specialized machines are available for stitching pants pockets, attaching collars and waistbands, hemming pants and cuffs, sewing buttons and buttonholes, attaching belt loops, bar tacking, overlock stitching, etc. More sophisticated models may have a touch pad interface, pre-programmed stitch libraries, automatic thread cutters, and automated back stitching.

Knitting System: an electronic machine with a computer for reading needle patterns input from a floppy disk or cartridge.

Contains electronic selection units, having two selecting points for knit, tuck, three-way technique, transfer, and receive. The selection made at this point passes through a cam track. Cams are machined metal plates attached to a cam plate. An electronic step motor controls the presser cams and stitch cams, which alternate in the direction of the carriage. These are for drawing the needle down to pull more or less yarn into the needle hook to form a different size of knitted loop.

Laser Cutter: an automated cutter that uses a laser beam to cut fabric. Retractable bed, or pallet, laser cutting systems spread the fabric on a pallet and move it to the cutting zone to be cut. After cutting, the pallet is moved to the other side of the cutting zone, where the cut parts are removed while the next parts are cut. Patterns longer than the cutting zone are automatically divided by software into frames ("slices") that are fit into cutting zone area. Conveyorized laser cutting systems cut the material while the material is moving. The software automatically divides long patterns into "slices" (frames) that are cut continuously. For example: RD Corp. Laser Specifications: Typical required floor space for either Pallet or Conveyor system is about 240 square feet. Typical pallet size is 6 feet (1.8 m) wide x 12 feet (3.6 m) long. Cutting speed is up to 90 in/s (2.3 m/s), with Rapid speed up to 120 in/s (3 m/s).

Manual Cutter: hand held rotary or straight knife cutter.

Plotter: a device that draws pictures on paper based on commands from a computer.

Plotters differ from printers in that they draw lines using a pen. As a result, they can produce continuous lines, whereas printers can only simulate lines by printing a closely spaced series of dots.

Plotter/Cutter: a plotter with which a knife can be used in place of a pen. Cuts samples from pattern paper or cardboard, or cuts fabric for prototypes.

Spreader: a device for taking fabric off a roll and setting it down on a cutting table. Often used in conjunction with an automatic cutter.

Water-jet Cutter: uses high-pressure water mixed with an abrasive to cut through all types of material. Can use Computer Numerical Control (CNC). The motion systems are the same as for laser cutting systems.

example: Lasermade laser cutting systems use garnet as an abrasive in the water

List of Hardware Manufacturers and Distributors

Cutters:

- Apparatex (see Canadian Apparel Directory, www.apparatex.com) – distributor of cloth cutting machines, cutting room supplies, fabrics, and notions. Edmonton, Alberta.
- assyst (www.assyst-intl.com) – paper plotter/cutters
- Autometrix (www.autometrix.com) - single layer fabric cutting on plotter/cutter
- B & W Sewing Machine Co. (see Canadian Apparel Directory) – suppliers of Juki machinery and equipment
- Bruck (see Canadian Apparel Directory) – suppliers of new and rebuilt industrial sewing machines, cutters, and spreaders; sells Singer, Yamato, Juki, Cansew, Wolf
- Cybrid
- Eastman (www.eastmanww.com) – Eastman automated cutters
- Gerber (www.ggt.com) – Gerber automated cutters, laser cutters
- Gordon Sewing Machine Co. (see Canadian Apparel Directory) – distributors of J.B. Gury cloth cutting equipment, Beka needles, and new and used industrial sewing machines
- Investronica Sistemas – Investronica automated cutters
- IOLINE (www.ioline.com) – plotter/cutters
- Lectra (www.lectra.com) – Lectra automated knife cutters, laser cutters, water jet cutters, automatic spreaders, maintenance, training, and support
- M.S.M. Ltd. (see Canadian Apparel Directory) – supplier of used and new sewing machines, cutting machines, and eyelet and rivet machines; sells Fipi, Cima, Fimma, TRC, Eastman, Brother
- Machine à Coudre Delisle (see Canadian Apparel Directory) – importer and distributor of cutting, fusing, and sewing parts and supplies; sells Kingtex, Sunstart, J.B. Gury, Orange Needles, Reliant Fusing Press, Kansai Special
- Machines à Coudre Supreme Inc. (see Canadian Apparel Directory) – sales, service, rentals of sewing machines, industrial equipment, cutting, pressing, model forms, parts, and needles; sells Pfaff, Juki, CanSew, Brother, Union Special, Scruba, KingTex, Kansai Special, Pegasus, Superior, Sheldon, Sussman, VaporPress, Wolf, Eastman
- Michel Simard Ltd. (see Canadian Apparel Directory) – supplier of sewing machines, die cutting presses, and other industrial equipment
- PAD System Technologies (www.padsystem.com) – distributes AlgoTex and Ioline plotters, Numonics digitizers, and Kuris roboticized cutters
- Pfaff (see Canadian Apparel Directory) – retail and wholesale of domestic and industrial sewing machines, cutting machines
- RD Corp. (www.planet.eon.net/~rdcorp/index.html) – CAD/CAM Systems, cloth cutting machines, laser cutters, cutting tables, factory equipment. For laser cutter, computer imports files as Gerber Cut File, DXF, HPGL and others, optimizes cutting path and generates the laser-cutting file.
- R.D. Goldsworthy & Co. Ltd. (see Canadian Apparel Directory) – sales and service of industrial and commercial sewing machines, spreaders, cutters, embroidery machines, ergo workstations; sells Pfaff, Pegasus, GGT(Gerber)/Niebuhr, Schmrtz,

- EFKA, Quick, WISS, Singer, Kessler, Maimin
- Reliable Sewing Machine Co. Ltd. (see Canadian Apparel Directory and 1995 Reliable catalogue) – supplier of industrial equipment, parts and service; sells Yamato, Juki, Mitsubishi, Singer, Relsew, SMF/Reece, Eastman, Sussman, Consew, Siruba, Rotondi, Hoffman, Oshima, Ace Hi, Groz Beckert, Clinton, Trimmer, Silverman, AC, PSR, Beisler, Galkin, Albatross, Racing
- Rubenstein Bros. Co. Inc. (see Canadian Apparel Directory, www.rubco.com) – sales, parts, service, and financing of new and used machines for cutting, sewing, finishing, embroidery, and warehousing; sells Brother, Tajima, Eastman, Merrow
- Rubenstein Bros. Ont. Ltd. (see Canadian Apparel Directory, www.rubco.com) – agent for Brother industrial embroidery machines, Happy embroidery machines, Eastman cutters, CRA spreaders, Merrow, UTICA, Whirly machines
- SMART Flat Bed Laser Cutting Range
(<http://web.singnet.com.sg/~smcpl/product/lasercut/laser.htm>)
- Tukatech (www.tukatech.com) – TUKAcut cutters. The on-board computer can independently memorize the cutting graphics. It can be directly connected to the CAD system, networked or the cut data/marker may be transferred via floppies. The computer regulates and displays the management of cutting parameters, cutting speed, vertical blade speed, blade sharpening frequency, vacuum intensity regulation etc.
- USM Canada (see Canadian Apparel Directory) – supply and service machines for cutting, transfer printing, and heat sealing; sells PCI, PMF, BSB, Allen, Bima, Unifast, Samco, Texon, Chaignauld
- Unequip Machinery Corp. (see Canadian Apparel Directory) – used specialty machinery and equipment for cutting rooms

Plotters:

- Algotex- used by PAD
- assyst (www.assyst-intl.com)
- Cybrid
- Drastem
- ENCAD (www.encad.com) – used by Lectra; digital color printers/plotters for textiles, also deals with inks and fabrics for color accuracy
- Gerber (www.ggt.com) – GGT AccuPlot
- Graphtec
- HPGL
- IOLINE (www.ioline.com) – used by OptiTex, PAD
- Investronica
- Lectra (www.lectra.com)
- Mimaki
- Mutoh
- Numonics –used by PAD and by assyst
- PAD System Technologies (www.padsystem.com) – distributes Algotex and Ioline plotters, Numonics digitizers, and Kuris roboticized cutters
- Roland
- Signature

- Stylist 2000
- TUKAjet (www.tukatech.com) – Hi-Speed Ink Jet Plotters
- WILD
- Zeta

Digitizers:

- Bidmate
- Calcomp
- GTCO
- Kurta
- Lectra (www.lectra.com)
- Numonics – used by Gerber, Optitex, PAD
- PAD System Technologies (www.padsystem.com) – distributes AlgoTex and Ioline plotters, Numonics digitizers, and Kuris roboticized cutters
- Polygon
- Summa MicroGrid
- Wacom

Knitting Machines and Jacquard Machines:

- Barney Knitting Machinery Co., Inc. (www.barneyknitting.com) – new Wildman Jacquard circular knitting machines; used Wildman Jacquard and Jumberca circular knitting machines; used Stoll, Lamb, Shima Seiki, Schaffhausen, Dubied, and Universal flat knitting machines
- ITM Ltd., South (see Canadian Apparel Directory, www.industryweb.net/itmsouth) – used Shima, Universal, Protti, Dubied, Stoll flat knitting machines; used Jumberca, Phillips, Wildman, Mecmor, Mayer, Lebocey circular knitting machines
- Jumberca (www.jumberca.com) – circular single and double knit jacquard/knit machines; design pattern on Jumberca Scorpio software
- Protti (www.prottiusa.com) – flat knitting machines; Protti software
- Shima Seiki (www.shimaseiki.co.jp) – Shima Seiki computerized flat knitting machines; knit patterns designed on company's hardware, or converted from Jumberca files; company makes pattern software systems for other knitting machine brands
- Stoll (www.stolluk.co.uk, www.stoll.de) – new and used flat knitting machines, jacquard machines; knit patterns must be designed on Stoll software as TIFF files
- United Texmac Pte Ltd (UNITEX) (www.unitex.com) - Graphical pattern can be created either using a patterning **CAD/CAM software** equipped with the machine or via image scanner.

Sewing Machines:

- Atlanta Attachment Canada (see Canadian Apparel Directory) – Atlanta Attachment automated sewing machines and attachments
- B & W Sewing Machine Co. (see Canadian Apparel Directory) – suppliers of Juki machinery and equipment
- Brother (<http://www.brother.com/us-ism/e-ism-info-ca.html>) – Brother sewing machines
- Bruck (see Canadian Apparel Directory) – suppliers of new and rebuilt industrial sewing machines, cutters, and spreaders; sells Singer, Yamato, Juki, Cansew, Wolf
- Ex-Rees Specialty Sewing Machinery Canada Inc. (see Canadian Apparel Directory) – distributor for new and used AMF and Reece equipment, parts and service
- Gordon Sewing Machine Co. (see Canadian Apparel Directory) – distributors of J.B. Gury cloth cutting equipment, Beka needles, and new and used industrial sewing machines
- H.H. Industrial Sewing Machine Co. (see Canadian Apparel Directory) – supply and service industrial sewing machines; sells Brother, Pfaff, Anker-Tex, Janssen, AMF, Juki
- John Garde & Co. Ltd. (see Canadian Apparel Directory) – sales and service of industrial sewing machines, parts, and supplies; sells Singer, Eastman, Juki Brother, Consew, Bonis, Wolf
- Jomida Industries Inc. (see Canadian Apparel Directory) – distribute Consew, Golden Wheel, Siruba, Mitsubishi
- Juki Union Special, Inc. (www.juki.com) – Juki sewing machines
- M.S.M. Ltd. (see Canadian Apparel Directory) – supplier of used and new sewing machines, cutting machines, and eyelet and rivet machines; sells Fipi, Cima, Fimma, TRC, Eastman, Brother
- Machine à Coudre Delisle (see Canadian Apparel Directory) – importer and distributor of cutting, fusing, and sewing parts and supplies; sells Kingtex, Sunstart, J.B. Gury. Orange Needles, Reliant Fusing Press, Kansai Special
- Machines à Coudre Supreme Inc. (see Canadian Apparel Directory) – sales, service, rentals of sewing machines, industrial equipment, cutting, pressing, model forms, parts, and needles; sells Pfaff, Juki, CanSew, Brother, Union Special, Scruba, KingTex, Kansai Special, Pegasus, Superior, Sheldon, Sussman, VaporPress, Wolf, Eastman
- Mason Sewing Machine Co. Ltd. (see Canadian Apparel Directory) – supplier of industrial sewing machines and attachments, sales, service, and rentals
- Michel Simard Ltd. (see Canadian Apparel Directory) – supplier of sewing machines, die cutting presses, and other industrial equipment
- Pfaff (see Canadian Apparel Directory) – retail and wholesale of domestic and industrial sewing machines, cutting machines
- Pimac Inc. (see Canadian Apparel Directory) – exclusive distributor of Rimoldi products
- R.D. Goldsworthy & Co. Ltd. (see Canadian Apparel Directory) – sales and service of industrial and commercial sewing machines, spreaders, cutters, embroidery machines, ergo workstations; sells Pfaff, Pegasus, GGT(Gerber)/Niebuhr, Schmrztz, EFKA, Quick, WISS, Singer, Kessler, Maimin

- Reliable Sewing Machine Co. Ltd. (see Canadian Apparel Directory and 1995 Reliable catalogue) – supplier of industrial equipment, parts and service; sells Yamato, Juki, Mitsubishi, Singer, Relsew, SMF/Reece, Eastman, Sussman, Consew, Siruba, Rotondi, Hoffman, Oshima, Ace Hi, Groz Beckert, Clinton, Trimmer, Silverman, AC, PSR, Beisler, Galkin, Albatross, Racing
- Rubenstein Bros. Co. Inc. (see Canadian Apparel Directory, www.rubco.com) – sales, parts, service, and financing of new and used machines for cutting, sewing, finishing, embroidery, and warehousing; sells Brother, Tajima, Eastman, Merrow
- Rubenstein Bros. (Ont.) Ltd. (see Canadian Apparel Directory, www.rubco.com) – agent for Brother industrial embroidery machines, Happy embroidery machines, Eastman cutters, CRA spreaders, Merrow, UTICA, Whirly machines
- Union Special Canada (see Canadian Apparel Directory) – sales and service of Union Special industrial sewing machines and parts
- Vancouver Sewing Machines (see Canadian Apparel Directory) – supplier of sewing machines

Section 4: Knitting

Summary of Available Knitting Software

AranPaint: allows the user to design a piece of aran knitting. It does not design sweaters but rather aran patterns.

Features:

- Point and click interface
- Selection of 2,3,4,5 & 6 stitch cable patterns, bobbles, plain old knit and purl stitches
- 50 row by 50 stitch canvas
- Tiling option to that will repeat pattern in several ways (vertically, horizontally)
- Printing options include written instruction, chart which includes both the number of stitches and rows in pattern, print picture of the design or design can be converted into bitmap files

Libraries:

- Aran patterns
- Knit types

Hardware:

- Runs on Windows

Demo: Available to download from the following site:

<http://opera.iinet.net.au/~coolhoun/index.html>

Price: \$40.00 Australian (or ~\$36.00 Can) Note: All payments must be made in Australian dollars.

Contact:

Lisa Hounshell
P.O. Box 1002
Willagee Central LPO
Willagee WA
Australia
6156

Email: coolhoun@iinet.net.au

Cochenille Design Studio: Designs sweaters in a multitude of shapes and sizes. Garment Styler offers various choices for creating different necklines, sleeves, armholes, and styles.

Features:

- Uses a sloper, or an image of body measurements to assist in designing sweaters that are entered by the user.
- View the ease in your pattern and how it drapes
- Uses asterisks to indicate which sleeves match which armholes
- Allows some “tweaking” in the final design
- Measurements available in inches and centimeters
- Displays rows instead of inches/centimeters to make program compatible to knitting machines
- Schematic drawings can be displayed in various sizes including actual
- Styler Set #1 is an added feature with various new styles available

Libraries: Garment Styler

- Standard sizes for men, women and children sweaters
- 12 Style selections: 5 types of pullovers, 2 cardigans, 2 dresses, 2 vests, and a jacket
- 6 armhole types, 23 sleeve designs
- 17 neckline options
- straight or sloped shoulders

Library: Styler Set #1

- 28 styles: boleros, dresses, notched vests, camisole and a peplum
- 12 armhole types, 36 different sleeves
- 36 different necklines: Wide scoops, deep scoops, angled square, deep square

Hardware:

- Runs on Windows

Demo: Garment Styler is available to download from the following site:

<http://www.cochenille.com>. Styler Set #1 demo not available

Price: \$85 US Garment Styler
 \$25 US Styler Set #1

Contact:

Cochenille Design Studio

P.O. Box 234276

Encinitas, CA

92023-4276

Phone: (858) 259-1698

Fax: (858) 259-3746

Email: info@cochenille.com

Knitware Software Design: This program allows the user to design sweaters such as pullovers, vests and cardigans. This program does not include any fancy choices of sweater design.

Features (Sweater 2.0):

- Pattern created can be used for both hand and machine knitting and/or ribbing
- Can custom sizes for body, sleeves, neckline, ribbing
- Variety of choices for sweater styles
- Ability to change the finished measurements
- View schematic of sweater with horizontal and vertical measurements
- Program will produce an error if selected measurements or options are inappropriate
- Calculates estimated or precise amount of yarn needed for design

Library (Sweater 2.0):

- Standard sizes for children 20-32 (chest measurements), women 30-48, and men 32-52
- Style components including amount of ease, neckline, collar style, etc.
- Neckline choices include: crew, V, square, scoop, butter boat or overlapped boat
- Collar options available are: single band, double band, rolled edge, cowl, turtleneck, shawl, simple hood and shaped hood

Hardware:

- Windows 95/98/NT

Demo: Knitware Sweater Design is available to download from the following site:

<http://www.islandnet.com/knitware/kwdesc.htm>

Price: \$50 US/\$60 Can Sweater 2.0 (for Windows 95/98/NT)
\$50 US/\$60 Can Sweater 1.5 (for DOS & Win 3.1)
\$45 US/\$50 Can Doll & Bear Clothes 1.5 (for DOS & Win 3.1)

Contact:

Morningdew Consulting Services

7604 Morningdew Rd.
Victoria, B.C.
V9E 2A1

Phone: (250) 652-4097
Fax: (250) 652-5285

Knitware Retailers: **Doodles**
Oakville, ON
Email: doodles@bserv.com

DesignAKnit: This program allows the user to design a variety of different sweaters with different patterns.

Features:

- Compatible for both hand and machine knitting
- Displays sweater assembled, in separate parts, sweater design
- Can display pattern row by row, while each row is numbered with appropriate needles needed
- Can give verbal instructions, and audible warnings while designing and fabricating
- Can design different patterns to be applied onto sweaters

Library:

- Standard sizes for women, men and children
- Choice of types of sweaters and necklines
- Shape pattern and stitch patterns

Hardware:

- Runs on Windows
- For verbal instructions, need a Window's compatible sound card and speakers

Demo: Available to download from following site:

<http://www.knitcraft.com/designaknit.html>

Price: \$360 + & 10 S&H (Professional version)
 \$280 + \$10 S&H (Standard version – cannot create own shape files for garments,
 can only use templates)

Contact:

Retail Shop
 215 North Main
 Independence, Missouri
 64050

Phone: (819) 461-1248
 Email: knitcraft@knitcraft.com

Design-A-Pattern: Allows the user to design a variety of different knitted products. Can also convert a color pattern created in the 'paint' option to knitting surface.

Features:

- Choose sweater style, neckline, sleeves
- Tweaking to measurements, can customize sizes
- Convert to a grid, to give knitting measurements
- Also can obtain the written pattern
- Can create a pattern on the knitting surfaces in Paint that convert to Design-A-Pattern
- Can classify patterns according to style and order

Library:

- Standard women, men, and children sizes

- Different sweater, neckline, armhole styles

Hardware:

- Windows 95/98/NT

Demo: Design-A-Pattern is available to download from the following site:
<http://www.nwnet.co.uk/bramwell/despat.htm> or <http://www.ileen.com>

Price:

1st program: \$75
2nd program: \$65
3rd program: \$55
4th program: \$45
5th program: \$35

Contact:

Ileen Levy
Ileen's Needle Nook
Hannibal, MO

Phone: 1-800-221-NOOK
Email: ileen@nemonet.com
Website: <http://www.ileen.com>

Definition of Hardware Devices Used for Knitting

- *Standard:* Needles are spaced at 4.5 mm apart. Knit lightweight yarns. Will knit fairisle, stockinet, tuck, slip and lace. Knits fingering wt or lighter yarn but also sport wt yarn. Option of either punchcard or electronic options.

Manufacturers: Passap, Brother, Studio

- *Mid-Gauge:* Needles space at 6,7,8 mm. Works best with 5 stitches per yarn but have Tension Control Dials to be used with heavier and lighter wt yarns. Do not have option of electronic or punchcard methods and do not have ribber options. Needles for tuck, slip, and fairisle must be hand selected (exception Studio 860) & some may require a special carriage for fairisle knitting.

Manufacturers: Bond, Studio, Brother 350

- *Bulky:* Needle spacing at 9 mm. Can be either completely manual punchcard (no electronic) or completely electronic. It is designed for heavy worsted (4 ½ stitches per inch) and heavier. Has option of ribbing but can be just as fast to do it manually. Punchcard and electronic machines have automatic needle selection for tuck, slip and fairisle.

Manufacturers: Passap, Brother, Studio

List of Hardware Manufacturers and Distributors

Brother Knitting Machines: Manufacturer of large variety of knitting machines both electronic and punch card.

Features:

- Punch card technology which allows user to select tuck stitch, skip stitch, fairisle, and weaving to produce garment
- Electronic Knitting machine has a memory of 665 different stitch patterns.
- Software can be used to create own patterns and produced on the electronic knitter.

Hardware Available:

- KH868/864 Punch card
- KH970 Electronic
- KR850/838 Ribbing Attachments
- KG95 Automatic Garter Carriage
- KL116 Knit Leader
- Color Changer
- KE100 Motor Drive Unit
- KA8210 Intarsia Carriage
- KA8300 Transfer Carriage
- KA8310 Linker
- KA436 Blank Card/KA451 Card Punch
- PPD120 Pattern Programming Device

Cost:

Contact:

BROTHER INTERNATIONAL CORP. (CANADA) LTD.

1 rue Hôtel de Ville,
Dollard-des-Ormeaux,
Québec, H9B 3H6

Phone: (514) 685-0600

Fax: (514) 685-0700

<http://www.brother.com/E-product/e-prodca.html>

Studio Knitting Machines: Manufacturer of large variety of knitting machines, manual, electronic and punch card.

Features:

- Can produce a fine, standard or bulky weave
- Punch card machine can produce a pattern up to 24 stitches wide (all other patterns must be divided evenly into 24)
- Electronic machine can produce a pattern from one stitch up to the number of needles available on the machine.
- Electronic machine is compatible with a variety of knitting machine software.

Hardware Available:

- Manual (Hobby machine, Ultra fine Gauge)

- Punch card (Fine, Standard, & Bulky Gauge)
- Electronic (Fine, Standard, & Bulky Gauge)
- Ribbers
- Electronic Controller/Pattern Extender
- Intarsia Carriage
- Lace Carriage
- Fairisle Carriage
- Ribber Birdseye Jacquard Carriage
- Weaving Arm
- 4-color Yarn Changer
- Garter Bar
- Transfer Carriage
- Linker

Cost:	Manual	Hobby Machine	\$340
	Manual	Ultra-fine Gauge	\$1,625
	Punch Card	Fine Gauge	\$1,695
	Punch Card	Standard Gauge	\$1,695
	Punch Card	Bulky Gauge	\$1,695
	Electronic	Fine Gauge	\$1,995
	Electronic	Standard Gauge	\$1,995
	Electronic	Bulky Gauge	\$1,995

Contact:

Passap: Manufacturer of large variety of knitting machines both electronic and punch card.

Features:

- Passap E8000, E6000 are electronic knitting machines
- Passap Duomatic 80 is a punch card knitting machine
- Passap Vario has the ability to deal with a variety of different yarns and produce fine, standard and bulky garments.

Hardware Available:

- Passap E8000
- Passap E6000
- Passap Duomatic 80
- Passap Vario
- Accessories for

PASSAP E6000:
Autocolor 600
U70 / U100E
Tricofit
Picto
W600
GT900/4, T601/4

PASSAP DUOMATIC 80:
Deco
Autocolor 80
U70 / U100E
Picto
W600
T601/4

Cost:

Contact:

Mac Jean Doyon #662318
2348 Herron Road, Dorval
(514) 422-8232

Lakeshore Sew & Knit Circle
46 Westleigh Cres., Toronto
(416) 251-6858
vwscanada@earthlink.net

Section 5: Contractors

List of Contracting Companies for Outsourcing

CANADA

Quebec & Ontario

- **G.F. Grading and Marking** (www.sourcingweb.com)
Pattern marking, grading, marking services. Can also arrange for cutting services.
Specializing in: Women's Sportswear & Dresses, Men's Sportswear

Contact: Gabriel Fouque
9310, St. Laurent Blvd.
Montreal, PQ
H2N 1N4
Tel: (514) 389-8588, Fax: (514) 389-9392

- **Incredible Clothing**
Grading, Marking, cutting and sewing services. Can also embroider
Specializing in: Knit, cotton clothing

387 Limestone Cres.
Downsview, ON
M3J 2R1
Tel: (416) 665-8802, Fax: (416) 665-8861
Website: www.incredibleclothing.com

- **Keystone Industries Ltd.**
Grading, Marking, Cutting and Sewing services
Specializing in: woven bottoms, jeans

Contact: Mary Maraj (ext. 232)
5440 Boul. Thimens
St. Laurent, PQ
H4R 2K9
Tel: 1-800-297-7111, (514) 333-7171, Fax: (514) 333-6336
Email: marym@keystone-jeans.com

- **Lammoda Confection Inc.**
Cutting and Sewing services
Specializing in: Women's Fashions

KVL Inc. (sub division of Lammoda)
Specializing in: Women Coats

Contact: Kin Seto
P.O. Box 374
Westmount, PQ

H3Z 2T5
Tel/Fax: (514) 366-4660

- **Les Modes Carl Fashions Inc.**

Sewing services
Specializing in: Women's Pants

296 Victoria Street
Edmunston, NB
E3V 2H9
Tel: (506) 735-1902, Fax: (506) 735-1917

- **Jalon Mode** (see Canadian Apparel Directory)
Pattern-making, computerized grading, and cutting services
789 Mercier, Iberville, QC
- **Moja Knit Canada, Inc.** (see Canadian Apparel Directory)
Vertically integrated knitting mill
1550 Chabanal West, Montreal QC, H4N 1H4
Tel: (514) 381-8657, Fax: (514) 381-8650
- **Service de Coupe** (see Canadian Apparel Directory)
Cutting contractor
8595 Boul. Langelier, Montreal QC, H1P 2Z4
Tel: (514) 324-3693, Fax: (514) 324-6583

Western Canada

- **ADA Designs** (see Canadian Apparel Directory)
Design services, sample sewing, specializing in women's and children's patterns
3125 Royal Ave, North Vancouver, BC, V7K 1Y7
Tel: (604) 984-0990
- **Fashionmark Solutions Inc** (see Canadian Apparel Directory,
www.fashionmark.com)
Pattern making, grading, and markers
301-343 Railway, Vancouver, BC V6A 1A4
Tel: (604) 683-9279, Fax: (604) 683-9201
Email: info@fashionmark.com
- **Freelance Pattern Design** (see Canadian Apparel Directory)
Freelance pattern drafting, grading, and spec drawing
Ladler, BC
Tel: (604) 946-8095, Fax: (604) 946-0532
- **Precision Patterns, Inc.** (see Canadian Apparel Directory)
Computerized pattern-making, grading, and marking
2559 Palmerston Ave, Vancouver BC, V7V 2W5
Tel: (604) 925-6381, Fax: (604) 925-6381

- **Studio Maija, Clothing Design Services** (see Canadian Apparel Directory)
Clothing design, specializing in women's and children's wear, pattern-making, grading, marker making, and design.
335 East 5th St, North Vancouver, BC, V7L 1M1
Tel: (604) 983-3675, Fax: (604) 983-3675
- **RD Corp.** (www.planet.eon.net/~rdcorp)
Laser cutting services. Computer imports files as Gerber Cut File, DXF, HPGL and others, optimizes cutting path and generates the laser-cutting file.
4220-86 Street, Edmonton, Alberta, Canada T6K 1E5
Tel: 780-450-0941, Fax: 780-438-9088
Email: rdcorp@planet.eon.net

USA

- **London Computer Cutting** (see Fashion Manuscript Magazine)
Computerized cutting.
489 Getty Ave, Clifton NJ 07011
Tel: (973) 340-3131, Fax: (943) 340-7164
- **Metrix Computer Cutting, Inc.** (see Fashion Manuscript Magazine)
Computerized cutting.
489 Getty Ave, Clifton NJ 07011
Tel: (973) 340-3131, Fax: (943) 340-7164
- **ApparelMark** (www.apparelmark.com)
Pattern making, grading, and marking. Gerber Technology AM5, and AccuMark Cad Cam Computer System.
7307 Remcon, Suite 104, El Paso Texas 79912
Tel: (915) 581- 7571, Fax (915) 581- 7151
Email: elizabeth@apparelmark.com
- **Marker Express** (www.markerexpress.com)
Computerized pattern making, grading, marker making, plotting, data management and Remote Data Support (RDS) services to companies with or without their own CAD system. Uses Investronica and Lectra CAD systems.
2170 NW 82 Ave, Miami, FL 33126
Tel: 305-717-5010 Fax: 305-717-5009
Email: info@MarkerExpress.com

APPENDIX

Apparel Industry Web Links

CAD Info Links

Apparel Industry Magazine: <http://www.aimagazine.com/>
FabriCAD apparel links: <http://www.fabricad.com/hot.html>
Techexchange apparel info: <http://www.techexchange.com/thelibrary.html>
SourcingWeb: <http://www.sourcingweb.com/>
Bobbin Group: <http://www.bobbin.com/BOBBINGROUP/>

CAD Systems

assyst: <http://www.assyst-intl.com/>
Fashion CAD (CAD CAM Solutions): <http://www.cadcam.solutionsaustralia.com.au/>
Cadtex Corporation: <http://www.cadtex.com/>
Gerber Technology: <http://www.gerberotechnology.com/>
KaratCAD: <http://www.karat.com/>
Lectra Systemes: <http://www.lectra.com/>
Info Design (NedGraphics): <http://www.idvision.com/>
OptiTex (SGS): <http://www.optitex.com/>
PAD System: <http://www.padsystem.com/>
TUKAcad (Tukatech): <http://www.tukatech.com/>

Sewing Equipment

Atlanta Attachment: <http://www.atlatt.com/>
Rubenstein Bros.: <http://www.rubco.com/>
Singapore Machinery Co.: <http://web.singnet.com.sg/~smcpl/>

Cutting Equipment

Autometrix automated cutters: <http://www.autometrix.com/Default.htm>
Bobbin Show Cutters Pages:
<http://apparel.indiamart.com/nift/gmt/oct1998/from10021998.html>,
<http://www.bobbin.com/media/97sept/prcut.htm>
Eastman automated cutters: <http://www.eastmanww.com/>
EdgeWise laser cutters: <http://www.edgewisetools.com/>
Emery hand cutters: <http://www.emery.com.tw/>
Ioline cutters/plotters: <http://www.ioline.com/>
Lasermade: <http://www.lasermade.com.au/>
Metrix/Gerber: <http://www.fashiondex.com/metrix/>
RD Corp laser cutters: <http://www.planet.eon.net/~rdcorp/>
Rubenstein Bros.: <http://www.rubco.com/>
Wolf: <http://www.wolfmachine.com/>

Knitting/Jacquard Equipment

DMB knitting links: <http://www.dmbolutions.net/textile/textlink/textlink.htm>
ITM: <http://www.industryweb.net/itmsouth/index.html>
Jumberca: <http://www.jumberca.com/>
Shima Seiki: <http://www.shimaseiki.co.jp/homee.html>
Stoll: <http://www.stolluk.co.uk/>, <http://www.stoll.de>
Yamata Dobby looms: <http://www.yamadadobby.com/>

Barney Knitting Machinery Co.: <http://www.barneyknitting.com/index.html>

Plotters

ENCAD: <http://www.encad.com/>

Ioline: <http://www.ioline.com/>

Outsourcing Contractors

ApparelMark, Inc.: <http://www.apparelmark.com/>

FashionMark Solutions, Inc.: <http://www.fashionmark.com/services/>

Precision Pattern Production: <http://www.grade-mark.com/index.html>

RD Corp cutting: <http://www.planet.eon.net/~rdcorp/>

Graphics File Formats Info

File Format FAQ: <http://www.landfield.com/faqs/by-category.html>

TailorMade Software: <http://www.tailormade.com/>

Webopedia: <http://pcwebopedia.com/>

Table of Definitions of Graphics File Formats

<i>Extension</i>	<i>Abbreviation of</i>	<i>Owned by</i>	<i>Vector or Raster</i>	<i>Description</i>
HPGL	Hewlett-Packard Graphics Language	Hewlett Packard	vector	Set of commands for controlling pen plotters and cutters - pick up the pen/knife, put it down, move here, move there. Very few complex commands are part of HPGL since the original plotters did not include powerful CPUs.
DXF	Drawing Exchange Format	Autodesk	vector	Created by Autodesk for AutoCAD - AutoCAD's generic file format. Almost all PC-based CAD systems support DXF.
DWG	AutoCAD Drawing	Autodesk	vector	The internal binary database format for and native file format of AutoCAD.
IGES	Initial Graphics Exchange Specification	U.S. Product Data Association (USPRO), and IGES/PDES Organization (IPO)	vector	An ANSI standard. Neutral data format for digital exchange of information among most CAD systems. Data models are in the form of 3D wire frame surfaces or solid representations.
DRW	Draw	Micrografx	vector	File format used by Micrografx Designer/Draw.
CADL / CDL	Cadkey Language	Cadkey	vector	Cadkey's development language.
GGT	Gerber Garment Technology	Gerber Technology, Inc	vector	Graphic data format used extensively in the electronic fabrication industry.
WPG	WordPerfect Graphic	WordPerfect	vector	Graphic file format used in Corel WordPerfect drawings.
PICT / PCT	Macintosh Picture	Apple Computer	vector	Supported by all graphics programs that run on a Macintosh.
EPS	Encapsulated PostScript	Adobe	vector, supports raster	The term EPS usually implies that the file contains a bit-mapped representation of the graphics for display purposes. EPS uses a combination of PostScript commands and TIFF or PICT formats.

Extension	Abbreviation of	Owned by	Vector or Raster	Description
CGM	Computer Graphics Metafile	ANSI, ISO, IEC, DOD, and NIST standards organizations	vector, supports raster	Formally ratified by ANSI. It is a neutral, standard, platform-independent format and is supported by a wide variety of software and hardware products. It is used primarily in transferring between applications. This format is not generally supported in Windows- the WMF is preferred.
WMF	Windows Metafile Format	Microsoft	vector, supports raster	File format used to exchange <u>graphics</u> information between Microsoft Windows applications. WMF files can hold both vector and raster images.
EMF	Enhanced Metafile	Microsoft	vector, supports raster	32-bit metafile that can be used by Windows 95, 98 and NT to display a picture. An enhanced metafile can contain a much broader variety of commands than a "regular" Windows metafile.
BMP	Bitmap	Microsoft	raster	A representation, consisting of rows and columns of dots, of a graphics image. To display or print the image, the computer translates the bit map into pixels (for display screens) or ink dots (for printers).
BMP (DIB)	Device-Independent Bitmap	Microsoft	raster	Graphics stored in DIB format generally end with a BMP extension. Called device-independent because colors are represented in a format independent of the final output device. DIB provides images that are scalable independent of the device.
TIF	Tagged Image File Format	Adobe	raster	One of the most widely supported file formats for storing bit-mapped images on personal computers (both PCs and Macintosh computers). Used mainly in scanning and photographic applications.
TGA	Targa	Truevision Inc.	raster	Compressed bitmap used mainly in photographic applications.

Extension	Abbreviation of	Owned by	Vector or Raster	Description
GIF	Graphics	CompuServe	raster	Format used by CompuServe.

	Interchange Format	Corporation		<u>Supports</u> color and various <u>resolutions</u> . It also includes data compression, making it especially effective for scanned photos.
JPEG	Joint Photographic Experts Group	JPEG committee, ISO	raster	Standardized image compression mechanism. Works well on photographs, naturalistic artwork, and similar material, but not so well on lettering, simple cartoons, or line drawings. Although it can reduce files sizes to about 5% of their normal size, some detail is lost in the compression.
PCX	PC Paintbrush bitmap	ZSoft	raster	A compressed format commonly used for Windows paint applications supported by many graphics programs, as well as most optical scanners and fax modems.
DCX	Windows Images	Microsoft	raster	A format for multiple page PCX files (Windows only)
RAS	Sun Raster file	Sun Microsystems	raster	Native format of Sun Microsystem Unix systems.
CALS	Continuous Acquisition and Life-cycle Support	United States Department of Defense	raster	Black and white output by applications used by industries that contract with the U.S. government and military. It was originally designed to simplify the storage and sharing of graphics files.
XBM	X windows Bitmap		raster	A simple, uncompressed graphics format used primarily in the X Window System. XBM files are 1-bit (i.e. black-and-white) images.
IFF	Interchange File Format	Amiga	raster	For storage and exchange of data between different programs. All Amiga applications support this standard. IFF stores graphics, sound data, text, and configuration data.
PSD	Adobe Photoshop	Adobe	raster	Photoshop's internal image format.