

# The Basics of Selling Printers

LASER, IMPACT, THERMAL

# IBM



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## Why IBM?

IBM provides world class service, excellent print management capabilities, and offers a total solution from one provider.

### Why this course?

Selling printers is complex. A salesperson needs to understand data streams, attachments, operating systems, media, and printer types in order to provide the right solution for the customer. This course will get us started.

# Printing Systems Sales

Three Regions: East, Central, and West

Regional Organization

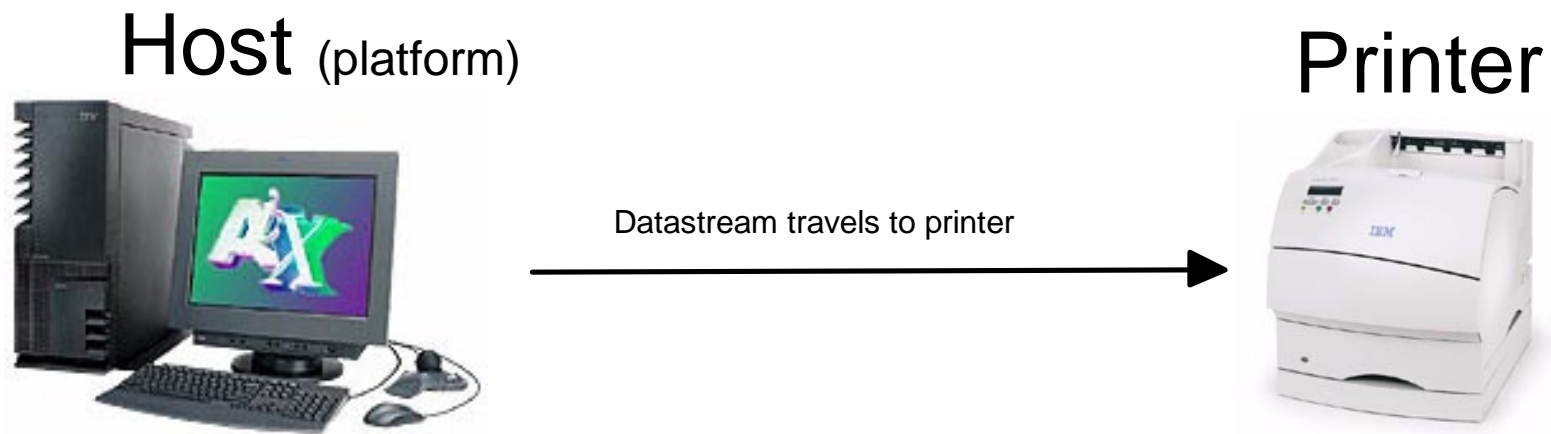
General Territory Reps.

Specialists

National Printing Channels Team

Field Engineering

# How the printer gets information



How to attach the printer to the host? (attachment type)

Does the attachment type support the datastream?

# UNDERSTANDING DATASTREAMS

## EBCDIC VERSUS ASCII

	<b>EBCDIC</b>	<b>ASCII</b>
	8 bit datastream	6 bit datastream
Types of datastreams	AFPDS, IPDS, SCS, IGP, CODE V	(Proprinter III or Epson FX 1050 emulation) PCL Postscript
Attachment types supported	Twinax, Coax, Channel, ethernet or token ring (with PSF)	Parallel, serial, ethernet, token ring, USB
Platforms	AS/400, System 390, ES 9000	Personal Computers, RISC 6000
Operating systems	OS/400, MVS, VM, VSE	Windows 3.1,95,98.00 Windows NT, DOS

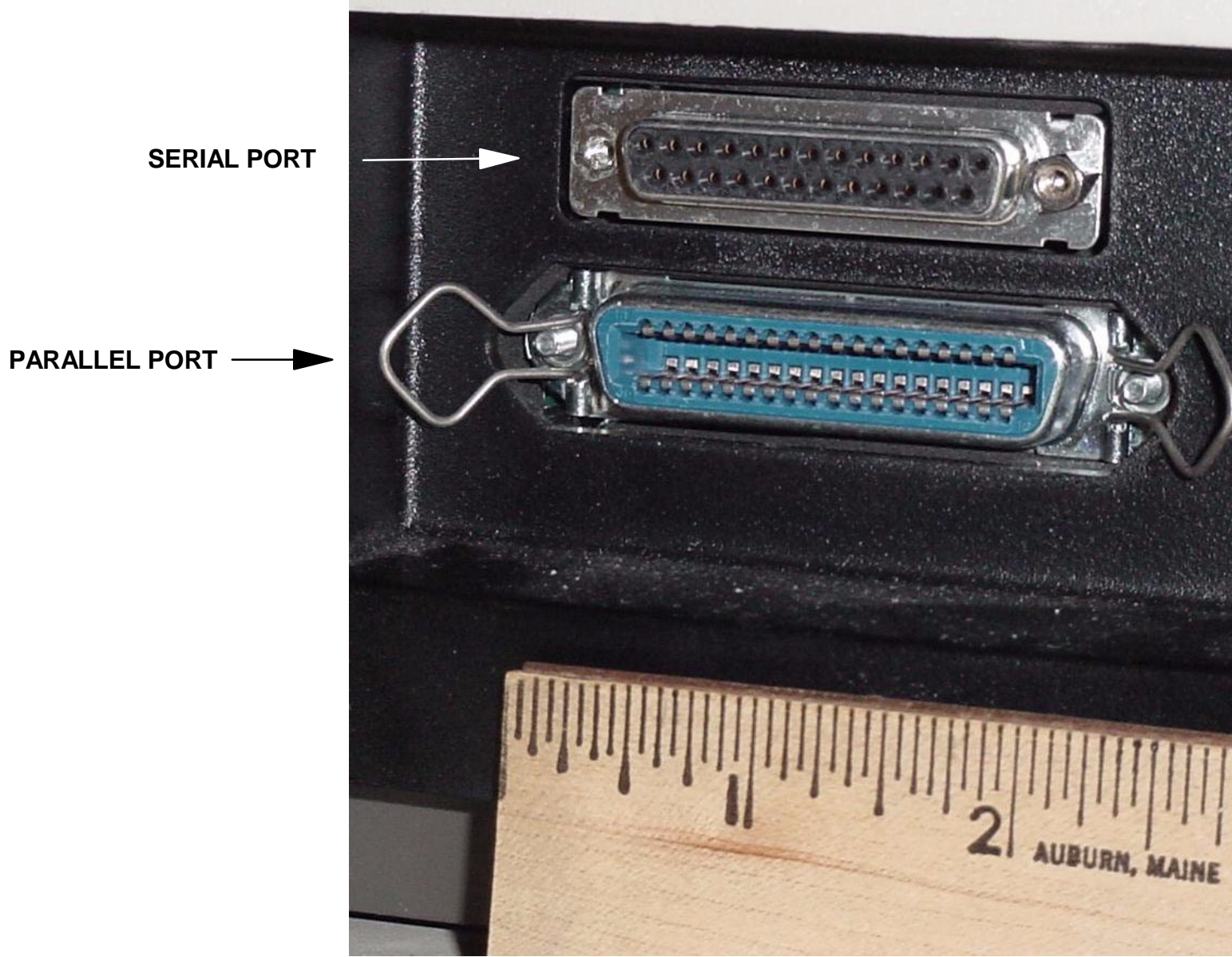
Conversions can be made from one data stream to another. Examples are:

- >Host print transform on the AS/400----Converts SCS to PCL
- >Infoprint Manager ---- Converts Afpds, ascii, pcl, pdf, scs, sap to IPDS
- >PSF ---- converts SCS to IPDS
- >Infoprint Server ---- Converts IPDS to Postscript (PDF)
- >Middleware --- Cybra, Teklynx, Loftware, T.L. Ashford, Strandware, Seagull Scientific

# Attachment Types







# Speed

## Laser Printers

PPM = Pages per minute

IPM = Impressions per minute (This is defined as one side of a 8.5 X 11 inch sheet of paper.)

## Impact Printers

Serial Printers use CPS (characters per second)

Shuttle Matrix (Line Matrix) use LPM (lines per minute)

Print quality affects the speed of Impact printers.

Draft mode = fastest speed but a lesser print quality

DP mode = medium speed and Medium print quality

NLQ mode = slowest speed but best print quality

## Thermal Printers

IPS = inches per second

Approximate Speed Conversions

$$\text{CPS} \times .67 = \text{LPM}$$

$$\text{LPM} / .67 = \text{CPS}$$

$$\text{IPM} \times 50 = \text{CPS}$$

$$\text{CPS} / 50 = \text{IPM}$$

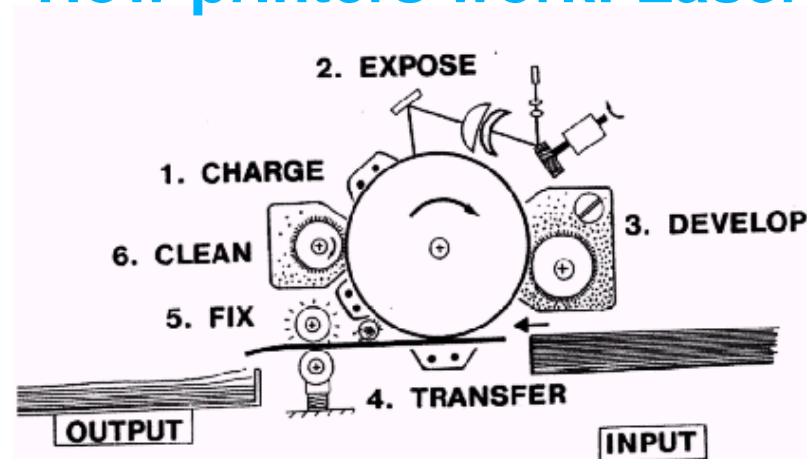
$$\text{IPM} \times 33 = \text{LPM}$$

$$\text{LPM} / 33 = \text{IPM}$$



# How printers work: Laser

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1. An organic photoconductor (drum or belt) is uniformly charged by a corona.
2. A light source creates a latent image on the photo-receptor according to the information sent by the computer. The conductivity (or charge) of the drum increases where the light strikes and this allows the surface charge to decay; the charge remains the same where the light does not strike the drum.
3. The photoconductor rotates to a developing station where toner particles are attracted to the latent image.
4. The photoconductor continues to rotate to a transfer station where the toner image is attracted to the paper.
5. The toner is fixed to the paper by heat and pressure.
6. The photoreceptor is cleaned of any residual toner.\*

\*Biscos & Levy. Non-Impact Electronic Printing. Charlottesville: InterQuest, Inc, 1993.

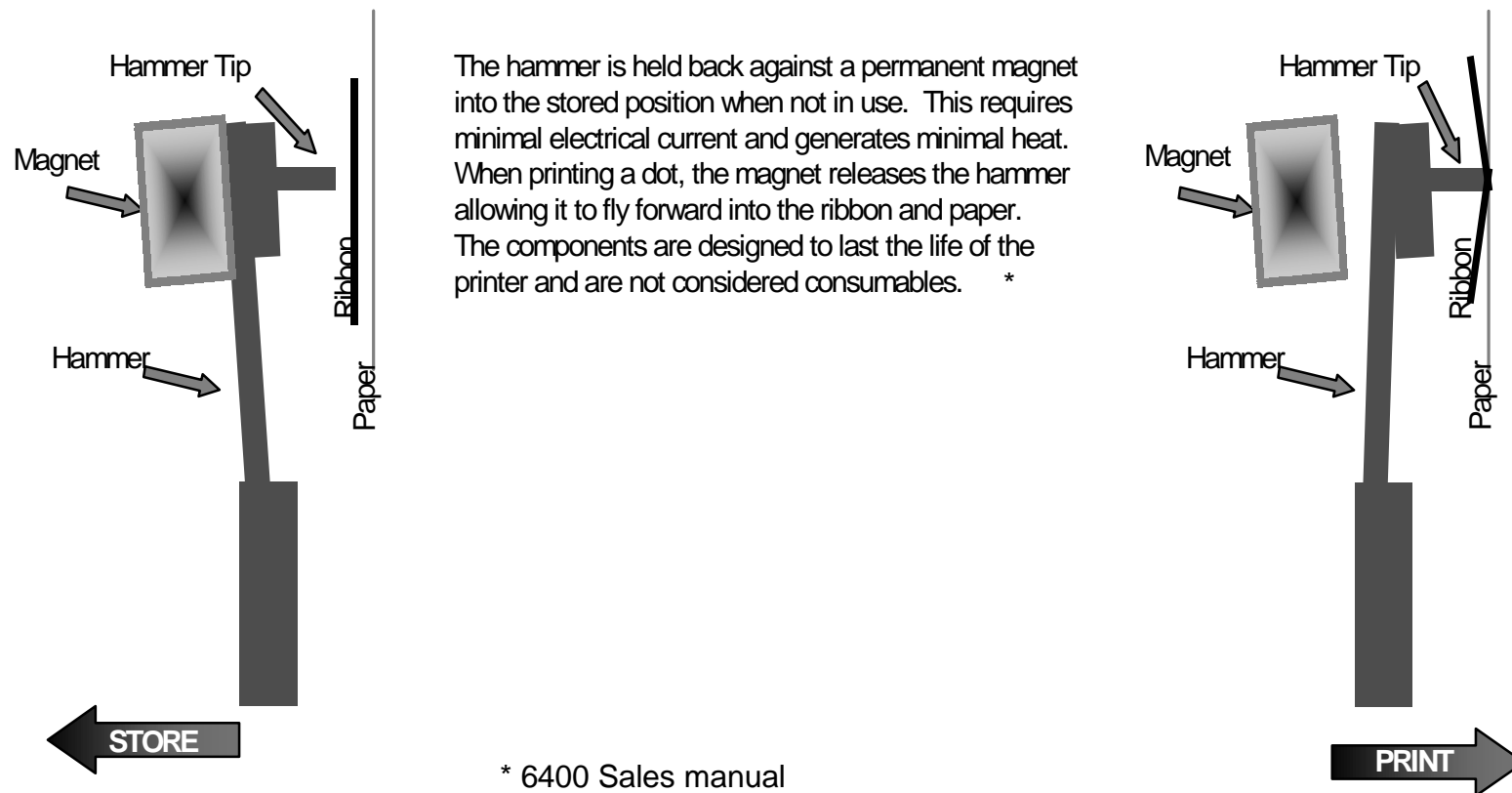
This is known as a page printer because when you send a job to the printer you send it a page at a time. Therefore, the amount of memory needed is determined by how complex each page is and not how long the job is (number of pages).

**DUTY CYCLE: RATED VERSES RECOMMENDED**

**Advantage/Disadvantage**

## How printers work: Impact

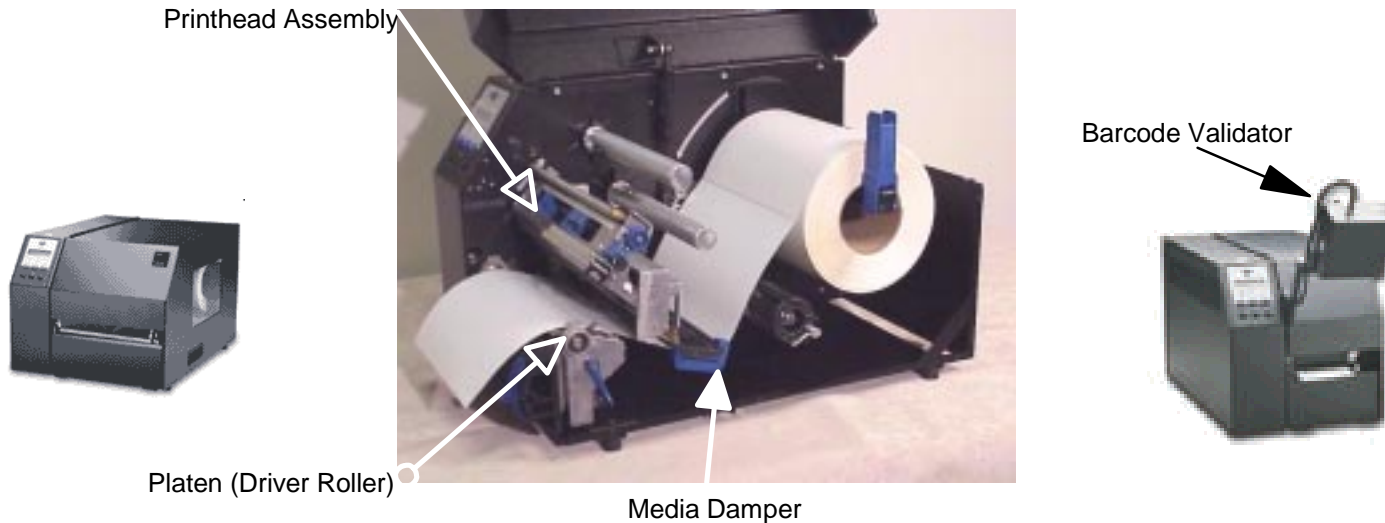
### Stored Energy



Serial Matrix verses Shuttle (line) Matrix  
Band Printers  
Advantages/Disadvantages

# How printers work: Thermal

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Here is how it works. Let's say we want to print an "A"

1. The operating system sends a command to the printer to print an "A"
  2. The thermal head heats up the area for an "A"
  3. When hot enough, the thermal head will fix (melt) the wax, resin, or wax/resin blend to the paper.
  4. The thermal head cools and the ribbon moves down.
  5. Now the printer is ready to print the next piece of information.
- All this happens in a fraction of a second.
  - The ribbon can only be used once, as it passes by the thermal head once.

## **Where is this used?**

This printer is used to make labels in shipping, receiving, sorting, and pricing applications.

So it is used in warehouses, distribution/retail centers, production facilities, etc.

## **Direct Thermal vs. Thermal Transfer**

### **Advantage/Disadvantage**

# Media Types

## Continuous Form

Fan Fold (Pin Fed), Green Bar

## Cut Sheet

Types: paper, cardstock, labels

Sizes: letter (8.5 x 11), legal (8.5 x 14), ledger (11 x 17),  
universal paper trays, custom sizes

Media weights: 20 lb stock and others

Paper Paths: straight, S-shaped, C-shaped

## Thermal: Matching the right media with the ribbon

Ribbon	Wax	Wax/Resin Blend	Resin
Media	Paper	Paper and some synthetic	Synthetic only

# Broadest Line of Printers

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- Impact and Non-impact Industrial
- Workgroup Laser
- Cutsheet Production
- Continuous Form Production
- Enterprise Color






# Impact and Non-impact Industrial





Printer Name	Type of printer	Max speed Max duty cycle	Media supported
4400-00x	THERMAL Label Printer	2-10 ips	Continuous form labels
4232-302	IMPACT Serial Matrix	600 cps	Pinfed Continuous Forms
4230-xxx	IMPACT Serial Matrix	375,480, or 600 cps	Pinfed Continuous Forms
4247-003	IMPACT Serial Matrix	700 cps	Pinfed Continuous forms/ cut sheet
6400-xxx	IMPACT Line printer/ Shuttle matrix	500,1000,1500 lpm	Pinfed Continuous forms
Infoprint 62 (4370)	LASER Continuous forms	62ipm/600,000 impressions per month	Pinfed Continuous forms



# Workgroup Laser

Printer name	Type of Printer	Max speed Max duty Cycle	Media Supported
 <p>Infoprint 1120 (4520-xx1)</p>	Cutsheet Laser	20 ipm 100k per month	letter, legal, and custom forms
 <p>Infoprint 1125 (4525-xx1)</p>	Cutsheet Laser	25 ipm 120k per month	letter, legal, and custom forms
 <p>Infoprint 1130 (4530-xx1)</p>	Cutsheet Laser	30 ipm 150k per month	letter, legal, and custom forms
 <p>Infoprint 1140 (4540-xx1)</p>	Cutsheet Laser	40 ipm 200k per month	letter, legal, and custom forms
 <p>Infoprint 1145 (4545-xx1)</p>	Cutsheet Laser	45 ipm 250k per month	letter, legal, ledger, and custom forms

## Cutsheet Production




Printer name	Type of Printer	Max speed Max duty cycle	Media Supported
 <p>Infoprint 70 (2770-001)</p>	Cutsheet Laser	70 ipm 400k per month	letter, legal, ledger, and custom forms
 <p>Infoprint 2000 (2710-xx1)</p>	Cutsheet Laser	110 ipm 2 million per month	letter, legal, ledger, and custom forms

# Continuous Form Production



Printer name	Type of printer	Max speed Max Duty cycle	Media Supported
Infoprint 3000 (3000-xxx)	Continuous form laser	344 ipm 8.8 million per month	Continuous forms 8 to 18 inches wide
Infoprint 4000 (4000-xxx)	Continuous form laser	1002 ipm 17.4 million per month	Continuous forms 9 to 18 inches wide
Infoprint 4100 (4100-xxx)	Continuous form laser	1500 ipm 37.5 million per month	Continuous forms 8 to 19.5 inches wide

# Enterprise Color Solutions

Printer name	Type of printer	Max speed Max Duty cycle	Media Supported
 <p>Infoprint color 70 (3170-xxx)</p>	Continuous form color laser	70 ipm 700k per month	Continuous forms 8 to 12 inches wide
 <p>Infoprint color 100 (3170-xxx)</p>	Continuous form color laser	100 ipm 700k per month	Continuous forms 19 to 20 inches wide
 <p>Infoprint color 130 (3170-xxx)</p>	Continuous form color laser	130 ipm 700k per month	Continuous forms 19 to 20 inches wide

# QUESTIONS TO ASK

- What is your operating system?
- Which datastream (language) are you sending to the printer?
- How are you going to attach the printer?
- What are you using now?
- How much are you going to print per month? [Duty Cycle (Recommended versus Rated)] and will your volume increase?
- Speed? (ppm,ipm,lpm,cps,ips)
- What is your print window? (mission critical)
- How is the printer being used? (mission critical)
- Where is the printer being used? (mission critical)

## Tools to help you sell

- Printing Systems Web Sites  
(Sales and external)
- Product CDs
- Spec. Sheets
- Sales Manual
- Your Channel Rep
- Technical Support
- SOS Office (Sales Operations Support)  
[For the first available representative](#)  
1-800-793-5889 and select option 2



# QUESTIONS AND ANSWERS

To give feedback or recommendations on this course, please contact Brian Leatherman at [bleather@us.ibm.com](mailto:bleather@us.ibm.com)

## PRINTING GLOSSARY

- AFP - (ADVANCED FUNCTION PRESENTATION) AN ARCHITECTURE THAT PROVIDES THE INTERFACE AND COMMAND CAPABILITY TO ADDRESS THE COMPLEX FUNCTION OF PRINT RESOURCE MANAGEMENT, CONTROL, AND DOCUMENT PRODUCTION, USES THE IPDS DATASTREAM.
- ARCHITECTURE - A STRUCTURE TO CREATE, SEND, AND CONTROL PRINT JOBS.
- ATTACHMENT - HOW YOU PHYSICALLY CONNECT THE PRINTER TO THE HOST
- ASCII - A 6 BIT DATASTREAM, INCLUDING PCL, POSTSCRIPT, AND PROPRINTER III / EPSON FX 1050
- BAND PRINTER - A TYPE OF IMPACT PRINTER THAT HAS A METAL BAND WITH FULLY FORMED CHARACTERS ON IT TO STRIKE THE RIBBON AGAINST THE PAPER (EXAMPLES ARE THE 4245, 5262, AND THE 6262)
- BAR CODE - A CODE REPRESENTING CHARACTERS BY SETS OF PARALLEL BARS OR VARYING THICKNESS AND SEPARATION THAT ARE READ OPTICALLY BY TRANSVERSE SCANNING.
- BNC CONNECTOR - THE END OF COAX CABLING THAT IS USED TO PHYSICALLY ATTACH THE CABLE TO THE PRINTER.
- BUS-N-TAG - SEE "CHANNEL"
- CAT 5 - THE CABLING USED IN AN ETHERNET NETWORK. THE CABLING USED FOR A RJ-45 CONNECTION.
- CHANNEL - A COMMUNICATION CONTROLLER HARDWARE UNIT USED TO ATTACH THE CONTROLLER TO A SYSTEM/370 DATA CHANNEL.
- COAX - CABLE CONSISTING OF A CONDUCTOR, USUALLY A SMALL COPPER TUBE OR WIRE WITHIN, AND INSULATED FROM ANOTHER FROM ANOTHER CONDUCTOR OF LARGER DIAMETER, USUALLY COPPER TUBING OR COPPER BRAID. USED IN S/390 ENVIRONMENTS.
- CONSUMABLES - THESE ARE THE SUPPLY ITEMS; LIKE TONER CARTRIDGES, RIBBONS, AND USAGE KITS.
- CONTINUOUS FORM PRODUCTION - A PRODUCT GROUP IN THE IBM PRODUCT LINE INCLUDING THE INFOPRINT 3000, 4000, AND 4100.
- CONVERSIONS - SEE "TRANSFORMS"
- CORONA - IN PRINTERS, A SMALL DIAMETER WIRE TO WHICH A HIGH VOLTAGE IS APPLIED, CAUSING IONIZATION OF THE AIR. THE IONIZATION CREATES AN ELECTRICAL CHARGE TO PERFORM VARIOUS FUNCTIONS DURING THE PRINTING PROCESS.
- CPS - (CHARACTERS PER SECOND) THE SPEED RATING FOR SERIAL MATRIX PRINTERS (INCLUDING THE 4230, 4232, AND 4247)
- CUTSHEET PRODUCTION - A PRODUCT GROUP IN THE IBM PRODUCT LINE INCLUDING THE INFOPRINT 60, 70, AND 2000.
- DATA STREAM - A SET OF INSTRUCTIONS USED TO INSTRUCT THE PRINTER WHAT TO PRINT. (IPDS, SCS, PCL, POSTSCRIPT) ALSO KNOWN AS LANGUAGE
- DOUBLE BYTE CHARACTER SET - A SET OF CHARACTERS IN WHICH EACH CHARACTER IS REPRESENTED BY 2 BYTES.
- DPI - (DOTS PER INCH) REFERRING TO RESOLUTION OR PRINT QUALITY, HOW MANY DOTS ARE PLACED PER INCH.
- DRIVER - A PROGRAM THAT CONTAINS INFORMATION NEEDED TO RUN A PRINTER.
- DUTY CYCLE - THE AMOUNT OF PRINTING THAT CAN BE DONE ON A PRINTER IN ONE MONTH, USED FOR LASER PRINTERS.
- DUPLEX - REFERS TO PRINTING ON BOTH SIDES OF A PAGE.
- EDCIDC - A 8 BIT DATASTREAM, INCLUDING SCS (SNA), AFPDS, AND IPDS.
- EMULATION - THE USE OF PROGRAMMING TECHNIQUES AND SPECIAL MACHINE FEATURE TO PERMIT A COMPUTING SYSTEM TO EXECUTE PROGRAMS WRITTEN FOR ANOTHER SYSTEM.
- ENTERPRISE COLOR - A PRODUCT GROUP IN THE IBM PRODUCT LINE INCLUDING THE INFOPRINT COLOR 70, 100, AND 130.
- ERROR RECOVERY - THE PROCESS OF CORRECTING OR BYPASSING THE EFFECTS OF A FAULT TO RESTORE A COMPUTER SYSTEM TO A PRESCRIBED CONDITION.

## PRINTING GLOSSARY (*continued*)

- ETHERNET - A TYPE OF L.A.N. (LOCAL AREA NETWORK)
- FAN FOLD - A TYPE OF CONTINUOUS FORM PAPER THAT IS FOLDED BACK AND FORTH, USUALLY PIN FED. (I.E. GREEN BAR PAPER)
- GRAPHIC - PERTAINING TO CHARTS, TABLES, PICTURES, AND THEIR CREATION.
- GREEN BAR - A TYPE OF CONTINUOUS FORM PAPER, PIN FED, THAT HAS GREEN BARS ACROSS IT TO HELP IN READING DOWN LINES OF DATA.
- HOT PORT SWITCHING - THE ABILITY FOR A PRINTER TO ACCEPT DATA THROUGH TWO DIFFERENT PORTS ON THE PRINTER.
- IMPACT AND NON-IMPACT INDUSTRIAL - A PRODUCT GROUP IN THE IBM PRODUCT LINE INCLUDING THE 4232, 4230, 4247, 6400, 4400, AND INFOPRINT 62.
- IMPACT PRINTER - A TYPE OF PRINTER THAT HAS A PRINT HEAD THAT STRIKES THE RIBBON AGAINST THE PAPER TO LEAVE AN IMAGE. (LIKE A TYPEWRITER)
- IP ADDRESS - (INTERNET PROTOCOL) USED ON A NETWORK (L.A.N.) TO IDENTIFY A DEVICE (PRINTER)
- IPDS - (INTELLIGENT PRINTER DATASTREAM) THE DATASTREAM OF THE AFP ARCHITECTURE THAT SUPPORTS GRAPHICS, BAR-CODES, ERROR RECOVERY, AND TWO WAY COMMUNICATION.
- IPM - (IMPRESSIONS PER MINUTE) DEFINED AS THE SPEED A LASER CAN PRINT ONE SIDE OF A 8.5 X 11 INCH SHEET OF PAPER.
- IPS - (INCHES PER SECOND) DEFINED AS THE SPEED A THERMAL PRINTER CAN PRINT.
- KANJI - A GRAPHICAL CHARACTER SET CONSISTING OF SYMBOLS USED IN JAPANESE IDEOGRAPHIC ALPHABETS. USES THE DOUBLE BYTE CHARACTER SET.
- LAN - (LOCAL AREA NETWORK) A COMPUTER NETWORK LOCATED ON A USER'S PREMISES WITHIN A LIMITED GEOGRAPHICAL AREA.
- LANDSCAPE - PERTAINING TO A DISPLAY WITH GREATER WIDTH THEN HEIGHT. CONTRAST TO PORTRAIT.
- LASER PRINTER - A NON-IMPACT PRINTER THAT CREATES LATENT IMAGES BY DIRECTING A LASER BEAM ONTO A PHOTOCONDUCTIVE PRINTING MEDIUM. TONER PARTICLES, ATTRACTED TO THE ENERGIZED LATENT IMAGE, MAKE THE IMAGE VISIBLE.
- LEDGER - A SIZE OF PAPER THAT IS 11 X 17 INCHES
- LEGAL - A SIZE OF PAPER THAT IS 8.5 X 14 INCHES
- LETTER - A SIZE OF PAPER THAT IS 8.5 X 11 INCHES
- LINE MATRIX - A TYPE OF IMPACT PRINTER THAT PRINTS LINES OF DATA. (ALSO KNOWN AS A SHUTTLE MATRIX) LIKE THE 6400.
- LONG EDGE FEED - THE LONGER OF THE TWO SIDES OF PAPER BEING FED INTO THE PRINTER.
- LPM - (LINES PER MINUTE) THE UNIT THAT A LINE PRINTER REPRESENTS SPEED BY.
- MEDIA - ANOTHER NAME FOR PAPER, OR WHAT IS GOING TO BE PRINTED ON
- MIDDLEWARE - A THIRD PARTY SOFTWARE SOLUTION THAT CAN CONVERT DATA AND/OR MODIFY AND DESIGN IT. (I.E. THE MAKING OF LABELS)
- MULTIPART FORMS - A TYPE OF MEDIA USED WITH IMPACT PRINTERS THAT IS SEVERAL PIECES ON TOP OF ONE ANOTHER WITH CARBON IN BETWEEN THE FORMS SO ONE IMPACT FROM THE PRINTER WILL MAKE SEVERAL COPIES OF THE FORM.
- NETWORK - SEE "L.A.N."
- OPERATING SYSTEM - THE SOFTWARE THAT IS USED TO GENERATE THE DOCUMENTS TO BE PRINTED. RESIDES ON THE PLATFORM.
- PAPER PATH - THE WAY THE PAPER PASSES THROUGH THE PRINTER.
- PARALLEL - A TYPE OF PHYSICAL ATTACHMENT THAT IS USED TO ATTACH THE PRINTER TO THE HOST. ONLY SUPPORTS ASCII DATA.
- PCL - A P.C. BASED ASCII DATASTREAM USED TO PRINT LETTERS AND NUMBERS.
- PDF - A PostScript APPLICATION THAT IS USED TO PRINT A FILE LIKE A GRAPHIC.
- PFI - (PICTURE ELEMENT) THE SMALLEST PRINTABLE OR DISPLAYABLE UNIT ON A PHYSICAL MEDIUM

## PRINTING GLOSSARY (*continued*)

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- PIN FED - A TYPE OF CONTINUOUS FORM MEDIA THAT HAS SMALL HOLES ON THE EDGES OF THE PAPER SO THE TRACTOR ON THE PRINTER CAN PULL THE PAPER THROUGH THE PRINTER.
- PLATEN - THE AREA ON AN IMPACT PRINTER THAT SUPPORTS THE PAPER WHEN THE RIBBON IS IMPACTED AGAINST THE PAPER.
- PLATFORM - THE PIECE OF HARDWARE WHERE THE OPERATING SYSTEM RESIDES ON.
- PORTRAIT - PERTAINING TO A DISPLAY WITH GREATER HEIGHT THEN WIDTH. CONTRAST TO LANDSCAPE.
- POSTSCRIPT - A TYPE OF ASCII DATASTREAM THAT SUPPORTS THE PRINTING OF GRAPHICS.
- PPM - (PAGES PER MINUTE) A UNIT THAT A LASER PRINTER REPRESENTS SPEED BY.
- PRINT MANAGEMENT - THE ABILITY TO CONTROL PRINT JOBS. (A TWO WAY COMMUNICATION WITH THE PRINTER AND THE OPERATING SYSTEM, INCLUDING ERROR RECOVERY, SCHEDULING, AND PRINTER STATUS.
- PSF - (PRINT SERVICE FACILITY) A PIECE OF SOFTWARE THAT CAN BE ENABLED ON THE AS/400 OR S/390 TO CONVERT THE SCS DATASTREAM TO IPDS.
- PULL - A TERM USED IN IMPACT CONTINUOUS FORM PRINTING WHEN THE TRACTOR "PULLS" THE PAPER THROUGH THE PRINTER. SO THE TRACTOR IS BEYOND THE PRINTHEAD.
- PUSH - A TERM USED IN IMPACT CONTINUOUS FORM PRINTING WHEN THE TRACTOR "PUSHES" THE PAPER THROUGH THE PRINTHEAD. SO THE TRACTOR IS BEFORE THE PRINTHEAD.
- RESOLUTION - THE PRINT QUALITY, USUALLY REPRESENTED BY DPI (DOTS PER INCH)
- RJ-45 - THE TYPE OF PHYSICAL CONNECTION USED IN AN ETHERNET NETWORK. LOOKS LIKE A PHONE LINE.
- RPQ - (REQUEST FOR PRICE QUOTE) A TYPE OF NUMBER USED IN IBM FOR OPTIONS TO THE PRINTER THAT ARE NONSTANDARD.
- SCS - A TYPE OF DATASTREAM USED IN MAINFRAME ENVIRONMENTS THAT SUPPORTS THE PRINTING OF LETTERS AND NUMBERS BUT NOT GRAPHICS.
- SERIAL - A TYPE OF PHYSICAL ATTACHMENT THAT IS USED TO ATTACH THE PRINTER TO THE HOST.
- SERIAL MATRIX - A TYPE OF IMPACT PRINTER THAT PRINTS ONE CHARACTER AT A TIME.
- SHORT EDGE FEED - THE SHORTER OF THE TWO SIDES OF PAPER BEING FEED INTO THE PRINTER.
- SHUTTLE MATRIX - SEE "LINE PRINTER"
- SIMPLEX - REFERRING TO PRINTING ON ONLY ONE SIDE OF THE PAGE
- SNA - SEE "SCS"
- TCOP - (TOTAL COST OF PRINTING) INCLUDING THE ORIGINAL PRICE OF THE PRINTER, SUPPLIES, MAINTENANCE, ETC.
- TCP/IP - (TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL) SEE "IP ADDRESS"
- THERMAL PRINTER- A TYPE OF PRINTER THAT HAS A PRINT HEAD THAT HEATS UP TO FIX (MELT) THE WAX, RESIN, OR BLEND TO THE PAPER. GENERALLY USED TO MAKE LABELS.
- TOKEN RING - THE TYPE OF L.A.N. (LOCAL AREA NETWORK)
- TRACTOR - IN A CONTINUOUS FORM PRINTER THAT IS USED TO MOVE THE PAPER THROUGH THE PRINTER.
- TRANSFORM - A TERM USED TO DESCRIBE CONVERTING ONE TYPE OF DATASTREAM TO ANOTHER.
- TWINAX - A TYPE OF PHYSICAL CONNECTION USED IN THE AS/400 ENVIRONMENT.
- WORKGROUP LASER - A PRODUCT GROUP IN THE IBM PRODUCT LINE INCLUDING THE INFOPRINT 1120, 1125, 1130, 1140, AND 1145.