

IBM

3800

IBM 3800  
Printing Subsystem

## Product Description

The high-speed, general-purpose IBM 3800 Printing Subsystem is a non-impact system printer that uses standard single-ply paper. It uses an electrophotographic technique to print on paper, rather than mechanically striking the paper through an inked ribbon, as does a typewriter or conventional impact printer.

The 3800 is designed to print faster than current impact printers and to provide compatibility for user programs that, until now, have used impact printers. It also provides easy-to-use programming interfaces for its new functions and features.

Among these new features are:

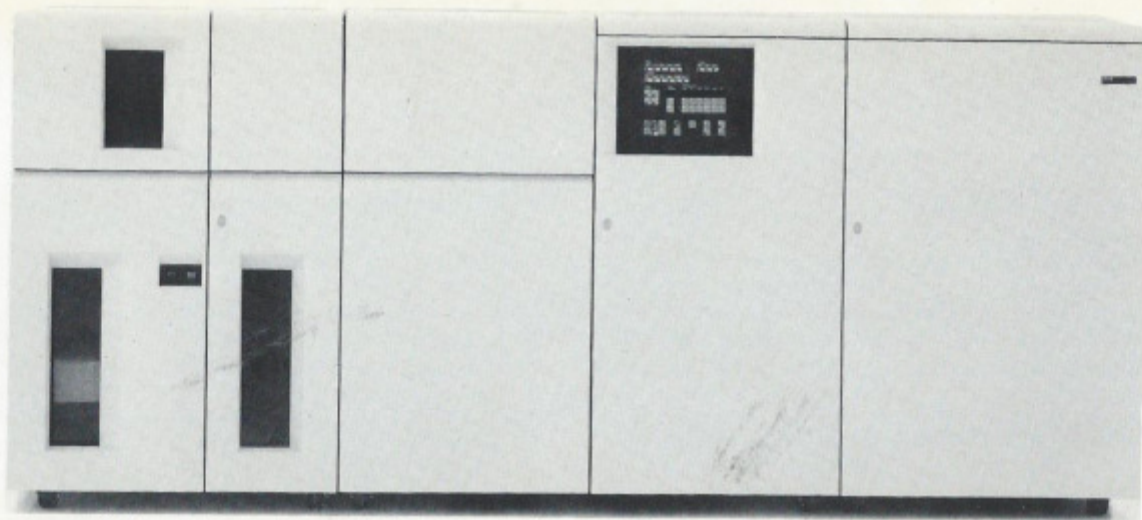
- Any two of eighteen different character sets (including 10, 12-, and 15-pitch sets) can be used separately or intermixed. These can be changed between data sets without operator intervention. With the optional additional writable character generation storage, up to four character sets can be used at the same time. Capability to print at vertical spacings of six and eight lines per inch separately or intermixed.
- Page buffer storage of 54K bytes.

- Multiple copies can be printed on single-ply paper under program control, thus eliminating the need for multi-ply paper and subsequent delevaing.
- Copy modification permits changing or suppressing printing of selected data from copy to copy when multiple copies are being printed.
- Graphic character modification allows the substitution or extension of graphic characters in an already-defined character set.
- The forms overlay permits printing of specialized forms as data is being printed, thus eliminating the need for preprinted forms.

## Print Speed

Print speed range:

- Up to 167 11-inch length forms per minute with single copy speeds up to 10,020 lines per minute at six lines per inch or 13,360 lines per minute at eight lines per inch.
- Up to 526 3½-inch length forms per minute with single copy speeds up to 7,890 lines per minute at six lines per inch or 10,520 lines per minute at eight lines per inch.



*Photo is of a design model*

## Technology and Unique Hardware Features

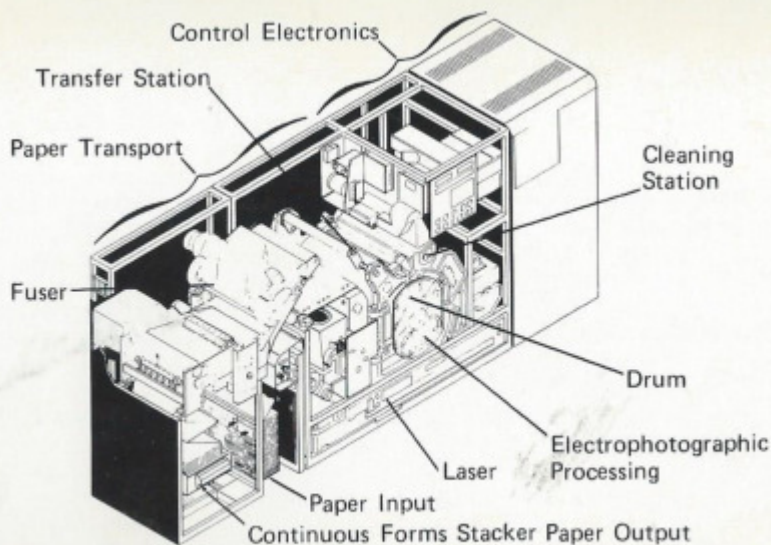
The control electronics is an interrupt driven microprogrammed control system. It has two storage components; a monolithic read only store (ROS) and a writable control storage (WCS). WCS is volatile and its contents are lost when power goes off. A ROS microprogram routine is used to load WCS from the 33FD disk. The CE panel functions, microinstruction retry logging, and resident instruction execution unit (IEU) tests are all accomplished using microinstructions in ROS. The IEU uses MST-1 technology.

Printing is accomplished by exposing a charged photoconductor (PC), wrapped around drum, to the desired character configuration using a low-power laser. This exposure creates a latent electrostatic image on the photoconductor. The image is subsequently developed with a black thermoplastic powder (toner) and transferred to paper. The photoconductor is then cleaned and reconditioned for subsequent exposure.

Characters are generated by a modulated beam of laser light that scans the moving PC to form a raster of horizontal lines. The illuminated areas of the PC are thus selectively discharged to form latent electrostatic images of characters on the PC suitable for development.

The helium neon laser is a source of continuous coherent light. A series of optic lenses focus the light beam which is then modulated by an acousto-optical transducer. A mirror, rotating at high speed, causes the modulated laser beam to scan continuously across the moving PC surface.

The toned images that have been attracted to the paper by electrostatic forces at the transfer station are bonded permanently to the paper by the fuser using a combination of heat and pressure.



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## Maintenance Strategy

Preventive and scheduled maintenance with component replacement is a prime factor in achieving customer availability.

This printing subsystem is similar to that of a process control application in that the printer electronics control system monitors and controls the printing process as well as buffering and processing the variable data to be printed. The process monitoring data, necessary for the printer electronics to perform its control function, is the same data necessary for the CE to effectively diagnose errors and isolate the failure to an FRU.

- The printer electronics will store errors and printing process condition data into a 24-sense byte error log at the time of an error, even when successful automatic retries become transparent to the operator. This allows for deferred and scheduled maintenance repairs and keeps machine availability at a maximum.

Most maintenance requirements of the 3800 are use-sensitive. Therefore, a measurement of actual customer usage will be provided to permit the CE to determine when PM is required. This will facilitate scheduling PM and parts replacement based upon actual usage and not on calendar time periods.

Subsystem malfunctions will be resolved using the following aids:

- Test page function
- CE panel/operator panel
- Microdiagnostics/OLTS
- Error logs/error printout
- Maintenance Information Manual (MIM)
- Forms flash test negative
- Power sequence panel

The extensive microdiagnostics allow virtually all diagnosis/repair to be done off line.

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## MIM Overview

- Organized for the symptom-to-fix maintenance concept
- Error analysis down to an adjustment or field replaceable unit (FRU)
- How-to-fix theory of operation and error detection for each functional unit
- Overview of operation and data flow
- Print Quality Index contains samples of problems, symptom description, MAP selection page

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## New CE and Operator Panel

Each panel contains touch-sensitive switches and highly reliable LED displays. Binary bits are automatically converted and displayed as hex characters.

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## Operator Training

FE will provide operational features instruction. This "hands-on" instruction will include forms loading, unloading, splicing, changing forms, print alignment, error recovery, and extended operator practices.

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## Extended Operator Practices

With the intent of maximizing machine availability, the operator is expected to perform certain tasks. These tasks involve:

- Vacuum; input station, transfer station, continuous forms stacker, transfer corona.
- Clean; charge and preclean coronas by using a built-in push-pull plunger.
- Change developer as required.
- Add new/remove used toner as required.
- Advance PC.
- Remove jams.
- Clean forms overlay negative.

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## System Program Support

The printer operates under the OS/VS1 and OS/VS2 Operating System via a channel attachment to byte multiplex, selector, or block multiplex channels and can be added to a system configuration containing an IBM System/370 Model 145, 155II, 158, 165II, or 168.

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## FE Career Path

The 3800 is an FE career path General Systems product.

International Business Machines Corporation  
Field Engineering Division  
1133 Westchester Avenue  
White Plains, New York 10604



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