3800

Printer

IBM

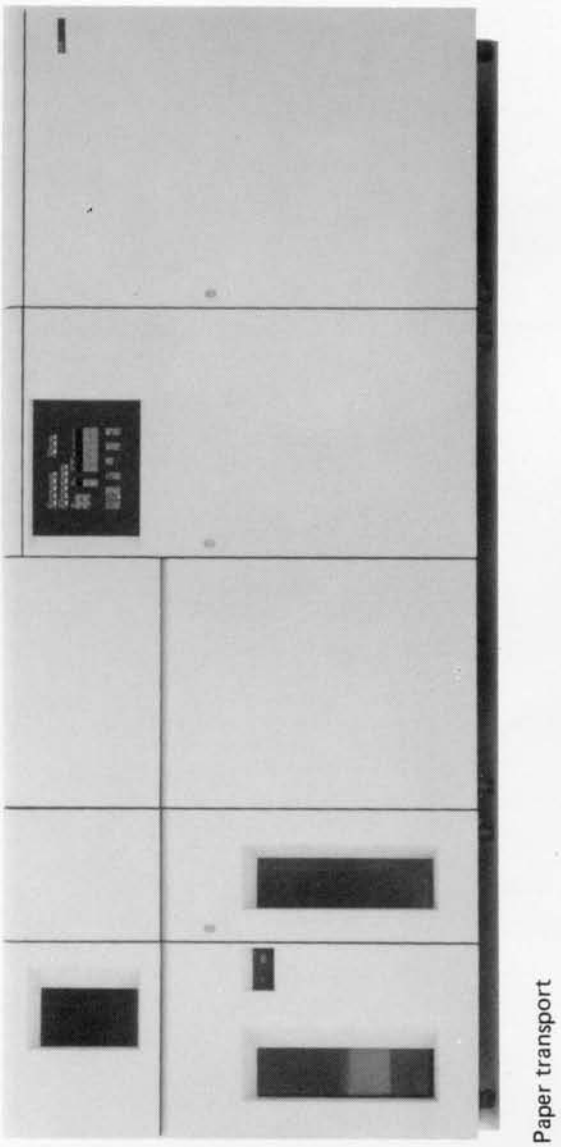


Figure 1. The three physical sections of the 3800 printer.
Photo is of a design model.

Physical Characteristics of the 3800

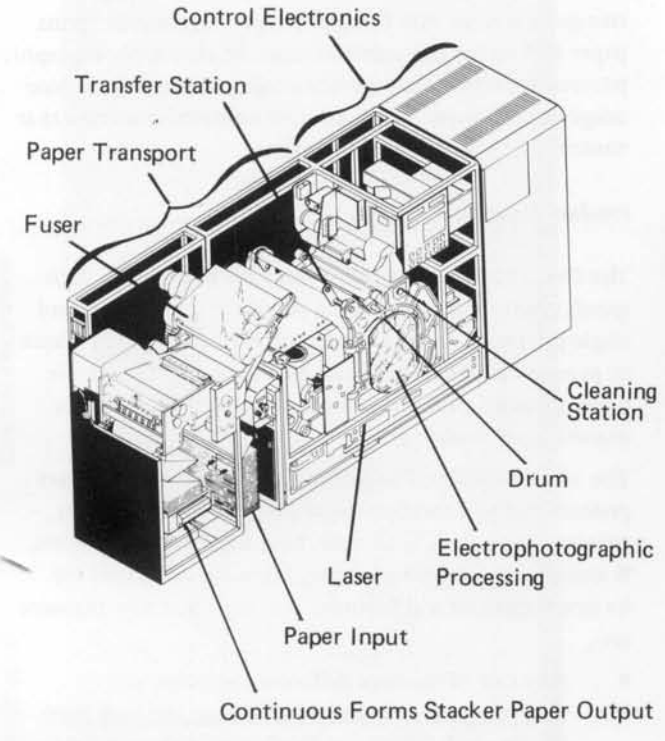
The 3800 printer consists of three sections: A paper transport section that feeds single-ply continuous forms paper and stacks the printed forms, an electrophotographic processing section that creates images and transfers those images to the paper, and a control electronics section that controls the operation of the printer.

Product Description

The IBM 3800 Printing Subsystem is a nonimpact, high-speed, general-purpose 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 in most cases 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 one of thirteen different character sets (including 10-, 12- and 15-character per inch sets) can be used: These can be changed between data sets without operator intervention. With the additional Writable Character Generation Module (WCGM), up to four character sets can be used at the same time.
- Capability to print at vertical spacings of 6 and 8 lines per inch (LPI) separated 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 multiple-ply paper and subsequent deleaving.
- 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

- Using 11 inch long forms: up to 167 pages per minute equal to 10020 lines per minute (LPM) at 6 LPI or 13360 LPM at 8 LPI.
- Using 3,5 inch long forms: up to 526 pages per minute equal to 7890 LPM at 6 LPI or 10520 LPM at 8 LPI.

System Program Support

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

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 Writeable Control Storage (WCS). The WCS 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) test are all accomplished using ROS microinstruction. The IEU uses MST-I technology.

Printing is accomplished by exposing a charged photoconductor (PC) to the desired character configuration produced by a low power laser. This exposure creates a latent electrostatic image on the photoconductor. The image is then developed with a black thermoplastic powder (toner) and transferred to the 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 drum, 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 disk rotating at high speed causes the modulated laser beam to scan continously 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.

Maintenance

This printing subsystem is similar to that of a process control application in that the print 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 a Field Replaceable Unit (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 to the customer at a maximum.

A measurement of actual customer usage will be provided to permit CE to determine when PM is required.

P.M. and scheduled maintenance with component replacement is a prime factor in the reliability of the 3800 printer subsystem.

The subsystem failures can be resolved using the following aids:

- Test page function
- CE panel/operator panel
- Microdiacnostics/OLTS
- Error Logs/Error Print Out
- Maintenance Information Manual (MIM)
- Forms Flash Test negative
- Power Sequence Panel

MIM Overview

- Organized for the symptom to fix maintenance concept.
- Error analysis down to an adjustment or 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.

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.

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 by using a built in vacuum and a special attachment for transfer corona cleaning.
- Clean; charge and pre-clean 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

CE Career Path

The 3800 is a CE Career Path "General System" product.

Operator Training

CE 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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