



The IBM 1130/2250
Model 4 Graphic Data
Processing System

1122 11
3050 30

Printed in USA 520-1934-0



A prime concern of today's scientists and engineers is how to get the precise information they need at the moment they need it. The format in which the data is presented is also of importance. For maximum decision-making effectiveness, the data should be made available in a concise, relevant and readily usable form.

A solution to this challenging problem is *graphic data processing*. This is a unique method of man-machine communication that allows the user to literally look into the computer for instant access to the specific data he needs. The data is displayed in the form of charts, diagrams, drawings or lines of alphameric characters.

Graphic data processing has had a dramatic impact on scientific and engineering design and analyses applications. It has substantially reduced problem solution time and improved the quality of the results.

This dynamic capability is now available to users of the IBM 1130 Computing System by attaching the IBM 2250 Display Unit Model 4.

A Compact, Economical System

The combination of the high-speed computing power of the 1130 with the visual display capability of the IBM 2250 Display Unit Model 4 provides a compact graphic data processing system. The 1130/2250 is available in two configurations:

A Stand-Alone System which provides the ability to execute many engineering and analyses applications, such as stress analysis, circuit design and system simulation.

A Remote System which permits the 1130 system to be attached to an IBM System/360 by telecommunication lines. This configuration gives remotely located display users direct access to the large storage facilities and computational power of System/360.

The 2250 Display Unit Model 4

The heart of the 1130/2250 graphic system is the compact, easy-to-use 2250 Model 4. The display unit offers 1130 users a means of presenting computer-generated information in its natural form: graphically for drawings or alphanumerically for descriptive data. The data appears on a 21 - inch direct-view cathode ray tube in the desired pattern as a series of points or vectors.

Images can be modified by entering additional information from three different sources: the Alphameric Keyboard for message entry and editing; the Program Function Keyboard for application flexibility; or the hand-held Light Pen. Each of these devices is located on the 2250 console, permitting the designer to provide instantaneous direction to his problem solution. When he is satisfied with the results he sees on the screen, the designer can direct his data to its most convenient output form, either alphanumeric or graphic.

Extensive Display and User Interaction Capabilities

Among the outstanding features of the versatile 2250 Model 4 are:

- A 12"x 12" display area.
- A total of 3,848 character positions; 52 lines with 74 characters per line.
- Up to 2,000 characters or 2,800 incremental vectors can be displayed at a 40 times per second refresh rate; up to 2,600 characters or 3,700 incremental vectors at a 30 times per second refresh rate.
- Straight lines of any length, at any angular orientation can be drawn at any position on the screen.
- Incremental beam positioning is provided for efficient core utilization and programming flexibility.

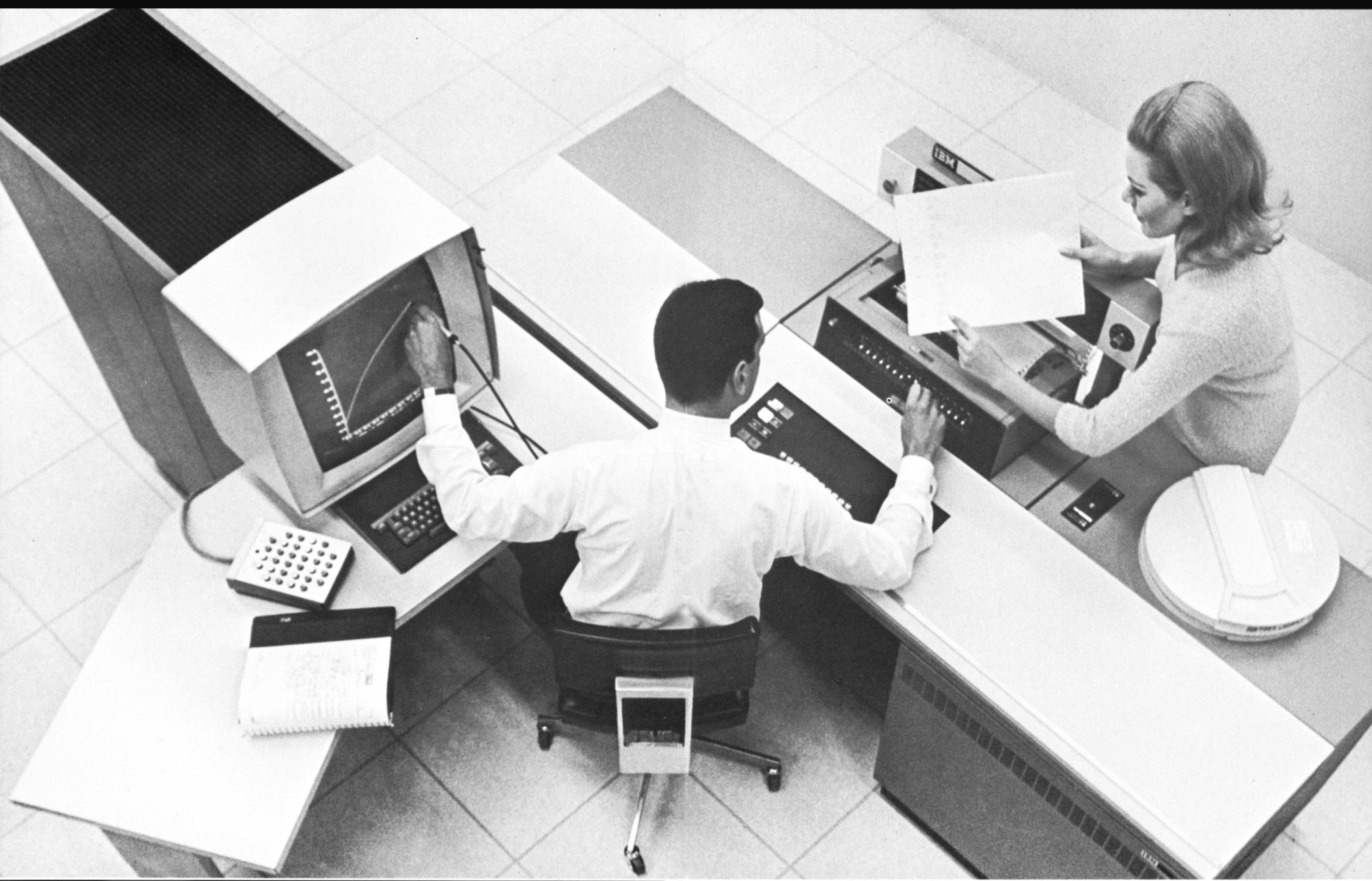
Flexible Character Capacity

- Character font design can be programmed.
- Superscripting and subscripting can be performed.
- Upper and lower case is provided.

A Personalized Graphic System

The 2250 Model 4 and the 1131 Central Processing Unit can be operated as a single unit because of the proximity of the 2250 to the 1131 operator console. The table-top of the 2250 provides a convenient work space for the system user.

The removable and interchangeable IBM 2315 Disk Cartridges allow each user to retain data and programs relating to his application.



A Wide Range of Applications

There is a wide range of application for the 1130/2250 Graphic Data Processing System. The 2250 console bridges the gap between the man and the computer by providing the user with a "window into the computer." The computing system provides the high speed calculation while the user brings his imagination, judgment and experience to the solution of the problem.

As a stand-alone graphics system or attached to System/360, the 1130/2250 system can execute a range of applications from simple data analysis programs to complex 3-dimensional design and numerical control. One of the key advantages found in many of these applications is the rapid turnaround time achieved through the use of the on-line console—an important factor in winning bids, improving design and reducing overall cost in the solution of a problem. Among the applications for graphics are:

Data Reduction

The test data from physical testing activity where a number of variables interact dynamically are tabulated, plotted, and smoothed in order to be intelligible to the engineer. Although computers have greatly assisted the data reduction process, elapsed time from test to analysis has been a serious bottleneck. The 2250 makes possible on-line integration of otherwise meaningless data; test results are available for analysis in a fraction of the time previously required for interpretation, editing, and reprocessing of partially reduced data.

Computer-Aided Design

The 2250 Display Unit provides a powerful man-machine interface for computer-aided design. Although conventional batch processing of FORTRAN problems is well suited to structured problems, the engineer needs a window into the computer for the typically unstructured problems so frequently found in design work. The computer accepts the engineer's problem statement through the 2250, computes tentative or intermediate results, and displays these as curves and graphs *while he is thinking about his problem*. With this computer assistance, the engineer can rapidly arrive at an optimum design solution. Computer time is not wasted on lengthy computation based on unpromising assumptions.

Engineering Analysis

In every engineering discipline there exist analysis problems characterized by tedious iterations and voluminous output. By building graphics into the solution of the problem, faster turnaround is achieved through accurate and rapid analysis at the console. Often, many needless iterations are eliminated through visual verifications and selections.

Design Drafting

Recent advances in master dimensioning—the mathematical definition of surfaces—are being linked to graphic data processing. These mathematical surface descriptions are displayed on the 2250; then the designer uses the computer's analytic geometry processing capability to construct the remaining lines, circles, arcs, and curves to complete the engineering description. This "drawing," together with computed dimensions, annotation, parts list, etc., is transferred to recorders or automatic digital drafting machines to exact size, or the drawing is suitably scaled for distribution. Since the drawing data has been captured in computer-readable form, it can then be used by a numerical control parts programmer for subsequent numerically controlled production of the part.

Numerical Control

The once tedious job of preparing a parts program manuscript to be punched into cards for input to a computer can be avoided by Numerical Control Graphics. The programmer describes the dimensions of the parts, establishes the cutter tool path, and names the machine tool functions directly on the 2250. Not only does he see the shape of parts and the resulting cutter location pictorially, but he gets immediate notification of error conditions for his attention. The result is fewer man-hours to prepare N/C programs, and marked reductions in lead time.

Get More Details

IBM graphic data processing is a dynamic and flexible tool available to scientists and engineers who are seeking ways to meet the demands and challenges of today's advanced technologies. For more information on this versatile system, contact your IBM sales representative.

International Business Machines Corp.
Data Processing Division
112 East Post Road
White Plains, New York 10601
(USA only)

IBM World Trade Corporation
821 United Nations Plaza
New York, New York 10017
(International)

