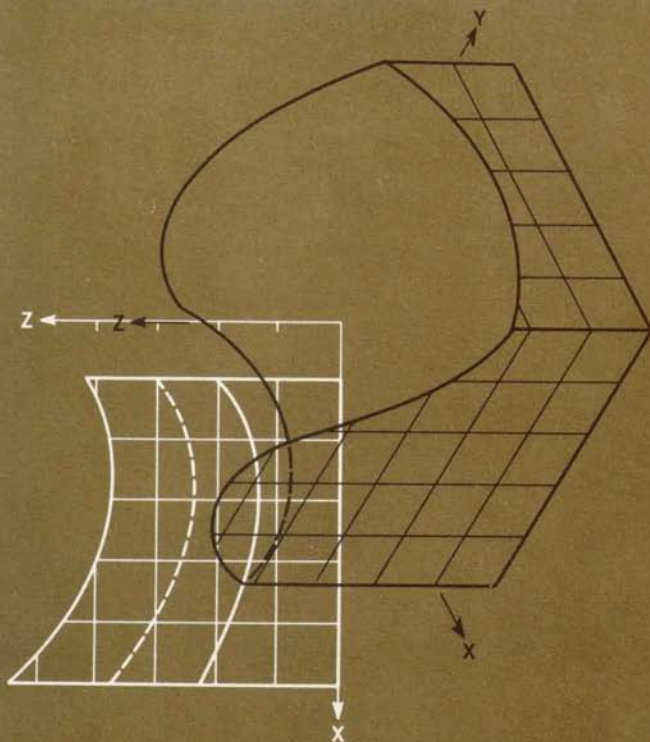


IBM

**IBM 2280 Film Recorder
IBM 2281 Film Scanner
IBM 2282 Film Recorder/Scanner**



Customer Engineering Announcement

1001011001111100011011101010000
0100101100111110001101110101000
0010010110011111000110111010100
0001001011001111100011011101010
0000100101100111110001101110101
1000010101110110001111100110100
0000101011101100011111001101001
0001010111011000111110011010010
0010101110110001111100110100100
0101011101100011111001101001000

This announcement introduces the following image-processing equipment: the IBM 2280 Film Recorder, the IBM 2281 Film Scanner, and the IBM 2282 Film Recorder/Scanner. The 2280 is an output device for producing graphic and alphanumeric images on film; the 2281 is an input device for converting images on preprocessed film into digital data. The 2282 provides both capabilities within an integrated configuration. All three units can be attached to any IBM System/360 processor via the IBM 2840 Display Control unit. These film units provide unique flexibility in handling graphic data at very high speed and for a wide range of scientific and industrial applications.

Characteristics

- IBM System/360

Basic Units

- IBM 2280 Film Recorder
- IBM 2281 Film Scanner
- IBM 2282 Film Recorder/Scanner
- IBM 2840 Display Control

General Characteristics

- Graphic data handling capability
- Character generation
- Absolute and relative addressing
- Automatic vector subdivision

Film Handling

- 35-mm unspocketed silver emulsion film
- Program-controlled film movement
- Four film-advance distances
- Automatic film-threading

Recorder

- Two program-selectable line widths
- On-line film processing
- Rear-projection screen
- Film frame resolution of 150 lines of 204 characters each

Scanner

- 63 Program-selectable light-threshold levels
- Scan vector response partitioning
- Program-controlled film advance and backspacing

Functional Description

IBM 2280 Film Recorder

The IBM 2280 Film Recorder will record both graphic and alphanumeric data on 35-mm film under program control. Straight lines of any length, numbers, letters, and

special characters of any size or style can be recorded at any attitude. The processor program directs the motion of a CRT beam across the surface of unexposed 35-mm silver emulsion film, thus causing the desired information to be exposed to the film. A character generator provides for high-speed recording of standard characters and symbols. The exposed film may be developed within seconds after exposure by the on-line processor or moved directly to the take-up cassette for batch processing on off-line equipment. Images developed on line may, at the option of the operator, be viewed at the 22.8 by 22.8-inch rear-projection screen prior to entering the take-up cassette. If on-line processing is selected, the film is immediately ready for aperture card mounting, storage in its roll form, or enlargement on a film-to-hard-copy device.

IBM 2281 Film Scanner

The IBM 2281 Film Scanner converts photographically exposed film images directly into digital data. A CRT is used as a flying spot scanner to scan information on preprocessed 35-mm film according to the scanning pattern specified by the program. A digital readout to the processor occurs when light transmission through the film meets a preselected threshold. Any one of 63 levels of threshold sensitivity can be program-selected.

Film advance, backspacing, and image registration are program-controlled. Manual registration can also be performed by use of the built-in visual registration screen.

IBM 2282 Film Recorder/Scanner

The IBM 2282 Film Recorder/Scanner combines all the functions of the 2280 and the 2281. A single film transport and CRT are used for both recording and scanning operations. The unit is converted from recorder to scanner (and vice-versa) by changing the film and setting the mode switch.

Record and scan circuitry for control of film unit operations is included in the film unit. Digital data received from the 2840 are assembled and converted into analog quantities during record operations. In scan operations, analog, read, and status data are converted by the film unit into digital data and transmitted to the 2840.

IBM 2840 Display Control

The IBM 2840 Display Control unit can service up to four film units (any combination), or one film unit and up to five IBM 2250 Model 2 Display units. All devices attached to the 2840 (both film and display units) can be operated simultaneously through time-sharing of the character generator and buffer storage circuitry. In addition, since buffer storage allocation is under computer program control, different images can be displayed simultaneously in multiple-display/film unit installations. A film unit attachment feature and a subchannel position are required for each attached film unit.

Programming

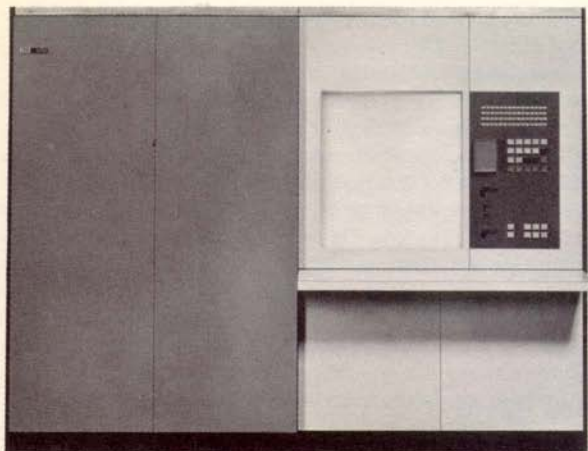
Programming for the IBM 2280, 2281, and 2282 will support the wide range of applications requiring the capabilities of these devices. This support will be available under the IBM System/360 Control Program.

After the desired image has been built up in the processor in the form of a set of control orders, it is sent to the 2840 buffer storage with the standard *write* commands. When storage is completed, the film unit control circuitry interprets the control orders to initiate such functions as image creation, film advance or backspace, conditional in-buffer branching, and storing of input data.

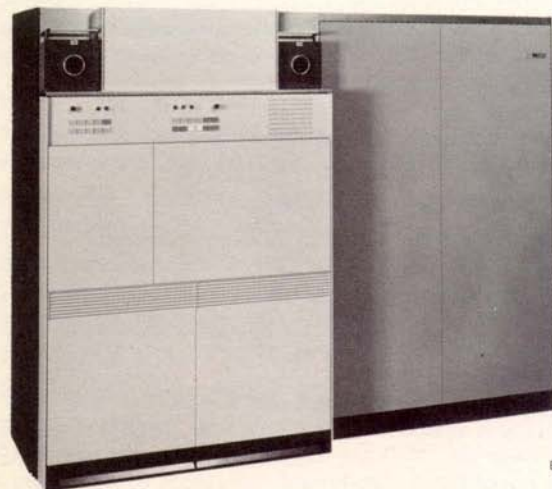
CE Panel

The CE panel on the film units provides appropriate facilities for monitoring and controlling film unit operations. In the IBM 2282 Film Recorder/Scanner (and, when applicable, in the 2280 Recorder and 2281 Scanner configuration), a group of indicators provides information on film processing, such as film movement, positioning, adjustment, exposure, and chemical processing, as well as information on scan and recording operations. Switches and meters on the panel permit the CE to:

1. Advance complete film frames in the record or record/process mode (frame size determined by Film Distance switch).
2. Advance or backspace complete film frames in the scan mode (frame size determined by Film Distance switch).
3. Register film frames forward or backward in up to 63 increments.
4. Advance or backspace film at manual registration speeds at the CRT gate in the scan mode, and at the project-film gate in the record/process mode.
5. Monitor and control processing of film.
6. Control power for the film transport.



FRONT

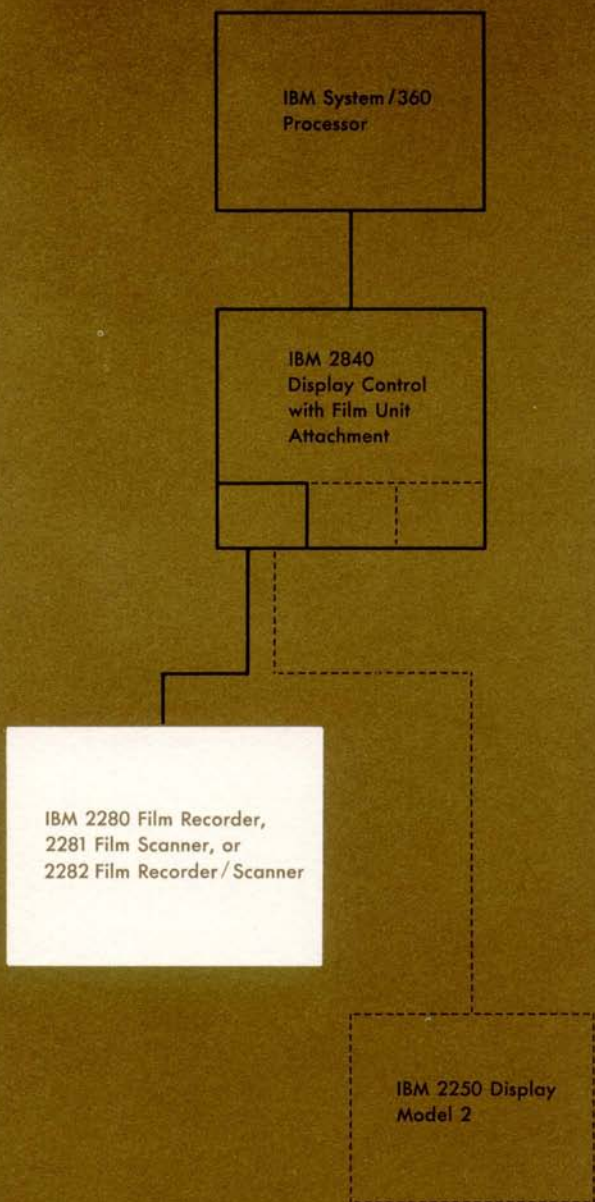


BACK

IBM 2282 Film Recorder/Scanner

IBM

International Business Machines Corporation
Data Processing Division
112 East Post Road, White Plains, New York



The IBM 2840 Display Control can service up to 4 Film Units or various combinations of Film and Display Units.