

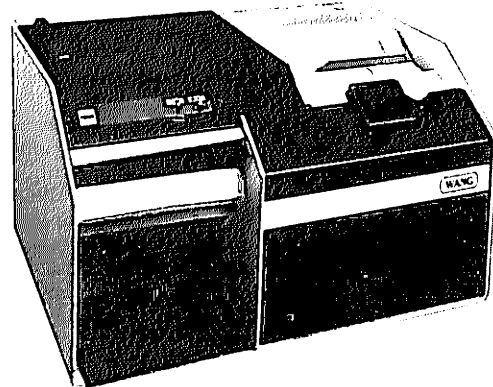
The Wang Model 2234A Hopper-Feed Punched Card Reader permits punched card input to Wang systems in a variety of different reading modes. BASIC program cards or data cards punched in Hollerith code (the character code used by most keypunch devices) are automatically converted by the Model 2234A from Hollerith to ASCII (the code used internally by Wang systems). Data cards punched in a non-Hollerith code can be processed by reading the data in binary form and interpreting it under software control.

Although compact in size, the Model 2234A provides an input hopper which can accommodate a maximum card stack of 550 cards (assuming the standard card thickness of 7 mils). Cards are picked from the hopper and passed through the reader with a vacuum-type pick mechanism which causes minimal wear and tear to the cards, and enables the reader to attain reading rates as high as 300 cards per minute (although the actual reading rate in any application is largely determined by the amount of CPU processing required per card). In certain applications, overall throughput time for processing data cards can be improved by using the special "Look-Ahead" feature, which enables card reading to be carried out concurrently with CPU processing. The input hopper can be replenished (and the output stacker emptied) during processing without disturbing the reader, a feature which permits unusually long jobs to be run without interruption.

Cards read by the Model 2234A must comply with industry standards for 80-column punched cards. The relevant standards are detailed in two sets of specifications issued by the American National Standards Institute, ANSI x 3.11-1969, and ANSI x 3.21-1967.

Versatility is an important feature of the Model 2234A; it provides a total of six different reading modes for different applications:

- (1) DATA (Hollerith Data Values) — Discrete data values (separated by commas) are read, converted from Hollerith to ASCII, and assigned sequentially to a receiving argument list. (Available on all systems.)
- (2) DATA (Hollerith Data Card Image) — An 80-column card is read as one continuous value, and each character is translated from Hollerith to ASCII. The resultant value, stored in an alpha array, represents an exact ASCII "image" of the original card. (Not available on the System 2200A, or on standard versions of the 2200S.)
- (3) DATA (Binary Card Image) — An 80-column card is read as one continuous value, with each column interpreted as 12 binary digits. The 12-bit value is automatically separated into a pair of 6-bit values, each of which is stored in one byte in a receiving array. The resultant 160-byte value represents a binary "image" of the original card. The binary data can be interpreted under software control with data manipulation language features available on most Wang systems. (Not available on the System 2200A or standard versions of the 2200S.)
- (4) PROGRAM (BASIC Program Cards in Hollerith) — BASIC program cards are read, automatically converted from Hollerith to ASCII, and either stored in memory or immediately executed as part of a batch job stream. (Available on all systems.)



MODEL 2234A HOPPER FEED PUNCHED CARD READER

DATA SHEET

- (5) LOOK-AHEAD (Hollerith Card Image) — An 80-character Hollerith card image is read, converted to ASCII, and held in a card reader buffer while the CPU is occupied with other processing. (Not available on the System 2200A or standard versions of the 2200S.)
- (6) LOOK-AHEAD (Binary Card Image) — A 160-byte binary card image is read and held in a card reader buffer while the CPU is occupied with other processing. (Not available on the System 2200A, or standard versions of the 2200S.)

BATCH PROCESSING

A number of individual programs and their associated data decks can be loaded from the card reader and run automatically in sequence without normal user intervention. Automatic sequential processing of programs and data is called "batch processing," and is initiated by selecting the card reader as the Console Input device.

Cards containing system commands such as CLEAR, RUN, LIST, etc., are inserted between the individual program decks in the input hopper. Each program then can be automatically loaded from cards, listed, and run. As a program is loaded, any statement lines having syntax errors are listed or displayed, along with the appropriate error codes, to simplify debugging. When a program has completed execution, the system command cards are read in, instructing the system to clear memory and load the next program automatically.

Batch processing is a particularly useful feature for educational applications where program decks from an entire class can be rapidly processed as a batch. Syntax errors in each program are immediately listed or displayed as the program is loaded.

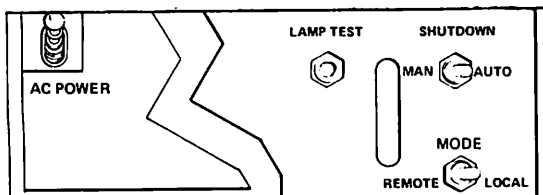
LANGUAGE RESTRICTIONS (2200A and 2200S)

The Model 2234A will interface with all 2200 series systems. With the System 2200A and standard versions of the 2200S, however, the card reader is limited to only two modes of reading:

1. DATA — Hollerith Data Values
(Reads data values separated by commas, and converts and assigns them sequentially to an argument list.)
 2. PROGRAM — Hollerith Program Cards
(Loads BASIC programs punched in Hollerith or batch processes a group of program decks.)
- In these two modes, the card reader is selected for Console Input or INPUT.

READER CONTROLS

1. STOP Switch — stops operation after current card has been completely read.
2. RESET Switch — automatically resets the counter and initializes the Card Reader, or restarts the reader after a stop operation.
3. MODE Switch — has two settings, LOCAL and REMOTE. LOCAL Mode is used for off-line card reader operation (chiefly for maintenance purposes). REMOTE Mode is used for on-line operation. In REMOTE Mode, the System 2200 controls card input (normal operating mode with the System 2200).



ERROR DETECTION

READ CHECK Alarm — indicates that a card is torn or mutilated on leading edge, or is punched before the first column.

STACK CHECK Alarm — indicates previous card is not seated correctly in output stacker.

PICK CHECK Alarm — indicates card has not been picked from the Hopper or not read within a certain amount of time.

HOPPER CHECK Alarm — activated if input hopper is empty or output stacker is full.



All built-in features assure the operator that cards are being fed, read and stacked correctly. All error codes are available to the program controlling the Card Reader in modes 2 and 3 (Hollerith and Binary Card Images).

SPECIFICATIONS

Size
 Height 11 in. (27.9 cm)
 Width 19 1/4 in. (48.9 cm)
 Depth 14 in. (35.5 cm)

Weight
 60 lb (27.3 kg)

Operating Environment
 50°F to 90°F (10°C to 32°C)
 40% to 60% relative humidity

Power Requirements
 Voltage 115 VAC ± 10% single phase, 60 Hz ± 1 Hz
 230 VAC ± 10% single phase, 50 Hz ± 1 Hz
 Power 1650 watts (max) Starting Load for 3 sec
 750 watts (max) Running Load

Cabling
 12-ft (3.7m) cable to CPU connector.
 8-ft (2.5m) cord to power source.

Hopper Size
 4.0 in. (approx 550 cards of 7 mils thickness)

Stacker Size
 4.0 in. (approx 550 cards of 7 mils thickness)

Read Rate
 300 Cards per minute (max)

Pick Mechanism
 Vacuum

Transport Mechanism
 Rollers

ORDERING SPECIFICATIONS

A Hopper-Feed Punched Card Reader for entering data or programs into any Wang system. The unit must be able to read punched cards at a maximum rate of 300 cards per minute. Each card must contain up to 80 columns for entry of data or programs, in Hollerith or Binary coded format. The input/output Hopper must have a capacity of 550 cards.

Standard Warranty Applies.

Wang Laboratories reserves the right to change specifications without prior notice.

