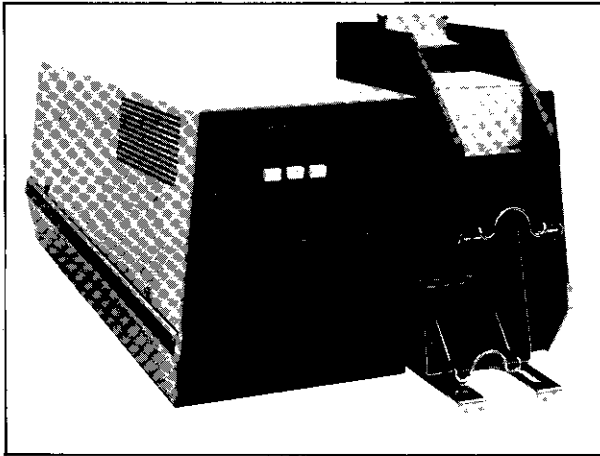


# 7260A and 12986A Subsystem Optical Mark Readers



These two Optical Mark Readers save data preparation time and prevent errors by using one functional card for both source documentation and data entry. The data may be marked with an ordinary soft lead pencil, eliminating the need for special marking pencils or keypunch operations. An added advantage is easy correction of errors; handwritten messages are simply erased. With proper clock marks, areas used for handwritten or printed instructions can be erased.

Each form may contain pencil marks and any combination of prepunched holes and/or preprinted marks. In addition, marks, punched holes, and even form layouts may be randomly intermixed and still accepted by the Reader.

## Features

- Reads marks made by ordinary soft lead pencil
- Reads punched holes and preprinted marks
- Single document may be used for both source document and data entry
- Reads up to 300 cards per minute
- Remote computer applications\*

\*7160A only

### CUSTOMIZED FORMS

Any number of columns from one to 80 may be read, although up to a 40-column format for marks and 80-column for punched holes are most common. Many variations in layout and color may be used to produce a form; in either standard tab-card size or up to (28.26 cm) 11-1/8 inches long. Printing is done in reflective ink, which while highly visible to the eye, is invisible to the Reader. Different colors may be used to visually identify different forms or sections on a form. Additional information or instructions may be printed on the back of the form. Clock marks are printed on the nine-row edge of the form, in non-reflective ink. Clock marks allow vertical columns to be positioned where desired on the form. If the optional Encoder is used, clock marks may be omitted for fixed density applications where columns are equally spaced on the form. An optional Select Hopper (option 002) is available which allows selected cards to feed into a separate hopper under computer control.

### DATA ENTRY RIGHT AT THE SOURCE

Applications are unlimited because the Optical Mark Reader needs only the most common of data entry devices - pencil and paper. A doctor can record his patient's test results right at bedside, on a single form, then use it for both his record and computer input. An entire class of students can simultaneously program a computer from their desks or at home. Custom forms can be designed for the foreman to do labor reporting, the QA inspector for his tests, for grading exam papers or for the finance department's payroll needs. Other applications include inventory control, production control, warehousing, transportation, shipping and receiving, oil, gas and chemical research and field data, automotive testing, retail data, consumer surveys, status reporting, and research.

### 12986A SUBSYSTEM

The Optical Mark Reader Subsystem is a parallel output device for direct attachment to a computer as a system card reader.

HEWLETT  PACKARD

## MODES OF OPERATION

### Not Ready Mode

The Optical Mark Reader is automatically preset to the "not ready" mode when the power is turned on. This is a standby condition during which the Reader is unable to read cards.

### Ready Mode

The Mark Reader is placed into the "ready" mode by pushing the "ready" button. The "ready" lamp will light if all the following conditions exist:

- Cards are in the input hopper.
- Output hopper is not full.
- All read-head lamps are good.
- Power is ON.

The Mark Reader must now receive a "clear to send" command before it picks cards. The unit will revert back to the "not ready" mode for any of the following reasons:

- No cards are in the input hopper.
- Output hopper is full.
- Burned out read head lamp.
- Power failure has occurred.
- Stop button has been depressed.

## 7260A

This Optical Mark Reader is a serial ASCII output device that can be used as a terminal adjunct for remote computer applications. The unit is designed for operation with terminals, computers or remote data systems, via modems or direct connection.

### FOR USE AS A TERMINAL

The Reader sends and receives in ASCII. A remote computer can have full control over the Reader for card feeding and status checks. An optional Select Hopper is available which allows the user to select certain cards and feed them into a separate hopper under computer control.

### MULTIPLE DATA RATES

Forms can be read at a rate up to 300 cpm. Card feed rate depends on the amount of data to be read on each card and the data transmission rate. Rates of 110, 150, 300, 600, 1050, 1200 and 2400 baud can be selected. By proper use of end of record marks, only data marked on cards will be read, trailing spaces will be ignored, thus optimizing data transmission.

### INTERNAL BUFFERS

Data read from the cards or forms, is stored in intermediate buffers to give flexibility in data output rates and allow optimum data transmission. Additionally, now you can operate on blocks of data instead of stacks or cards.

## DATA RETRANSMISSION

The 7260A is capable of retransmitting data already read under computer control.

## CODING FORMAT

The standard 128-character Hollerith character set is accepted and the data is transmitted in 7-level ASCII code. Other decoding options are available on request. With Image Option, card binary image may be transmitted. Under program control, ASCII may still be transmitted.

## Specifications

### General:

### FORM DIMENSIONS

Standard tab card size, 8.26 x 18.73 cm or 8.26 x 28.26 cm (3-1/4 x 7-3/8 inches or 3-1/4 up to 11-1/8 inches)

### PRINTING INKS

Reflective (for form printing): Sinclair and Valentine J-6983 or equal.\*

Non-Reflective (for clock marks): Sinclair and Valentine Black Offset J-24107, or Black Letter press J-20673 or equal.\*

*\*See specification sheet 5952-2774, "Hewlett-Packard OMR Tab Card Specifications."*

### HOPPER CAPACITY

300 card input, 450 card output. 450 card input available (see Option 001).

### LAMP FAIL PROTECTION

If a lamp burns out in the read-head, the Reader becomes not ready. The Reader cannot become ready again until the lamp is replaced.

### CONTROLS

Line Switch  
Ready Switch  
Stop Switch

### INDICATORS

Ready Indicator  
Pick Fail Indicator

### POWER REQUIREMENTS

100/120Vac (see Option for 220/240 Vac operation)  
+5% -10%, selectable by rear panel switch  
47.5 Hz-66 Hz  
Average running VA: 300 VA  
Main Fuse: 4 AT  
Transformer Fuse: 2 AT

**APPROVAL:** The Reader has U.L. and CSA\* approval and meets IEC specifications.

*\*Pending*

## Specifications

### 12986A SUBSYSTEM (Parallel Output)

#### INTERFACE

The unit transmits data over a 12-channel parallel bus, one channel per card row. Data is transferred column-by-column in card image format.

#### Input Signals to Mark Reader

- Device command
- Clear to send
- Select command (option 002)
- Bell command (option 004)

#### Signals From Mark Reader

- 12 channels of data
- Device flag
- Status channels
  - Hopper status
  - Feed status
  - Card in gate
  - End of card (extended card in gate)

#### Specific Voltage Levels

##### Input to Mark Reader

- Logic 1 state: 0 to +.5 volts
- Logic 0 state: 2.4 to 25 volts
- (Input impedance is 2.4 k $\Omega$ .)

##### Output from Mark Reader

- Logic 1 state: 0 to +.5V, 16 mA maximum
- Logic 0 state: 25V maximum
- (Output is open collector.)

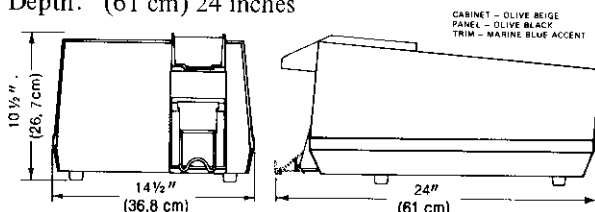
#### ENVIRONMENTAL CONDITIONS

- Storage Temperature: -40°C to +75°C (-40°F to 167°F)
- Exposure, Power On: -20°C to +65°C (-4°F to 149°F)
- Operating Temperature: 0°C to +55°C (32°F to 131°F)
- Humidity: 5%-95% at 25°C to 40°C (77°F to 104°F)
- Vibration: 10-55 Hz, .01 in. peak-to-peak excursions

Cards: The cards to be read by the Reader are required to meet specifications from 20% -75% RH at 23°C (73°F) (American National Standards Institute-Specifications for general purpose cards for information processing). Beyond this range, there is no guarantee for card specifications. The Reader is designed to read cards over the 20-75% RH range, and in most cases will work beyond this range.

#### PHYSICAL CHARACTERISTICS

- Height: (26.7 cm) 10-1/2 inches
- Width: (36.8 cm) 14-1/2 inches
- Depth: (61 cm) 24 inches



#### CARD CODE AND OUTPUT CODES

The information from each card is converted by the Reader to a parallel 12-channel format. A piece of data is transferred to the computer as a Logic 1.

The computer program must translate the 12 bits of information into useable data.

Pin	Function	True*	False*
1	Data Output Row R	0V	+V
2	Data Output Row X	0	+V
3	Data Output Row 0	0	+V
4	Data Output Row 1	0	+V
5	Data Output Row 2	0	+V
6	Data Output Row 3	0	+V
7	Data Output Row 4	0	+V
8	Data Output Row 5	0	+V
9	Data Output Row 6	0	+V
10	Data Output Row 7	0	+V
11	Data Output Row 8	0	+V
12	Data Output Row 9	0	+V
16	Card in Gate Status	0	+V
22	Bell Command (Optional)	0	+V
13	Feed Status (Not Busy)	0	+V
21	Select Command (Optional)	0	+V
20	Clear to Send	+V	0
23	Feed Command	0	+V
14	Hopper Status (OK)	0	+V
15	Extended Card in Gate	0	+V
19	Device Flag	0	+V
18	Ground		
36	Ground		

\*0 = 0 to +.5, +V = +25V maximum

Interface Connector: 36-Pin Cinch Micro-Ribbon (57-40360-375) on rear panel.

## Specifications

### 7260A (Serial ASCII Output)

#### INTERFACE

The unit uses Electronic Industries Association (EIA) RS-232-C Specification for "Interface Between Data Terminal Equipment Employing Serial Binary Data Interchange", for signal input levels, signal output levels, input impedance, cabling on connectors, and connector pin numbers.

The interface cable from the MODEM to the Reader is (228 cm) 7.5 feet long and has a male 25 pin connector on each end. The Reader can be used with up to 50 feet (1524 cm) of cable.

#### CODE CAPACITY: Recognizes 128-character

Hollerith code. Other codes available on request.

**TRANSLATION:** Translates to bit-serial 7-level ASCII with even parity (odd parity available by changing internal jumper). The Reader will output "line feed" at beginning of card and "carriage return" at end of card. (Other card to code translations can be arranged by contacting your local HP Sales Office.) Image output is available, see Option 019.

### ORDERING INFORMATION

12986A Optical Mark Card Reader Subsystem includes: Optical Mark Reader plus interface kit including computer I/O Board with interface cable, and all necessary software for operation with HP 2100 based computer systems.

#### 12986A Options

- 001 500 Card Input Hopper (increases reader height from 26.7 cm (10-1/2 inches) to 30.5 cm (12 inches).
- 002 Select Hopper. Separate unit for storing cards selected by computer control.
- 003 Encoder. Allows reading of punched cards, 80 or 40-column, or 40-column marked cards without clock marks. Rear-panel switch allows reading of standard marked card with clock marks.
- 004 Bell. Audible event indicator activated under computer control.
- 015 220 or 240 Vac +5% -10% power line operation at 50 Hz power line (maintains nominal feed rate at 50 Hz).
- 016 50 Hz power line operation at 115 Vac +5% -10%

**OPERATIONAL MODES:** Demand and continuous feed.

**STANDARD COMMAND USED TO CONTROL READER:\***      **STANDARD STATUS CODES RETURNED FROM READER:**

Demand	Y <sup>c</sup>	Ready	R <sup>c</sup>
Continuous	X <sup>c</sup>	Pick Fail	I <sup>c</sup>
Image On (Opt)	R <sup>c</sup>	Hoppers	G <sup>c</sup>
Image Off (Opt)	T <sup>c</sup>	Select Fail (Opt)	K <sup>c</sup>
Retransmit	H <sup>c</sup>	Select Successful (Opt)	L <sup>c</sup>
Stop	I <sup>c</sup>	Not Ready	← <sup>c</sup>
Abort	L <sup>c</sup>		
Select (Opt)	K <sup>c</sup>		
Bell (Opt)	G <sup>c</sup>		
Execute	Q <sup>c</sup>		

*\*NOTE: Superscript <sup>c</sup> denotes "control key", control character generated by typing character shown, while holding the control key.*

**PARITY:** Generates and transmits even parity (odd parity available by changing internal jumper).

**DATA RATES:** 110, 150, 300, 600, 1050, 1200, 2400 baud, switch selectable.

**INTERFACE:** RS232C.

**INTERFACE CONNECTORS:** 2 Cinch or Cannon DBM-25S on rear panel.

**PICK-FAIL:** If the Reader is requested to pick a card, it will pick one time and then determine if the card is under the read-head. If the card does not arrive under the read-head, the Reader will attempt picking twice more. Should the card still not arrive under the read-head, the Reader becomes "not ready." The motor is shut off, a front panel lamp lights, and a control character indicating a "pick fail" is transmitted.

### EQUIPMENT SUPPLIED

Interface kit included in 12986A  
Operating Manual 07261-90000  
Card Weight 07261-60380  
Power Cord 2.28m (7.5 ft) 8120-1348  
Dust Cover 4040-6529

### ORDERING INFORMATION

7260A Optical Mark Reader

#### 7260A Options

- 001 500 Card Hopper (increases Reader height from 26.7 cm (10-1/2") to 30.5 cm (12").
- 002 Select Hopper. Separate hopper for storing cards selected by computer control.
- 003 Encoder. Allows reading of punched cards, 80 or 40-column marked cards without clock marks. Rear-panel switch allows reading of standard marked card with clock marks.
- 004 Bell. Audible event indicator activated under computer control.
- 005 220/240 Vac +5% -10% (main fuse 2 AT, transformer 1 AT).
- 006 50 Hz. Maintains nominal feed rate at 50 Hz
- 016 Mute and Line – Local Operation. Allows operation with local terminal, and allows muting of Terminal Printer.
- 017 Nulls. Transmits null characters when data outside 128 character set is marked.
- 018 Mnemonic Control. Allows 3-letter mnemonics to control Reader when control codes would interfere with system operation.
- 019 Image. Transmits binary card image as two typing characters with even parity, activated by control codes from computer.

### EQUIPMENT SUPPLIED

Operating Manual 07260-90000  
Interface Cable (228 cm/7.5 ft) 07261-60390  
Card Weight 07261-60380  
Power Cord (228 cm/7.5 ft) 8120-1348  
Dust Cover 4040-6529

### SOFTWARE AVAILABLE

7260A OMR Logical Driver (ACR01)



Sales and service from 172 offices in 65 countries.  
1501 Page Mill Road, Palo Alto, California 94304