The Revolutionary 240 Magnetic Printer by Data Interface



By the time you say
"Good Morning San Francisco"
we've printed 480 characters,
clearly...quietly.....

Infact. by the time you finished a San Francisco, you could h printed this brochure!

The Revolutionary Magnetic Printer

The new one.

Data Interface introduces the strong, silent low cost DI-240 Magnetic Printer. The non-impact line printer which prints up to 240 characters per second, magnetically. It's fast. It's quiet. It performs.

- Designed small enough to carry.
- Designed reliable enough to print data at rates up to 240 characters per second, serial or parallel, all day.
- Designed simple enough for a secretary to operate.
- Styled smart enough to sit on your mahogany desk.

Economical.

The DI-240 Magnetic Printer is economical to operate-ultra-reasonable is the wordbecause no special paper is required. In fact,

the DI-240 Magnetic Printer uses anything from newsprint to bond; cloth will work beautifully. Buy a 400 foot roll of paper for under \$1.00 anywhere and get perfect print out.

The letters on the DI-240 Magnetic Printer are quickly discernible, easily readable, both upper and lower case. There's no straining your eyes, no deciphering characters. The V doesn't look like a U. The O is not the same as zero.

Adaptable.

The DI-240 Magnetic Printer can print in Russian, Japanese or Hebrew; or in any special font-design your own font, change type by changing a simple electronic component.



The entire cycle of the DI-240 Magnetic Printer from data input to visible print out is done in a split-second. SNAP! Like that, in less than 330 milliseconds. Quickly. Quietly. Cleanly.

Powerful.

DI-240 Magnetic Printer accepts input data asynchronously at bursts up to 5,000 cps; or serial data at rates up to 240 cps.

Versatile.

The DI-240 Magnetic Printer is versatile. It permits remote switching from print mode to graphics mode right in the middle of transmission without graphic transmission lag throughout the whole message. It'll interspace schematics, graphics, maps, even signatures inserted anywhere in the print out. Talk about convenience, performance. . . .

The DI-240 Magnetic Printer has a switch selector for the serial mode capable of three selected speeds. For example: 10, 30 or 240 characters per second. The serial input meets EIA Standard RS 232. The parallel input is compatible with TTL Logic.

Optional.

- Fonts—foreign language, weather font, optical or magnetic reader or customer designed.
- Graphics—remote controlled switch into or out of graphics mode.
- Codes—Baudot or other
- Drive—Sprocket feed, fanfold—field changeable.
- Parity Error recognition
- Answer back
- Address recognition

DI-240 Non-Impact Magnetic Printer

Specifications:

Printing Speed

0 to 240 characters/second

0 to 180 lines/minute

Printing Density

80 Characters/line

6 lines/inch

Character Set

96 Alphanumeric

upper and lower case

Font

10 x 12 matrix

Data Input

ASCII 7 level, serial or parallel

Logic 1 = 0 to -20.0 volts Logic 0 = +3.0 to +20.0 volts

(polarity reversal by switch position)

Input Commands

ASCII...

LF

Output Commands

Acknowledge—ready

Negative acknowledge—not ready

Writing Technique

Magnetic

Interface

Complies with RS-232C

Front Panel Controls

Power "ON-OFF"

Switch

Paper advance

Push button

Paper

81/2" wide roll—400 ft. length

Power

115 volts

60Hz

Size

183/4 x 53/4 x 153/4

Weight:

33 lbs.



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Patents applied for & issued

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DI-240 MAGNETIC PRINTER Technical Description

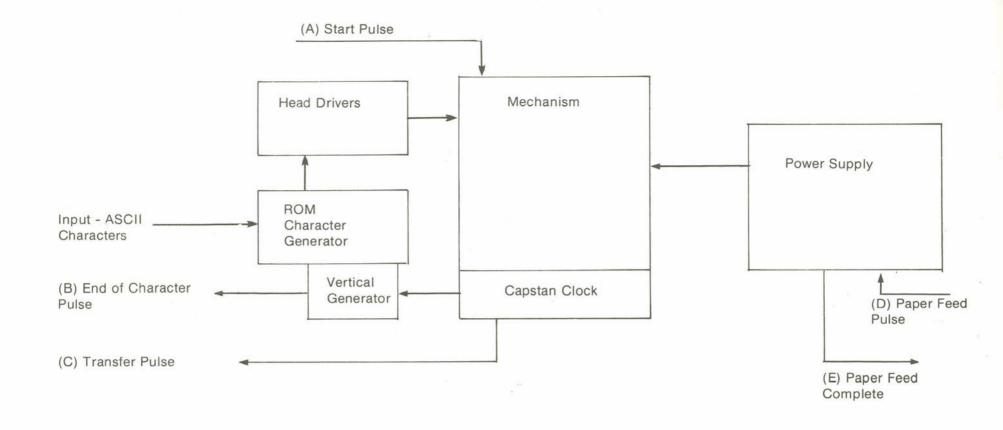
The Data Interface, DI-240 Magnetic Line Printer combines novel technology with simple implementation to achieve a highly reliable, rapid and economical printer operating at speeds up to 180 lines per minute on ordinary paper. This desk top unit produces clean, high quality print with excellent archival properties.

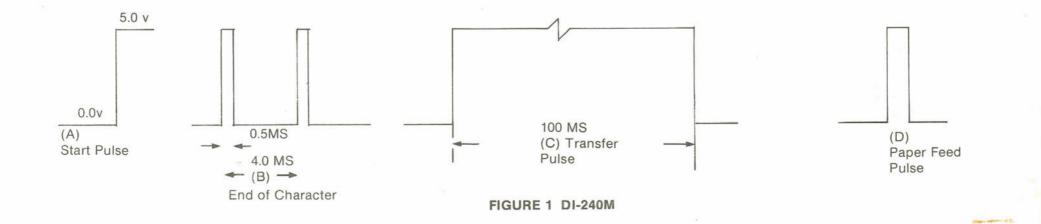
The DI-240 utilizes, as a basic printing technique, the collection, transfer and fusing of magnetically polarized toner particles from a magnetic belt onto ordinary paper. The characters are written onto the belt much in the way that a magnetic tape recorder operates. After the belt has been excited by the magnetic write head, it is exposed to dry toner. The toner particles adhere to the magnetically charged areas on the tape. When an entire line, roughly eight and one-half inches of tape, has passed from the write head to the left hand edge of the paper, the motion is stopped. With the paper and magnetic belt at rest, a mechanical pressure is applied to the paper and the belt which transfers the magnetic toner from the magnetic belt to the paper. When this operation is complete, the tape is allowed to move past an erase head and again initiate the writing of characters on the belt from the write head. The paper is moved over a heater to fuse the copy.

At its maximum data throughput rate, the DI-240 operates at 3 lines per second. The information is visible immediately after the transfer from the magnetic belt to the paper has occurred.

The DI-240 Magnetic Line Printer is available in three models:

- 1) DI-240M—Base unit, parallel entry, suitable for incorporation into a computer or other format capable system where control electronics is available for use with the printer.
- 2) DI-240P—Buffered parallel entry. Contains all the electronics necessary to operate the printer plus a 120 character input buffer. Requires no outside control.
- 3) DI-240—Full capability, serial and parallel buffered input, completely self contained printer.





DI-240M

The DI-240M is supplied on a metal mounting plate with all the mechanical and specialized electronic parts required to operate the printer. The case or cover is optional. The electronics consist of all the elements required to supply operating power, fuser power and control, erase function, paper feed function, font storage and write head drive. (See Fig. 1 for the elements of this unit and the character of the signals required for operation).

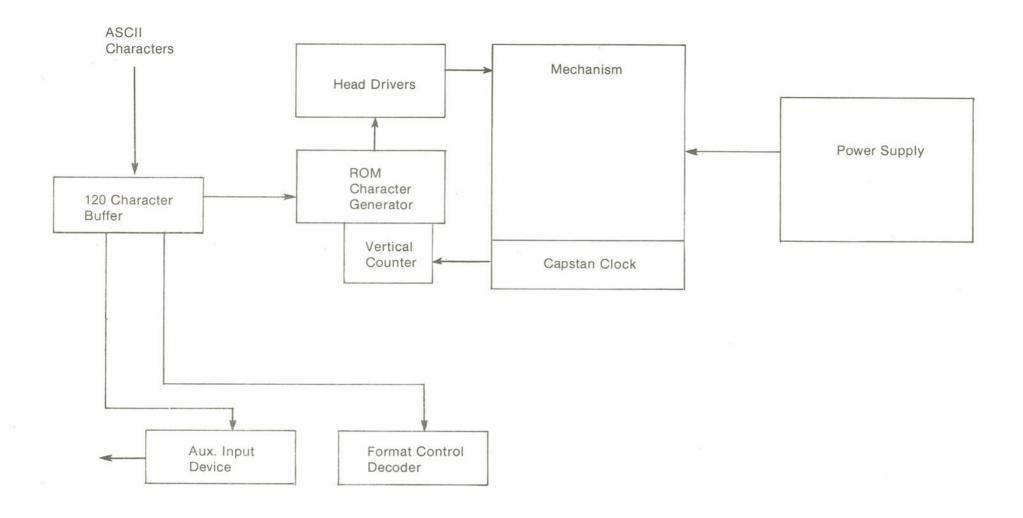
Sequence of Events for Print Cycle-

- 1. "START" (A)—to initiate operation of a print cycle the computer or control unit must supply the printer with a "START" comand. (See Fig. 1). After the start line is raised*, the printer will initiate operation and respond to internal and external signals so long as the line is held raised. Lowering this line is an "OFF" or stop command and will cause the printer to cease operation at the completion of its current cycle, if the line is lowered at least 25 milliseconds prior to the end of cycle.
- 2. EOC (B)—end of character is a 0.5 millisecond pulse from the printer that is a command to supply a character. The character, a seven level ASCII code, must be supplied during each of the 0.5 millisecond intervals that the EOC line is raised.
- 3. Transfer (C)—approximately 300 milliseconds after the first EOC pulse, the line is complete and the printer will issue a transfer pulse. The transfer line is raised for 100 milliseconds during which time the transfer of character from the belt to the paper occurs. This event takes 100 milliseconds after which the line is dropped and the paper is ready to be moved.
- 4. Paper Feed (D)—a short pulse, 1 millisecond duration minimum, must be supplied from the computer or the control device at the end of this transfer pulse to command the paper feed to operate.
- 5. Paper Feed Complete (E)—when the paper movement has been completed, the printer issues a signal to indicate completion of this action.

Options: The following options are available with the DI-240M;

- a) Font—customer specified or designed font, can be supplied in place of, or in addition to, the standard font. For Exampe: Katakana Japanese, Hebrew, Greek, etc. The printer capacity of 96 characters consists of a single printed circuit card.
- b) 80, 120, or 132 characters per line.

*NOTE: all signals are for TTL logic, "raised" line or "ON" is plus 2.5 to 5.0 volt level, "lower" line or "OFF" is 0 volts.



DI-240P—PARALLEL ENTRY

The DI-240P is supplied on a metal mounting plate, encased, with a complete compliment of mechanical parts. This unit contains all of the electronics and mechanical components of the DI-240M plus:

- *120 character input buffer
- *Format Control Decoder
- *Auxiliary Input, punched paper tape, etc.
- *Case

Data Input: Seven lines are provided for the full upper and lower case ASCII coded character set. A high* corresponds to a one, a low* is a zero.

Printer Ready: The DI-240 provides a separate ready line. Any time the ready line is high*, the printer will accept data. The negative going transition of the ready line is an acknowledgement that the DI-240 has received data.

The ready line is completely asynchronous. Unless the printer buffer is full, the ready line can remain low, or not ready, for a maximum of 150 usec. With the buffer full the ready line can remain low, or not ready, for as long as 333 milliseconds.

Strobe: A negative transition to a low* of the strobe line clocks the seven bits of ASCII coded data into the DI-240. The data should be strobed only when the ready line is high as previously explained. The strobe line should be held low for a minimum of 400 usec or until acknowledged by a low ready line.

Clear: Holding the clear line at a low* for a minimum of 200 usec will clear the line buffer and initialize the control logic.

(The DI-240 is cleared and initialized automatically when power is turned on).

The ready line goes to the ready state when the clear line is driven low. Therefore, data should not be strobed when the clear line is low.

*Parallel entry uses TTL logic, a high is +2.4 to 5.0 volts, a low is 0 volts to +0.5 volts.

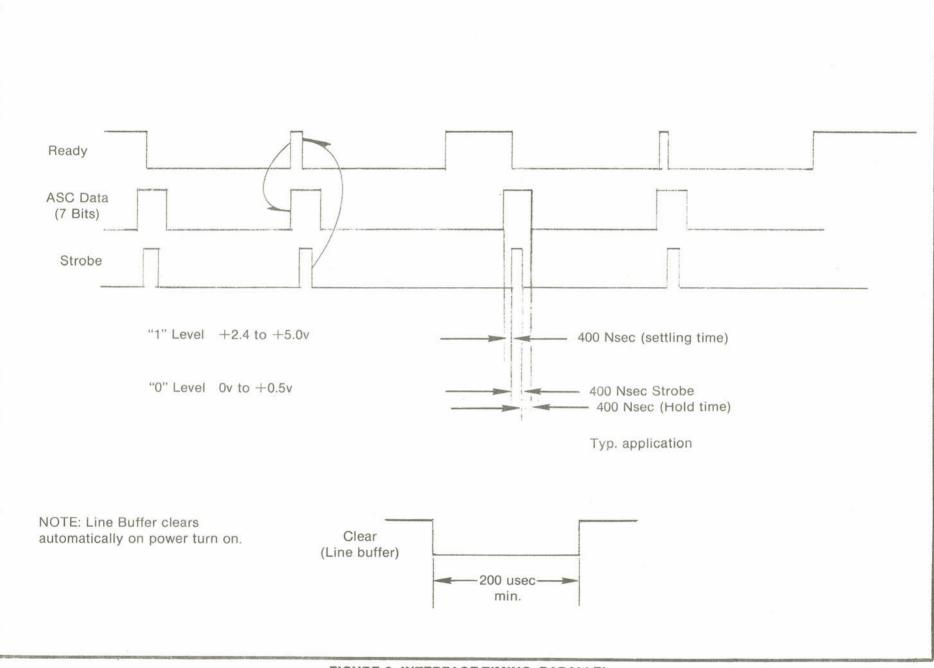


FIGURE 3 INTERFACE TIMING, PARALLEL

Sequence of Operation (See Fig. 2, 3 and 4).

The printer, after turn "on", will raise the "ready" line to indicate it is able to accept data. The data should then be supplied in ASCII code, 7-bit parallel, plus strobe. The "ready" line will go to the "not ready" level when the strobe is received by the printer. The "ready" line will go to the "ready" level when the printer is able to accept the next character. The printer will accept input data characters asynchronously at rates up to 150 microseconds per character. A line terminating code such as LF will cause the printer to print the line of data in the input buffer, up to the line terminating code, while still accepting input characters.

All commands such as paper feed, end of character and transfer are generated and handled within the printer.

Options: a, b from the DI-240M plus;

- c) Self Test—a front panel control which will cause the printer to print an internally generated series of alphanumerics to assure the user of proper printer operation.
- d) Non-Print character deletion—eliminates the effect of non-print characters. Without this option, all non-print characters create a blank space in the printed copy.
- e) Overprint—permits the equivalent of a carriage return operation without line feed or paper advance.
- f) Fast Advance—upon receipt of 3 or more line feed signals the printer will advance paper, without the print cycle, the number of lines equivalent to the number of sequential line feeds received.
- g) Paper empty-not ready signal.

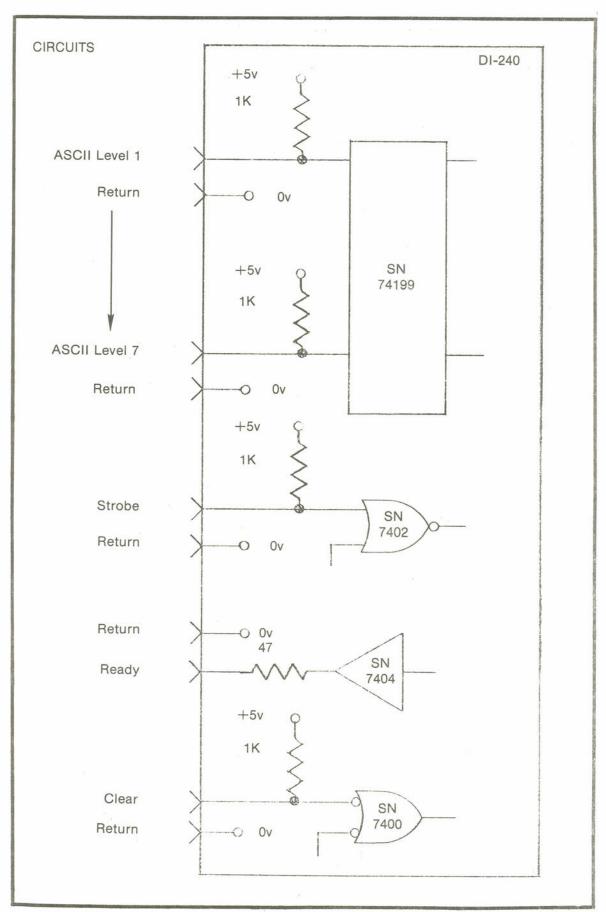


FIGURE 4 PARALLEL INTERFACE

DI-240

The DI-240 is a combined serial-parallel input printer. It performs exactly the same as the DI-240P with the additional advantage of an RS 232 serial input. (See Fig. 5 and 6). In the serial mode, the user has the choice of any one of three previously selected data rates. The serial data format is standard ASCII Serial mode operates under the same restraints as previously described in the parallel operation.

SERIAL INTERFACE:

Serial In: Serial data meeting RS232 specifications is applied to this line. The character should consist of ten bits as follows: One start bit, seven data bits, one parity bit, and a minimum of one stop bit. The parity bit is ignored by those printers without the parity option, but must be included for timing purposes.

This line would typically be connected to RS232C circuit BB, Pin 3.

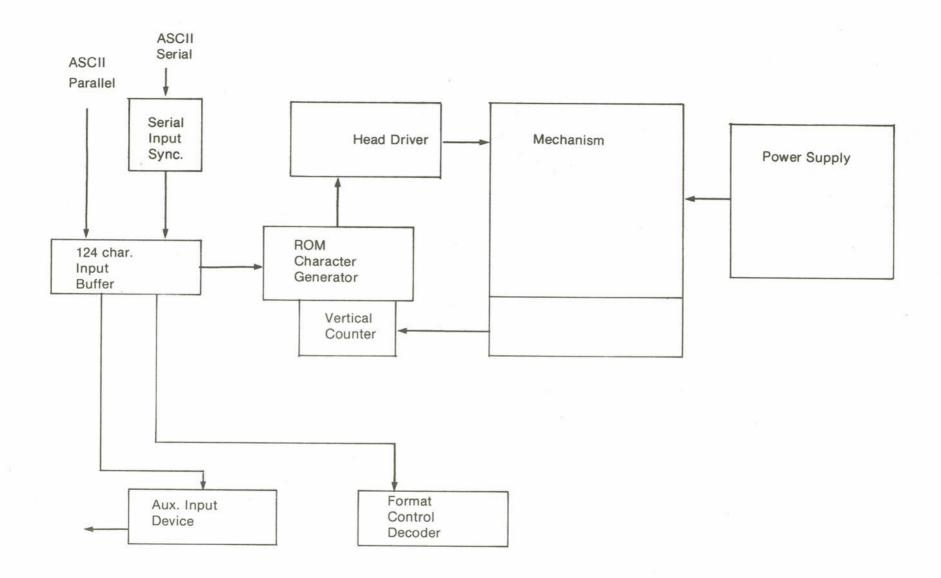
Supervisory: This line is provided for use as a ready line in the serial mode of operation. The negative, or low condition, signifies that the DI-240 character buffer is full and that the flow of data should be interrupted until the line goes positive, or high. The supervising levels are TTL although other levels can be provided as an option.

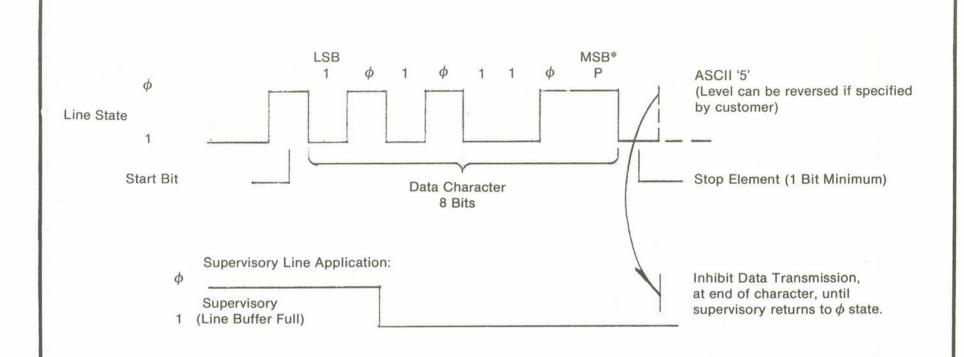
This line would typically be connected to RS232C circuit SCA, Pin 19 (or BELL 202C, Pin 11). Refer to RS232C Sections 4.4 and 5.6.2.

When using line printers in serial applications, the systems designer must consider the short line situation. The line feed character, LF, (012) in the data stream is the print command. Therefore a stream of line feed characters at 1200 baud would be a demand to print at 120 lines/second. The printer's buffer can swallow more than 100 print commands without choking but the supervisory line should be used or fill characters provided to guarantee printing of all data received. Refer to Figure 6, short line calculation, to find the number of fill characters required.

The options include all of those previously mentioned plus:

- —) Baudot or other code.
- j) Parity Error—underline of character in question for serial entry*
- k) Graphics input-serial or parallel.
- I) Answer Back—upon receipt of "ENQ" or who are you—answer back capability with up to 32 characters is supplied with the customer's chosen message*.
- m) Address Recognition-address.





Short Line Calculation

$$\frac{X}{80} = \frac{BAUD}{2400}$$

Where X is shortest line that can be continuously transmitted without utilizing supervisory line.

Notes:

I Levels conform to EIA RS 232 C

II Customer to specify BAUD

III $\phi = +3v \text{ to } +25v$ 1 = -3v to -25v

*Ignored by DI240 without parity option

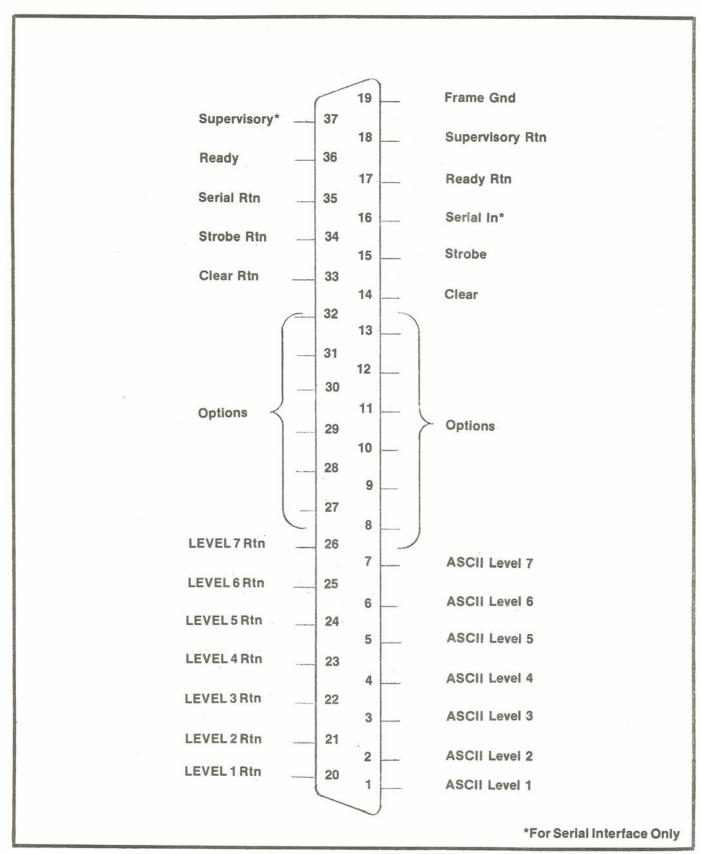


FIGURE 7 DI-240 INTERFACE CONNECTOR

The DI-240 series of printers offer the user a high speed, silent line printer for computer or communications use. This is the ideal hard copy companion for a CRT display terminal because of its high speed, low cost of operation, silent operation and small size. As a dayafter-day operation device, the DI-240 will prove to be highly reliable, easy to operate and flexible.

*Not available with parallel graphics option.

DI-240 ENVIRONMENTAL SPECIFICATIONS

AC Power 115 ± 10 volts

> 60 ± 3 volts 500 watt surge 250 watt average

Temperature - Operating

Non-operating

10 degrees C to 40 degrees C -10 degrees C to +70 degrees C

10% to 95 % R. H. over operating

temperature range

Altitude

Interface

Humidity

-1,000 to +10,000 feet

SPECIFICATIONS Magnetic Printer

0 to 240 characters/second Printing Speed

0 to 180 lines/minute

72/80 characters/line Printing Density

6 lines/inch

94 printable alphanumeric, full ASCII Character Set

upper and lower case

Data Input

ASCII

Logic 1=0 to -20.0 volts Logic 0 = +3.0 to +20.0 volts

(polarity reversal by switch position) ASCII 7 level, serial or parallel

Input Commands ASCII

LF. CR. **GRAPHICS**

Acknowledge - ready **Output Commands**

> Negative acknowledge - not ready SERIAL - Complies with RS-232 PARALLEL - Compatible with TTL

Power "ON-OFF" - switch Front Panel Controls

> Paper advance - push button Paper supply - indicator

Power 60 3Hz, single phase

115 10 volts

500 watt peak 250 watt average

181/4" X 53/4" X 153/4"

Size

Weight 33 lbs.