WANG

2261
HIGH-SPEED PRINTER
REFERENCE MANUAL

SYSTEM 2200

2261
High-Speed Printer Reference Manual

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HOW TO USE THIS MANUAL

This manual provides quick answers to questions concerning the operation of the Model 2261 High-Speed Printer. It is assumed that users of this manual already are familiar with the System 2200A/B Reference Manual and the System 2200A/B BASIC Programming Manual.

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Section I

General Information

INTRODUCTION

This manual describes the characteristics and operations of the Model 2261 High-Speed Printer (Figure 1). The Model 2261 is a high-speed impact printer that generates printer characters in a 9x7 matrix form. The Printer uses two print heads which operate in unison and print in both forward and reverse directions. Each head travels only half the width of the paper. With the dual head mechanism, the Printer operates at a rate of 330 characters per second and can achieve a rate of 125 lines per minute ± 10%. Characters are printed six (vertical) lines and 10 (horizontal) characters to the inch. Characters can be elongated for enhanced output as needed (see Section III). The complete character set for the Model 2261 is given in Appendix C . A 132-character buffer receives a complete line of data transmitted from the System 2200 to the Printer.

Once the Printer is activated, if no print message is received by the Model 2261 after nine seconds, the motor is deactivated until the next print message is received. This feature greatly reduces standby noise and motor wear. If paper runs out during printer operation, an audible two-second tone is sounded and System 2200 operation halts. A vertical format tape provides vertical format control. If you have problems with the vertical format tape, call your WANG Service Representative. Continuous-form paper of widths from 4 to 14-7/8 inches can be used with the printer since the distance between the pin-feed mechanisms is continuously adjustable.

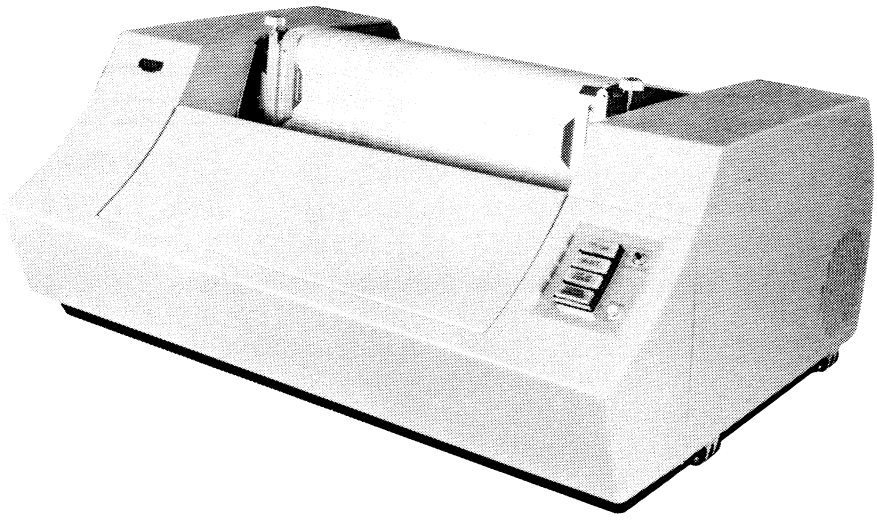


Figure 1. The Model 2261 High-Speed Printer

SECTION I – GENERAL INFORMATION

UNPACKING AND INSPECTION

The Model 2261 High-Speed Printer must be unpacked and installed by your WANG Service Representative. Upon receipt of your equipment, contact your WANG Service Representative and wait for his arrival. Failure to follow this procedure may void your warranty.

INSTALLATION

1. The Printer Controller board should be installed in the CPU chassis by a WANG Service Representative.
2. The 36 pin Amphenol interface connector must be plugged into the Printer Controller peripheral board and the Lock Clips placed in the up (locked) position (see Figure 2).
3. The power cord from the High-Speed Printer must be plugged into a wall outlet.
4. Be sure the CPU is connected to the Power Supply and that the Power Supply is plugged into a wall outlet.

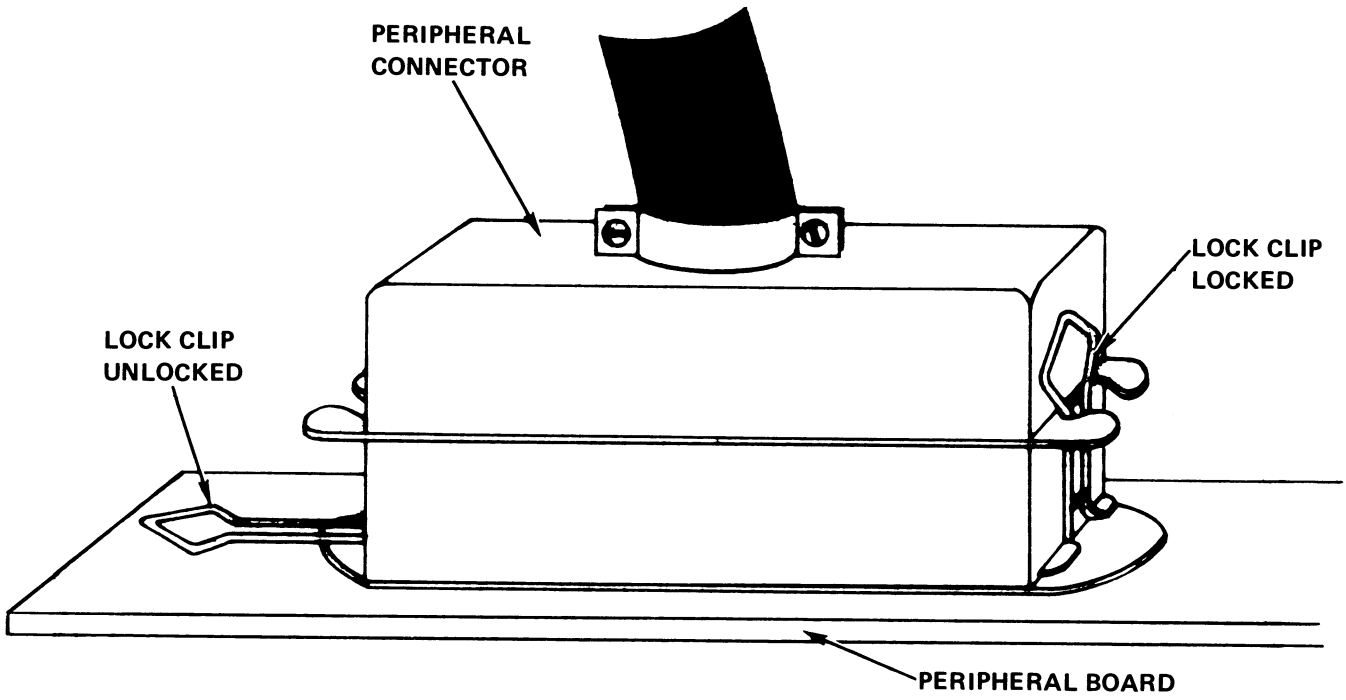


Figure 2. Peripheral Board and Lock Clips

SECTION I – GENERAL INFORMATION

PAPER INSERTION

1. Slide continuous-form pin-feed paper into the slot in the back of the Printer until it comes out between the pin-feed mechanisms (see Figure 3).
2. Open the pin-feed gates, insert the paper holes evenly over the pins, and close the gates. If the distance between the pin-feed mechanisms must be adjusted, unscrew the right-hand lock knob and slide the mechanism to the proper position.
3. Press the ON/OFF button at the right of the Printer. It should illuminate.
4. **If the SELECT button also illuminates at this time, call your WANG Service Representative and do not proceed.**
5. Press the TOP-OF-FORM button to advance paper automatically in the Printer.
6. Use the Platen Knob to readjust the exact paper placement, if necessary. Paper can be manually advanced for adjustment by pulling out the Platen Knob and turning it.
7. **NEVER OPERATE THE HIGH-SPEED PRINTER WITHOUT PAPER.**
8. If paper runs out while the Printer is being used, the System 2200 ceases operation and an audible two-second tone is sounded by the Printer. Press the FORMS OVERRIDE button to print the current print line and insert fresh paper in the Printer to continue operation.

PRINT ADJUSTMENT

To adjust the print blackness, follow the procedure detailed below.

1. The Printer must have paper in it and be turned OFF.
2. Open the front cover of the Printer and find the Print Heads (see Figure 3).
3. Identify on each Print Head the Penetration Control Knob and the Lock Knob. (The Penetration Control Knob has a numbered dial.) Normally during shipment, the Penetration Control Knob is set at 5; it must be adjusted to give normal print quality.
4. Unlock the Lock Knob on one of the Print Heads.
5. Manually move the Heads back and forth.
6. Turn the Penetration Control Knob until slight smudging of the paper occurs when the Head is manually moved across the paper.
7. Turn the Penetration Control Knob counterclockwise until the smudging disappears. This is the optimum setting for Penetration Control.
8. Lock the adjustment by turning the Lock Knob until it stops.
9. Repeat the adjustment for the other Print Head.
10. When both Heads are properly adjusted, close the front cover of the Printer. The Printer does not operate unless all covers are closed.
11. If, during Printer operation, the paper does not feed smoothly due to its catching on the front surface of the Print Heads, be sure that the Print Heads are properly adjusted and locked in place.

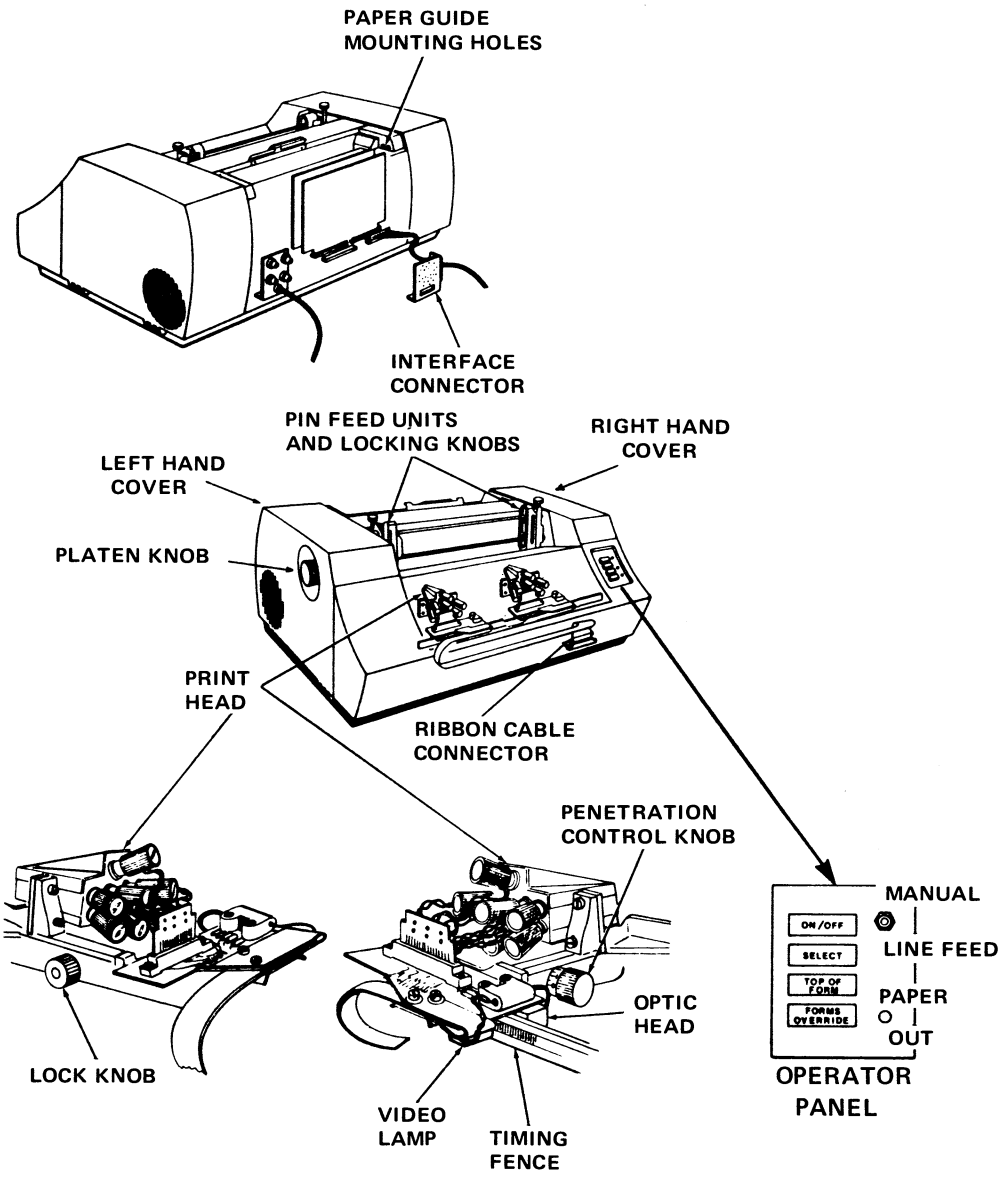


Figure 3. Internal Mechanisms of the Model 2261

RIBBON REPLACEMENT

1. Turn OFF the Printer.
2. Open the front cover of the Printer and find the Penetration Control Lock Knobs; loosen them.
3. Set the Penetration Control Knobs (one on each Print Head) to 5.
4. Push off the left and right-hand covers.
5. Compare the Ribbon Mechanism with that in the diagram inside the front cover of the Printer to find the parts needed and follow the path of the ribbon in the mechanism.
6. Remove caps from the Ribbon Reversing guides and swing the tension arms clear of the ribbon spools.
7. Lift spools from axles and discard.
8. Place the partially wound spool of the new ribbon on the right-hand axle, and thread the ribbon through the guides, idlers and rollers.
9. Place the full spool on the left-hand axle.
10. Replace caps on the Ribbon Reversing guides and close the side covers of the Printer.
11. Readjust the Penetration Control (see Print Adjustment) and tighten the Penetration Control Lock Knobs.
12. Close the front and side covers of the Printer to resume operation.

FUSE REPLACEMENT

Any of the four fuses (see Figure 4) located on the rear panel of the Model 2261 can be changed by twisting the bad fuse out of the socket and twisting in a new fuse. Fuse 4 is the main fuse, a 6 amp slo-blo fuse. Fuse 1 controls the light indicators and is 5 amps. Fuses 2 and 3 control the carriage of the Printer and are 2 amps each.

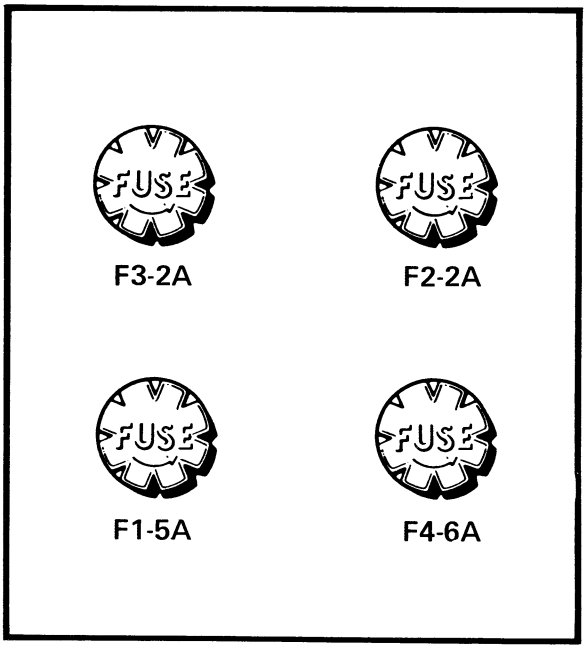


Figure 4. Fuse Panel

VERTICAL FORMAT CONTROL

The mechanism which guides paper movement in the Model 2261 is located under the left-hand cover of the Printer. The Vertical Format Unit (Figure 5) contains a paper tape reader which provides vertical tab and Top-of-Form spacing control via perforated paper tape. Before operating the Printer, verify that the paper tape is properly seated in the Vertical Format Unit.

The standard one-inch wide, eight-channel, specially impregnated black paper tape has sprocket holes located between channels three and four; holes for Vertical Tab in channel 5; and for Top-of-Form in channel 7. The sprocket holes have 1/10 inch pitch between holes. The tape reader and paper feed mechanisms are mechanically linked so that each line feed both advances the paper one line, and the paper tape one sprocket hole. When the Printer receives a Vertical Tab code [HEX(0B)], the tape is advanced to the next hole in channel 5 and the paper is advanced correspondingly. When the Printer receives a Form Feed code [HEX(0C)], or the TOP-OF-FORM button is pressed, the paper is advanced until the paper tape reaches the next hole in channel 7. On the standard paper tape, Vertical Tab holes are spaced six sprocket holes apart (this corresponds to a one inch tab or six lines); and Form Feed holes, 66 sprocket holes apart (this corresponds to an eleven inch form). To position the tape at the Form Feed holes, pull out and hold the platen knob and press the TOP-OF-FORM button.

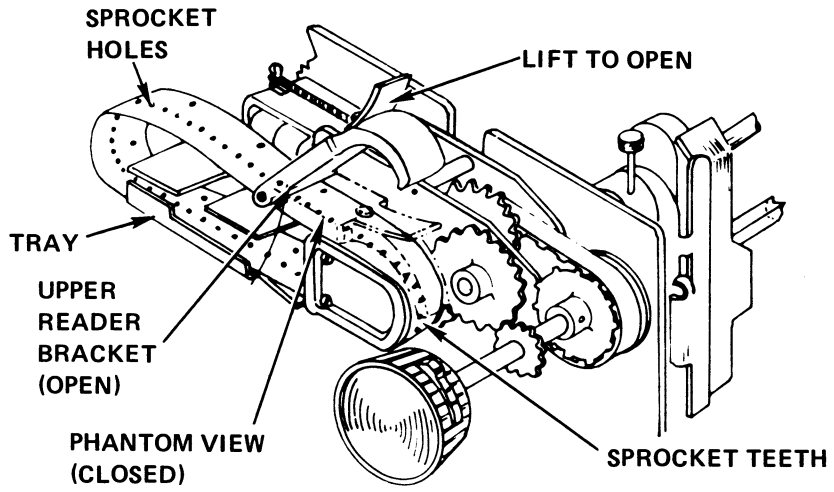


Figure 5. Vertical Format Unit

SECTION I – GENERAL INFORMATION

SYSTEM 2200 TURN-ON PROCEDURE

1. Verify that all power cords are connected to a source of electrical power and all peripheral cables are connected to the WANG System 2200 CPU.

2. Turn ON all switches (one on the Power Supply and one on each peripheral; i.e., the CRT, any tape units). The Power Supply switch should be turned on last. At turn-on the system is Master Initialized; i.e., memory is cleared of all programs and variables, and the addresses of primary devices are set to their default values.

   No device address is automatically set for the Printer when the system is Master Initialized. The device address for the Printer must be specified using a SELECT statement (see Section II).

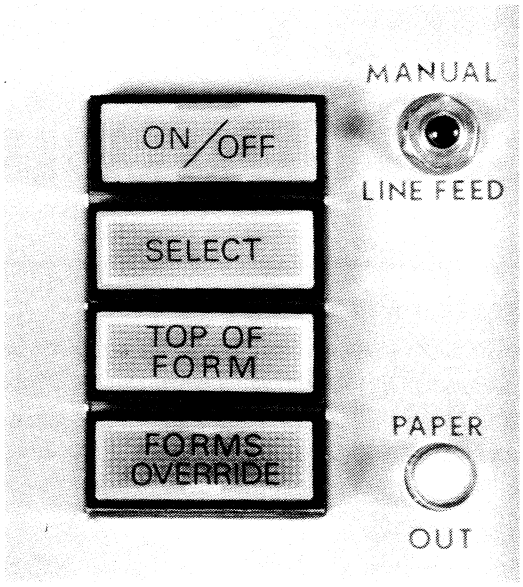


Figure 6. Control Panel

MODEL 2261 TURN-ON PROCEDURE

On the right side of the front panel of the Model 2261 is the Control Panel of the Printer. It contains the buttons and light indicators for controlling manual Printer operations (see Figure 6).

ON/OFF — To turn the Printer ON, press the ON/OFF button once. The button illuminates. To turn the Printer OFF, press ON/OFF again; the light is turned off. If the SELECT button illuminates the moment the ON/OFF button is pressed, call your WANG Service Representative and **do not proceed.**

SELECT — After turning ON the Printer, press the SELECT button. SELECT places the Printer in the ready position to receive data. The SELECT button is illuminated at all times when the Printer can receive data from the System 2200. When SELECT is depressed, the 132-character buffer for the Printer is cleared.

TOP-OF-FORM — With the Printer ON and SELECTed, paper is manually advanced to Top-of-Form by pressing this key.

FORMS OVERRIDE — When out of paper, the Printer ceases operation and an audible tone is sounded. The PAPER OUT light indicator illuminates, and the WANG System 2200 halts. Press and hold down the FORMS OVERRIDE button to complete printing the line and to reactivate the System 2200. Be sure to insert paper in the Printer before continuing operation.

NEVER OPERATE THE HIGH-SPEED PRINTER WITHOUT PAPER!

MANUAL LINE FEED — The black button in the upper right corner of the Model 2261 Operator Panel is used for manual single-line feed.

Section II
Using the Model 2261 as an Output Device

THE SELECT STATEMENT

The SELECT statement must be used to select the High-Speed Printer as the output device. A SELECT statement can be used either in the immediate mode or as a statement within a program. When used with the Model 2261, the syntax of the SELECT statement requires that it contain a PRINT, LIST or CO command and a Device Type Code. Line length can also be specified. Each of these SELECT parameters is described below.

DEVICE TYPE CODES

Every peripheral attached to the WANG System 2200 is assigned a three-character Device Type Code. The Device Code is in the form (XYY), where X is the Device Type and YY is the Device Address. The Device Type (X) determines which internal System 2200 I/O routines are used to control the Printer. The Model 2261 is a device that automatically executes a line feed (i.e., advances the paper to a new line) following the execution of a carriage return. In most cases, carriage return commands are initiated from the System 2200 CPU. However, there is one exception to this rule; the Model 2261 initiates its own carriage return command whenever 132 characters (including spaces) are printed on a single line.

Type	Operation
0	This Device Type addresses devices that do not automatically execute a line feed after a carriage return; therefore the System 2200 supplies a line feed after each system-generated carriage return. When this Device Type is selected for the Model 2261, output which is normally single spaced is now double spaced (see Figures 7 and 8).
2	This Device Type addresses devices that automatically execute a line feed after a carriage return; it is the Device Type normally used with the Printer. With this Device Type, the System 2200 does not supply a line feed command after each system-generated carriage return. Output is single spaced.
4	This Device Type suppresses the automatic carriage return issued by the System 2200 at the end of PRINT, PRINTUSING and HEXPRINT statements that contain no trailing punctuation. Whenever a system-generated carriage return is initiated, the system automatically adds a line feed following it. The use of this Device Type is further discussed in the section on Special Techniques.

The device address (YY) of the Model 2261 Printer Controller board is preset to 15 by WANG Laboratories before the unit is shipped, and must be the address used in SELECT statements used with the Printer. If a second printer is used on the same System 2200, it is assigned device address 16 by the WANG Service Representative who installs your system. The second Printer can be any of the following: Model 2261 High-Speed Printer, Model 2221 Line Printer (132 column), Model 2231 Line Printer (80 column) or Model 2241 Thermal Printer. Device address 15 is used in all further examples in this manual.

```
SELECT PRINT 215

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888
    888888999999999900000000000

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888
    888888999999999900000000000

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888
    888888999999999900000000000


SELECT PRINT 215 (132)

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000
    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000
    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000
    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000


SELECT PRINT 015 (132)

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000

    IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK88888888889999999999000000000

PROGRAM

      1 SELECT PRINT xyy (zzz)
      5 FOR I=1 TO 10
      10 PRINT "IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999999000000000"
      15 NEXT I
```

Figure 7. Sample Printout Running the Above Program Using Different Device Type Codes, Line Lengths and the PRINT Parameter

```
SELECT LIST 015 (132)

1SELECT PRINT 115(132)
5 FOR I=1TO 10
10PRINT "IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888888999999999900000000001111111111222222222233333333334444
4444444"
15 NEXT 1
```

```
SELECT LIST 215

1SELECT PRINT 115(132)
5 FOR I=1TO 10
10PRINT "IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKK
KKKKK8888888888999999999900000000001111111111222222222233333333
34444444444"
15 NEXT 1
```

```
SELECT LIST 215 (132)

1SELECT PRINT 115(132)
5 FOR I=1TO 10
10PRINT "IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888888999999999900000000001111111111222222222233333333334444
4444444"
15 NEXT I
```

Figure 8. Sample Printout Using LIST With Different Device Type Codes and Line Lengths

SECTION II – USING THE MODEL 2261 AS AN OUTPUT DEVICE

PRINT

```
:SELECT PRINT 215
```

This statement selects the Printer with the Device Type Code 215 for all program output resulting from the execution of PRINT, PRINTUSING or HEXPRINT statements. Printout resulting from PRINT statements entered in the immediate mode appear on the CRT unless the Printer is selected for CO (see SELECT CO 215).

Example:

```
:10 SELECT PRINT 215          or      :SELECT PRINT 215
:20 PRINT "X", "X↑2"                  :20 PRINT "X", "X↑2"
:30 FOR X=1 TO 5                      :30 FOR X=1 TO 5
:40 PRINT X, X↑2                      :40 PRINT X, X↑2
:50 NEXT X                            :50 NEXT X
```

When either of these programs is executed, the printed output is:

```
X          X^2
 1          1
 2          4
 3          9
 4          16
 5          25
```

LIST

```
:SELECT LIST 215
```

This statement selects the Printer with the Device Type Code 215 for all program listings.

Example:

To list the program in the first example above on the High-Speed Printer, key in as immediate mode statements:

```
:SELECT LIST 215
:LIST
```

The printed output is:

```
10 SELECT PRINT 215
20 PRINT "X", "X^2"
30 FOR X=1 TO 5
40 PRINT X, X^2
50 NEXT X
```

SECTION II – USING THE MODEL 2261 AS AN OUTPUT DEVICE

CO

```
:SELECT CO 215
```

This statement selects the High-Speed Printer with the Device Type Code 215 for all console output. This includes all system displays, such as the READY message; output from STOP and END statements; any data keyed in on the keyboard and entered into the System 2200; and all output from immediate mode operations, TRACE statements, and error messages.

Example:

Key in as an immediate mode statement **SELECT CO 215**, touch the **RETURN/EXECUTE** Key and touch the **RESET** key. The output on the printer is:

READY

All information entered into the System 2200 via the keyboard is now printed on the High-Speed Printer.

LINE LENGTH

The maximum number of characters per line that can be printed on the Model 2261 is 132. To accommodate various paper widths and special forms whose width is less than 132 characters, the length of the output line can be specified by enclosing the desired line length in parentheses following the Device Type Code in the SELECT statement. This number is stored within the System 2200 and indicates the effective line length of the selected device to the System. For example:

SELECT PRINT 215 (132)	(Selects the Model 2261 for printing, sets line length to 132)
SELECT LIST 215 (80)	(Selects the Model 2261 for listing, sets line length to 80)
SELECT CO 215 (112)	(Selects the Model 2261 for console output, sets line length to 112).

If a line length is not specified for PRINT, LIST or CO, the last line lengths selected for these operations are used. Master Initialization sets these line lengths to 64 characters. The maximum line length which can be specified in a SELECT statement is 255. However, the use of a line length greater than the physical carriage width of a specific peripheral device is not recommended.

The line length setting is used by the System 2200 to generate an automatic carriage return when a line exceeds the specified line length and when no carriage return is supplied by the program. This prevents printout from being lost. As a line of output is printed on the Model 2261, the System 2200 keeps a count of the number of characters sent. If this line count equals the current value of the line length before the output line is complete, a carriage return is executed, the line count is reset to zero, and the unfinished output is continued on the next line. If the output is completed and a carriage return is transmitted before the line count equals the line length, the system automatically resets the line count to zero for the start of a new line (a print statement with no trailing comma or semi-colon causes a carriage return to be executed at the end of the output). The line count is reset to zero under any one of the following conditions:

1. The line count equals the line length.
2. A carriage return is output when a PRINT, PRINTUSING or HEXPRINT statement is executed. (Printing a HEX(0D) does not reset the line count.)
3. The system is RESET.

4. A CLEAR command is executed.

5. The system is Master Initialized.

The following example illustrates the automatic carriage return generated by the selected line length. With this program in memory (note line length is set to 5):

```
10  SELECT PRINT 215 (5)
20  PRINT "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG"
```

When the program is executed, it produces the following output:

```
T H E   Q
U I C K
B R O W N
  F O X
J U M P S
  O V E R
  T H E
L A Z Y
D O G
```

Note that spaces in the line are included in the line count.

SPECIAL TECHNIQUES

The normal Device Type used with the Model 2261 is type 2. When the Printer is selected with this device type for LIST, PRINT, or CO, normal single spaced output is produced. Device Type 0 can also be used with the Model 2261. In this case, output which appears single spaced under type 2 appears double spaced. This is because both the CPU and the Printer execute line feed commands following each system-generated carriage return.

(see example FIGURE 9)

Device Type 4 is intended for use with System 2200 plotter peripherals and has limited application with other types of peripherals. There are, however, two specific instances where it can be of use with the Model 2261 Printer.

The first instance concerns the printing of lines which contain exactly 132 characters. Assume the Printer has been selected with Device Type 2 and Line Length 132 (i.e., SELECT PRINT 215 (132)). For output lines fewer than 132 characters in length and containing no trailing punctuation, the CPU issues a carriage return following the final character in the line. The Printer follows this carriage return with an automatic line feed. The next line of output is then printed directly beneath the first. When a line containing exactly 132 characters is printed, an additional event occurs. After the 132nd character is printed, the Printer itself executes a carriage return followed by an automatic line feed. The CPU then issues the

```
SELECT PRINT 415 (132)

   IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKII
   IIIIIIIIKKKKKKKKKK8888888889999999990000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000
   000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKK
   KKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999
   9900000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIII
   KKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000000000IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK888888888899
```

```
SELECT LIST 415 (132)

1SELECT PRINT 115(132)

5 FOR I=1TO 10

10PRINT "IIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKKIIIIIIIIIIKKKKKKKKKK8888888889999999990000000000111111111122222222233333333334444
4444444"

15 NEXT I
```

Figure 9. Using Device Type 4 to PRINT and LIST with the Model 2261. Program is the same as in Figure 7.

carriage return that normally occurs when the line count equals the selected line length, and the Printer follows this with another automatic line feed. The result is a skipped line before the next line of output.

This skipped line can be avoided by using the following technique. Immediately before printing one or more consecutive PRINT, PRINTUSING or HEXPRINT statements, each of which produces an output line containing exactly 132 characters, place a SELECT PRINT 415 statement in the program. Before the next statement that prints a line of fewer than 132 characters, include a SELECT PRINT 215 statement.

Example:

100 SELECT PRINT 415
110 PRINT (output line of exactly 132 characters)
120 PRINTUSING 130, A, B, C
130 % (image containing exactly 132 characters)
140 SELECT PRINT 215
150 HEX PRINT A$ (output line of fewer than 132 characters)

This technique works because the Device Type 4 suppresses the normal carriage return supplied by the CPU at the end of the PRINT statements in lines 110 and 120. The only carriage returns (and subsequent line feeds) produced are those supplied by the Printer when the 132nd character of lines 110 and 120 are printed. Care must be taken to ensure that output lines containing fewer than 132 characters are not printed while the Model 2261 is selected with Device Type 4. If this occurs, the output from consecutive print statements is printed all on one line until the end of the Model 2261 carriage is reached; at this time carriage return and line feed are automatically executed by the Printer (see Figure 9).

Device Type 4 is also useful in the production of double spaced program listings. Normally, when double spacing is desired, the Printer is selected with Device Type 0. (i.e., SELECT LIST 015 (20)). In this case, all LIST output is double spaced. Carriage returns followed by line feeds are initiated by the CPU at the end of each program text line as well as whenever the line count equals the selected line length. After the Model 2261 executes a carriage return, it supplies another line feed, producing the double spacing after each printed line.

With Device Type 4, the CPU suppresses the carriage return (and therefore the accompanying line feed) normally supplied when the line count equals the selected line length. The carriage return that normally follows the end of a text line is not affected. A more interesting double spaced output is therefore achieved with Device Type 4 (see Figure 9).

With these two exceptions it is recommended that the Model 2261 normally be selected with Device Type 2 or 0.

SECTION II – USING THE MODEL 2261 AS AN OUTPUT DEVICE

COMBINED PARAMETERS

It is possible to combine parameters in a SELECT statement.

Example:

SELECT PRINT 215 (100), LIST 215 (80), CO 215 (131)

but it is not possible to select two output devices for the same parameter, i.e., the statement

SELECT LIST 215, LIST 005

will allow listing of programs only on the CRT.

DESELECTING THE MODEL 2261

To deselect the Printer, use one of the following methods.

1. Select another device for PRINT, LIST or CO.
2. Master Initialize (turn Power Supply OFF, then ON). Master Initialization selects the CRT for all I/O operations.
3. Key in CLEAR and touch the RETURN/EXECUTE key. PRINT and LIST operations are returned to the device which has been selected for Console Output (CO). If the Printer is currently the CO device, either method 1 or 2 must be used to deselect it.

Section III
Formatting
Printed Output

PRINT, PRINTUSING AND HEXPRINT STATEMENTS

PRINT, PRINTUSING and HEXPRINT statements within programs produce output on the Model 2261 when it has been selected either in the program or with an immediate mode statement of the form SELECT PRINT XYY. When the program is executed, output is printed on the Model 2261.

The Model 2261 has a carriage width of 132 characters, divided into eight 16-character zones and one 4 character zone (columns 0 through 15, 16 through 31, 32 through 47, 48 through 63, 64 through 79, 80 through 95, 96 through 111, 112 through 127 and 128 through 131). If commas separate elements in a PRINT statement, each successive element is printed at the start of a new zone; if semicolons separate the elements, printed output is packed (see the System 2200 A/B Reference Manual and the sample programs and output below).

For example, the following program is in memory:

```
10  SELECT PRINT 215
20  PRINT "X", "X*75"
30  PRINT
40  FOR X = 1 TO 5
50  PRINT X, X*75
60  NEXT X
```

Touch the RETURN key and the RETURN/EXECUTE key to produce the following output. (Turn ON and SELECT the printer.)

```
X          X*75
1           75
2           150
3           225
4           300
5           375
```

With the commas in lines 20 and 50 changed to semicolons, the program is:

```
10  SELECT PRINT 215
20  PRINT "X"; "X*75"
30  PRINT
40  FOR X = 1 TO 5
50  PRINT X; X*75
60  NEXT X
```

SECTION III – FORMATTING PRINTED OUTPUT

The output produced is:

```
XX * 75
 1   75
 2   150
 3   225
 4   300
 5   375
```

THE TAB(FUNCTION

When a PRINT statement containing a TAB(expression is encountered, the Printer tabs across to the column specified by the integer portion of the TAB(expression.

Example:

The program line **10 PRINT TAB(30); "NAME"** is in memory.

Enter SELECT PRINT 215 and touch the RETURN/EXECUTE key. Touch the RUN key to execute the program. The Printer prints the word NAME starting at column 30.

It is not recommended that values of TAB(expressions greater than 132 be used with the Printer; values greater than 255 are illegal and produce a System 2200 Error Message.

PRODUCING ELONGATED CHARACTERS

Elongated characters can be produced on the High-Speed Printer to highlight printed output. Elongated characters are generated for a single line with the Hex code (0E) (see Section IV).

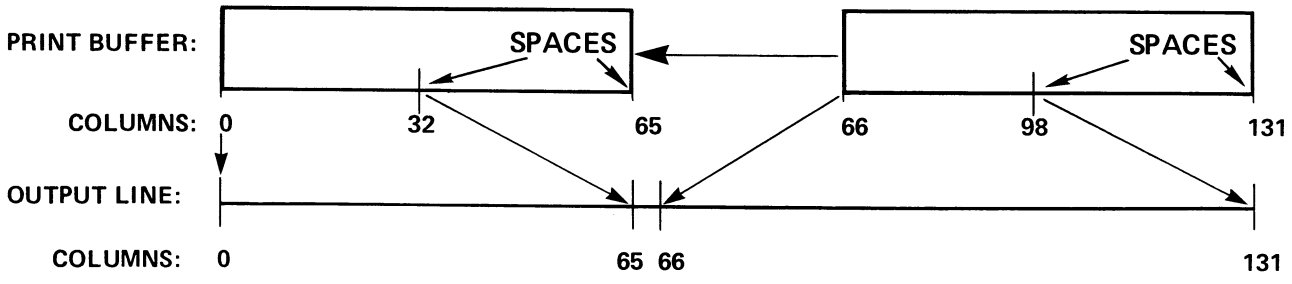
For example: with the following program in memory:

```
10  SELECT PRINT 215 (100)
20  PRINT HEX(0E); "WANG LABORATORIES"
```

executing the program produces the following output:

WANG LABORATORIES

Elongated characters require twice as much print space as normal printing. Therefore only 66 elongated characters can be printed in any one line. Because the Model 2261 has two print heads, special procedures are required when printing elongated characters in lines longer than 33 characters. The first 33 characters of a 66 character line are printed by the left Print Head (buffer columns 0 through 32) and exactly fill the first half of the printed line. The second 33 characters of the line are printed by the right Print Head (buffer columns 66 through 98) and exactly fill the second half of the printed line (see Figure 10).



Therefore, to print a line of more than 33 characters (including spaces) certain rules must be followed:

1. Place a HEX(0E) in the PRINT statement, followed by a semi-colon, to signify elongated characters.
2. Place the first 33 characters of the line in columns 0 through 32 of the buffer.
3. Fill columns 33 through 65 with spaces using the TAB(function.
4. Place the remaining characters of the line in columns 66 through 98 of the buffer.

For example, the following program is in memory:

```
10  SELECT PRINT 215 (132)
20  PRINT HEX(0E);"THE QUICK BROWN FOX JUMPS OVER TH";TAB(66);"E LAZY DOG"
```

Touch the RUN key and the RETURN/EXECUTE key to execute the program. This produces the following output:

(85% actual size)

The HEX(0E) statement in line 20 specifies that the line is to appear in elongated form. The first string of characters, "THE QUICK BROWN FOX JUMPS OVER TH", contains 33 characters and is placed in columns 0 through 32 of the buffer. The TAB expression fills columns 33 through 95 with spaces, and allows the remaining eleven-character string to be placed in columns 66 through 75.

Section IV

The HEX Function

The HEX function is used in a BASIC program to output characters on the Printer that do not appear on the Model 2215 or Model 2222 Keyboards, or to output special Printer Control Codes. The HEX function has the form:

HEX(hexdigit hexdigit [hexdigit hexdigit . . .])

where hexdigit = a digit 0 to 9 or a letter A to F. An even number of characters must always appear in a HEX statement (see Appendix A for hexadecimal codes). HEX codes can be combined. For example, the following program in memory,

```
10  SELECT PRINT 215
20  PRINT HEX(2424)
30  END
```

produces the printout when run:

$$

The special Control Codes* for the Printer are:

Function	HEX Code	Description
ALARM	HEX(07)	Generates an audible tone about two seconds in duration in the speaker at the rear of the Printer.
LINE FEED	HEX(0A)	Advances paper one line.
VERTICAL TAB	HEX(0B)	Advances paper until the next hole in Channel 5 of the Vertical Format Unit paper tape is reached.
FORM FEED	HEX(0C)	Advances paper until the next hole in Channel 7 of the Vertical Format Unit paper tape is reached.
CARRIAGE RETURN	HEX(0D)	Causes the characters stored in the Printer buffer to be printed.
ELONGATED CHARACTER	HEX(0E)	Signifies that characters in the buffer be printed in expanded form (see Section III).

*Any control code in a statement line is always executed first; if more than one occurs, they are executed in order from left to right. Code OE elongates all characters in the statement line.

Appendix A

Hexadecimal Codes

HEX CODE	HIGH-SPEED PRINTER CHARACTER	CRT CHARACTER
HEX(01)	Not Applicable	Cursor home
HEX(03)	Not Applicable	Clears screen and cursor home
HEX(07)	Alarm	Not Applicable
HEX(08)	Not Applicable	Backspace
HEX(0A)	Line Feed	Cursor down (line feed)
HEX(0B)	Vertical Tab	Not Applicable
HEX(0C)	Form Feed	Cursor up (reverse index)
HEX(0D)	Carriage Return	CR Carriage Return
HEX(0E)	Elongated Character	Not Applicable
HEX(20)	Space	Space
HEX(21)	!	!
HEX(22)	"	"
HEX(23)	#	#
HEX(24)	$	$
HEX(25)	%	%
HEX(26)	&	&
HEX(27)	'	' (apostrophe)
HEX(28)	(	(
HEX(29)	)	)
HEX(2A)	*	*
HEX(2B)	+	+
HEX(2C)	,	, (comma)
HEX(2D)	-	- (minus)
HEX(2E)	.	.
HEX(2F)	/	/
HEX(30)	0	0
HEX(31)	1	1
HEX(32)	2	2
HEX(33)	3	3
HEX(34)	4	4
HEX(35)	5	5
HEX(36)	6	6
HEX(37)	7	7
HEX(38)	8	8
HEX(39)	9	9
HEX(3A)	:	:
HEX(3B)	;	;

HEX CODE	HIGH-SPEED PRINTER CHARACTER	CRT CHARACTER
HEX(3C)	<	<
HEX(3D)	=	=
HEX(3E)	>	>
HEX(3F)	?	?
HEX(40)	@	@
HEX(41)	A	A
HEX(42)	B	B
HEX(43)	C	C
HEX(44)	D	D
HEX(45)	E	E
HEX(46)	F	F
HEX(47)	G	G
HEX(48)	H	H
HEX(49)	I	I
HEX(4A)	J	J
HEX(4B)	K	K
HEX(4C)	L	L
HEX(4D)	M	M
HEX(4E)	N	N
HEX(4F)	O	O
HEX(50)	P	P
HEX(51)	Q	Q
HEX(52)	R	R
HEX(53)	S	S
HEX(54)	T	T
HEX(55)	U	U
HEX(56)	V	V
HEX(57)	W	W
HEX(58)	X	X
HEX(59)	Y	Y
HEX(5A)	Z	Z
HEX(5B)	[	[
HEX(5C)	\	\
HEX(5D)	]	]
HEX(5E)	↑	↑
HEX(5F)	←	←

Appendix B

Specifications

Print-out Speed
330 characters per second
125 lines per minute ± 10%

Character Configuration
Dot Matrix - 9 dots wide by 7 dots high or 18 dots wide by 7 dots high expanded

Character Size
0.08 x 0.10 in. (wxh) (0.20 x 0.25 cm)
or 0.17 x 0.10 in. (wxh) (0.43 x 0.25 cm) expanded.

Character Set
Full alphanumeric

Line Width
132 characters maximum (66 characters expanded)

Paper
14.75 in. (37.5 cm) pin-feed. Width from 4 in. (10.2 cm) to maximum. Recommended paper: 15 lbs white sulphite bond, 9 lb carbon

Duplicate Copies
Up to four copies in addition to the original can be generated

Switches
ON/OFF, SELECT, TOP-OF-FORM, FORMS OVERRIDE, LINE FEED

Printer Size

Length	20 in. (50.8 cm)
Width	27.75 in. (70.5 cm)
Height	11.5 in. (29.2 cm)

Weight
118 lbs (53.5 kg)

Site Width
Not less than 48.1 in. (1.2m) to accomodate opening side covers

Cable
8 ft (2.4 m) Cable to Printer Controller

Power Requirements
117 volts AC ± 10% 60 Hz ± 1 cps or
234 volts AC ± 10% 50 Hz ± 1 cps

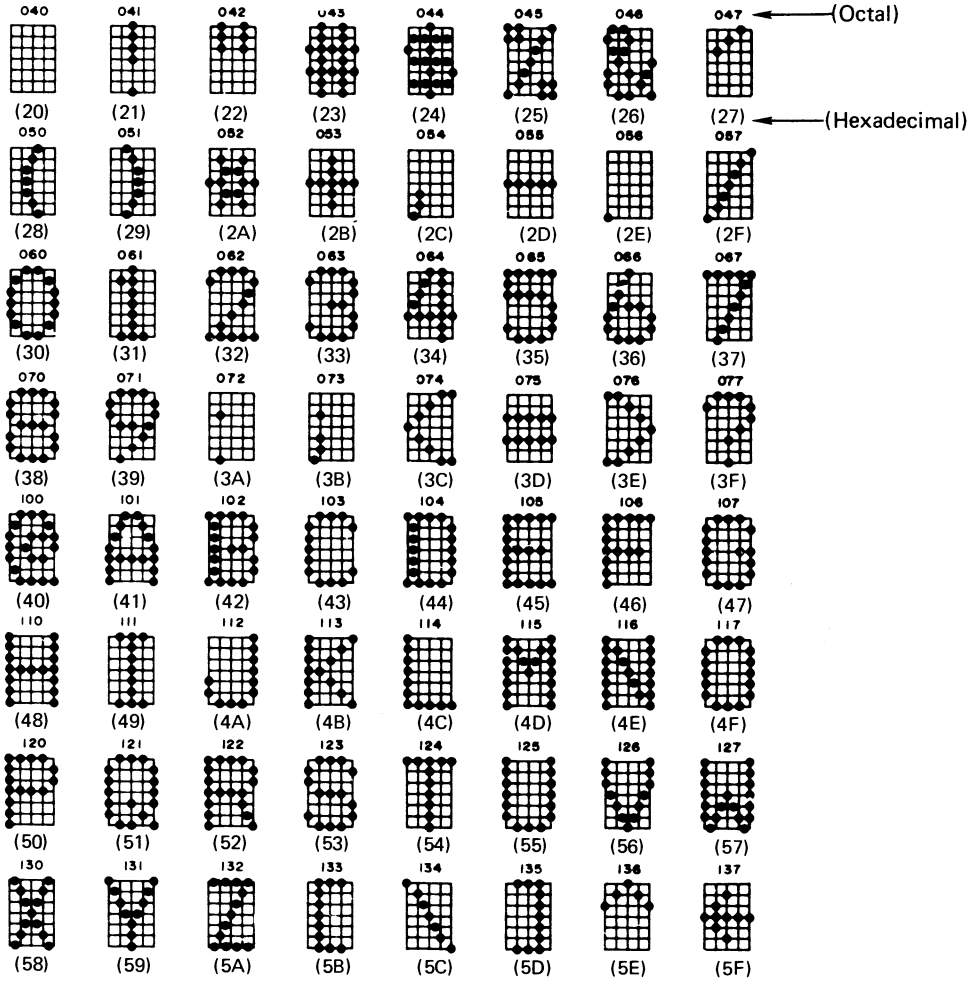
Operating Environment
50°F to 90°F (10°C to 32°C)
40% to 60% relative humidity

Fuses
6 amp slo-blo, 5 amp, 2 amp

Accessories
1000 sheets full width continuous form paper, warning label, paper rack.

Appendix C

Character Set



NOTE:

There are nine locations (lines and spaces) usable in each row of the matrix, but no two locations can be used consecutively.

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