



DIGITAL  
RESEARCH®

**DR Draw™**

Graphic Application

# User's Guide Supplement

for CP/M-86® and Concurrent CP/M™  
on the IBM® Personal Computer



**DIGITAL  
RESEARCH®**

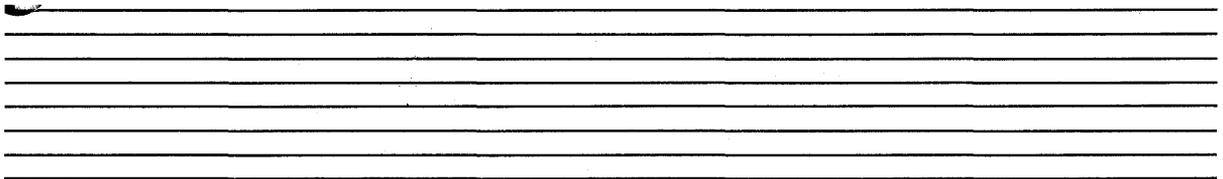
**DR Draw™**

Graphic Application

**User's Guide Supplement**

for CP/M-86® and Concurrent CP/M™

on the IBM® Personal Computer



COPYRIGHT

Copyright © 1983 by Digital Research Inc. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise, without the prior written permission of Digital Research, Post Office Box 579, Pacific Grove, California, 93950.

Readers are granted permission to include the example programs, either in whole or in part, in their own programs.

DISCLAIMER

Digital Research makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Further, Digital Research reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Digital Research to notify any person of such revision or changes.

TRADEMARKS

Digital Research and CP/M-86 are registered trademarks of Digital Research Inc. Concurrent CP/M, DR Draw, GSX-86, and SpeedStart are trademarks of Digital Research. Epson is a registered trademark of Epson America, Incorporated. FX-80, FX-100, GRAFTRAX Plus, MX-80, and MX-100 are trademarks of Epson America, Incorporated. Hewlett-Packard is a registered trademark of Hewlett-Packard Corporation. IBM is a registered trademark of International Business Machines. Hercules Graphics Card is a trademark of Hercules Computer Technology. Mouse Systems is a trademark of Mouse Systems Corporation.

The DR Draw Graphic Application User's Guide Supplement for CP/M-86 and Concurrent CP/M on the IBM Personal Computer was prepared using the Digital Research TEX™ Text Formatter and printed in the United States of America.

\*\*\*\*\*  
\* First Edition: December 1983 \*  
\* Release: 1.0 \*  
\*\*\*\*\*

# Foreword

---

## **DR Draw**

DR Draw™ for the CP/M-86® and Concurrent CP/M® operating systems on the IBM® Personal Computer lets you create many types of charts, diagrams, report covers, and drawings. Whatever you create can be printed on paper, transparencies, or film for reports and presentations.

Your DR Draw package comes with Graphics System Extension (GSX-86™), a special program that adds graphic capabilities to your operating system and lets you use several types of printers, plotters, and other output devices. GSX-86 also lets you use many graphics programs developed by Digital Research® and other software manufacturers.

This manual is a supplement to the DR Draw Graphic Application User's Guide (cited as DR Draw User's Guide).

---

## **DR Draw PACKAGE**

The DR Draw package contains four diskettes: two DR Draw program diskettes and two library diskettes. The DR Draw program diskette that you use depends on whether your computer has an 8087 microchip.

- If your computer has an 8087 microchip, use the DR Draw program diskette labelled "DR Draw 8087."
- If your computer does not have an 8087 microchip, use the DR Draw program diskette labelled "DR Draw."

---

Each DR Draw program diskette contains the following files:

- DR Draw program files
- SpeedStart™, the CP/M-86 operating system and a subset of CP/M-86 utility programs
- GSX-86 files
- README.DOC information file
- GINSTALL program file
- a preconfigured set of fonts
- a preconfigured set of device drivers

The DR Draw library diskettes contain two program libraries:

- a complete device driver library of GSX programs necessary to support many types of printers and plotters other than those in the preconfigured set of device drivers on the DR Draw program diskette
- a complete library of font styles for use with DR Draw

Changing font styles is explained in "Copy Files" in Section 3 of this supplement and in Appendix A of the DR Draw User's Guide.

---

**SUPPLEMENT  
OVERVIEW**

This supplement describes how to install DR Draw on your computer. It contains three sections and an appendix. Section 1 describes the system requirements for DR Draw. Section 2 explains how you:

- 
- copy your DR Draw program diskette to create a work diskette
  - check the README.DOC file
  - use GINSTALL to reconfigure the device driver files if necessary
  - format a diskette to store the picture files you create with DR Draw
  - start DR Draw

Section 2 includes an installation checklist in case you have a problem starting DR Draw.

Section 3 explains how to display a directory of files, erase files on a diskette, check the remaining space on a diskette, and copy files. Appendix A describes the plotter configuration and communications protocol.

---

## **CONVENTIONS**

Whenever you insert a diskette in a drive, you must log it in, so CP/M-86 knows you changed diskettes. To log in a diskette, you press and hold the CONTROL (Ctrl) key and type the letter C after you insert the diskette in the drive. In this supplement, logging in a diskette is referred to as pressing Ctrl-C. If you are using DR Draw with Concurrent CP/M, you do not need to press Ctrl-C.

In this supplement, colored type displays information that appears on your monitor. Boldface colored type indicates information that you type.



# Table of Contents

---

## 1 System Requirements

Introduction . . . . .	1-1
Minimum Components . . . . .	1-1
Optional Components . . . . .	1-1
Preconfigured Set of Device Drivers . . . . .	1-2
Using a Mouse . . . . .	1-2
Graphics Cursor Movement . . . . .	1-3

## 2 Installing DR Draw

Introduction . . . . .	2-1
Copy Your DR Draw Program Diskette . . . . .	2-2
Use DSKMAINT To Format . . . . .	2-2
Use DSKMAINT To Copy Diskettes . . . . .	2-4
Check the README.DOC File . . . . .	2-6
Use GINSTALL To Change Device Drivers . . . . .	2-7
Format a Diskette . . . . .	2-7
Start DR Draw . . . . .	2-8
DR Draw with CP/M-86 Speedstart . . . . .	2-8
DR Draw with Concurrent CP/M . . . . .	2-9
Installation Checklist . . . . .	2-10

## 3 More about CP/M-86

Introduction . . . . .	3-1
Display a Directory . . . . .	3-1
Erase a File . . . . .	3-2
Check Remaining Space on Diskettes . . . . .	3-3
Copy Files . . . . .	3-4

# Appendix

---

<b>A</b>	<b>Plotter Configuration . . . . .</b>	<b>A-1</b>
----------	--	------------

# Section 1

## SYSTEM REQUIREMENTS

---

### INTRODUCTION

DR Draw is easy to install and use on your microcomputer system. This section explains what you need to use DR Draw on your IBM Personal Computer with the CP/M-86 or Concurrent CP/M operating system.

---

### MINIMUM COMPONENTS

DR Draw requires the following minimum components:

- 128 kilobytes of Random Access Memory (RAM)
- two double-sided disk drives, or one hard disk and one double-sided disk drive
- graphics card
- graphics monitor (monochrome or color)

If your IBM Personal Computer does not have these minimum components, contact your computer dealer.

---

### OPTIONAL COMPONENTS

In addition to the minimum components, you can have devices such as the following attached to your computer:

- printer
- mouse
- camera
- plotter

---

**PRECONFIGURED SET  
OF DEVICE DRIVERS**

GSX-86 contains programs that give graphics capability to your operating system and control the output devices attached to your computer. These programs are called device drivers.

For your convenience, device drivers for the most popular output devices are on your DR Draw program diskette. If the output devices on your computer are listed below, the preconfigured device drivers on the DR Draw program diskette do not need to be changed. If you have other output devices that are included in the GSX device driver library, refer to "Use GINSTALL to Change Device Drivers," in Section 2.

- IBM Color/Graphics Monitor Adapter card
- Hewlett-Packard® 7470A or 7475 Graphics Plotter configured according to the instructions in Appendix A (for use with CP/M-86, but not with Concurrent CP/M)
- one of the following printers:

IBM 80 CPS Graphics Printer  
Epson® MX-80 with GRAFTRAX Plus  
Epson MX-100  
Epson FX-80™  
Epson FX-100™

---

**USING A MOUSE**

If you have a GSX-supported mouse, such as the PC Mouse by Mouse Systems™, you can use it with DR Draw to make menu selections and to draw. The DR Draw User's Guide tutorial tells you more about how you use a mouse with DR Draw. The README.DOC file provides information about installing mice that are supported in the GSX device driver library.

If you want to use the keyboard instead of the mouse, follow the instructions in the DR Draw User's Guide.

---

**GRAPHICS CURSOR  
MOVEMENT**

When you create drawings with DR Draw, a graphics cursor appears, showing you your location on the drawing surface. To move the graphics cursor, use the arrow keys. The graphics cursor has two speeds: fast and slow. DR Draw lets you switch between the fast and slow speeds by pressing the INSERT (Ins) key. When you start DR Draw, the cursor speed is fast. To switch to the slow speed, press the Ins key before you press an arrow key. After you switch to the slow speed, you will notice the cursor moves a smaller distance. To return to the fast speed, press the Ins key again before you press an arrow key.

End of Section 1



## Section 2

# INSTALLING DR DRAW

---

### INTRODUCTION

After checking the system requirements, you are ready to install DR Draw. This section describes the following procedures:

- duplicate your DR Draw program diskette to create a work diskette
- check the README.DOC file on your work diskette
- use GINSTALL to change the device drivers on the work diskette if necessary
- format a diskette to store the picture files you create with DR Draw

After you complete these tasks, turn to "Start DR Draw," in this section.

If you have the equipment listed in Section 1 and know how to do the tasks listed above, proceed with these tasks to protect your investment. If you need help with these tasks, this section contains step-by-step instructions.

**Note:** The information provided in this supplement does not replace the manuals that came with your computer and operating system.

The procedures described in this supplement assume your computer has two double-sided floppy disk drives. If your computer has a hard disk and one double-sided floppy-disk drive, refer to your operating system manual for details on how to copy and format diskettes.

---

To use DR Draw with the Concurrent CP/M operating system, you need to format and copy diskettes using the DSKMAINT program that is part of Concurrent CP/M rather than using the CP/M-86 DSKMAINT program on your DR Draw program diskette. To do this, perform the tasks in this section after you load Concurrent CP/M. The processes are the same.

---

**COPY YOUR DR Draw  
PROGRAM DISKETTE**

Before you use DR Draw, copy the program diskette. The duplicate becomes your work diskette. After you make your work diskette, store the DR Draw program diskette in a safe place away from magnets, magnetized elements, dust, humidity, extreme heat, and temperature changes. By copying the DR Draw program diskette, you can create another copy of DR Draw if you accidentally damage your work diskette.

The following steps guide you through DSKMAINT, the program that you use to format and copy a diskette. The procedure assumes your computer has two double-sided floppy disk drives.

---

**Use DSKMAINT  
To Format**

The steps below tell you how to use DSKMAINT to format a diskette.

1. Insert the DR Draw program diskette in drive A. Ensure the operating system prompt, A>, appears on the monitor.
2. Insert the diskette to be formatted in drive B. If you use a diskette that has information stored on it, the DSKMAINT procedure destroys all information it contains.

- 
3. Type DSKMAINT as shown here:

A>DSKMAINT

Press the RETURN key, ↵.

The following message appears on your monitor.

Main Menu  
SELECT FUNCTION

F1 ---> Verify a diskette  
F3 ---> Copy from one Diskette to another  
F5 ---> Format a Single Sided Diskette  
F7 ---> Format a Double Sided Diskette  
F9 ---> Exit this program

4. Press F7 to format a double-sided diskette. The following message appears on your monitor.

Format a Double Sided Diskette  
SELECT DISKETTE TO FORMAT

F2 ---> A:  
F4 ---> B:

F10---> Exit to main menu

5. Press F4 to format the diskette you inserted in disk drive B. At this point, DSKMAINT warns you that formatting the diskette destroys any data on the diskette and asks:

Is this what you want to do (Y or N)?

If you type N for no, DSKMAINT returns you to the Formatting Menu. If you type Y for yes, the message below appears on your monitor to tell you the diskette is being formatted:

Formatting the Diskette in Drive B:  
Formatting track 0

- 
6. When DSKMAINT has finished formatting your diskette track by track, it automatically writes information on the first track of the diskette that is required for the operating system. DSKMAINT then verifies the diskette contents track by track, counting down the tracks as it works. The message on your monitor changes to:

Verifying track n

The lowercase n appears on your monitor as the track number that DSKMAINT is verifying.

7. When DSKMAINT is through verifying the contents of the diskette on drive B, the Formatting Menu shown in step 4 returns to your monitor. Press F10 to return to the Main Menu.

---

#### **Use DSKMAINT To Copy Diskettes**

After you format a diskette, you are ready to make a duplicate of the DR Draw program diskette. Follow the steps below.

1. When you finished formatting, you pressed F10 in response to the Formatting Menu to return to the Main Menu shown here:

Main Menu  
SELECT FUNCTION

F1 ----> Verify a diskette  
F3 ----> Copy from one Diskette to another  
F5 ----> Format a Single Sided Diskette  
F7 ----> Format a Double Sided Diskette  
F9 ----> Exit this program

---

To copy from one diskette to another, press F3. The following message appears on your monitor:

```
Copy from one Diskette to another
SELECT SOURCE DISKETTE
```

```
F2 ---> A:
```

```
F4 ---> B:
```

```
F10---> Exit to main menu
```

2. Press F2 to select the diskette in drive A as the source diskette. The following message appears:

```
Copy from one Diskette to another
SELECT DESTINATION DISKETTE
```

```
F2 ---> A:
```

```
F4 ---> B:
```

```
F10---> Exit to main menu
```

3. Press F4 to select the diskette in drive B as the destination diskette. DSKMAINT warns you that the copying procedure destroys any data that already exists on the destination diskette and asks:

```
Is this what you want to do (Y or N)?
```

4. Type Y for yes to proceed with copying. If you type N for no, DSKMAINT returns you to the Copy Menu.
5. DSKMAINT tells you which diskette is the source and which is the destination diskette and displays the track number as it is written and checked to ensure accurate copying.

- 
6. After DSKMAINT finishes copying, the Copy Menu reappears on the monitor. Repeat the copy process, steps 1 through 6, if you wish to duplicate the library diskettes. When you are done copying, press F10 to return to the Main Menu. Then press F9 to exit DSKMAINT.

Label and date your DR Draw work diskette and any other duplicates you made. Put the DR Draw distribution diskettes in a safe place.

---

**CHECK THE  
README.DOC FILE**

The README.DOC file on the DR Draw work diskette provides information on installing mice and on using GINSTALL. It also lists the files on the DR Draw program and library diskettes. Display or print the contents of the README.DOC file before you continue.

The TYPE command shown below displays the README.DOC file from your work diskette in drive A on your monitor. To print the README.DOC file at the same time that it is displayed, press and hold the Ctrl key and the letter P before you type the command. To stop printing what is displayed on the monitor, press Ctrl-P again. If you changed diskettes, press Ctrl-C.

**A>TYPE README.DOC**

If the output devices attached to your computer are among those in "Preconfigured Set of Device Drivers," in Section 1, turn to "Format a Diskette," in this section. If your output devices differ, you need to change the device drivers on your DR Draw work diskette. Refer to "Use GINSTALL to Change Device Drivers."

**USE GINSTALL  
TO CHANGE  
DEVICE DRIVERS**

The GINSTALL program on your DR Draw work diskette tells you what device drivers are in the device driver library on your DR Draw library diskette. GINSTALL also explains how to change the device drivers on your work diskette. You need to use GINSTALL if you have the following:

- a graphics card or output devices other than those in "Preconfigured Set of Device Drivers," in Section 1
- both a color and a monochrome graphics monitor and you want to draw in color
- a color graphics monitor and you want to draw in color

Follow the five steps below to use GINSTALL.

1. Insert your work diskette in drive A.
2. Ensure the operating system prompt, A>, appears on your monitor. If the prompt is not on your monitor, press and hold the Ctrl, Alt, and Del keys and release all three keys simultaneously.
3. Insert the DR Draw device driver library diskette in drive B. Press Ctrl-C.
4. Type the GINSTALL command as follows:  
  
A>**GINSTALL**
5. Follow the instructions that appear on your monitor.

---

**FORMAT A  
DISKETTE**

You create picture files when you use DR Draw. To save these files, you must store them on a formatted diskette. If you already have a formatted diskette, label it to store your DR Draw picture files and turn to "Start DR Draw," in this section.

---

To format a new diskette or reformat a used diskette, follow the DSKMAINT procedure for formatting a diskette, as described in "Copy Your DR Draw Program Diskette." If you format a diskette that contains files, DSKMAINT removes all the files on it. If you are using DR Draw with Concurrent CP/M, use the DSKMAINT program that is part of your Concurrent CP/M operating system.

---

**START DR Draw**

You have completed five procedures preparatory to starting DR Draw.

- You copied the DR Draw program diskette to create your work diskette.
- You checked the README.DOC file on your work diskette.
- You used GINSTALL to change device drivers on your work diskette, if necessary.
- You stored the DR Draw program and library diskettes in a safe place.
- You formatted and labeled a diskette to store the picture files you create with DR Draw.

---

**DR Draw with  
CP/M-86 SpeedStart**

You are now ready to use DR Draw. To start DR Draw using CP/M-86 SpeedStart on your work diskette, insert your work diskette in drive A and the formatted diskette for your DR Draw picture files in drive B. If the CP/M-86 system prompt is on your monitor, press Ctrl-C. If the CP/M-86 system prompt is not on your monitor, press and hold the CONTROL (Ctrl), the ALTERNATE (Alt), and the DELETE (Del) keys and release all three keys simultaneously.

---

When you see the system prompt on your monitor, type the GRAPHICS command shown below.

**A>GRAPHICS**

Press the RETURN key.

The GSX-86 copyright message appears and tells you that GSX-86, the program that gives your operating system graphics capability and controls the output devices, is available for use. After the GSX-86 copyright message, the CP/M-86 system prompt, A>, appears. Type DRAW or DRAW87 depending on whether you used the "DR Draw" or "DR Draw 8087" program diskette to make your work diskette. If you do not have an 8087 microchip, type the following:

**A>DRAW**

If you have an 8087 microchip, type the following:

**A>DRAW87**

A DR Draw message appears on your monitor as DR Draw is loaded into memory. You then see the DR Draw Main Menu. You are now ready to turn to your DR Draw User's Guide, which tells you how to create graphic designs with DR Draw.

---

**DR Draw with  
Concurrent CP/M**

To start DR Draw using your Concurrent CP/M operating system, insert the disk labelled "Boot Disk" in drive A. Press and hold the CONTROL (Ctrl), ALTERNATE (Alt), and DELETE (Del) keys. Release all three keys simultaneously. When the Concurrent CP/M operating system prompt, B>, appears on your monitor, remove your operating system diskette from drive A and insert your DR Draw work diskette. Type the GRAPHICS command and the DRAW or DRAW87 commands as described above.

If you have an 8087 microchip and your work diskette is a copy of "DR Draw 8087," you need to type the following command line before you start DR Draw:

**B>CHSET A:DRAW[8087=ON]**

---

This command permanently sets your work diskette for the 8087 microchip.

---

**INSTALLATION  
CHECKLIST**

If you have a problem starting DR Draw, use the checklist below to ensure you have completed all necessary steps.

- Is your computer turned on?
- Is the operating system prompt on your monitor?
- Did you use the correct DR Draw program diskette when you created your work diskette?
- Did you put your work diskette in drive A?
- Did you use the GINSTALL program to change the device drivers on your DR Draw work diskette, if necessary?
- Did you type the GRAPHICS command followed by the DRAW or DRAW87 command to start DR Draw?

End of Section 2

## Section 3

### MORE ABOUT CP/M-86

---

#### INTRODUCTION

In addition to CP/M-86 and the DSKMAINT program, the DR Draw program diskette contains four programs that let you do the following:

- display a directory of all the files on a diskette
- erase a file you created
- check the amount of space remaining on a diskette
- copy files

This section contains a brief description of these programs.

**Note:** If you are using DR Draw with Concurrent CP/M, you must use the equivalent programs that came with the Concurrent CP/M operating system.

---

#### DISPLAY A DIRECTORY

The DIR command lets you display a directory of all the files on a diskette.

To display a directory of files on your work diskette in drive A, do the following:

1. Ensure your work diskette is in drive A and the system prompt, A>, is on your monitor. Press Ctrl-C.
2. Type the following DIR command:

**A>DIR**

Press the RETURN key.

The directory of files on your work diskette in drive A appears on your monitor.

To display a directory of files on a picture file diskette in drive B, do the following.

1. Ensure your work diskette is in drive A and the system prompt, A>, appears on your monitor.
2. Insert the picture file diskette in drive B. Press Ctrl-C.
3. Type the DIR command followed by the drive identifier and a colon as shown below:

A>DIR B:

Press the RETURN key.

The directory of files on the picture file diskette in drive B appears on your monitor.

---

#### **ERASE A FILE**

The ERA command lets you erase files that you no longer need so you can increase the amount of available storage space on a diskette. Use this command carefully. After you erase a file, the only way to re-create it is to enter the information again.

To erase a picture file on the work diskette in drive A, do the following:

1. Insert the work diskette in drive A and ensure the system prompt is on your monitor. Press Ctrl-C.
2. Type ERA, the filename, and the filetype as shown in the following example. DR Draw picture files always have a filetype of PIX.

A>ERA CHART1.PIX

Ensure you typed the correct filename and press the RETURN key. When the system prompt returns, the file called CHART1.PIX has been erased from the work diskette in drive A.

---

To erase a file on a picture file diskette in drive B, do the following:

1. Ensure your work diskette is in drive A and the system prompt, A>, appears on your monitor.
2. Insert the diskette that contains the file you want to erase in drive B. Press Ctrl-C.
3. Type ERA followed by the drive identifier, a colon, the filename, and the filetype. For example, to erase a file called CHART2.PIX from the diskette in drive B, type the following command:

A>ERA B:CHART2.PIX

Ensure that the filename and filetype are correct, then press the RETURN key. When the system prompt reappears on the monitor, the file called CHART2.PIX has been erased.

---

**CHECK REMAINING  
SPACE ON DISKETTES**

To check the amount of space remaining on a diskette, use the STAT command. The STAT command lets you check how much space remains on the work diskette and on your picture file diskettes. The following examples show you how to use the STAT command.

1. To check how much space remains on the work diskette and a picture file diskette, insert the work diskette in drive A and the picture file diskette in drive B. Press Ctrl-C. Type the following STAT command to check the remaining space on both diskettes.

A>STAT

---

The following message appears on your monitor:

```
A:RW, Free Space:    48k
B:RW, Free Space:    314k
```

The message tells you that 48 kilobytes remain on the diskette in drive A and 314 kilobytes remain on the diskette in drive B. The RW in the message tells you that the diskettes in both drives can be read and written.

2. To check the remaining space on a picture file diskette in drive B, ensure your work diskette is in drive A and the system prompt is on your monitor. Insert the picture file diskette in drive B. Press Ctrl-C. Then type the STAT command, the disk drive identifier, and a colon as shown here:

```
A>STAT B:
```

The message on your monitor says:

```
B:RW, Free Space:    92k
```

The message tells you that 92 kilobytes are available on the diskette in drive B and that you can read and write to the diskette.

---

## COPY FILES

The PIP command lets you copy files from one diskette to another. You need to use PIP if you want to change the DR Draw font styles on your work diskette. The font styles on your DR Draw font library diskette are discussed in Appendix A of the DR Draw User's Guide. You can have three font styles on your work diskette. The font styles you select from the library diskette must be renamed with the following filenames when they are copied to your work diskette: FONTA.BIN, FONTB.BIN, and FONTC.BIN.

---

To change the font style called FONTA.BIN on your work diskette, select the font style you want by looking in Appendix A of the DR Draw User's Guide. Appendix A also contains the library diskette filenames for the fonts. The following example shows you how to use the PIP command to copy and rename a file called GOTITA.16 to FONTA.BIN.

1. Insert your work diskette in drive A and ensure the operating system prompt is on your monitor.
2. Insert the DR Draw font library diskette in drive B. Press Ctrl-C.
3. Type the following PIP command:

```
A>PIP A:FONTA.BIN=B:GOTITA.16
```

This command copies the file called GOTITA.16 from the library diskette in drive B to your work diskette in drive A and renames it FONTA.BIN. The file remains on the library diskette with its original filename of GOTITA.16.

End of Section 3



## Appendix A

# PLOTTER CONFIGURATION

---

If you are using DR Draw with CP/M-86, you can use the Hewlett-Packard 7470A or 7475 Graphics Plotter. Configure the plotter as follows:

- option 1 (RS-232-C/CCITT V.24)
- null modem cable
- plotter configured with the communications protocol:

8-bit ASCII  
no parity  
1 stop bit  
9600 baud

There are two communications ports on the IBM Personal Computer: communications port 1 and communications port 2. Connect the plotter to communications port 1.

Refer to the operator's manual for the plotter or contact your computer dealer for details on the preceding communications protocol.

End of Appendix A

# NOTES

# NOTES

