UniForm

User's Guide

Preface

Congratulations on your decision to purchase UniForm. It will open new avenues of communication between your computer and many others, giving you the ability to exchange diskettes full of information with people using other types of computers. We think you'll agree that UniForm is one of the best additions you've ever made to your computer system.

UniForm allows you to redefine the operating format of one of your floppy disk drives. You manipulate the data on the diskette with the tools you normally use: word processors, file transfer utilities, or other programs. UniForm is invisible to you when it is in use.

This manual assumes that you have a basic working knowledge of your computer system and the programs you will be using. If you have not yet learned to use COPY (for copying files between diskettes) and CHKDSK (for checking how much room is left on a diskette), you should read your DOS manuals and use a practice diskette to learn the basics of them. Once you know the basics, you can move on to UniForm.

This user's guide will provide practical examples to supplement the self-prompting menus of UniForm. If you want to know more about what UniForm does, read the introduction, which follows. When you're ready to start using UniForm, take just a moment to read about the conventions; then you'll quickly be on your way.

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1.0 Introduction

Since the introduction of the IBM PC, PC-DOS and the PC-DOS disk format have been accepted as the standard for many new computers. However, a large number of 5 inch diskette based CP/M computers exist in offices and homes around the world. Many of these computers are using the same databases, spreadsheets, and word processors that the MS-DOS computers are using, and the **data files are compatible**. Only the diskette formats aren't.

In the past, when data files had to be moved from a CP/M disk to a PC-DOS disk, people struggling with this problem used various means to get around it. For example, they transmitted data serially through a cable or used primitive file conversion programs to convert files from one diskette to another. These methods were time-consuming, laborious, and sometimes very expensive. Now that UniForm is available, information can be moved between computers quickly and easily.

UniForm gives you the ability to directly read and write diskettes from almost all of the popular CP/M computers and to initialize blank diskettes in the format of your choice. UniForm is also easy to use; it has clear, self-prompting menus and sensible warning messages. It works on your existing IBM PC or compatible computer with no modifications.

UniForm is so easy to use that you will rarely need these written instructions. Once you have invoked UniForm to select a diskette format to work in, you simply use the DOS commands you are already familiar with (such as COPY, your word processor, or database) to create, move, and manipulate text or data. (Your computer works the same way it always did). Databases, spreadsheets, and documents created on a CP/M computer can then be used directly on the IBM PC. To help you get familiar with UniForm, we have provided directions that are as concise as possible and we have included plenty of practical examples.

Take a moment to read about the conventions used in this manual. Everything will then be much easier to understand.

1.1 Conventions Used in This Manual

To make reading this guide a little easier, we have clarified certain conventions and phrases:

- "RETURN" or "<cr>" means that you should press the **RETURN** key.

- "<ctrl>" in front of a character means that you should hold the **CONTROL** key down while pressing the character specified (just as with the **SHIFT** key).

- When a command to the computer is shown, your inputs will appear in **boldface**.

- The word "format" is used several ways in the computer world, which can lead to some confusion.

  In this guide, the word "format" is used to describe the layout of the data on a diskette. Different computers lay out the data differently and therefore use different diskette formats.

  In some manuals, the word "format" refers to the process of initializing a diskette to a particular format. Often this process is referred to as "formatting a diskette." To eliminate confusion, we will refer to the process as "initializing a diskette to a particular format."

- Your computer needs to have a special type of diskette placed in drive A after the power is turned on. Putting the diskette in causes DOS to be loaded, and the "A>" prompt then appears on the screen. We will refer to this type of diskette as a "DOS system diskette." It has to contain at least the DOS operating system and probably has one or two more utility programs on it. If you have an IBM PC-XT that loads DOS from your hard disk, your hard disk drive is considered to be your "DOS system disk."

- The UniForm program will allow you to change the operating format of one of your floppy disk drives (usually drive B on a dual floppy drive computer). We will refer to this disk drive as the "UniForm drive."

The first step in using UniForm is to make a working copy of your diskette. Follow the directions in Section 2.0 of the manual and you'll be using UniForm in no time.

1.2 System Requirements

Check the system requirements listed here to make sure that you have everything needed for proper operation of UniForm:

- IBM PC, IBM PC-XT, IBM PC-AT, or 100% compatible computer
- two floppy disk drives or one fixed disk drive and one floppy disk drive
- 128K memory
- PC-DOS/MS-DOS version 2 or higher

2.0 Making a Working Copy

The first thing to do is to make a working copy and save the original diskette as a backup. Use the following procedure to create a working copy of UniForm on your DOS system diskette.

1) Turn on your computer and insert your DOS system diskette. Make sure that you have the DOS system prompt "A>" before you proceed to the next step.

2) Place your UniForm master diskette into an available disk drive.

3) Now copy the UniForm files to the DOS system diskette. For our example, we will assume that you put the master UniForm diskette into drive B. If you inserted it into a drive other than B, substitute the correct drive letter in place of the B in the following command:

   A>copy b:*.* a:<cr>

   If you receive an "Insufficient disk space" error message while you are copying the UniForm files, it means that the diskette you are copying to is full. In this case, you must either erase some files from your DOS system diskette, using the DEL command, or try using another diskette and repeating the steps until you are successful.

4) UniForm should now be on your DOS system diskette. You can therefore remove the UniForm master diskette and put it in a safe place.

2.1 UniForm Installation

UniForm must be properly installed on your DOS system diskette before it can be used. Check the system requirements in Section 1.2 to make sure that you have everything needed for proper operation of UniForm.

Use the following procedure to install UniForm on your DOS system diskette:

1) Boot up your system with DOS version 2.0 or higher.

2) If your system diskette has configuration file CONFIG.SYS on it, use your text editor to add a line to it. If your system diskette does not have a configuration file on it already, use your text editor to create the CONFIG.SYS file. Select one of the following lines to put into the configuration file according to the model computer you have:

DEVICE = UNIFORM.SYS (for IBM PC & IBM PC-XT)

DEVICE = UNIFORM.SYS AT = + (for IBM PC-AT)

DEVICE = UNIFORM.SYS AT = + DR = 1 (for BM PC-AT with optional 320K/ 360K 48 TPI disk drive)

If you have an IBM PC-AT, refer to Appendix D before continuing.

3) Boot up your system. If the UniForm device driver has been properly installed, a copyright notice should appear at the bottom of your screen. UniForm is now ready for use.

These instructions should be sufficient for most applications. Since this is a simplified installation, several defaults have been assumed and are discussed here:

- UniForm assumes that it should use the last disk drive on the system. UniForm will determine the last drive by reading the dip switches inside the computer. These switches indicate the number of floppy drives that are installed.

  NOTE: UniForm may not work if the dip switches that indicate the number of floppy drives are set improperly. If this problem is suspected, either set the dip switches inside your computer properly or refer to the DR parameter in Appendix A, Table A-5.

- UniForm will reserve the bottom line of the display for a status line. Information pertaining to the currently selected CP/M format and warning messages will appear in the status line. Any messages in the status line will appear in bright white characters by default.

NOTE: If the reserved status line at the bottom of the screen interferes with other programs that use the same line, it can be suppressed. Refer to the SE parameter in Appendix A, Table A-1.

- UniForm will produce a two tone sound when a warning message is displayed in the status line. If you prefer not to hear this sound, you can disable it. Refer to the AU parameter in Appendix A, Table A-1.

See Appendix A for more detailed installation instructions.

3.0 Using UniForm

UniForm can perform many functions, so you will see several options after you invoke it. One of the most important functions is the selection of the desired diskette format for a floppy drive (which is usually drive C on a two floppy drive system). Once you have used UniForm to select a CP/M diskette format, you can put a diskette of that format into the drive and use it just as you normally would.

The diskette that you want to work on may have come from another make of computer, or you may want to put information on a new diskette and send it to someone with a different make of computer. If you are creating a new disk, you will need to use the diskette initializer function to initialize the diskette to the proper format before you use it.

The most important feature of UniForm is its simplicity. Once you've selected a given CP/M format for your drive, you simply use familiar commands to manipulate data on the diskette. You can work directly on that diskette with your word processor. You can easily copy files between your DOS format and the selected CP/M format by using the COPY command. You can, for example, display the directory of the CP/M diskette by using the DIR command or display the amount of space left on a diskette by using the CHKDSK command.

3.1 Selection of Disk Formats

Disk format selection allows you to choose the operating format for the UniForm drive. Having selected a new format, you can then place a diskette initialized to that format in the drive and use it as you normally would, with any of your DOS programs.

1) Turn on the computer and put in the DOS system diskette containing UniForm (for fixed disk computers follow your normal system loading procedure). At this point the DOS system should prompt "A>".

2) Type the command:

A> **uniform** < cr >

The CP/M format selection menu should appear.

Now look at the screen. At the top is the version of UniForm and the computer make and model it's configured for. Below the version is a line showing the menu number you are looking at and how many menus there are.

Next you'll see a menu in which each entry is made up of a format letter, a diskette type, and a description of the make and model of computer that they are used in. The menu is in alphabetical order.

The diskette types are as follows:

    SS – single sided (only one side is used)
    DS – double sided (both sides are used)
    SD – information is recorded in single density
    DD – information is recorded in double density
    48 – 48 tracks of information per inch (TPI) of diskette
    96 – 96 tracks of information per inch (TPI) of diskette
    8″ – 8 inch floppy diskette

Below the menu is a line showing the currently selected format and the UniForm drive letter. At the bottom is a prompt line showing which options you can enter at this time. Let's try the options out one at a time.

In case you can't remember what the options in the disk format menu are, UniForm has a help screen to explain. Press **?** to see that screen. The disk format menu will then be replaced by the help screen, on which there is a brief description of each available option. After you read the screen, press any key to get back to the format selection menu.

3) Press **A**. The current format shown above the prompt line now corresponds to the format at position "A" of the format selection menu. By simply typing a format letter, you can select the format you want.

4) Press the **SPACE BAR**. The current format shown now indicates no format selected. Pressing the **SPACE BAR** disables the UniForm drive.

5) Press **2**. The menu number indicated now shows that you are on menu 2. Also, the menu of formats has changed to reveal the next group in alphabetical order. Try pressing other menu numbers. Note that when you select a nonexistent menu number, UniForm will beep and print a message near the bottom of the screen. If it does this, just type a good menu number and continue. Take a moment to look at the various menus and, just for fun, try some numbers that don't exist.

6) Find the menu that has the "Osborne 1 [SS:DD:48]" format on it. Press the letter for that format type. The current format should indicate "Osborne 1 [SS:DD:48]" above the prompt line. If you select the wrong format, just select another until you get it right. At this point you have found and selected the format of your choice.

If you have been experimenting enough, you may have noticed that some of the formats display the message "(initialize only)" when selected. These are all DOS formats. You can select them to initialize a disk, then use the diskette with DOS.

If you try to exit the format selection mode with one of these "initialize only" formats selected, you'll receive a warning message and be given the option of ignoring the selected format and exiting or being returned to the format selection menu.

7) Press **RETURN**. UniForm will return you to DOS. If you have followed this procedure correctly, a message indicating which format your UniForm drive has been set to should be printed at the bottom of the screen as UniForm exits. The message should look like this:

    Drive x set to: Osborne 1 [SS:DD:48]

where x indicates the UniForm drive letter.

This message means that UniForm is active. UniForm will stay active until one of the following conditions occurs:

1) The computer's power is turned off.
2) The computer is "reset" by the pressing of < ctrl-alt > del.
3) The **SPACE BAR** is pressed to select "no format" while you are in UniForm's format selection menu.

3.2 Initializing a Diskette

Your DOS system includes a FORMAT program to initialize diskettes to DOS format. UniForm performs the same function for you, but with the following additions:

- UniForm's diskette initializer allows you to select your choice from a menu of formats, including your host format. For example, if you want the diskette to operate in an Osborne 1 computer, simply select "Osborne 1" from the menu. When UniForm is finished initializing the diskette, it will be in the format used by the Osborne 1 computer.

- UniForm checks the integrity of each track on the diskette immediately after it has been initialized. If an error is detected, UniForm will automatically try to initialize that track nine more times before deciding that the diskette has a bad spot there. At the end of the initializing procedure, UniForm will report if it encountered any permanent errors while initializing the diskette.

To use UniForm to initialize a diskette in the Osborne 1 format:

1) Use UniForm to select the "Osborne 1 [SS:DD:48]" format for your UniForm drive.

2) Put a blank diskette to be initialized to "Osborne 1 [SS:DD:48]" format into the UniForm drive. Press < ctrl > I (or **TAB** if your keyboard has a **TAB** key). Note the message: **Initializing a disk will erase any existing data on the disk!** Near the bottom of the screen you'll see that the diskette is going to be initialized in the "Osborne 1 [SS:DD:48]" format. If you change your mind at this point, you can reply by pressing **N** to avoid initialization. If you want to continue, press **Y**.

In the middle of the screen you should see a message alternating between "Initializing" and "Verifying." This message will continue until the diskette is completely initialized. On occasion you may notice a "Retry" followed by a number flashing on the screen. This message tells you that UniForm has detected an error while verifying the current track and is in the process of reinitializing that track. If the error persists after ten tries, UniForm will consider that track to be permanently bad and will continue with the next track.

3) When diskette initialization is complete, a message indicating the number of permanently bad spots on the diskette will be displayed. If there are any at all, you should discard that diskette. The price of a diskette is not worth the misery of losing data that may have taken you hours to create.

Usually there won't be any permanent errors, and the message will confirm that fact. In this case the diskette is ready to use. In either case, press any key when you are ready to continue and you'll be returned to the menu of disk formats.

4) Press the **SPACE BAR** to disable the UniForm drive. Remove the diskette that you initialized to "Osborne 1 [SS:DD:48]" format and press **RETURN** to exit UniForm.

You should now have a diskette that is ready to be used in an Osborne 1 computer (or any computer using UniForm). Hang on to it so you can use it later for learning how to copy files.

In this example, we created a diskette to be used in the Osborne 1 format. However, we could have created one in any of the formats in the menu. UniForm and your computer make a very powerful combination.

3.3 Sample File Copying

If you have read the previous sections on initializing a diskette and selecting CP/M disk formats, you should now be able to copy files between one of your DOS diskettes and a diskette of the format of your choice. The following examples will use the DOS COPY command to copy a file first in one direction and then in the other.

3.3.1 Copying a File from DOS Format to Another Format

For our example, we'll assume that you have a file on your DOS system diskette named SAMPLE.TXT. We want to place the file SAMPLE.TXT on an "Osborne 1 [SS:DD:48]" format diskette (the one initialized in section 3.2).

1) Use UniForm to select the "Osborne 1 [SS:DD:48]" format for your UniForm drive.

2) Put a diskette initialized to "Osborne 1 [SS:SD:48]" format into the UniForm drive. At the DOS prompt, type in the command:

    A> **copy sample.txt c:<cr>**

    (In this example, "A" is the system drive and "C" the UniForm drive. Fixed disk systems may use different letters.)

    The file SAMPLE.TXT will now be copied from drive A (DOS format) to the "Osborne 1 [SS:DD:48]" format diskette in the UniForm drive. If you get an "Insufficient disk space" error, it means there was not enough room for the file on the receiving diskette.

You can see that copying files with COPY works the same way it always has. In fact, all your programs will work the same as they did before. UniForm is invisible to both you and your programs when it is in operation. You can operate on the Osborne 1 diskette directly, just as though it were in the DOS format.

3.3.2 Copying a File to DOS Format from Another Format

For this example, we'll assume that you have a diskette in your UniForm drive that is in the "Osborne 1 [SS:DD:48]" format (the one initialized in section 3.2). The Osborne diskette has a file on it named SAMPLE.TXT. We want to place the file SAMPLE.TXT on the host format diskette.

1) Use UniForm to select the "Osborne 1 [SS:DD:48]" format for your UniForm drive.

2) Put a diskette initialized to "Osborne 1 [SS:DD:48]" format into the UniForm drive. At the DOS prompt, type in the command:

    A> **copy c:sample.txt a:<cr>**

    ("A" is the system drive and "C" the UniForm drive. Fixed disk systems may use different letters.)

    The file SAMPLE.TXT will now be copied from the UniForm drive (Osborne 1 format) to the DOS format diskette in drive A. If you get an "Insufficient disk space" error, it means there was not enough room for the file on the receiving diskette.

You can see that copying files with COPY works the same way it always has. In fact, all your programs will work the same as they did before. UniForm is invisible to both you and your programs when it is in operation. You can operate on the Osborne 1 diskette directly, just as though it were in DOS format.

4.0 Advanced Features

This section describes the many advanced features of UniForm. Although the terminology is as simple as possible, it is geared to the experienced computer user.

4.1 Invoking UniForm Functions from the Command Line

Often it is desirable to perform certain UniForm operations without having to type responses to many prompt lines. UniForm has the capability of changing CP/M disk formats and initializing diskettes by entering the responses to each prompt on the command line. This is sometimes referred to as batch processing of commands. Batch processing is very useful if you have to change CP/M formats or initialize a diskette from a BATCH file.

To use this feature, you must know every key that you type in response to each prompt line. These keys are then typed after the UNIFORM command.

Before using UniForm functions from the command line, you should be aware of the following important points:

- At least one blank should be present between the UNIFORM command and the prompt responses. After that point, blanks are ignored and can therefore be inserted between keystrokes to make the command more readable.

- Control characters cannot be entered on a command line, so UniForm will accept the following character sequences in place of certain keys:

    /c   It is often desirable to accept a response from the keyboard in the middle of a command string. If the **/c** sequence is used in place of a keystroke, UniForm will wait for the next response from the keyboard before continuing.

/e The **/e** sequence is used in place of the **ESC** key. The **ESC** key can be used instead of the **RETURN** key when you want to exit the format selection menu and go back to the DOS system prompt.

/i The **/i** sequence is used in place of the **<ctrl>I** key to indicate that you want to initialize a disk in the currently selected format. Be careful if you use this sequence, since initializing a disk erases everything on it.

/q This is the "quiet" option, and it doesn't replace any key. It is used in a command line when you don't want any console output to be sent to the screen. If you don't want any console output at all, you must enter the **/q** sequence as the first option in the command line. Once the quiet option has been used, there is no way to turn the console output back on. Remember that if you have specified the quiet option and you are then prompted for a response, the prompt line will not be displayed and UniForm may appear to lock up. UniForm isn't really locked up, however; it's just waiting for you to type the proper response to its invisible prompt line.

/r The **/r** sequence is used in place of the **RETURN** key. Anywhere you would normally press the **RETURN** key, you will need to use this sequence instead, since a **RETURN** cannot be imbedded in a command line.

/s The **/s** sequence is used in place of the **SPACE BAR**, since spaces are ignored in the command line.

4.1.1 UniForm Batch Processing Examples

The following UniForm batch processing commands are provided as examples. They should answer any questions you have about this feature.

A> uniform a /e <cr>

In this example, UniForm's format selection menu will appear, format "A" will be selected as the current CP/M format, and UniForm will then exit to the DOS system.

A> uniform /q a /e <cr>

This command line will perform the same function as in the last example, but UniForm will not display anything on the console.

A> uniform /q /s /e <cr>

This command will enter UniForm's format selection menu, disable the UniForm drive, and then exit back to the DOS system. All this will be accomplished without any console output.

A> uniform /s /r <cr>

In this example, the UniForm drive will be disabled and you will be returned to the DOS system.

A> uniform 2 c /i /c /c /e <cr>

This command line will enter UniForm's format selection menu, switch to menu #2, and select format "C" as the current CP/M format. Next the **/i** will instruct UniForm to initialize a diskette in the current format. The next response that verifies your intent to initialize the diskette will be taken from the keyboard. When you respond by pressing **Y**, the diskette will be initialized. Once the diskette has been initialized, the number of permanent errors discovered will be displayed on the screen, and UniForm will again wait for you to type the next response. This has been done so you will have a chance to see if any permanent errors have been discovered on the diskette just initialized. After you press any key to continue, UniForm will display menu #2, and the **/e** sequence will cause UniForm to exit back to the DOS system. Format "C" on menu #2 will be UniForm's current CP/M format.

4.2 UniForm and Additional Disk Drives

The IBM PC version of UniForm is capable of supporting one 96 TPI disk drive in addition to your existing 48 TPI drive(s). It can also support an additional 8 inch disk drive if you have the proper type of disk controller. Since this capability requires the installation of another disk drive, it should be done only by someone who has the proper hardware knowledge. We cannot supply specific instructions for adding disk drives to your system. If you must use this feature of UniForm and you don't know how to add a drive, contact your computer dealer for assistance.

Before you can access additional disk drives, you must configure UniForm. Refer to Appendix A for instructions on how to do so. You will need to specify the physical drive address of the additional drive and whether your drive is single or double sided.

If you have installed everything properly, UniForm should now be ready to work with your additional disk drives.

4.2.1 Using an Additional Disk Drive with UniForm

Once you have properly configured UniForm for the additional drives, you should notice more formats in UniForm's CP/M format selection menu. You can identify the 96 TPI formats in the menu by the 96 and the 8 inch formats by the 8″ at the end of the "Type" column. When you select a 96 TPI CP/M format from the menu, UniForm will make your 96 TPI drive the UniForm drive. You will still use the same drive letter to reference your UniForm drive, but UniForm will select your 96 TPI drive instead. This will effectively assign more than one disk drive to the same drive letter, but UniForm will use the proper disk drive according to the format you have selected. Similarly, when you select an 8 inch format from the menu, UniForm will make your 8 inch drive the UniForm drive.

Appendix A Configuration

You can easily customize UniForm by adding parameters to the CONFIG.SYS file on your DOS system disk. Configuration will be needed if you add additional disk drives to your system. UniForm always requires that you have at least one 48 TPI disk drive on your system. UniForm can accommodate a 96 TPI disk drive added to your system and will provide you with additional CP/M formats that can be used. The IBM PC version of UniForm will also support an additional 8 inch disk drive, but you must have the proper disk controller. Our technical support staff can provide a list of supported controllers.

Configuration parameters are specified in the "DEVICE = UNIFORM.SYS" line in your CONFIG.SYS file. Refer to section 2.1 of this manual for installation information. Use of the configuration parameters should follow these rules:

- At least one blank must follow the "DEVICE = UNIFORM.SYS" statement before the first parameter is specified.

- Every parameter must have an argument following it.

It is recommended that blanks be inserted between parameters to improve readability, although the blanks are not necessary. An equal sign can be used between a parameter and its argument if desired. See section A.3 for examples of configuration parameters.

A.1 Changing Display Characteristics

The configuration parameters discussed in this section affect the way UniForm interacts with you on the screen and with sound. For examples on the usage of these parameters, see section A.3.

The following table (Table A-1) assumes that you are familiar with these argument types:

FLAG ————— A single character that indicates either true or false. UniForm will accept the following characters for a FLAG:

1 or **+** for true
0 or **–** for false

DIGIT ———— A single character number between 0 and 9.

NUMBER ———— One or more digits. A valid range for a number is 1 to 255.

Table A-1
UniForm Display Configuration Parameters

Parameter	Argument	Default	Description
AU	FLAG	+	The AU parameter controls the two tone audio warning alert. If the flag is true, the tones are generated on a warning condition. The default for this parameter is true.
BC	DIGIT	0	The BC parameter selects the background color for the characters in the status line. It will produce different results depending on the type of display adapter card in your computer. Refer to Table A-3 or A-4 for the value to use for your configuration. The default is 0, and it will produce a black background.
BK	FLAG	–	The BK parameter controls the blinking of the characters in the status line. The default value is false.
CL	NUMBER	0	The CL parameter defines the column in the status line in which the currently selected format is displayed. The default value is 0 (the first displayable column).
FC	DIGIT	7	The FC parameter determines the foreground color for the characters in the status line. It will produce different results depending on the type of video adapter card your computer has. Refer to Table A-2 or A-4 for the value to use for your hardware. The default value is 7, and it will produce white characters.

(continued)

Parameter	Argument	Default	Description
IN	FLAG	+	The IN parameter controls the intensity of the status line. If the parameter is set to true, the status line will appear in increased intensity. The default for this parameter is true.
SE	FLAG	+	The SE parameter determines whether or not the bottom line of the display will be used for a status line. If the status line interferes with the operation of another program, the parameter should be set to false. The default value for this parameter is true.
T1	NUMBER	72	The T1 parameter determines the time duration for a warning message delay unit. This parameter divided by 18 is approximately equal to the number of seconds for a delay unit. The default is 72, or approximately 4 seconds.
T2	NUMBER	3	The T2 parameter specifies the number of delay units in which a warning message will appear on the screen if the status line is enabled. If more than one warning message is needed, UniForm will display each message for one delay unit before switching to the next message. The total time duration for one warning message will be T2 times the delay unit. The default value for this parameter is 3, and it will display each warning message for approximately 12 seconds.

Table A-2
Foreground Color Display Parameters (Color Card)

Foreground Color	Parameters to Specify
Black	FC = 0 IN = –
Blue	FC = 1 IN = –
Green	FC = 2 IN = –
Cyan	FC = 3 IN = –
Red	FC = 4 IN = –
Magenta	FC = 5 IN = –
Brown	FC = 6 IN = –
White	FC = 7 IN = –
Gray	FC = 0 IN = +
Light Blue	FC = 1 IN = +
Light Green	FC = 2 IN = +
Light Cyan	FC = 3 IN = +
Light Red	FC = 4 IN = +
Light Magenta	FC = 5 IN = +
Yellow	FC = 6 IN = +
Bright White	FC = 7 IN = +

Table A-3
Background Color Display Parameters (Color Card)

Background Color	Parameter to Specify
Black	BC = 0
Blue	BC = 1
Green	BC = 2
Cyan	BC = 3
Red	BC = 4
Magenta	BC = 5
Brown	BC = 6
White	BC = 7

Table A-4
Monochrome Card Display Parameters

Video	Parameters to Specify
White Characters	FC = 7 IN = – BC = 0
Reverse Video	FC = 0 IN = – BC = 7
Underlined	FC = 1 IN = – BC = 0
Bright White Characters	FC = 7 IN = + BC = 0
Bright Reverse Video	FC = 0 IN = + BC = 7
Bright Underlined	FC = 1 IN = + BC = 0

A.2 Changing Disk Drive Characteristics

This section is provided for experienced users who add extra disk drives to their computers. When adding drives to your system, note the following points:

- If you have added 8 inch drives to your system, the disk controller must be compatible with the standard IBM PC disk controller. It must also automatically switch into 8 inch mode when an 8 inch drive is selected.

- If you have a properly installed 96 TPI or 8 inch disk drive on your system, you must know its physical drive address in order to configure UniForm. The physical drive address should be a number from 0 to 3 and should not be confused with the logical drive letter (A, B, etc.) that DOS uses to refer to disk drives. A unique physical address is assigned to each drive by a jumper on the drive itself. The first floppy disk drive is usually assigned address 0, the next will be 1, etc.

The configuration parameters discussed in this section describe the characteristics of the disk drives on your computer. For examples on the usage of these parameters, see section A.3.

The following table (Table A-5) assumes that you are familiar with these argument types:

FLAG ———— A single character that indicates either true or false. UniForm will accept the following characters for a FLAG:

        1 or **+** for true
        0 or **−** for false

DIGIT ———— A single character number between 0 and 9.

NUMBER ———— One or more digits. A valid range for a number is 1 to 255.

Table A-5
UniForm Disk Drive Configuration Parameters

Parameter	Argument	Default	Description
AT	FLAG	−	The AT parameter tells UniForm that you have an IBM PC-AT computer with at least 1 high capacity disk drive. Refer to Appendix D for more information. The default for this parameter is false.
DR	DIGIT		The DR parameter tells UniForm which 48 TPI physical disk drive to use. The first floppy disk on the system is numbered 0, the next is 1, etc. This parameter defaults to the highest disk drive number that is connected to your system according to the dip switch settings.
DR8″	DIGIT		The DR8″ parameter gives UniForm the physical drive address for an optional 8 inch disk drive. If you specify a digit from 0 to 3 for this parameter, UniForm will assume that you have an 8 inch disk drive connected to your computer.
DR96	DIGIT		The DR96 parameter gives UniForm the physical drive address for an optional 96

(continued)

Parameter	Argument	Default	Description
			TPI disk drive. If you specify a digit from 0 to 3 for this parameter, UniForm will assume that you have a 96 TPI disk drive connected to your computer.
DS	FLAG	+	The DS parameter is used to select between single sided and double sided 48 TPI disk drives. If the flag is true, UniForm will assume that the 48 TPI disk drive is double sided. If the flag is set to false, it will assume that the 48 TPI disk drive is single sided. The default for this parameter is true.
DS8″	FLAG	+	The DS8″ parameter is used to tell UniForm whether your optional 8 inch disk drive is single or double sided. If the flag is true, UniForm will assume that the 8 inch disk drive is double sided. If the flag is false, it will assume that the 8 inch disk is single sided. The default for this parameter is true.
DS96	FLAG	+	The DS96 parameter is used to tell UniForm whether your optional 96 TPI disk drive is single or double sided. If the flag is true, UniForm will assume that the 96 TPI disk drive is double sided. If the flag is false, it will assume that the 96 TPI disk drive is single sided. The default for this parameter is true.
SD5″	FLAG	−	The SD5″ parameter is used to tell UniForm whether your floppy disk controller supports single density for 5 inch drives. If this flag is true, UniForm will assume that single density will work on your 5 inch drives, and additional formats will appear in the menu. The default for this parameter is false.

(continued)

Parameter	Argument	Default	Description
SD8″	FLAG	+	The SD8″ parameter is used to tell UniForm whether your floppy disk controller supports single density for 8 inch drives. If this flag is true, UniForm will assume that single density will work on your 8 inch drives, and additional formats will appear in the menu. The default for this parameter is true.
ST48	NUMBER	6	The ST48 parameter specifies the step rate in milliseconds that UniForm should use with your 48 TPI disk drives. This number should be between 2 and 32. The default is 6 milliseconds.
ST8″	NUMBER	10	The ST8″ parameter specifies the step rate in milliseconds that UniForm should use with your 8 inch disk drives. This number should be between 1 and 16. The default is 10 milliseconds.
ST96	NUMBER	6	The ST96 parameter specifies the step rate in milliseconds that UniForm should use with your 96 TPI disk drives. This number should be between 2 and 32. The default is 6 milliseconds.
WP	FLAG	+	The WP parameter controls the write protection of 48 TPI formats when used in a PC-AT high capacity drive. Refer to Appendix D for more information. **Use of this parameter is not recommended and is at your own risk.** The default for this parameter is true.

A.3 Examples of Configuration Parameters

Following are a few examples of UniForm parameter lines and a short explanation of their effects:

DEVICE = UNIFORM.SYS AU – FC 6 IN + BC 3

This parameter line will disable the audio warning alert, and the status line will appear with yellow characters on a cyan background.

DEVICE = UNIFORM.SYS AU = – FC = 6 IN = + BC = 3

This parameter line will have the same results as in the first example. It is considered a bit more readable because the equal signs tend to group the parameter with its corresponding argument.

DEVICE = UNIFORM.SYS DR = 1 SE = –

This parameter line instructs UniForm to use physical drive 1 for the 48 TPI UniForm drive. It also disables the status line at the bottom of the screen. If a potential error condition occurs, the warning message will be printed on the screen at the current cursor position.

Appendix B Limitations/Hints

UniForm has a few limitations that you should be aware of:

- There are a number of disk formats that will not work reliably on the IBM PC (specifically because it uses the NEC 765 disk controller chip). Because there is a way around this problem, these formats were not eliminated from the UniForm menu.

  Some manufacturers did not follow disk initialization specifications closely enough. Disks created on these computers may not work properly on some computers, although they will work properly on the machine that they were created on.

  Since the problem exists when disks are initialized on these computers, disks that are initialized on your computer using UniForm will work properly on both computers. If you find a disk that will not work properly, try the following procedure:

  1) Initialize a disk in the proper format using UniForm.

  2) Place the disk that was just initialized into the computer that created the incompatible disk and copy the desired files to this disk using the CP/M PIP command.

  3) Remove the disk and put it back into your computer; you should now be able to use this disk without problems.

  In short, a disk initialized on your computer using UniForm will work in both computers, but a disk created on another computer may not work properly in your computer.

- Using UniForm to copy will not modify the files in any way. It is your responsibility to determine whether or not the copied file will work properly in your computer.

Appendix C Messages

UniForm may occasionally display a message to alert you of a possible error situation. If UniForm's audio warning alert (see the AU parameter in Appendix A) is active, you will hear a two tone sound before a warning message is displayed. If the UniForm status line (see the SE parameter in Appendix A) is active, the warning message will appear at the bottom of the screen for a period of time and then will disappear. If the UniForm status line is not active, the warning message will appear wherever the cursor happens to be on the screen, and it will not be erased after a period of time.

The messages have been made as clear as possible and as concise as space allows. Following are all the warning messages, with a brief explanation of each one.

A bad character was found in a CP/M filename; some files may not be accessible

This message indicates that there is at least one filename in the CP/M directory that contains a character that is invalid in an MS-DOS filename. Following is a display of valid characters for MS-DOS filenames:

A-Z 0-9 ! $ & # % ' ' ( ) – @ { }_

If any CP/M filename has a character that is not in this display, you will not be able to access it on your machine using UniForm. If there is a file that you cannot access because of an invalid character, you should rename the file using valid characters for an MS-DOS filename. You will probably have to perform the renaming function on a CP/M machine because MS-DOS won't let you use the invalid character in the rename command.

A disk format must be selected from the menu before you can initialize

You have tried to initialize the diskette in the UniForm drive without first telling UniForm what format to initialize to. Make your choice from the format selection menu; then perform the initialization.

A file with a nonzero user number was detected in the CP/M directory

This message is trying to warn you that the CP/M diskette that you are using contains at least one file on a user number other than zero. Since MS-DOS does not have user numbers, you should not use CP/M diskettes that have files on a user number other than zero. You may still use this diskette with UniForm, but you should be aware of the following points:

- When this diskette is accessed through UniForm, all the filenames on it from all user numbers will appear in one directory.

- If the CP/M diskette contained files in different user numbers with the same name, unpredictable results may occur if you try to access those files from MS-DOS.

- If you write anything to this CP/M diskette, UniForm will translate all the files on the diskette to user zero. You may read from this diskette without disrupting the files in other user numbers.

Either the directory on your CP/M disk is bad or the selected format is wrong

This message is displayed when UniForm finds something in the CP/M directory that it can't cope with. If you get this message, you should verify that the selected CP/M format matches the format of the diskette that you are trying to access. If you are sure that the format is specified properly, then you can't use that diskette with UniForm.

Not a valid option; try again or press ? for help

The character you pressed did not correspond to any of the allowable inputs. Read the prompt line near the bottom of the screen to find out what the allowable inputs are. If you are unsure what they mean, press ?, and a help screen that explains their functions will appear. Try again when you're ready.

Out of directory space on CP/M disk; deletion of some files will be necessary

The CP/M diskette that you were writing to doesn't have enough space in its directory to hold another file. This isn't a fatal error as long as you delete a file from the CP/M diskette before you remove the diskette from the machine.

Permanent errors were detected when verifying the disk

While initializing the diskette in the UniForm drive, places that would not initialize properly were found. You have either a bad diskette or a hardware problem with your computer. Try another diskette. If you determine that the diskette is bad, throw it away. Bad diskettes cause a lot of misery when you lose valuable data.

Subdirectories are not permitted on CP/M disks and should be removed

This message is telling you that you just created a subdirectory on your CP/M diskette. Since CP/M does not support subdirectories you should remove it (using the RMDIR command) before you bother putting any files into it.

That menu does not exist, use 1 thru

The number you entered while in the format selection menu does not correspond to a valid menu screen. The "#" in the message will be replaced by the highest menu number available when it appears on your computer. Near the top of the screen is a message showing the number of screens available. Use a number in that range and try again.

The UniForm menu must be used to select a CP/M format before this drive is used

This warning message is telling you that you tried to access the CP/M drive through UniForm before telling UniForm what format you wanted to use. You must select a format from the UniForm menu before attempting to access the CP/M drive.

This disk is READ ONLY and cannot be written on with a 96 TPI disk drive

You have selected a 48 TPI format and have attempted to write on it with a high capacity (96 TPI) disk drive. Your high capacity drive was not designed to write diskettes that are usable in 48 TPI drives. Refer to Appendix D for more information.

This selection can only initialize
Do you want to ignore this selection and exit the program (y/n)?

You have tried to set the UniForm drive to an improper format by exiting the format selection menu with an "initialize only" format selected. Only CP/M formats are allowed for the UniForm drive. Press **Y** to return to the main menu with no format selected. Press **N** to go back and select a CP/M format for the UniForm drive.

Warning! Initializing the disk will erase any existing data.
Are you sure that you want to initialize this disk?

Information on a diskette is stored magnetically. Writing new information erases anything that was there previously (just as recording music on a cassette tape does). Initializing a diskette will write information on the entire diskette, so it will wipe out anything that previously existed. Don't initialize a diskette that has any valuable information on it.

Your disk has a write protect label on it

You have just tried to write some information on a diskette, but the "write protect" notch on the diskette is covered. This inhibits the write operation. Remove the tape from the "write protect" notch and try again.

Your UniForm files have different version numbers
UNIFORM.SYS Version X.XX
UNIFORM.EXE Version Y.YY

The UniForm system consists of a device driver UNIFORM.SYS and the format selection menu UNIFORM.EXE. The version numbers of these two files must match before UniForm will proceed. Make a new working copy of UniForm from your master disk and try again.

Appendix D Use on the PC-AT

The IBM Personal Computer AT has a high capacity (96 TPI) disk drive as standard equipment. A 48 TPI disk drive is available as an option and is highly recommended for full use of UniForm's capabilities. UniForm will work in a limited fashion on the PC-AT with the standard high capacity drive if the "AT = +" parameter is specified in the CONFIG.SYS file. When using UniForm on the PC-AT, you should be aware of the following important points:

- UniForm will allow you to read, write, and initialize 96 TPI formats using the high capacity drive.

- When you select a 48 TPI format, the phrase "(read only)" will appear after the description. When this phrase appears, UniForm will not allow you to write to or initialize a diskette using the high capacity drive. This is because the diskette would probably not work reliably when used with a 48 TPI disk drive.

- If you have the optional 48 TPI disk drive, you should specify the "DR = 1" parameter in the CONFIG.SYS file. UniForm will then use your 48 TPI disk drive when you specify a 48 TPI format. This will allow you to read, write, and initialize 48 TPI formats on your PC-AT.

- If you insist on writing or initializing 48 TPI formats in your high capacity drive (you really shouldn't do this), you can specify the "WP = −" parameter in the CONFIG.SYS file. This parameter will override UniForm's write protection and allow you to write and initialize 48 TPI formats on the high capacity drive. **Use of this parameter is not recommended and is at your own risk.** Your high capacity drive was not designed to write diskettes that are usable in 48 TPI drives.

Appendix E Update Policy

Since UniForm is updated periodically with new formats and features, registered users can send in their master diskettes for updating to the latest version. Please note the following policy for updating UniForm master diskettes:

- There is a nominal charge for updating UniForm master diskettes. Contact Micro Solutions for the current update charge before sending your master diskette. Payment for the update must be included with the diskette.

- A registration card for your copy of UniForm must be on file with us before your diskette will be updated. If you did not receive one with your package or if you lost it, contact us and we'll send one to you. You can then return the completed card along with your disk for updating.

- In order to obtain an update, you must send in your original master UniForm diskette. Copies will not be accepted.

- UniForm is available for many different machines, and each version is considered a different product. We will not update your UniForm to run on a different machine.

Appendix F Technical Help

Most questions about UniForm and its operation are answered in this manual. If you are still in need of help, contact Micro Solutions and ask for UniForm technical assistance. Please have your UniForm master diskette and the following information handy before calling:
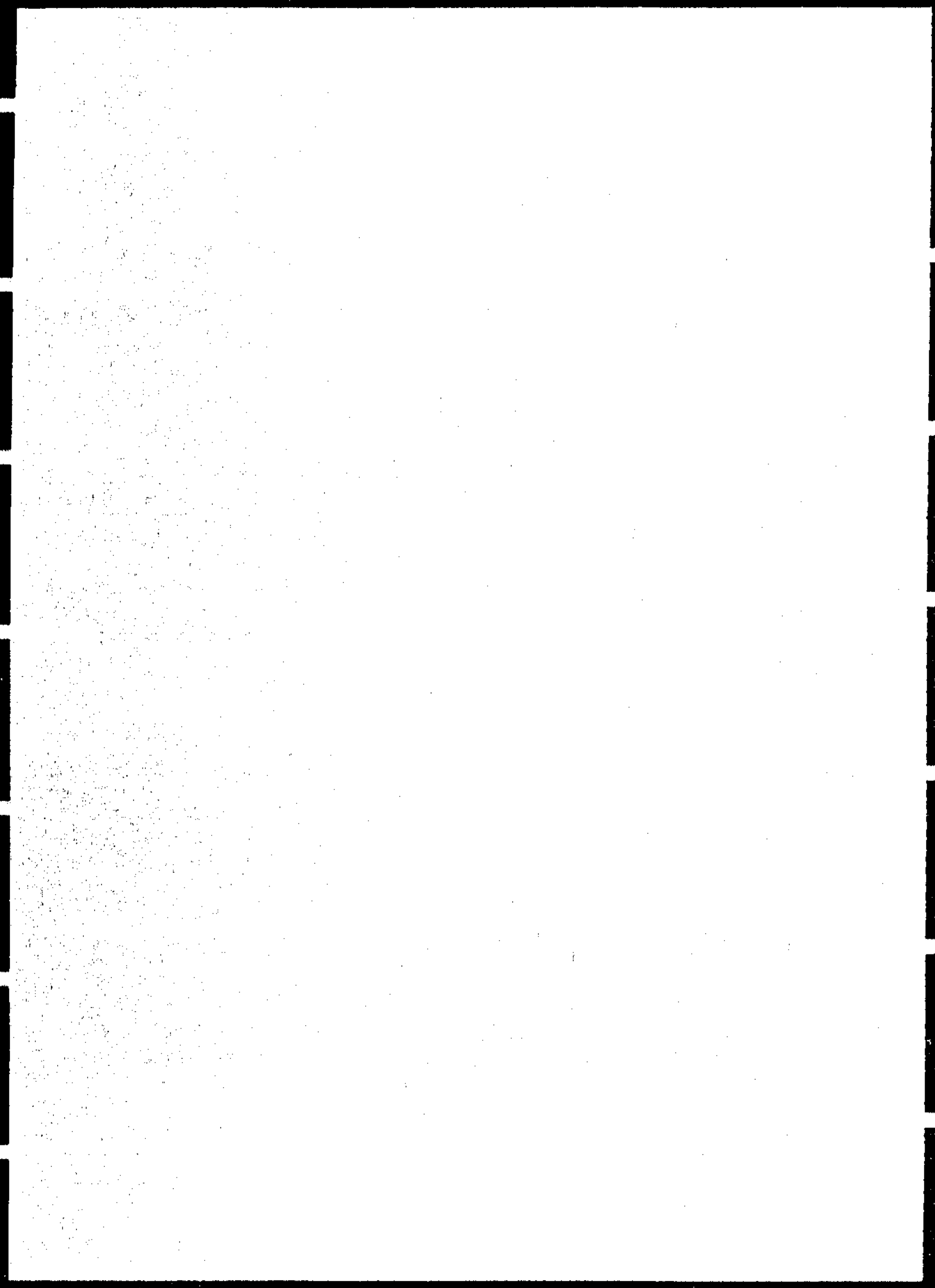
- The make and model of the computer that you are using

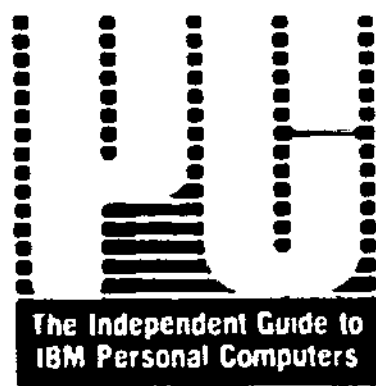- The UniForm menu's version and serial numbers

Our technical assistance staff will be happy to answer your UniForm questions Monday through Friday during normal business hours.

UniForm

User's Guide

Beating the DOS—

By emulating the disk drives of a foreign machine, Micro Solutions's UniForm allows CP/M and DOS machines to actually work on each other's files.

CP/M Compatibility Blues

Your company has always been right there with the leaders. That's why you have a Radio Shack TRS-80 Model I in the parts department (it was the all-time champ of desktop computers only 5 short years ago), and the accounting department has an Epson QX-10 (it seemed like a good idea at the time). And, you bought an Osborne I for your sales manager when the portables first came on the market.

Yes, you have some pretty nice equipment, but you've also got the "compatibility blues." For instance, Joe in the parts department has worked out a new 5-year inventory plan, and it's a 40-page document. You'd like to review it on your IBM word processor and send it back to him for a final look. But his disks won't work in your machine and vice versa. Of course, you could call each other using modems, communications packages, and two outside lines and move the text that way. Or, you could move the machines into the same room and rig up serial cables. However, either approach is going to create more hassle than it's worth.

The Best Solution

UniForm from Micro Solutions is the solution to the DOS-CP/M compatibility blues—in my opinion, the best and least-expensive solution that is on the market. Basically, *UniForm* lets one of your PC's floppy drives emulate a drive from any one of 30 machines (see sidebar, "The Great Pretender," for a list). Of course, other utility programs enable you to format CP/M disks under DOS and copy files back and forth, but *UniForm* actually emulates the foreign drive; therefore, your applications programs can work directly with files on the alien disk. For example, you can take a spreadsheet that was created on a Xerox 820, load the file directly into your own spreadsheet program in the B: drive, manipulate the data, and then write the file back. The disk can then be returned to the Xerox machine and be used there. No boards, no wires—just the beauty of full-disk compatibility at a modest cost ($69.95).

Micro Solutions developed *UniForm* because the company's computer retail

outlets had a compatibility problem. The problem was initially bred by the proliferation of the 8-bit CP/M machines that came onto the market in 1980. Later, the problem became critical when Osborne dropped out of the market. Micro Solutions wanted to support its Osborne customers with Kaypro software. *UniForm* was developed for that purpose and has been sold rather informally, but quite successfully, for more than 2 years in the CP/-M marketplace. The CP/M versions of *UniForm* were basically disk formatters and copy utilities. The concept of disk emulation (or translation) so applications software can directly access data files on alien disks was introduced with the new PC version of *UniForm*.

Using UniForm

UniForm is shipped on one DOS-formatted disk that is accompanied by a well-written 24-page manual. Files on the disk include UNIFORM.SYS, UNIFORM.EXE, and FIXANSI.EXE. The first file, UNIFORM.SYS, is a device driver that is installed by including the line "DEVICE-UNIFORM.SYS" in the DOS CONFIG.SYS file. FIXANSI.EXE is a patch to the DOS ANSI.SYS file, which must be installed to ANSI.SYS if that driver is active in the CONFIG.SYS file. And, of course, UNIFORM.EXE is the main program.

The heart of the system is the device driver that reads your PC's drive setup and establishes a new logical drive at the top of

The Great Pretender

UniForm lets one of your PC's floppy drives emulate a drive from 1 of these 30 machines.

This list shows the disk and machine formats that are available when *UniForm* is run on a PC AT equipped with a 1.2-megabyte drive and a 360K drive. In this configuration, the B: drive is normally used as the master drive when *UniForm* is running (see main article for further details).

FORMAT	DESCRIPTION
DS:DD:48	A. B. Dick Magna III
SS:DD:48	Actrix
DS:DD:48	Actrix
DS:DD:48	Advanced Digital Super 6
DS:DD:96	Altos Series 5
SS:DD:48	Bondwell 12
DS:DD:48	Bondwell 14
DS:DD:48	BMC if800 model 20
DS:DD:48	Cal-PC
DS:DD:96	CMC Intnl. Supersystem 2
SS:DD:48	Cromeco CDOS
DS:DD:48	Cromeco CDOS
SS:DD:48	Cromeco w/Intl Term CPM
DS:DD:48	Cromeco w/Intl Term CPM
DS:DD:48	Datavue DV80
DS:DD:96	DEC II
SS:DD:96	DEC Rainbow
SS:DD:48	DEC VT-180
DS:DD:48	Digilog
DS:DD:48	Direct 1025
SS:DD:96	Eagle II
DS:DD:48	Epson QX-10
DS:DD:48	Epson QX-10 (European)
DS:DD:48	Fujitsu Micro 16s
DS:DD:48	Gnat System 10
SS:DD:48	Heath w/Magnolia CP/M
DS:DD:48	Heath w/Magnolia CP/M
DS:DD:48	Hewlett Packard HP-125
SS:DD:48	IBM PC using CP/M-86
DS:DD:48	IBM PC using CP/M-86
SS:DD:48	IBM PC PC-DOS Version 1
DS:DD:48	IBM PC PC-DOS Version 1
SS:DD:48	IBM PC PC-DOS Version 2
DS:DD:48	IBM PC PC-DOS Version 2
SS:DD:48	IMS 5000
DS:DD:48	IMS 5000
SS:DD:96	IMS 5000
SS:DD:48	Kaypro II
DS:DD:48	Kaypro 4
DS:DD:48	Kaypro 10
SS:DD:48	Lobo MAX-80
DS:DD:48	Magic Computer
DS:DD:48	Micron Quark
SS:DD:96	Monroe
SS:DD:48	Morrow MD2
DS:DD:48	Morrow MD3
DS:DD:48	NCR Decision Mate V
SS:DD:48	NEC PC-8001

(continued)

the drive list if you have dual floppies or dual floppies and a hard disk drive. Otherwise, the *UniForm* drive is installed in the B: drive. This automatic logical drive assignment can be forced if you have other drivers that automatically assign drives. In any event, one of your floppy drives develops a split personality. In normal operation under DOS, the appointed floppy behaves as usual. However, when *UniForm* is run, that drive gets a new letter designation and reads and writes in its newly assigned format.

It's very easy to invoke *UniForm*. When you type UNIFORM at the DOS prompt, you are presented with a menu of possible formats for the *UniForm* drive. *UniForm* can sense the configurations of your machine and adjusts the list to add formats according to the drives you have installed. (For example, *UniForm* adds 8-inch formats to your list if it finds an 8-inch driver card in your system.) You simply select the format you want, and the DOS prompt reappears. From then on, the *Uni-Form* drive reads and, in most cases,

writes to the *UniForm* drive in its new format. All the familiar DOS commands and applications programs work as usual because they "think" that they are looking at an ordinary MS-DOS drive.

I tested *UniForm* on a PC with two double-sided, double-density drives and on an AT with a 1.2-megabyte floppy drive, a 380K floppy drive, and a 20-megabyte hard drive. The target machines included an Epson QX-10 running CP/M 2.1, the same machine using an MS-DOS board, and a Kaypro. For simplicity, I transported *WordStar* files in all possible directions. All disks were written from and read to by all combinations of machines. *UniForm* worked flawlessly.

Interesting Possibilities

I found that using *UniForm* on a PC AT presents some interesting possibilities if you have the optional 48-track double-sided, double-density drive in addition to the standard 96-track high-density disk drive. Micro Solutions says the optional drive is "highly recommended for full use of *Uni-Form*'s capabilities." When the AT is equipped with only the high-capacity

drive, *UniForm* uses it to read, write, and initialize disks from the machines on the list that use the 96-tpi format. (These disks cannot be initialized with a standard PC.) If you select a 48-tpi CP/M disk, and you don't have the optional drive, *UniForm* sends a "Read only" notice to the screen

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UniForm does nothing to the data in the file itself. It primarily moves data around.

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and refuses to write to the disk. If, on the other hand, you have the optional 48-tpi drive installed, *UniForm* automatically uses that drive when you specify a 48-tpi disk format.

Alien Formats

You'll find that some alien disk formats simply won't be able to work with *Uni-Form*. Basically, the disk controller must

be compatible even though the disk formats are not. For example, hard-sectored formats are out. Some unlisted formats will work but only if the other machine's disks are initialized on the PC to start with. As Micro Solutions explains, "Some manufacturers did not follow disk initialization specifications closely enough. A problem exists when disks are initialized on these computers, but disks initialized on your PC using *UniForm* will work properly on both computers." Therefore, the trick is to initialize a disk under *Uni-Form* on the PC and put that disk into the alien machine to read data from or copy data to it.

UniForm does nothing to the data in the file itself. Therefore, it will not convert a program written for the PC, such as *1-2-3*, to a version that will run on an 8-bit CP/M machine. It primarily moves data around. *UniForm* is one of those programs that is a reviewer's delight. It does what it's supposed to without pretense or confusion. In short, it's a best bet for curing the compatibility blues. ∎

(The Great Pretender continued)

DS:DD:48	NEC PC-8801	SS:DD:48	Systel II
DS:DD:48	OKI if800 model 20	DS:DD:48	TeleVideo
DS:DD:48	Olivetti	DS:DD:96	TeleVideo 1603
SS:DD:48	Olivetti ETV 300	DS:DD:48	Tektronix 4170
DS:DD:48	Olympia EX-100	SS:DD:48	TI Professional CP/M-86
SS:DD:48	Osborne 1	DS:DD:48	Toshiba T100
SS:DD:48	Osborne Executive	SS:DD:48	TRS-80 Mod 3 MM CP/M
DS:DD:48	Otrona Attache	DS:DD:48	TRS-80 Mod 3 Holmes CP/M
SS:DD:48	Phillips PC-2010		
DS:DD:96	Philips PC-2012	SS:DD:48	TRS-80 Mod 4 MT CP/M
DS:DD:96	Pied Piper	SS:DD:48	TRS-80 Mod 4 CP/M
DS:DD:48	Sanyo 125-C	DS:DD:48	Wangwriter
SS:DD:48	Seequa Chameleon CP/M	SS:DD:48	Xerox 820-II
DS:DD:48	Seequa Chameleon CPM	DS:DD:48	Xerox 820-II
DS:DD:96	Seiko	DS:DD:48	Xor 5
DS:DD:48	Sharp	SS:DD:48	Zenith Z-90 48 TPI
SS:DD:48	Superbrain JR	SS:DD:48	Zenith Z-100 CP/M
SS:DD:48	Superbrain 40 track	DS:DD:48	Zenith Z-100 CP/M
DS:DD:48	Superbrain QD	DS:DD:48	Zorba —D.A.