

ON-SIDE

A Sideways Printing Program

by

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INTRODUCTION

WHAT IS ON-SIDE?

On-Side is a sideways printing program written for the IBM Personal Computer and PC-compatible computers. If your printer is compatible with the Epson/IBM Graphics standard (most PC printers are), then you can use On-Side to print reports down the page instead of across, and in a variety of character font styles.

WHY DO I NEED A SIDEWAYS PRINTING PROGRAM?

Has this ever happened to you? You just finished putting together a new spreadsheet or report for a presentation you are going to make. The report looks perfect on the screen. But then you print it, and find that it's too wide to fit on the paper.

First you go back and jam all the columns closer together. Still too wide. You consider using wider paper, but you don't have any around, or your printer doesn't take it, or you don't feel like hand-loading every page of a long report. Finally, in desperation, you use your printer's tiny compressed print font -- the one that gives the boss eye-strain. Or else you print the report on two pages and tape them together. Either way, the result is definitely not what you had intended.

With On-Side, your printer can print the report sideways -- down the paper instead of across, so a wide report can be printed the long way on a sheet of paper even if your printer can't take wide paper. And if a report overlaps onto two or three pages, the perforations can be left connected so that a really wide report folds up nicely into letter-size for filing.

For most users, sideways printing is preferable to printing in compressed mode, or using big sheets of green bar computer paper that never fit into files, notebooks and briefcases.

With ON-SIDE, not only can you print wide reports sideways on narrow or wide paper, you also have a choice of several character font styles, some of which may be better than the fonts your printer produces horizontally.

Use ON-SIDE with spreadsheet reports, word processing documents, database reports. . . . just about any program that can write its printed output to disk can be used with ON-SIDE. For example, you can prepare a wide report with ExpressCalc, use the /Print command to print it to disk, then run ON-SIDE to print the report sideways. An ExpressCalc report can be printed up to nine feet wide using ON-SIDE.

All the font styles provided with ON-SIDE can be enlarged or magnified to "stretch" themselves vertically or horizontally, or both. By magnifying the fonts in all their various sizes and shapes, you have 175 different style/size combinations to choose from.

And let's say there's one character in the font style that you don't like -- maybe you prefer a slash through your zeros, or a fatter exclamation point -- ON-SIDE lets you change any character's dot pattern, permanently, with its easy-to-use Font Editor screen. If you feel creative, make your own personalized fonts, starting from scratch or using an existing font as a starting point.

WHAT IS SHAREWARE?

Expressware distributes On-Side as a "SHAREWARE" product. This means we encourage customers to copy the diskettes and share them with friends and acquaintances. After a prospective user has tried out the programs, if he decides to use them, he purchases a registered set from his local dealer or directly from Expressware.

Shareware is a marketing method which allows our products to become known by thousands of users without having to spend large amounts of money on advertising. These savings are then passed along to our customers in the form of inexpensive, yet powerful, software. A small number of shareware companies, Expressware included, have had great success with the shareware marketing method.

Many software companies have abandoned the shareware method, feeling that it cannot work for them. But our own experience indicates that Shareware works well when the customer feels he is getting a good deal, and does not feel he is being tricked or coerced into the purchase. For that reason, our evaluation disk sets are not copy-protected or "crippled" in any way. All our products are sold with a full money-back guarantee if the product is returned in sellable condition within sixty days of purchase (limit: one per customer). So if you need the full 85-page User's Guide to effectively evaluate On-Side, order the registered set. If you are not completely satisfied, you can return it for a full refund.

A prospective customer once asked: "If people can get it for free, then why would anyone buy it?" There are many benefits of buying a registered copy: registered users receive the latest copy of the programs on diskette, a professionally prepared manual, free technical support, regular copies of the ExpressNews newsletter, and notification of major upgrades and new products. Also, registered users are not violating the copyright if they use the software for purposes other than evaluation. Since we make our living by selling registered copies, your support allows us to improve and upgrade the software. We have been writing and improving our software packages since 1984. Purchases of registered copies allow us to continue that effort.

On-Side is not public domain software. The programs and manual are

(C) Copyright Expressware Corporation, 1988. When a customer sends us money for our shareware products, it is not considered a donation. We ship the latest version of On-Side on diskette, and the latest edition of the printed On-Side User's Guide.

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We do have a few rules about reselling our software. Commercial sale of the diskettes is prohibited without Expressware's written permission; the printed manual may not be copied or reproduced; and no alterations may be made to the files on the diskette.

On-Side can also be used free by educational institutions to teach students about computer software. There are some guidelines that apply. There are also textbook editions of the On-Side manual available to schools and their book stores. Contact Expressware and ask for an "Educator Packet" with all the details.

WILL ON-SIDE RUN ON MY COMPUTER?

If your computer is 100% compatible with the IBM PC, XT or AT, then On-Side will definitely run on it. Some semi-compatibles may require some special configuring. Generally, if your computer uses the PCDOS or MSDOS operating system, then On-Side will probably run on it. There are some minimum hardware requirements:

- PCDOS or MSDOS version 2.0 or higher
- At least 256K of RAM memory
- One diskette drive or a hard disk
- A dot-matrix graphics printer

Your computer may have either a monochrome or 80-column color monitor. If you have a color monitor, On-Side will format its screens in your choice of colors. The printer must be compatible with the IBM/Epson graphics standard (most PC printers are).

HOW DO I GET STARTED?

The first step is to install the On-Side software on your computer. Usually this is a simple process, but there are some PC's with unique configurations which require special procedures. The second chapter of this manual is called INSTALLING ON-SIDE, and it takes you through the steps of installing the programs and sample files.

If you are a newcomer to On-Side you will want to review the User's Guide carefully. On-Side is so easy to use, the User's Guide isn't usually required, but some features are not readily apparent without reading the manual.

We hope you find On-Side useful. Who knows, we may be starting a new trend -- someday maybe all reports will be printed sideways.

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INSTALLING ON-SIDE

On-Side may be run on a computer with a diskette drive or a computer with a hard disk drive. If your computer has one or more diskette drives, the installation process is explained in the section following this one, titled "Computers With Diskette Drives". Like most other software programs, On-Side runs much faster on a hard disk. If you have an application that needs more speed, a hard disk is an excellent investment, costing only a few hundred dollars to add to most PC's.

These installation instructions assume that you have a basic understanding of DOS commands and terms. If you are not familiar with terms such as subdirectory, path, formatted diskette, etc. you will need to consult your DOS manual for more information.

COMPUTERS WITH HARD DISKS

On-Side may be installed in a subdirectory with any valid name; for this example we will create a subdirectory called SIDE from the root directory and put the programs in it. Put the On-Side Program Disk in drive A and enter the DOS commands shown below. The explanation on the right indicates what each command is accomplishing:

C:	Make drive C: the current drive
CD \	Change to the root directory of drive C:
MD SIDE	Make a new subdirectory called SIDE
CD SIDE	Change directory to the new SIDE subdirectory
COPY A:*.*	Copy files from program disk into new subdirectory

The COPY command copies the programs, font files and sample print files which will be used later in the tutorial.

COMPUTERS WITH DISKETTE DRIVES

To install On-Side on a diskette-based system you will need a blank diskette. Label it "On-Side Working Disk". Put your DOS diskette in drive A and type:

```
DISKCOPY A: B:
```

The diskcopy program will give you a message to put the source diskette in drive A and the destination diskette in drive B. Put the master copy of the On-Side Program Diskette in drive A. Put the On-Side Working Disk in drive B. Press a key, and the copy will start. DISKCOPY makes an exact duplicate of the program disk. When DISKCOPY finishes, it asks if you want to copy another diskette. Indicate N, then file the master diskette in a safe place.

On the diskette version of On-Side there is not enough room on the program diskette for DOS or COMMAND.COM unless you erase the *.PRN files. If there is no DOS on the diskette, use a separate DOS diskette to boot your computer, then

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remove the DOS diskette, insert the On-Side program diskette in drive A, and start On-Side (as described below in the section titled "Starting On-Side"). When you have finished with On-Side and exit to DOS, since there is no COMMAND.COM program on the diskette, you receive a message to "Insert Diskette with COMMAND.COM in drive A and press any key". At this prompt, put your DOS diskette back in drive A, press a key, and the DOS command line appears.

COMPUTERS WITH COLOR MONITORS

If your computer has a color monitor and a graphics board, On-Side automatically displays its screens in color.

On-Side detects whether your computer has a monochrome board or a color graphics board, and then uses colors or black/white accordingly. But some computers have a black and white monitor connected to a color board, which tricks On-Side into sending colors to the black-and-white screen. This can cause characters to appear hazy and unreadable, or in some cases, characters may not appear on the screen at all.

STARTING ON-SIDE

Please do not use the Master Program Diskette to run On-Side. If you are running from diskette, make a working copy of the program diskette, and store the original in a safe place.

Users with hard disks use the following commands to start the program:

```
C:          Make drive C: the current drive (if it isn't already)
CD \SIDE    Change directory to the SIDE subdirectory
```

ON-SIDE Start the On-Side program

Users running On-Side on diskettes follow a different procedure. As we mentioned earlier, there is no room on the program diskette for DOS or COMMAND.COM unless the DOC files and PRN files have been erased, so you need to use a separate DOS diskette to boot your computer. Then remove the DOS disk, insert the On-Side disk in drive A, and type:

ON-SIDE

The On-Side program loads into memory, and after a second or two, the banner screen appears.

If your banner screen does not display, or if it has some unreadable characters, you probably have a special hardware configuration that On-Side cannot properly detect. See the /M command in the next section.

The banner screen is displayed until you press a key. Then the On-Side Main Menu displays.

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COMMAND LINE OPTIONS

In the example above we simply typed ON-SIDE on the command line to start On-Side. There are other things that could have been typed on that same line. For example, the name of the file to be printed, including the drive and path could have been included on the command line; the name of the font to be used may also optionally be included. Here are some examples of valid startup commands:

ON-SIDE RPT.PRN	Indicates name of report to be printed
ON-SIDE \MASTER\RPT.PRN	Report is in subdir \MASTER on current drive
ON-SIDE B:\MASTER\RPT.PRN	Report is in subdir \MASTER on drive B
ON-SIDE RPT.PRN BOLD	Report RPT.PRN to be printed using BOLD font

In addition to the name of the file to be printed and the font name, the command line may contain one or more of the following commands:

/M Monochrome (black and white) display: This command is sometimes necessary when using On-Side on a monochrome graphics monitor with a color graphics board. Users with color graphics monitors can also use the command to make the screens appear in black and white.

/S Turn off the sound: On-Side makes a distinctive

"beep" when an invalid character is entered. Some computers have louder speakers than others, and the sound may be annoying to you or to others around you. Use the /S command to turn it off.

/B Use BIOS calls for screen display: Some computers' video memory is not fully compatible with the IBM PC. To display data on the screen as quickly as possible, On-Side places data directly into video RAM. Some early models of MS-DOS computers did not map video memory at the same address as the IBM PC. On computers whose video RAM is at a different address, nothing gets displayed; i.e. the screen stays blank. If you specify /B on the command line, On-Side uses calls to the ROM BIOS for screen displays. This makes screen displays slower, but assures that the data is displaying.

/GO Batch mode: This command tells On-Side to immediately print the file indicated on the command line. If /GO is specified, On-Side does not display any screens or prompts, but immediately starts printing. When the printing is finished, On-Side automatically ends and returns to the DOS prompt.

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The following commands may be specified on the command line to override the sideways printing defaults. If /GO is also specified, these options take immediate effect, and the specified file is printed. If /GO is not specified, the normal screens appear, but these options appear on the screens as defaults. The equal sign is optional:

/LM=n	Left margin, in inches
/TM=n	Top margin, in inches
/LPP=n	Lines per page
/SP=n	Starting page number
/BLTR=n	Space between letters (in 72nds of an inch)
/BLIN=n	Space between lines (in 120ths of an inch)
/HM=n	Height magnification
/WM=n	Width magnification
/PW=n	Paper width in inches
/PH=n	Paper height in inches (0 for form feeds)
/DS	Double strike

For example, if On-Side is started using this command line:

```
ONside C:\MASTER\RPT.PRN PICA /M/S/DS /LM=1/PH0 /GO
```

the program prints the report called RPT.PRN in the \MASTER subdirectory on drive C, using the PICA font. The screen displays in monochrome (black and white) with no sound. The program immediately starts printing, with no prompt screens. The report is printed in double-strike with a left margin of one inch, and a form feed is used to advance the paper. Note that spaces may be used before or after operands, and that equal signs are optional.

The slash command switches must follow the print file name and font name if they are specified. Use the forward slash character "/". Backslash characters "\" do not work. There cannot be a space following the slash, but there may optionally be one or more spaces preceding it. For example, these are acceptable commands:

ONside /M/S	Acceptable
ONside/S	Acceptable
ONside C:X.PRN/M/S	Acceptable
ONside /M /S /B	Acceptable

These commands are unacceptable:

ONside / M Unacceptable. No space allowed between / and M

ONsideC:X.PRN Unacceptable. DOS thinks program name is ONsideC

On-Side can be configured to automatically use one or more of these command line options plus several other options by using special configuration files called Profiles.

KEYBOARD CONVENTIONS

In this manual, and on many On-Side screens, when you see a letter, number or special key enclosed in <brackets>, it means to press the key enclosed in brackets. For example, <F1> means press the F1 key. <Alt-F1> means hold down Alt and press F1. Likewise, <Shift-F1> means hold down Shift and press F1, and <Ctrl-F1> means hold down Ctrl and press F1.

When a letter <A> through <Z> appears in brackets, either an upper-

case (capital) or lower-case (small) letter may be entered. Sometimes at the bottom of a screen, the first letter of a word is enclosed in brackets, such as <P>rint. This is a short-hand way of indicating that pressing the P key selects the Print function.

THE <ESC> KEY

The Escape Key <Esc> can be used almost anywhere in On-Side to back out of a section of the program and return to the previous menu. When a screen is displayed and you want to return to the Main Menu, press <Esc>. <Esc> can even be pressed on the Main Menu to exit to DOS.

SINGLE KEYSTROKE INPUT

When a prompt requires that only one key be pressed, the command is carried out immediately without having to press <Enter>. Whenever an incorrect or inappropriate key is pressed, On-Side sounds a two tone warning and ignores the keystroke. The <F10> key indicates that you are finished entering information and are ready for the next screen.

INPUT FIELDS OF TWO OR MORE CHARACTERS

All questions or entries that allow more than one key to be pressed must be followed by an <Enter> before On-Side processes the keystrokes. On any prompt or field that allows two or more characters to be entered, the following editing keys may be used:

<Backspace>	Erases the character to the left of the cursor.
	Erases the character under the cursor.
<Ins>	Toggles Insert mode on and off. When Insert mode is on, the cursor increases in size. Characters are inserted at the cursor as they are entered, and the characters to the right of the cursor are shifted toward the end of the field.
<Left Arrow>	Moves the cursor left, toward the beginning of the field. No characters are erased.
<Right Arrow>	Moves the cursor right, toward the end of the field. No characters are erased.

<Home>	Moves the cursor to the first position of the field. If the cursor is already in the first position of the field, <Home> moves to the first field on the screen.
<End>	Moves the cursor to the position following the

last non-blank character on the line.

<Ctrl-Home> Erases the entire line and puts the cursor back at the beginning of the field.

<Ctrl-End> Erases all characters from the cursor to the end of the field. The cursor does not move.

<Enter> Indicates that all the data has been entered in the field. <Enter> may be pressed no matter where the cursor is within a field, and the entire field is processed as input.

Characters may not be entered past the end of a field. Any attempt to enter characters beyond the end of the field causes the computer to beep. However, all control keys (<Enter>, <Backspace>, <F10>, etc.) may still be used.

THE ALTERNATE <CTRL>-KEYS

On-Side also supports the keyboard standard for the <Ctrl> keys popularized by Micropro's WordStar, and sometimes referred to as the "WordStar control key standard". Many popular software programs support this standard.

Because the WordStar control key standard is so popular, we support it in all our software packages. There are two important reasons why this standard is so popular: (1) it allows touch-typists to perform all the control key functions without removing their hands from the keyboard; and (2) it allows numeric keypad users an optional set of arrow keys so <NumLock> can be left on all the time. If you are a fast typist and seldom look at the keyboard, or if you do a lot of ten-key input, you will likely find these control keys helpful. It takes some time to get accustomed to them, but eventually they become second nature just like the other keys on the keyboard.

The <Ctrl> key is like a special shift key. If you hold it down and press a letter, a special character is sent to the computer. These are the <Ctrl> keys which On-Side supports:

<Ctrl-E>	same as <Up Arrow>	<Ctrl-G>	same as
<Ctrl-S>	same as <Left Arrow>	<Ctrl-T>	same as <Ctrl-End>
<Ctrl-D>	same as <Right Arrow>	<Ctrl-Y>	same as <Ctrl-Home>
<Ctrl-X>	same as <Down Arrow>	<Ctrl-Q>	same as <Esc>
<Ctrl-F>	same as <Tab>	<Ctrl-W>	same as <F10>
<Ctrl-A>	same as <Shift-Tab>	<Ctrl-Enter>	same as <F10>
<Ctrl-V>	same as <Ins>		

PRINTING SIDEWAYS

Printing a report sideways is a two-step process:

1. First, the report must be written to disk. If the report is being printed by File Express or ExpressCalc, just select the option to write the report to disk instead of to the printer. Most spreadsheet programs, report writers and word processors are capable of writing reports to disk. They usually prompt for a name to call the report file. We suggest you use the extension PRN on the file name, to identify it as a print file.
2. After the report is written to disk, exit to DOS and start the On-Side program, following the instructions in the chapter titled INSTALLING ON-SIDE. When the Main Menu screen displays, press <1> or <P> to Print Sideways.

There are many features in On-Side, so there are numerous options to select. When printing sideways, the three screens discussed on the following pages are each displayed, allowing you to change one or more of the options.

But for most sideways printing applications, none of the options need to be changed, because On-Side will "default" to the most commonly used choice for each option. If all the options on a screen are exactly as you want them, you can either press <Enter> on each field, or you can press <F10> to immediately advance to the next screen.

If you know in advance that all the options are correct, you can bypass the three sideways printing screens and immediately start printing sideways by including the name of the print file and the command /GO on the command line when starting On-Side:

```
ON-SIDE DEMO.PRN /GO
```

THE "PRINT SIDEWAYS" SCREEN

Assume for a moment that we want to change some of the options. The first of three screens contains these fields:

File to be printed: The first prompt asks for the name of the print file. This is where you enter the name of the file you wrote to disk with your report writer or word processor. On-Side lists the .PRN files in a window on the right. You can use the <Up> and <Down> arrows to select one of the files in the window, or you can type the name of a file. (The file need not be displayed in the window to be printed. It may be on a different drive or path, or may have an extension other than PRN.)

The drive letter and path name are optional. When the print file name has been selected, press <Enter> to advance to the next field.

Font to be used: On-Side can print your reports in a variety of fonts, or letter styles. Once again, On-Side displays a window. This one lists the available fonts. You can use the <Up> and <Down> arrows to select one of the fonts in the window, or you can type the name of a font. On-Side defaults to the NORMAL font unless you have customized the default font or you have specified a font name on the command line at startup. Entering this command:

```
ONside C:\ONside\DEMO.PRN BOLD
```

tells On-Side to print the file called DEMO.PRN which is in the directory C:\ONside\, using the BOLD font. If the line had also included /GO, On-Side would print the file then return to DOS without pausing.

Double strike: This option makes the printed characters darker by printing them twice. This is useful if the printer ribbon is worn, but it does slow down the printing to half its normal speed.

Paper width in inches: Most printers use standard letter-size paper which is eight-and-a-half inches wide and eleven inches tall, so those are the dimensions On-Side uses as its defaults. Any value from 3 to 20 may be entered here. If your printer uses wide paper, specify 14.5 as the paper width. It's true that the paper is slightly more than 14.5 inches in width, but most wide printers can only print fourteen inches across. Specifying more than 14.5 inches can cause some characters to be lost on the right edge of the paper.

Paper height in inches: On-Side needs to know the height in inches of the paper so it can skip to a new sheet of paper when starting a new page. Most paper is eleven inches tall, so that is the default. If your printer is set up to use form feeds, and top-of-form is set, specify zero for the paper height and On-Side sends a form feed at the end of a page instead of several line feeds. When <Enter> is pressed on this field, the next screen is displayed.

THE MAGNIFICATION SCREEN

The second screen has only two fields to be entered, but an entire screen is used for illustrating and explaining the concept of character magnification.

The text and illustrations on this screen explain the concept of magnifying or "stretching" characters to produce a different sized font. Some fonts take on a whole new look when they are stretched taller or wider.

Most reports printed with On-Side use the standard unmagnified characters, but there are times when magnified characters can be useful -- perhaps to make an enlarged version of a report for a visual aid, or to make a sign or report cover. When magnifying characters, keep the following points in mind:

1. The number of lines that can print on a page are reduced if

characters are magnified vertically.

2. On-Side forms characters from dot patterns. When characters are magnified, the dots are simply printed larger. Diagonal lines and curves appear much more "jagged" when magnified.
3. Printing speed is slower when printing magnified characters, because there is more to print.

THE PAPER ALIGNMENT SCREEN

The third screen allows you to tell On-Side how to position its printed output on the paper. The illustration at the bottom of the screen shows a portion of sideways printing in relation to the right edge of the paper. When describing sideways printing, terms such as "top" and "right" can be confusing -- does "top margin" mean the top in relation to the printer, or the top of the printout where the headings are printed? To reduce this confusion, On-Side displays a flashing line on the screen to indicate visually which measurement the program wants.

Left margin in inches: As the illustration indicates, this is the distance from the paper's top perforation to the edge of the first column of characters. On-Side defaults to half an inch, and you can increase or decrease the left margin by changing this value.

The left margin option assumes that the paper in your printer is positioned so the print head is immediately below the perforation. If the print head is not adjacent to the top perforation when printing begins, your left margin will be larger than this field indicates. To reduce it, move the paper downward before printing.

Top margin in inches: When you move to this field, the flashing line on the illustration indicates the distance from the paper's right perforation to the top of the first printed line. On-Side defaults to half an inch, and you can increase or decrease the top margin of your report by changing this value.

This option assumes that the paper is positioned in the printer so that the print head is immediately to the right of the left perforation. If the print head is indented from the left perforation, the top margin will not be computed correctly, and On-Side may print beyond the right edge of the paper (or on narrow printers, will lose some data on the right).

Some users keep their print indented intentionally; perhaps they need a physical left margin for some other program, such as their word processor, and they don't want to slide the paper to the right every

time they use On-Side. If you encounter that problem, simply tell On-Side that the paper width is narrower. For example, if your paper is lined up so the first column is indented an inch, On-Side really only has 7.5 inches to print on, not 8.5 inches. So change the paper width to 7.5 and On-Side will be able to compute accurate margins.

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One final note on left margins and top margins: These margins do not increase if magnification is used. If you enlarge the letters to three times their normal size, these margins still remain exactly as many inches wide as specified.

Space between each letter: If the letters seem too "crunched" together, you can spread them apart by increasing this value. Most of On-Side's fonts have only 1/72nd of an inch between the letters (that's the height of one dot on your printer). You can increase this value from two to nine dots.

Each font has a minimum number of dots between each letter. This minimum is usually one, so on most fonts, a value of zero can't be specified for the space between letters. However, a font that connects the letters, such as a script font, might have a minimum of zero, since it's OK for the letters to touch each other.

Adding more space between letters causes the printed report to "spread out" somewhat, producing a slightly wider finished product. The standard fonts provided with On-Side have an underscore character which goes across the entire character grid, so if several underscores are together, they connect into one long line. Increasing the space between letters creates a small gap between each of the underscores.

Space between each line: You may have noticed that On-Side's printed lines are closer together than the typical horizontal printing that your printer produces. You can increase the space between each line by increasing this value. For example, if you are using the NORMAL font, and you want the lines spaced six lines per inch, change this option to 5.

To increase the maximum lines per page slightly, the space between each line can be reduced to zero. This doesn't look as bad as it sounds, since most letters won't actually touch the letters above and below them. The only time two letters touch is if a lower-case g, j, p, q or y comes in contact with a capital letter in the space immediately below it.

Lines per page: The lines per page default to either sixty or the maximum allowed, whichever is lesser. Larger fonts such as the VOGUE font permit considerably fewer lines per page because the characters are so tall. Likewise, if a small font's height is magnified

(stretched taller), fewer lines fit on a page. On-Side computes the maximum number of lines permitted, and displays the maximum on the prompt line as "(maximum of nn)". When the cursor moves to this field, a box appears at the bottom of the screen describing how the maximum lines per page can be increased. If the maximum is less than you need, consider one or more of the options listed in the window. When the option is changed, the new maximum is immediately displayed.

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READY TO PRINT

When all the options have been selected, make sure your printer is on, and that the paper is aligned, then press any key. On-Side displays the current page, and indicates the portion that is being printed by changing the color on the screen. Only the first 23 lines are displayed on the screen. The first 80 columns are also displayed, but if the page is wider than 80, the screen "scrolls sideways" as On-Side works its way across the page.

You may notice a slight pause on the first few lines of print, as On-Side goes to the disk to read the font file. After a few lines, most of the font letter patterns have been read into memory and the program is able to keep the printer running at its full speed. If the printing seems slower than horizontal printing, that's because in graphics mode (On-Side's mode) the print head only prints when travelling from left to right (uni-directionally), while in character mode it prints when travelling both directions (bi-directionally).

You can tell On-Side to pause the printing by pressing any key. When a key is pressed, a window appears in the middle of the screen. Pressing <Escape> when this window is displayed causes On-Side to stop printing and advance the paper to the top of the page, then return to the Print Sideways Screen. Pressing any key other than <Escape> causes printing to resume where it stopped.

When On-Side has finally printed every page in the print file, it advances the paper in the printer to the top of the page and returns to the Print Sideways Screen.

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