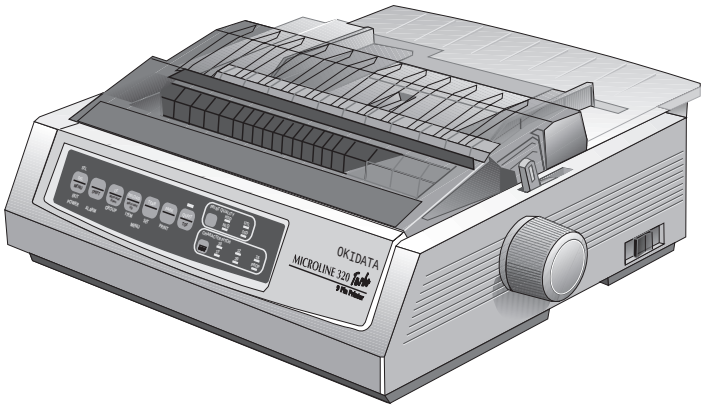
English

User's Guide



ML320/321 Turbo

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Year 2000 Compliance

All products currently sold by Okidata are Year 2000 Compliant. Each product contains information technology that accurately processes date and time data between the years 1999 and 2000. These products, when used in combination with products purchased from other manufacturers, whose products properly exchange date and time information, will accurately process the date and time. All future products are committed to meeting the same Year 2000 compliance.

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Safety

Your OKIDATA printer has been carefully designed to give you years of safe, reliable performance. As with all electrical equipment, there are a few basic precautions you should take to avoid hurting yourself or damaging the printer:

- Read the setup and operating instructions in this manual carefully. Be sure to save it for future reference.
- Read and follow all warning and instruction labels on the printer itself.
- Unplug the printer before you clean it. Use only a damp cloth; do not use liquid or aerosol cleaners.
- Place your printer on a firm, solid surface. If you put in on something unsteady, it might fall and be damaged; if you place it on a soft surface, such as a rug, sofa, or bed, the vents may be blocked, causing it to overheat.
- To protect your printer from overheating, make sure no openings on the printer are blocked. Do not put the printer on or near a heat source, such as a radiator or heat register. If you put the printer in any kind of enclosure, make sure it is well ventilated.
- The printhead can get quite hot when it has been printing for a length of time. Do not touch the printhead until it has had a chance to cool off.
- Do not use your printer near water, or spill liquid of any kind into it.
- Be certain that your power source matches the rating listed on the back of the printer. If you are not sure, check with your dealer or with your local power company.
- Your printer has a grounded, 3-prong plug as a safety feature, and it will only fit into a grounded outlet. If you can not plug it in, chances are that you have an older, non-grounded outlet; contact an electrician to have it replaced with a grounded outlet. Do *not* use an adapter to defeat the grounding.
- The printer must be installed near a power outlet which will remain easily accessible.
- To avoid damaging the power cord, do not put anything on it or place it where it will be walked on. If the cord becomes damaged or frayed, replace it immediately.

- If you're using an extension cord or power strip with the printer, make sure that the total of the amperes required by all the equipment on the extension is less than the extension's rating. Generally, the total ratings of all equipment plugged into any one power line should not exceed 15 amperes. Don't exceed this unless you know that the power line your equipment is plugged into has a rating above 15 amperes.
- Do not poke anything into the ventilation slots on the sides of the printer; you could get a shock or cause a fire.
- Aside from the routine maintenance described in this handbook, don't try to service the printer yourself; opening the cover may expose you to shocks or other hazards. Don't make any adjustments other than those outlined in the handbook — you might cause damage requiring extensive repair work.
- If anything happens that indicates that your printer is not working properly or has been damaged, unplug it immediately and follow the procedures in Section 6 for having your printer serviced. These are some of the things to look for:
  - — The power cord or plug is frayed or damaged.
  - — Liquid has been spilled into the housing, or the printer has been exposed to water.
  - — The printer has been dropped or its cabinet has been damaged.
  - — The printer doesn't function normally when you're following the operating instructions.

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Section 1: *Getting Started*

Features

- Super reliable, durable operation: 10,000 hours MTBF!
- Expandable head gap for handling forms up to 0.031" (0.79 mm) thick through the bottom feed path using the optional push and/or pull tractor.
- Advanced paper handling, with built-in rear push tractor and zero-tear forms capability
- Blazing print speeds:
  - — 300 cps in Utility mode
  - — 390 cps in High Speed Draft (HSD) mode
  - — 435 cps in Super Speed Draft (SSD) mode
- 100% backward compatible with Okidata ML320/321

Optional Accessories

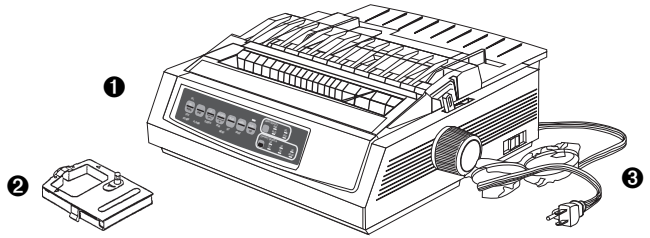
- Top-Mount Pull Tractor
- Bottom-Mount Push Tractor
- Serial Interface Board
- Cut Sheet Feeder which takes up to 100 sheets
- Roll Paper Stand (ML320 Turbo only)

See Section 6 for ordering information.

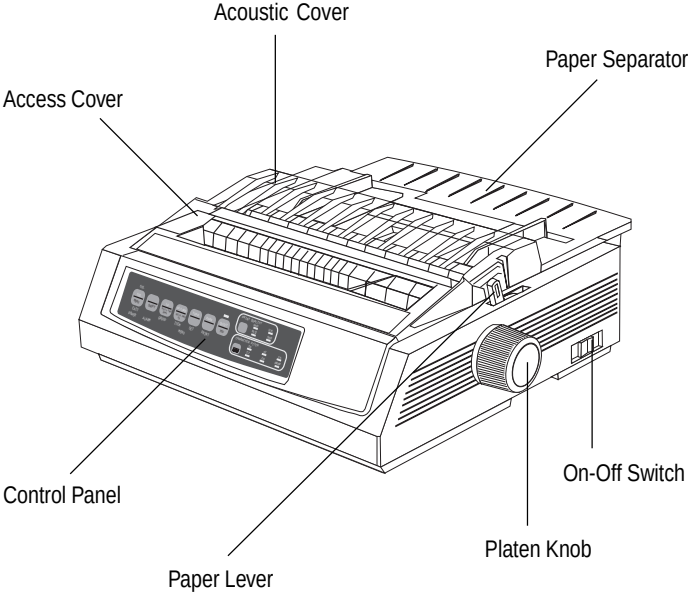
Unpacking

❶ Printer ❷ Ribbon cartridge ❸ Power Cord

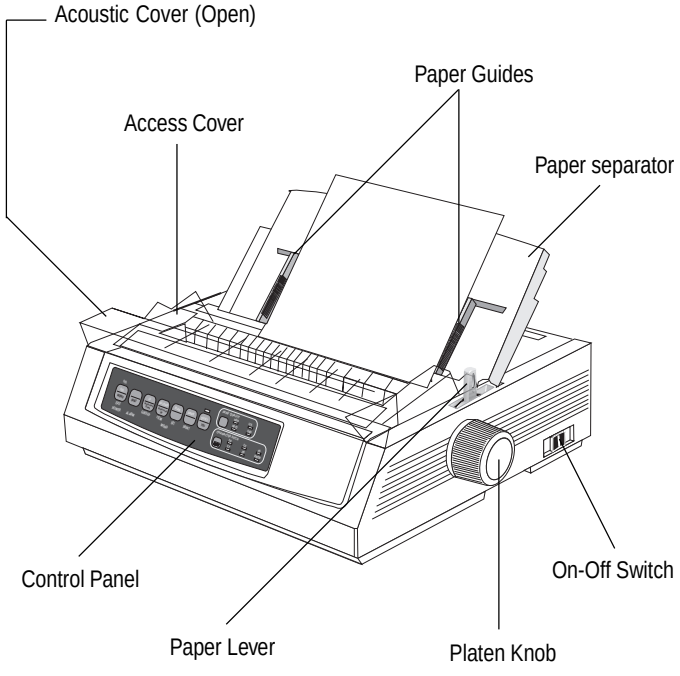
Any of the above missing? Contact your dealer.



Getting to Know Your Printer



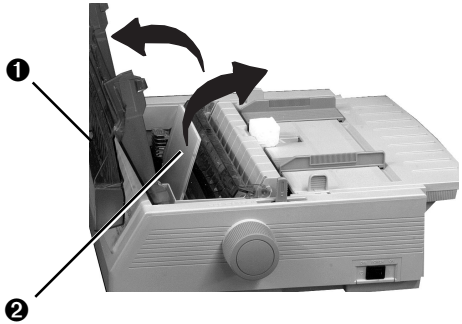
Set up for Rear Feed of Continuous Forms



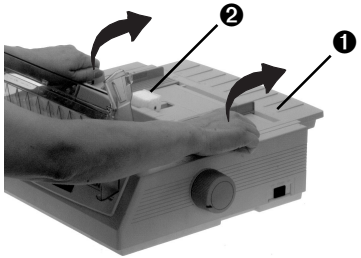
Set up for Single-Sheet Feed

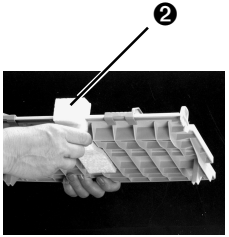
Removing the Shipping Restraints

1. Open the access cover (❶) and remove the printhead shipping retainer (❷).

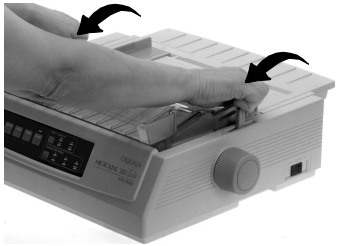


2. Grasp the tabs on the paper separator (❶), lift it off and remove the shipping retainer (❷).





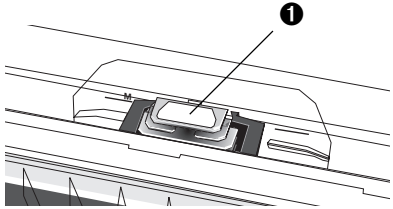
3. Replace the paper separator .



Note: *Save the shipping retainers and the packing material in case you ever need to ship the printer.*

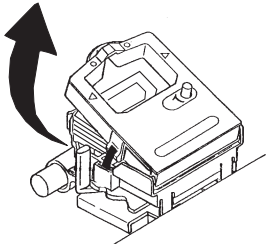
Installing/Replacing the Ribbon Cartridge

1. ***Make sure the printer is turned OFF.***
2. Center the printhead (❶).



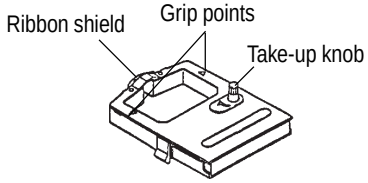
3. *If you are replacing the ribbon:* swing the front of the cartridge up off the printhead, then lift the cartridge out and discard it.

   Caution! *The printhead may be HOT!*

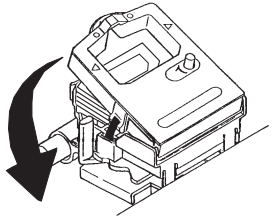


4. Unpack the ribbon cartridge.

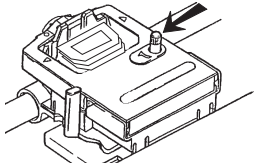
Important!
Do NOT remove the ribbon shield from the ribbon!



5. Install the new ribbon cartridge.



6. Turn the take-up knob in the direction of the arrow to take up any ribbon slack.



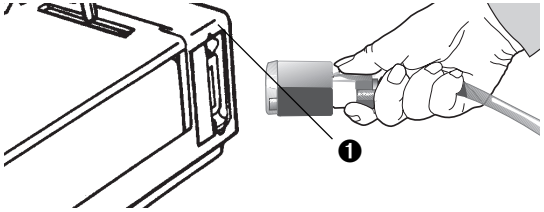
Connecting to the Computer

Note: *FCC regulations require the use of a* ***shielded*** *cable no longer than 6 ft. (1.8 m).*

An IEE 1284-compatible parallel cable is needed for bi-directional communications.

If you purchased the Serial Interface accessory, see the instruction sheet provided with it.

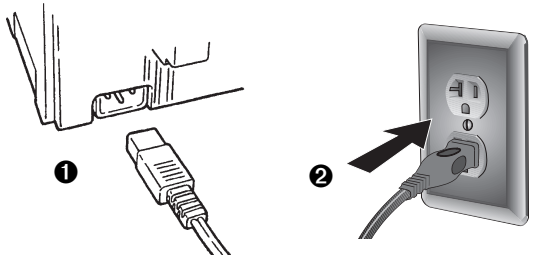
1. Plug the interface cable into the parallel port (❶) and secure it with the wire loops.



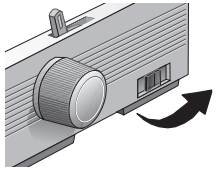
2. Attach the other end of the cable to your computer.

Connecting to the Power

1. ***Make sure both the printer and the computer are OFF.***
2. Plug the power cord into the back of the printer (❶), then into a grounded outlet (❷).



3. Turn the printer on.

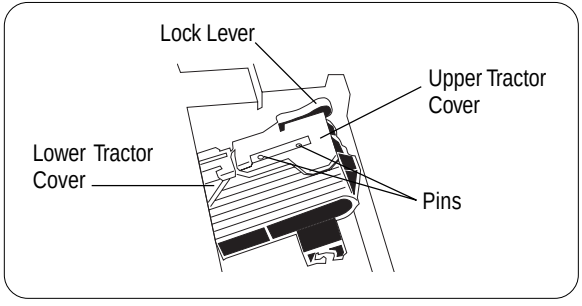


Loading Paper

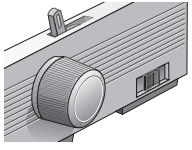
Loading Continuous Forms (Rear Feed)

We recommend the rear-feed path for printing reports, etc., on single-thickness, continuous-form paper. For graphics or charts, it's best to use the single-sheet path (top feed).

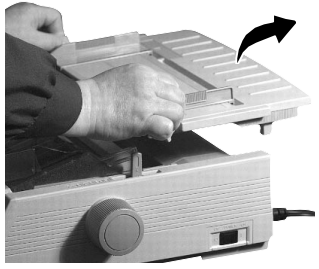
Note: *If you have paper in the paper path, be sure to remove it before installing rear-feed paper.*



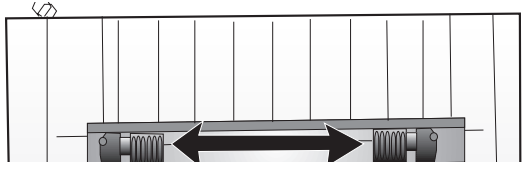
1. Move the paper lever to the position marked “REAR.”



2. Grasp the paper separator by the tabs and lift it off the printer.

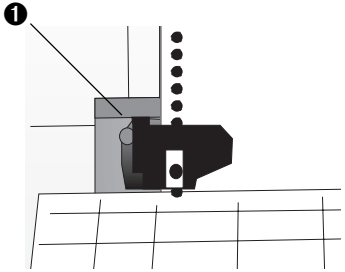


3. Pull up on the lock levers and open the tractor covers, then move the right tractor over to fit the width of the paper.



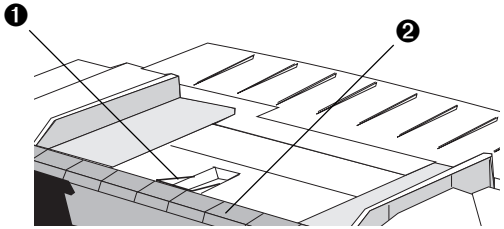
5. Place the first two holes in the paper over the tractor pins on either side and close the tractor covers.

6. Move the left tractor to align the edge of the paper with the appropriate reference mark (❶), and push back the lock lever.



7. Fine-tune the position of the right tractor to center the holes in the paper on the pins, and push back the right lock lever.

8. Reinstall the sheet guide and place the wire guide (❶) on the pull-up roller assembly (❷).



9. Press **FF/LOAD**. The paper feeds into the printer.

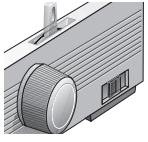
Note: *The standard setting for the Top of Form (where the printing begins) is 1-inch down from the top of the page. To change the setting, see page 9.*

Loading Single Sheets (Top Feed)

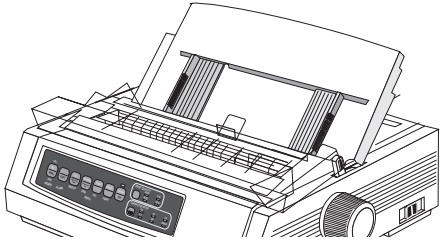
Use the single-sheet path for letterhead stationary, memos, and individual envelopes.

Note: *If you have continuous-form paper in the path, press* ***PARK*** *to remove it before loading single sheets.*

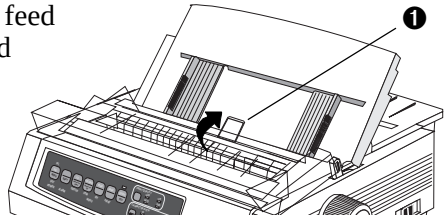
1. Make sure the printer is on and deselected (SEL light off).
2. Place the paper lever in the position marked "TOP."



3. Open the carriage cover and lift the paper separator to the single-sheet position.

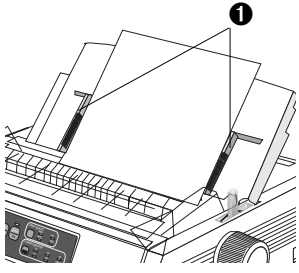


4. Make sure the wire feed guide (❶) is secured in the sheet guide.



5. Adjust the paper feed guides (❶) for the width of the paper and place a sheet of paper in the separator. The paper will feed into the printer.

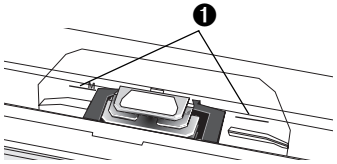
Important!
If the paper does not feed in, remove it. Check the paper lever position. Make sure the ALARM light is on: if it is flashing, hold the SHIFT key and press the CHARACTER PITCH (RESET) key. Reload the sheet of paper.



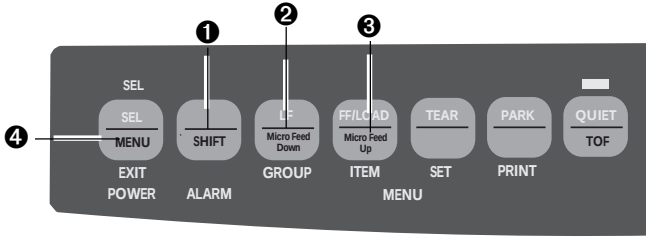
Note: *The standard setting for the Top of Form (where the printing begins) is 1-inch down from the top of the page. To change the setting, see page 9.*

Setting the Top of Form (TOF)

When setting the Top of Form, use the red line (❶) on the paper shield as a reference:



1. Make sure the printer is deselected (SEL light off).



2. Press and hold **SHIFT** (❶), then
   - ☛ Press **LF** (❷) to move Top of Form higher (paper moves down)
   - ☛ Press **FF/LOAD** (❸) to move Top of Form lower (paper moves up)
3. Press **SEL** (❹) to re-select the printer.

Temporarily Changing the Print Start Position

To change the print start position lower *for one page only*:

1. Press **SEL** to deselect the printer.
2. Press **LF** to change the position of the Top of Form.

Resetting TOF to the Standard Setting

1. Turn the printer off.
2. Hold **PARK** + **QUIET/TOF** while turning the printer back on.

Switching Paper Paths

To switch from continuous-forms to single-sheet feed:

1. Tear off any printed pages.
2. Press **PARK**.
3. Move the paper separator to the single-sheet feed position.
4. Place the wire feed guide in the paper separator.
5. Move the paper lever to the position marked “TOP.”
6. Place a sheet of paper in the paper separator.

To switch from single-sheet feed to continuous forms:

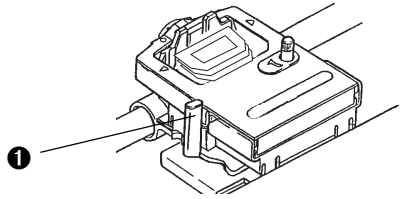
1. Press **FF/LOAD** to remove the single-sheet paper.
2. Lower the paper separator into the continuous-forms position and swing the wire feed guide over onto the pull-up roller.
3. Move the paper lever to the position marked “REAR” or “BOT,” as appropriate.
4. If necessary, load continuous-form paper.
5. Press **FF/LOAD**.

Setting the Printhead Gap

The printhead gap is the distance between the printhead and the platen.

Note: *Make sure the printer is turned off before you open the access cover.*

To adjust the gap, open the access cover and move the blue lever (❶) to the recommended setting from the table.



Media	Setting
12-20 lb paper	1
20-24 lb bond paper	2
Labels	3-4
Envelopes	4-5
2-part form (with carbon)	1-2
3-part form (with carbon)	2-3
4-part form (with carbon)	3-4
5-part form (with carbon)	4-5
6-part form (with carbon)	5

Note: *For dedicated, bottom-feed printing of extra-thick continuous forms (requires optional push and/or pull tractor), the printhead gap range can be expanded to take forms up to 0.031" (0.79 mm) thick. For more information, call Okidata Faxable Facts (1-800-654-6651) and follow the recorded message to have document # 2361 faxed to you.*

Running the Self Tests

Font Sample Test	ASCII Test
To run the test: Turn the printer off, then press and hold the **LF** key while turning the printer back on.	*To run the test:* Turn the printer off, then press and hold the **QUIET** key while turning the printer back on.
To stop the test before it finishes: Press **SEL**.	*To stop the test:* Press **SEL**.

Selecting an Emulation

Your printer has three emulations:

- Epson® FX (ESC/P)
- IBM® Proprinter III (PPSII) — *factory setting*
- OKIDATA® MICROLINE® Standard

Changing Emulations

1. Make sure paper is loaded.
2. Press **SHIFT** + **SEL**: the printer enters the Menu Mode.
3. Press **LF**: the following line prints:

   ```
   Printer Control   Emulation Mode   IBM PPR
   ```

4. Press **TEAR** consecutively until the emulation you wish to select prints in the right-hand column.
5. Press **SHIFT** + **SEL** to save your setting and exit the Menu Mode.

Selecting a Printer Driver

Before you can use your printer with software, you must enter the software and select the correct printer driver. If you have the wrong driver selected, you will see strange characters, incorrect fonts, etc.

Important! *See your software documentation for information on how to select a printer driver.*

Printer Drivers

The drivers below are listed by **decreasing** compatibility with your printer: *use one as close to the top of the list as possible.*

Epson FX	**IBM Proprinter III**
Okidata ML320/1T Epson	Okidata ML320/1T IBM
Okidata ML320/1 Epson	Okidata ML320/1 IBM
Epson FX286e	IBM Proprinter III
Epson FX 850/1050	IBM Proprinter II
Epson FX 800/1000	IBM Proprinter
Epson FX	IBM Graphics Printer

Okidata MICROLINE Standard
Okidata Microline 320/321T
Okidata Microline 320/321
Okidata Microline 520/521
Okidata Microline 292/293
Okidata Microline 192/193

OKIDATA Drivers

Okidata drivers are available for Microsoft® Windows® 95, Microsoft Windows 3.1x, and Microsoft Windows NT 3.51 and higher, through any of the following means:

- **Contact the Okidata WorldWide Web site at http://www.okidata.com**
- Connect with the OKILINK® BBS at (609) 234-5344
- Contact Okidata on CompuServe®:
  1. GO PCHW.
  2. In Library #2, select “Printer Utilities.”
- *Mail* your request for a diskette (3½") to OKIDATA, P.O. Box 4603, Trenton, NJ 08650-9852. Specify # MS-9267 for Windows 3.1x
  or # MS-9299 for Windows 95
  or # MS-9300 for Windows NT

Section 2: *Maintaining Your Printer*

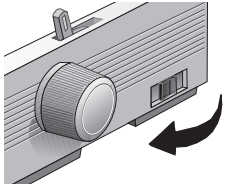
Replacing the Ribbon Cartridge

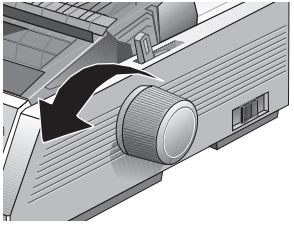
To replace the ribbon cartridge, see “Installing/Replacing the Ribbon Cartridge” in Section 1. For the best results, use genuine OKIDATA ribbons, Part. No. 52102001.

Clearing Paper Jams

Rear-Feed Jams

1. *Turn the printer OFF* and use the platen knob to back the paper all the way out.



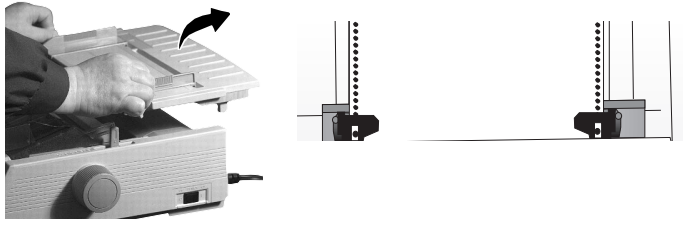


2. Open the access cover, and remove the pull-up roller assembly.

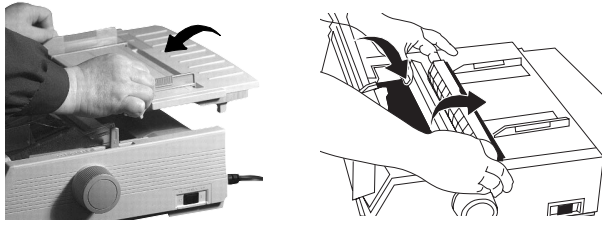
   Note: *Make sure the printer is turned off before you open the access cover.*

3. Remove any torn pieces of paper.

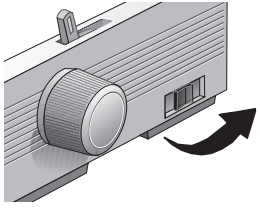
4. Remove the paper separator and reload paper.



5. Replace the the paper separator, replace the pull-up roller assembly, and close the access cover.



6. Turn the printer on.

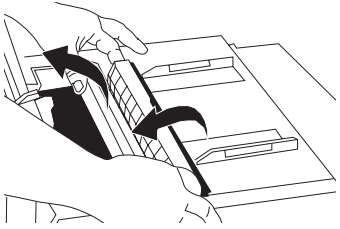


7. Press **FF/LOAD**.

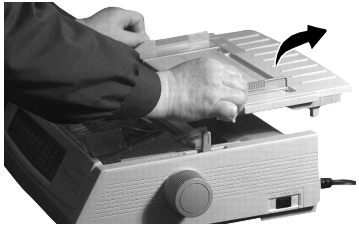
Correcting Repetitive Rear-Feed Jams

If the paper keeps jamming, you probably have bits of paper stuck in the paper path.

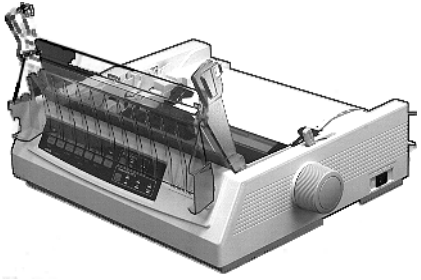
1. *Turn the printer off*, then turn the platen knob to back the paper out of the printer.
2. Open the access cover and remove the pull up roller assembly: remove any torn pieces of paper.



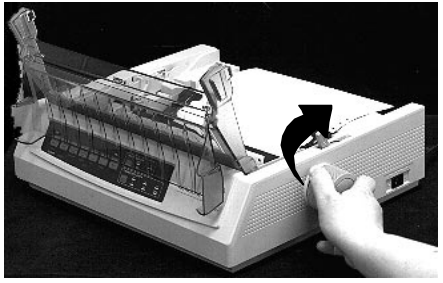
3. Remove the paper separator.



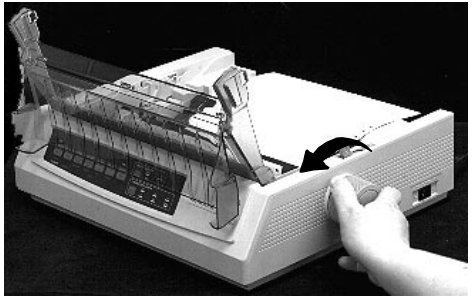
4. Fold some continuous-form paper over three times to make a page four sheets thick, load it on the tractors and close the covers.



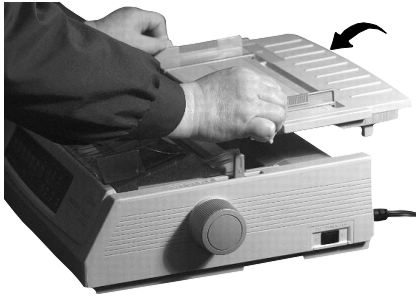
5. Use the platen knob to draw the quadruple-thick page around the platen: this brings out any jammed bits of paper.



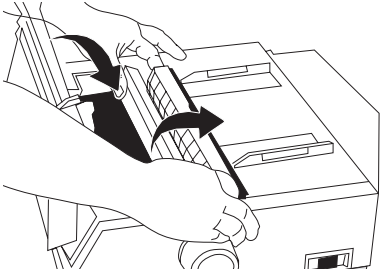
6. Remove the paper pieces, and use the platen knob to back the paper out.



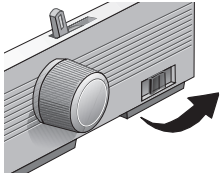
7. Reload regular paper and reinstall the paper separator.



8. Replace the pull-up roller assembly, and close the access cover.



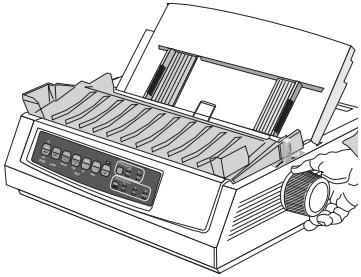
9. Turn the printer on.



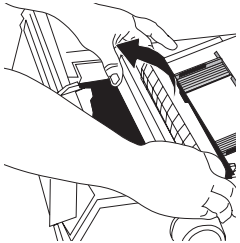
10. Press **FF/LOAD**.

Single-Sheet Jams

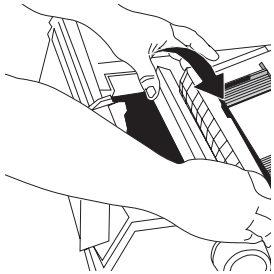
1. *Turn the printer off.*
2. Use the platen knob to back the jammed paper out.



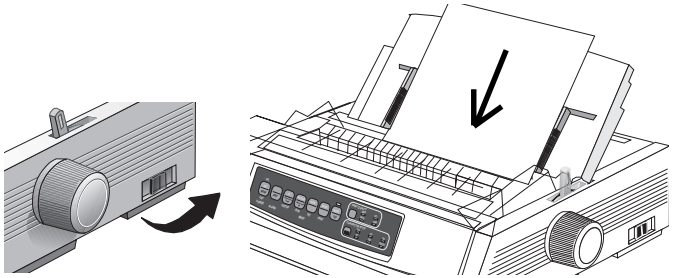
3. Open the access cover and remove the pull-up roller assembly.



4. Remove any torn pieces from around the carriage.
5. Reinstall the pull-up roller assembly, and close the access cover.



7. Turn the printer on, and reload paper.

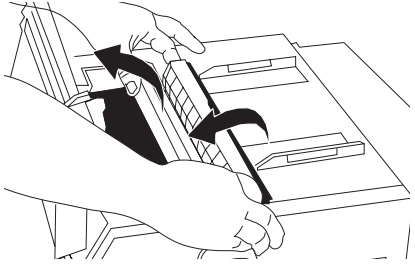


Cleaning the Housing

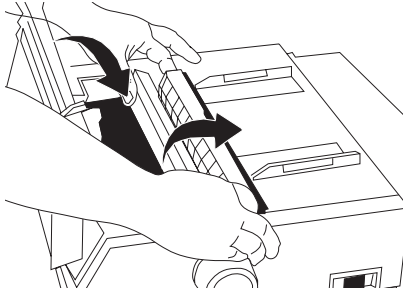
You should clean the printer every six months (or after about 300 hours of operation).

Note: *Never use solvents or strong detergents on the cabinet: they could damage the housing.*

1. *Turn the printer off*, and remove any paper from the path.
2. Open the access cover, remove the pull-up roller assembly.

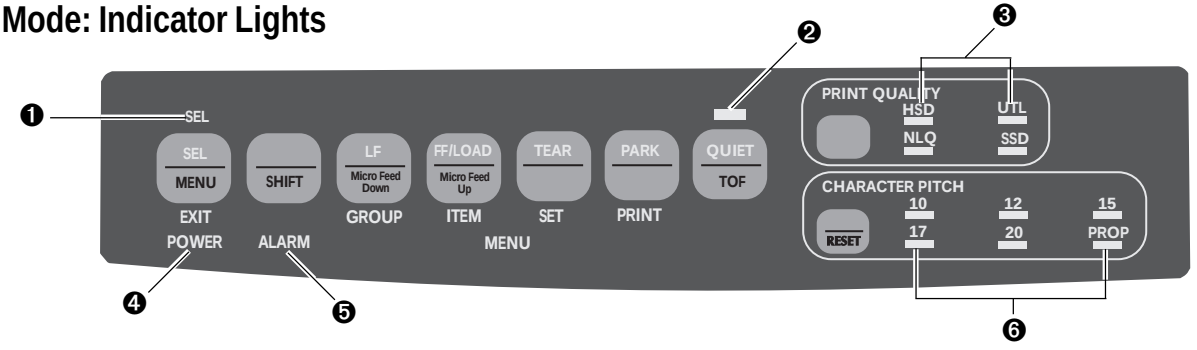


3. Use a clean, dry cloth to dust around the carriage shaft and platen. Remove any loose bits of paper.
4. Reinstall the pull-up roller assembly, and close the access cover.



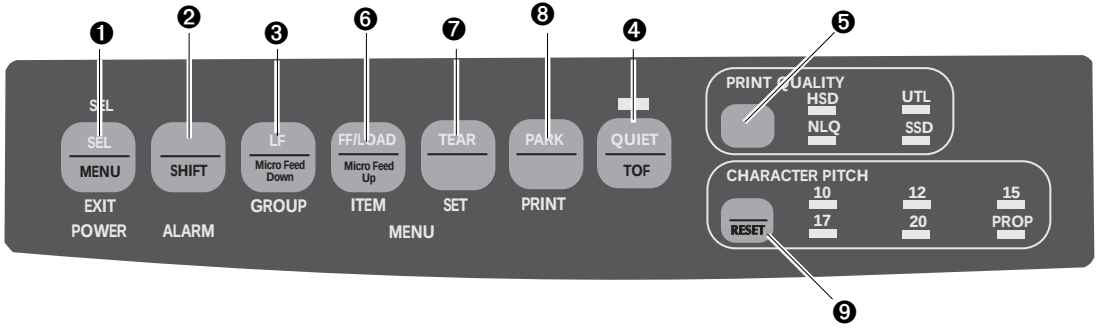
Section 3: Using Your Printer

Print Mode: Indicator Lights



❶ **SEL**: Glows = printer selected, ready to receive data Flashes = printer in Print Suppress Mode Not lit = printer deselected (cannot receive data)	❺ **ALARM**: Glows = error condition exists: ➤ out of paper (no other lights blinking) ➤ paper jam if 15 cpi light is also blinking ➤ paper lever is set to wrong position if 10 cpi light is also blinking. Blinks = error condition. Turn printer off, then on; if light still flashes, contact service dealer.
❷ **QUIET**: Glows to indicate that printer is in Quiet state.	❻ **10 / 12 / 15 / 17 / 20 / PROP**: Indicate character pitch selected.
❸ **HSD / UTL / NLQ / SSD**: Indicate print quality selected.	
❹ **POWER**: Glows when printer is turned on.	

Print Mode: Control Panel Keys



❶ **SEL**:	Selects/deselects printer. When held on power up, or with SHIFT key, engages Menu Mode: see page 22.	❺ **PRINT QUALITY**:	Selects print quality and font.
❷ **SHIFT**:	Press and hold while pressing another switch to engage the alternate function for that switch (e.g., "Micro Feed Down" for LF key).	❻ **FF/LOAD**:	Loads/ejects single sheet of paper; loads continuous-form paper or feeds it to next page.
❸ **LF**:	Moves paper up one line: press and hold for repetitive line feeds. When held on power up, activates Font Test.	❼ **TEAR**:	Moves continuous-form paper up for tear-off or back down for printing.
❹ **QUIET**:	Turns Quiet Mode on and off. When held on power up, activates Rolling ASCII Test.	❽ **PARK**:	Retracts continuous-form paper from the path
		❾ **CHARACTER PITCH**:	Selects the character pitch. Used with SHIFT key to reset the printer and clear the buffer.

Selecting the Print Quality

Important!

Front panel settings for print quality and character pitch are overridden by software commands. The lights will always reflect the printer's state.

Press **PRINT QUALITY** to select:

NLQ: Near Letter Quality

- Highest quality, slowest speed
- Courier or Gothic fonts
- Recommended for correspondence

UTL: Utility

- Medium quality, medium speed
- Gothic font only
- Recommended for internal documents and high-volume data.

HSD: High Speed Draft

- Lower quality, faster speed
- Gothic font only
- Recommended for drafts.

SSD: Super Speed Draft

- Lowest quality (12 cpi only), fastest speed
- Gothic font only
- Recommended for fastest output of drafts.

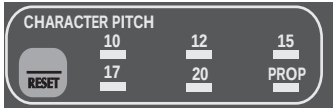
Using Super Speed Draft

To use Super Speed Draft (SSD), enter the Menu Mode and make changes as follows:

1. Press **SHIFT** + **SEL**.
2. Press **GROUP** twice.
3. Press **SET** until DRAFT prints as the setting for the Print Mode.
4. Press **ITEM**.
5. Press **SET** (SSD prints).
6. Press **SHIFT** + **SEL** to exit Menu Mode and save your changes.

Selecting the Character Pitch

Press **CHARACTER PITCH/RESET** to select the width of characters in characters per inch, or Proportional:



10 cpi

- Recommended for standard text
- Not available for SSD

12 cpi

- Recommended for standard text.
- Yields more text per page.

17.1 cpi, 20 cpi

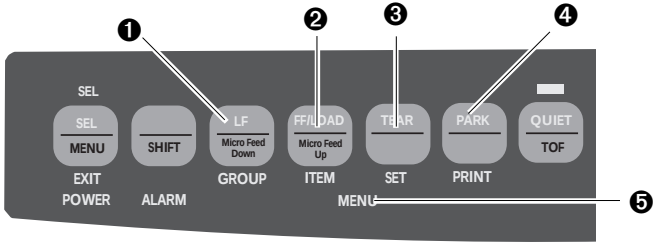
- Recommended for spreadsheets
- Smallest print
- Not available for SSD.

PROP

- Recommended for a more polished appearance.
- Proportional spacing
- NLQ and Utility only.

Menu Mode: Control Panel

In the Menu mode, you can use the front panel buttons to change the defaults for the printer parameters. The changes you make in the Menu mode are automatically saved when you exit the Menu mode and are retained even if you turn the printer off.



❶ **GROUP**: Prints the next Group in the Menu. With the **SHIFT** key, prints the previous Group.

❷ **ITEM**: Prints next Item in the Group. With the **SHIFT** key, prints previous Item in the Group.

❸ **SET**: Prints next Setting for an Item. With the **SHIFT** key, prints previous Setting for an Item.

❹ **PRINT**: Prints a copy of all the Menu settings. With the **SHIFT** key, prints the current settings for the Group selected.

❺ **MENU** light: Glows when the printer is in the Menu Mode.

Entering and Exiting the Menu Mode

To enter or exit the Menu Mode, hold **SHIFT** while pressing **SEL**.

Resetting the Menu

To reset the Menu to the standard settings:

1. Turn the printer *off*.
2. Press **SEL** + **LF** while turning the printer on.

Printing the Menu Settings

1. Make sure paper is loaded in the printer.
2. Enter the Menu Mode (**SHIFT** + **SEL**).
3. Press **PRINT** (PARK key).

Note: *To print out a listing of the settings for all menu items, regardless of the emulation selected or the accessories installed, enter the Menu Mode, then press **SHIFT** + **PRINT QUALITY**.*

Changing the Menu Settings

1. Press **SHIFT** + **SEL** to enter the Menu Mode.
2. Use the **GROUP**, **ITEM** and **SET** keys to make your changes:
   - ➤ Press **GROUP** until the Group you wish to change appears in the first column.
   - ➤ Press **ITEM** until the Item you wish to change appears in the second column.
   - ➤ Press **SET** until the setting you want appears in the third column.
3. Press **SHIFT** + **SEL** to exit the Menu Mode and save your settings.

Important! *If you turn the printer off without first exiting the Menu Mode, the changes you have made will be lost.*

Summary of Menu Settings

The table below shows the items which may appear in the menu. Settings which are engaged at the factory (defaults) are set in ***bold italic***. Some groups or entries will only appear when a specific emulation is engaged, as noted.

Group	Item	Setting
Printer Control	Emulation Mode	***IBM PPR***, EPSON FX, ML
Font	Print Mode	***Utility***, NLQ Courier, NLQ Gothic, DRAFT
	Draft Mode	***HSD***, SSD
	Pitch	***10 cpi***, 12 cpi, 15 cpi, 17.1 cpi, 20 cpi
	Proportional Spacing	***No***, Yes
	Style	***Normal***, Italics
	Size	***Single***, Double
Symbol Sets	Character Set	***Standard***, Line Graphics, Block Graphics
	Language Set	***American***, French, German, British, Danish I, Swedish, Italian, Spanish I, Japanese, Norwegian, Danish II, Spanish II, Latin American, French Canadian, Dutch, Publisher
	Zero Character	***Slashed***, Unslashed
	Code Page	***USA***, Canada French, Multilingual, Portugal, Norway, BRASC II, Abicomp
Rear Feed	Line Spacing	***6 LPI***, 8 LPI
	Form Tear-Off	***Off***, 500 mS, 1 sec, 2 sec
	Skip Over Perforation	***No***, Yes
	Page Width (wide model only)	***13.6"***, 8"
	Page Length	***11"***, 11-2/3", 12", 14", 17", 3", 3.5", 4", 5.5", 6", 7", 8", 8.5"

Group	Item	Settings
Bottom Feed	Line Spacing	***6 LPI***, 8 LPI
	Form Tear-Off	***Off***, 500 mS, 1 sec, 2 sec
	Skip Over Perforation	***No***, Yes
	Page Width (wide model only)	***13.6"***, 8"
	Page Length	***11"***, 11-2/3", 12", 14", 17", 3", 3.5", 4", 5.5", 6", 7", 8", 8.5"
Top Feed	Line Spacing	***6 LPI***, 8 LPI
	Bottom Margin	***Valid***, Invalid
	Page Width (wide model only)	***13.6"***, 8"
	Page Length	***11"***, 11-2/3", 12", 14", 17", 3", 3.5", 4", 5.5", 6", 7", 8", 8.5"
	Wait Time	500 mS, ***1 sec***, 2 sec
	Page Length Control	***by MENU Setting***, By Actual Page Length
Set-Up	Graphics	Bi-directional, ***Uni-directional***
	7 or 8 Bit Graphics*	***8***, 7
	Receive Buffer Size	1 Line, ***16K***, 28K
	Paper Out Override	***No***, Yes
	Print Registration	***0***, set in 0.05 mm increments: press SEL to shift registration to the left; press SHIFT + SEL to shift registration to the right.
	7 or 8 Bits Data Word*	***8***, 7
	Operator Panel Function	***Full Operation***, Limited Operation

* Appears only when the MICROLINE Standard emulation is selected.

Group	Item	Settings
Set-Up (continued)	Reset Inhibit	***No***, Yes
	Print Suppress Effective	***Yes***, No
	Auto LF	***No***, Yes
	Auto CR+	***No***, Yes
	Print DEL Code*	***No***, Yes
	SI Select Pitch (10 cpi)+	***17.1 cpi***, 15 cpi
	SI Select Pitch (12 cpi)+	***20 cpi***, 12 cpi
	Time Out Print	***Valid***, Invalid
	Auto Select	***No***, Yes
	Centering Position	***DEFAULT***, MODE 1, MODE 2
	ESC SI Pitch	***17.1 cpi,*** 20 cpi
Parallel I/F	I-Prime	***Buffer Print***, Invalid, Buffer Clear
	Pin 18	***+5V***, Open
	Auto Feed XT**	***Invalid***, Valid

* Appears only when the MICROLINE Standard emulation is selected.
+ Appears only when the IBM emulation is selected.
** Applies only when the Epson emulation is selected.

Explanations of Menu Items

7 or 8 Bits Data Word (ML). If your computer system uses seven bits to make up each unit of data, change this setting to 7.

7 or 8 Bit Graphics (ML). Choose the graphics your system uses: 7 or 8 dots in each column printed.

Auto CR (IBM). If you want the printer to automatically add a carriage return when a Line Feed is received at the end of a line, change the setting to Yes.

Auto LF. If your printout is consistently double spaced, select No; if it overprints, select Yes.

Auto Feed XT (Epson). If your system uses pin 14 of the parallel interface to control automatic line feed, change the setting to Valid.

Auto Select. If you always use the same Top of Form position, change the setting to Yes.

Bottom Margin. Change to Invalid if you want the printer to ignore the bottom margin setting. ***Caution!!*** *This can cause loss of data and damage the printhead.*

Centering Position. Used to limit printhead travel when printing narrow columns. Select Mode 1 for Model ML320; select Mode 1 or Mode 2 for Model ML321.

Character Set. Choose Standard (IBM Set I), Line Graphics (IBM Set II) or Block Graphics.

Code Page. Choose the Code Page character set you wish to use: USA (IBM 437), Canada French (IBM 863), Multilingual (IBM 850), Portugal (IBM 860), Norway (IBM 865), BRASC II, or Abicomp.

Draft Mode. Change to SSD if you wish to use the Super Speed Draft mode of printing. ***Note:*** *Print Mode must be set to DRAFT for this setting to be effective.*

Emulation Mode. Choose the printer emulation.

ESC SI Pitch. Sets the character pitch used when the ESC SI command is received.

Form Tear-Off. Choose 500 mS, 1 sec, or 2 sec to turn the Form Tear-Off feature on and to set the time interval for the printer to wait before advancing the paper.

Graphics. Change to bi-directional graphics for faster printing: optimize the registration using the Print Registration setting in the Menu.

I-Prime. Determines what the printer will do when it receives the I-Prime signal from the software: Buffer Print prints out the buffer contents before resetting; Buffer Clear dumps the buffer contents immediately. Invalid causes the printer to ignore the I-Prime command.

Language Set. Replaces certain standard symbols with special characters used in foreign languages.

Line Spacing. Change to 8 lines per inch to get more lines on a page.

Operator Panel Function. Change to Limited Operation to deactivate the PRINT QUALITY and CHARACTER PITCH buttons. This prevents these from being changed from the control panel when several people are using the printer.

Page Length. Selects the length of the paper you are using.

Page Width (Model 321 only). Change to 8" to print on letter-size paper.

Paper Out Override. Senses when less than 1" (25 mm) of paper remains and stops printing. Change to Yes to override the sensor. ***Caution!!*** *This can cause loss of data and damage the printhead!*

Pin 18. Sets the signal on pin 18 to +5 volts or to open.

Pitch. Choose the character width, in character per inch (cpi).

Print DEL Code (ML). Change to Yes if you wish to print the DEL code (decimal 27) as a solid box.

Print Mode. Choose the quality and speed of printing.

Print Registration. Change the setting as required to obtain the best registration for bi-directional printing.

Print Suppress Effective. If your system uses the DC1 and DC3 codes for something other than the print suppress mode, change the setting to No.

Proportional Spacing. Change the setting to Yes to engage proportional spacing of characters.

Receive Buffer Size. Selects the amount of memory devoted to holding received data. Choosing 1 Line will tie up your computer while printing, but if you abort the print job, the printer will stop much sooner.

Reset Inhibit. Select Yes to prevent your software from resetting your printer's settings.

SI Select Pitch, 10 cpi (IBM). Sets the pitch to be engaged when the printer control panel is set for 10 cpi and the SI command is received.

SI Select Pitch, 12 cpi (IBM). Sets the pitch to be engaged when the printer control panel is set for 12 cpi and the SI command is received.

Size. Change to Double for double width and height printing.

Skip Over Perforation. Change to Yes if you want the printer to go to the next page when it comes within 1" (25 mm) of the bottom of the page. Keep it set to No if your software has its own page formatting controls.

Style. Change to italics if you want the printed characters to be slanted.

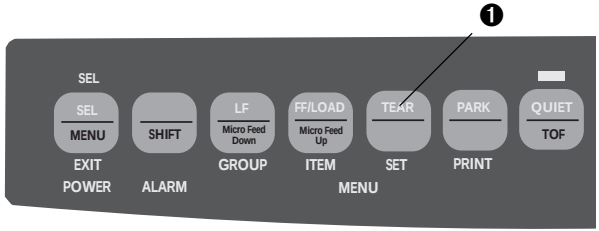
Time Out Print. If your software spends a long time processing between portions of data it feeds to the printer, change the setting to Invalid to keep your printer from dumping the received data while it is waiting for more.

Wait Time. Sets the amount of time the printer will wait for more data before moving to the form tear-off position.

Zero Character. If you do not want the printer to use a slash to distinguish the number zero from the capital letter O, change the setting to Unslashed.

Using the Printer's Features

Tear Feature



Use this feature to advance continuous-form paper up to the tear position by simply pressing **TEAR** (❶).

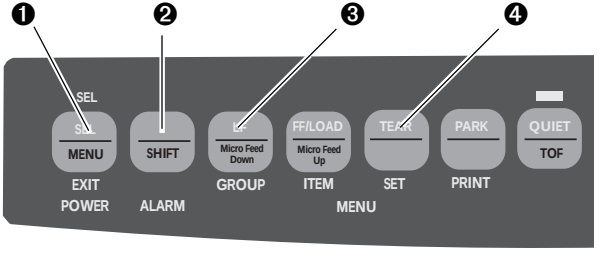
Note: *The Tear Feature can **not** be used when the optional pull tractor is engaged.*

Forms Tear-Off Feature

Important! *Never engage Forms Tear-Off when printing on labels!*

The Forms Tear-Off feature automatically moves continuous-form paper up to the tear position after the interval you select, then moves it back down again for printing when the printer receives more data.

This feature is normally turned off. To activate it:



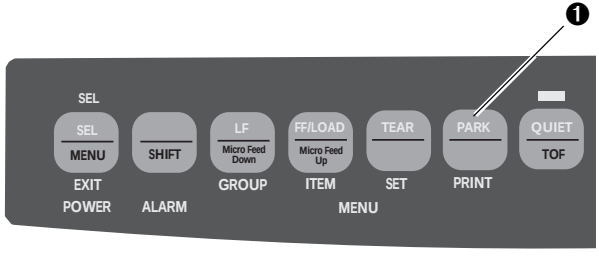
1. Press **SHIFT** (❷) + **SEL** (❶).
2. Press **GROUP** (❸) until one of the following lines appears, depending on which paper feed you are using:

```
REAR FEED       Form Tear-Off     OFF
BOTTOM FEED     Form Tear-OFF     OFF
```

3. Press **SET** (❹) until the time interval you wish to select appears in the third column.
4. Press **SHIFT** (❷) + **SEL** (❶) to exit Menu Mode and save the setting.

Note: *Some programs pause occasionally while sending data. If the pause is too long, the paper will advance to the tear-off position until more data is received. This extra paper movement can cause uneven print registration in graphics. If you have this problem, use the menu to turn off this feature.*

Paper Park Feature



To retract rear-feed paper form the paper path, press **PARK** (❶).

Section 4: Troubleshooting

Problem:
Nothing happens when I turn on the printer.

Solution:
Check the power cord connection to the outlet. If you are using a power strip, make sure it is turned on, and that the fuse has not blown nor the circuit breaker tripped.

Problem:
The printer does not print when the computer sends data.

Solutions:
1. Is the SEL light on? If not, press the **SEL** key.
2. Check that the interface cable is securely connected to both the printer and the computer.
3. If you have the optional serial interface board installed, check to be sure that it is firmly seated in the printer.

Problem:
I'm getting strange symbols, incorrect fonts, etc., when I try to print a document.

Solutions:
1. Check to be sure that the printer driver you have selected in your software matches the printer emulation. (Press **SHIFT** and **SEL** keys, then press **GROUP** key: this will print a line showing the emulation you have selected.)
2. If you have embedded any printer commands in your software, check to be sure that you entered them correctly.

Problem:
Ink smears on the paper when I print on narrow forms.

Solution:
This may be caused by excessive printhead travel from the centering position. Enter the Menu and set the Centering Position to MODE 1 (see Menu Mode in Section 3). For wide-carriage Model ML321T, if MODE 1 doesn't work, try setting the Centering Position to MODE 2.

Problem:
I've installed a new ribbon and the printing is smeared and streaked.

Solution:
The ribbon shield is either loose or missing. Remove the ribbon cartridge and check the ribbon shield: if it is loose, secure it in place, if it is missing, find it and reinstall it.

Problem:
The ALARM light is on and the Character Pitch 15 light is flashing.

Solution:
This indicates a paper jam. Press the SEL key and correct the paper jam situation (see “Clearing Paper Jams” in Section 2).

Problem:
The ALARM light is on and the Character Pitch 10 light is flashing.

Solution:
This indicates that the paper lever is set at the wrong position for the paper you are trying to use: move it to the proper setting.

Problem:
The ALARM light is blinking.

Solution:
Try turning the printer off and then back on again. If the light still blinks, call for service.

Problem:
The printer needs paper, but the ALARM light is not on and I can not load the paper.

Solution:
Press and release the SEL key, then hold the SHIFT key and press the RESET (CHARACTER PITCH) key: this resets the printer.

Problem:
The Print Quality and Character Pitch keys on the front panel won't work.

Solution:
The Operator Panel Function in the printer menu can be used to disable these buttons. If the printer is part of a customized system or if it is used by a number of people, the system manager may have used this option to make sure the printer is always set properly.

Problem:
My word processor files do not print the way I have the menu and front panel set.

Solution:
Before sending a file to the printer, many word processors send either an “initialization string” or an I-Prime signal to the printer.

The initialization string contains codes that override the panel and menu settings. To change your printer to ignore the reset code, enter the Menu Mode, go to the Set-Up group and change the setting for Reset Inhibit to Yes (see Menu Mode in Section 3).

The I-Prime signal will automatically override any front panel settings you have made. To eliminate this problem, enter the Menu Mode, go to the Parallel Interface group and change the setting for I Prime to Invalid (see Menu Mode in Section 3).

Problem:
Continuous-form paper is sticking to the paper separator.

Solution:
In cold dry weather, static charges can build up and make the paper cling to the paper separator. Try moving the paper guides together so that the paper rests on the guides rather than on the separator.

Section 5: Specifications

Print Method: Impact dot matrix

Printhead: 9 pins, 0.34 mm diameter, thermal protection

Print Speed:

Mode	*Characters per second*
Super Speed Draft (SSD)	435 cps
High Speed Draft (HSD)	390 cps
Utility (UTL)	300 cps
Near Letter Quality (NLQ)	75 cps

Characters per Line (CPL):

Setting	*ML320 Turbo*	*ML321 Turbo*
10 cpi	80 cpl	136 cpl
12 cpi	96 cpl	163 cpl
15 cpi	120 cpl	204 cpl
17.1 cpi	137 cpl	233 cpl
20 cpi	160 cpl	272 cpl

Emulations: Epson FX (ESC/P), IBM Proprinter III(PPSII), and OKIDATA Microline Standard co-resident

Interface: Standard: Centronics parallel, IEEE-284 compliant
Optional: RS-232C serial

Graphics Resolution:

Emulation	*Maximum Resolution*
Epson/IBM	240 (H) x 216 (V) dpi
OKIDATA	288 (H) x 144 (V) dpi

Resident Fonts:

Print Quality	*Available Fonts*
Near Letter Quality	Courier, Gothic
Utility	Gothic
High Speed Draft	Gothic
Super Speed Draft	Gothic

Resident Scalable Fonts*: Courier and Gothic, in sizes from 22 to 216 points

Bar Codes: Code 39, UPC A, UPC E, EAN 8, EAN 13, Interleaved 2 of 5, Code 128, Postnet

Receive Buffer Size: 28K

Reliability:

Parameter	*Reliability*
Mean Time Between Failures (MTBF)	10,000 hours at 25% duty cycle and 35% page density
Mean Time to Repair (MTTR)	15 minutes
Printhead Life	200 million characters average in 10 cpi draft mode at 25% duty and 35% page density
Ribbon Life (on average, 10 cpi utility)	3 million characters

*Selectable through software only.

Paper Specifications:

Paper Type	*Feed*	*Weight*	*Width Range*
Cut sheets	Top	14-24 lb.	NM+: 7.2" to 8.5" WM++: 7.2 to 14.3"
Single-part continuous forms	Rear, Bottom	12-24 lb.	NM+: 3-10" WM++: 3-16"
Carbonless continuous forms	Rear, Bottom	9-11 lb.	NM+: 3-10" WM++: 3-16"
Interleaf continuous forms	Rear, Bottom		NM+: 3-10" WM++: 3-16"
Labels	Bottom		NM+: 3-10" WM++: 3-16"
Envelopes, single feed	Top	24 lb. max.	6.5" to 9.5"
Envelopes, continuous feed, non-overlap	Bottom	24 lb. max.	6.5" to 9.5"
Card stock	Bottom	120 lb. max.	N.A.
Transparencies	Top	—	8.5" x 11"

+NM = Narrow Model, ML320 Turbo
++WM = Wide Model, ML321 Turbo

Paper Width Minimum: 3"
Maximum: ML320 Turbo, 10"
ML321 Turbo, 16"

Paper Weight 12 to 24 lb.

Paper Thickness Rear Feed: 0.014" (0.36 mm) max.
Bottom Feed*: 0.017" (0.43 mm) max., expandable to 0.031" (0.79 mm) max.

Dimensions (W x D x H)

ML320 Turbo: 15.7 x 13.6 x 4.6 inches (389 x 355 x 116 mm)

ML321 Turbo: 21.7 x 13.6 x 4.6 inches (550 x 355 x 116 mm)

Weight ML320 Turbo: 17.2 lbs. (7.8 kg)
ML321 Turbo: 22.2 lbs. (10.1 kg)

* Requires optional push or pull tractor.

Environmental Requirements

Parameter	***Range***
Operating Temperature	41 to 104°F (5 to 40°C)
Storage Temperature	14 to 122°F (-10 to 50°C)
Operating Humidity	20 to 80% RH
Storage Humidity	5 to 95% RH

Electrical Requirements 120 volts ac (+5.5%, -15%), 60 Hz (±2%)

Also available for 230 or 240 volts ac, 50 or 60 Hz (±2%)

Specifications subject to change without notice.

Section 6: Service

Getting Service and Support

Your Dealer

Consult the store where you purchased your printer, or call 1-800-OKIDATA for the location of the nearest Authorized Okidata Service Dealer. Have your ZIP code ready.

- Proof of purchase is required for warranty work. Be sure to retain your purchase documents.

The Okidata Customer Support Center

Okidata Automated Information Service

Call 1-800-OKIDATA (1-800-654-3282): available 24 hours a day, 7 days a week, providing immediate assistance with:

- Basic operating procedures for current Okidata products
- Sales and service referrals
- Parts and consumable referrals
- Product information

This service also provides access to Okidata's Faxable Facts document retrieval system.

Okidata Customer Support Representatives

Agents are available from 8 AM to 6 PM ET, Monday through Friday. Call 1-800-OKIDATA: before calling, have a printout of your printer menu handy (see page 23). Please call from a telephone close to your printer, so you can refer to it directly as needed during the conversation.

Our Customer Support Representatives are trained on all current Okidata products. They can answer your questions regarding

- Installation of your Okidata printer
- Usage and non-technical printer issues
- Availability and installation of Okidata printer drivers

  Note: *Customer Support Representatives are not trained to assist you with the use of commercial software packages. Please consult your software user's manual for information on their support.*

- Error message interpretation
- Parts identification
- Consumer relations

Okidata Faxable Facts

Call 1-800-654-6651 and follow the recorded message to have information faxed to you automatically through Okidata's Faxable Facts on-line document retrieval system:

- Pricing & information on ribbons and other consumables
- Product literature on other Okidata products
- Material Safety Data Sheets

Okidata Service Locations

- Allow 30 days for round trip shipping repair.
- Carry-in repairs: call in first to schedule service.
- Before shipping your printer, you must call and obtain a return authorization number.

U.S.
Okidata
2020 Bishops Gate Blvd.
Mt. Laurel, NJ 08054
Attn.: Field Service Dept.
Phone: 1-800-654-3282
Fax: 1-609-222-5247

U.S.
Okidata
851 Feehanville Drive
Mt. Prospect, IL 60056
Attn.: Field Service Dept.
Phone: 1-800-654-3282
Fax: 1-609-222-5247

Canada
2735 Matheson Blvd. East, Unit 1
Mississauga, Ontario
Canada L4W 4M8
Attn.: Field Service Dept.
Phone: 1-800-654-3282
Fax: 905-238-4427

Argentina
Megatech
Lavalle 1524
1048 Buenos Aires, Argentina

Phone/Fax: (541) 371-4123

Brazil
Oki Data do Brasil, Ltda.
Av. Leonardo da Vinci, 1178/1182
Jabaquara
Sao Paulo, Brazil
Phone: (5511) 5589-1518
Fax: (5511) 5584-0267

Chile
Teknos Comunicaciones
Santa Elena 2222
Santiago Chile
Phone: 555 5530
Fax: 56 (2) 550 2390

Colombia
Soluciones Tecnologicas
C/93 #14-17, OF 308
Centro 93
Bogota, Colombia
Phone: (571) 218-2380
Fax: (571) 622-1280

Mexico
Oki Data de Mexico, S.A. de C.V.
Av. Insurgentes 1700 - 7 Piso
Col. Florida 01030
Phone: 525-661-6860
Fax: 525-661-5861

Venezuela
MAI de Venezuela S.A.
Torre Lincoln, Piso 8
Sabana Grande
Caracas, Venezuela
Phone: 782.78.11
Fax: (02) 781.9390

Purchasing Replacement Parts & Accessories

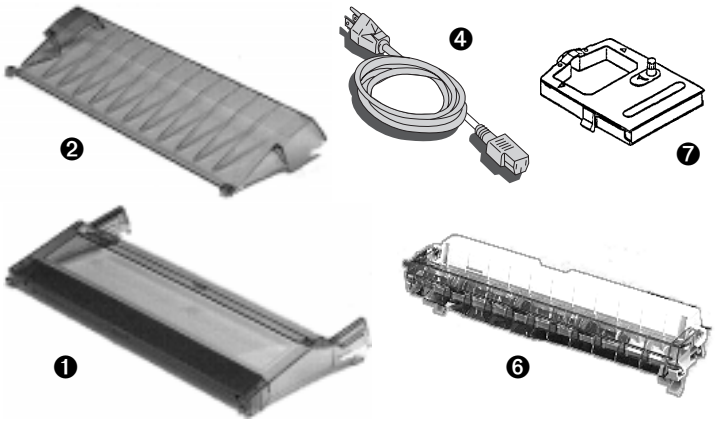
Before you order, know your printer model number (see the front of the printer) and have the correct part number and description of the item.

Ways to Purchase

- Consult the dealer where your purchased your printer.
- Consult an Okidata Authorized Sales or Service Dealer. Call 1-800-OKIDATA for the nearest Authorized Sales and Service location. Have your ZIP code ready for our Customer Support Representatives.
- Order toll-free by phone at 1-800-OKIDATA, using VISA, MasterCard, or American Express.
- Check office supply catalogs or your local stationery store. Most carry Okidata brand ribbons. Be sure to ask for genuine Okidata ribbons!
- In Canada, call 905-602-6400 to order parts: VISA and American Express are accepted.

Replacement Parts

Replacement Part	Order No.
Access Cover, ML320T (❶)	53076701
Access Cover, ML321T (❶)	53076801
Acoustic Cover, ML320T (❷)	53076901
Acoustic Cover, ML321T (❷)	53077001
Platen Knob (❸)	51902220
Power Cord (❹)	56609701
Printhead (❺)	50114601
Pull-Up Roller Assembly, ML320T (❻)	50411001
Pull-Up Roller Assembly, ML321T (❻)	50411101
Ribbon Cartridge (❼)	52102001



Manuals

Manual	Order No.
Service Manual	59272601
User's Guide	59270102
Reference Manual	59258304

Accessories

Accessory	Order No.
Model ML320T	
Pull Tractor, Top-Mount	70030501
Push Tractor, Bottom-Mount	70030701
Roll Paper Stand	70023301
Model ML321T	
Pull Tractor, Top-Mount	70030601
Push Tractor, Bottom-Mount	70030801
Both Models	
Cut Sheet Feeder (❹)	70030101
Serial Interface	70012801

Section 7: Commands

This section contains a listing of the more commonly used commands. For a listing of all the commands, along with information on their use, request a copy of the OKIDATA MICROLINE Reference Manual by filling out the Reference Manual Request Card in the front of this Users Guide or by *mailing* your request to OKIDATA, P.O. Box 4603, Trenton, NJ, 08650.

Epson FX Commands

Epson Command	ASCII	Decimal
Backspace	BS	8
Carriage Return, Execute	CR	13
Character Pitch		
Select 10 cpi	ESC P	27 80
Select 12 cpi	ESC M	27 77
Select 15 cpi	ESC g	27 103
Select Condensed Print	ESC SI, or SI	27 15, or 15
Cancel Condensed Print	DC2	18
Delete	DEL	127
Double Height On	ESC w 1	27 119 49
Double Height Off	ESC w 0	27 119 48
Double Width On	ESC W 1	27 87 49
Double Width Off	ESC W 0	27 87 48
Emphasized Print On	ESC E	27 69
Emphasized Print Off	ESC F	27 70
Enhanced Print On	ESC G	27 71
Enhanced Print Off	ESC H	27 72
Epson Set 1, Select	ESC t 0	27 116 48
Epson Set 2, Select	ESC t 1	27 116 49
Italic Printing On	ESC 4	27 52
Italic Printing Off	ESC 5	27 53
Form Feed	FF	12
Form Length		
n Inches (n = 1 to 22)	ESC C NUL n	27 67 0 n
n Lines (n = 1 to 255)	ESC C n	27 67 n

Epson Command	ASCII	Decimal
Horizontal Tab	HT	9
Justification		
Left	ESC a 0	27 97 48
Center	ESC a 1	27 97 49
Right	ESC a 2	27 97 50
Full	ESC a 3	27 97 51
Line Feed, Execute		
w/ Carriage Return	LF	10
n/216" (n = 0 to 255)	ESC J n	27 74 n
n/144" (n = 0 to 127)	ESC % 5 n	27 37 53 n
Reverse, n/216" (n = 0 to 255)	ESC j n	27 106 n
Line Spacing, Set		
n/144" (n = 0 to 127)	ESC % 9 n	27 37 57 n
n/216" (n = 0 to 255)	ESC 3 n	27 51 n
n/72" (n = 0-85 or 128-213)	ESC A n	27 65 n
1/6"	ESC 2	27 50
1/8"	ESC 0	27 48
7/72"	ESC 1	27 49
Paper Out Sensor Off	ESC 8	27 56
Paper Out Sensor On	ESC 9	27 57

Epson Command	ASCII	Decimal
Print Quality/Font		
Select HSD/SSD, depending on Menu setting for Draft Mode	ESC (0	27 40 48
Select NLQ	ESC x 1	27 120 49
Select Courier (NLQ only)	ESC k 0	27 197 48
Select Gothic (NLQ only)	ESC k 1	27 197 49
Select UTL	ESC x 0	27 120 48
Print Speed		
Half-Speed On	ESC s 1	27 115 49
Half-Speed Off	ESC s 0	27 115 48
Print Suppress Mode On	DC3	19
Print Suppress Mode Off	DC1	17
Proportional Spacing On	ESC p 1	27 112 49
Proportional Spacing Off	ESC p 0	27 112 48
Reset Printer		
Clear Buffer & Initialize	ESC @	27 64
Clear Print Buffer	CAN	24
Skip Over Perforation, Cancel	ESC O	27 79
Software I-Prime	ESC } NUL	27 125 0
Subscript On	ESC S 1	27 83 49
Superscript On	ESC S 0	27 83 48

Epson Command	ASCII	Decimal
Subscript/Superscript Off	ESC T	27 84
Underline On	ESC - 1	27 45 49
Underline Off	ESC - 0	27 45 48
Uni-Directional Printing		
One Line Only	ESC <	27 60
On	ESC U 1	27 85 49
Off	ESC U 0	27 85 48
Vertical Tab, Execute	VT	11

IBM Proprinter III Commands

IBM Command	ASCII	Decimal
Backspace	BS	8
Carriage Return	CR	13
Character Pitch		
Select 10 cpi	DC2	18
Select 12 cpi	ESC :	27 58
Select 15 cpi	ESC g	27 103
Select Condensed Print	ESC SI, or SI	27 15, or 15

IBM Command	ASCII	Decimal
Character Sets		
IBM Set I	ESC 7	27 55
IBM Set II	ESC 6	27 54
Publisher	ESC ! Z	27 33 90
Slashed Zero	ESC ! @	27 33 64
Unslashed Zero	ESC ! A	27 33 65
Double Width On	ESC W 1	27 87 49
Double Width Off	ESC W 0	27 87 48
Emphasized Printing On	ESC E	27 69
Emphasized Printing Off	ESC F	27 70
Enhanced Printing On	ESC G	27 71
Enhanced Printing Off	ESC H	27 72
Form Feed	FF	12
Form Length, n inches (n = 1 to 22)	ESC C NUL n	27 67 0 n
Form Length, n lines (n = 1 to 255)	ESC C n	27 67 n
Horizontal Tab, Execute	HT	9
Italics On	ESC % G	27 37 71
Italics Off	ESC % H	27 37 72

IBM Command	ASCII	Decimal
Line Feed, Execute		
w/ Carriage Return	LF	10
n/144" (n = 1 to 127)	ESC % 5 n	27 37 53 n
n/216" (n = 0 to 255)	ESC J n	27 74 n
Reverse	ESC]	27 93
Auto Line Feed On	ESC 5 1	27 53 49
Auto Line Feed Off	ESC 5 0	27 53 48
Line Spacing		
Set Spacing to 1/8"	ESC 0	27 48
Set Spacing to 7/72"	ESC 1	27 49
Set Spacing to n/72" (n = 0 to 255)	ESC A n	27 65 n
Store Spacing Set by ESC A n	ESC 2	27 50
Set Spacing to n/144"	ESC A n	27 65 n
(n = 1 to 127)	ESC A n	27 65 n
Set Spacing to n/216"	ESC A n	27 65 n
(n = 0 to 255)	ESC A n	27 65 n
Overscore On	ESC _ 1	27 95 49
Overscore Off	ESC _ 0	27 95 48
Paper Out Sensor Off	ESC 8	27 56
Paper Out Sensor On	ESC 9	27 57

IBM Command	ASCII	Decimal
Print Quality, Select HSD	ESC # 0	27 35 48
Print Suppress On, ML320T	ESC Q ETX	27 81 3
Print Suppress On, ML321T	ESC Q SYN	27 81 22
Print Suppress Off	DC1	17
Proportional Spacing On	ESC P 1	27 80 49
Proportional Spacing Off	ESC P 0	27 80 48
Reset: Clear Print Buffer	CAN	24
Software I-Prime	ESC } NUL	27 125 0
Stop Printing	ESC j	27 106
Subscript On	ESC S 1	27 83 49
Superscript On	ESC S 0	27 83 48
Subscript/Superscript Off	ESC T	27 84
Top of Form, Set at Current Position	ESC 4	27 52
Underline Printing On	ESC - 1	27 45 49
Underline Printing Off	ESC - 0	27 45 48
Uni-Directional Print On	ESC U 1	27 85 49
Uni-Directional Print Off	ESC U 0	27 85 48
Vertical Tab, Execute	VT	11

OKIDATA MICROLINE Standard Commands

Okidata Command	ASCII	Decimal
Backspace	BS	8
Carriage Return	CR	13
Character Pitch		
Select 10 cpi	RS	30
Select 12 cpi	FS	28
Select 15 cpi	ESC g	27 103
Select 17.1 cpi	GS	29
Select 20 cpi	ESC # 3	27 35 51
Character Sets		
Standard	ESC ! 0	27 33 48
Block Graphic	ESC ! 1	27 33 49
Line Graphics	ESC ! 2	27 33 50
Publisher	ESC ! Z	27 33 90
Slashed Zero	ESC ! @	27 33 64
Unslashed Zero	ESC ! A	27 33 65
Double Height On	ESC US 1	27 31 49
Double Height Off	ESC US 0	27 31 48
Double Width Printing	US	31
Emphasized Printing On	ESC T	27 84
Emphasized Printing Off	ESC I	27 73
Enhanced Printing On	ESC H	27 72
Enhanced Printing Off	ESC I	27 73
Form Feed	FF	12
Horizontal Tab, Execute	HT	9
Italic On	ESC ! /	27 33 47
Italic Off	ESC ! *	27 33 42
Line Feed Commands		
w/ Carriage Return	LF	10
w/o Carriage Return	ESC DC2	27 18
n/144" (n = 0 to 127)	ESC % 5 n	27 37 53 n
Reverse	ESC LF	27 10
Line Spacing		
Set Spacing to 1/6"	ESC 6	27 54
Set Spacing to 1/8"	ESC 8	27 56
Set Spacing, in n/144" (n = 0 to 127)	ESC % 9 n	27 37 57 n
Skip Over Perforation, in 1/3" increments (n = 1 to 9)	ESC G nn	27 71 nn
Skip Over Perforation Default	ESC % S 0	27 37 83 48

Okidata Command	ASCII	Decimal
Paper Out Sensor Off	ESC E 1	27 69 49
Paper Out Sensor On	ESC E 0	27 69 48
Print Quality		
Select HSD/SSD	ESC # 0	27 35 48
Select NLQ Courier	ESC 1	27 49
Select NLQ Gothic	ESC 3	27 51
Select Utility	ESC 0	27 48
Print Speed, Set to Full	ESC >	27 62
Print Speed, Set to Half	ESC <	27 60
Print Suppress On	DC3	19
Print Suppress Off	DC1	17
Proportional Printing		
On	ESC Y	27 89
Off	ESC Z	27 90
Reset: Clear Print Buffer	CAN	24
Shift-In	SI	15
Shift-Out	SO	14
Software I-Prime	ESC } NUL	27 125 0
Subscript Printing On	ESC L	27 76
Subscript Printing Off	ESC M	27 77

Okidata Command	ASCII	Decimal
Superscript Printing On	ESC J	27 74
Superscript Printing Off	ESC K	27 75
Underline Printing On	ESC C	27 67
Underline Printing Off	ESC D	27 68
Uni-Directional Print On	ESC -	27 45
Uni-Directional Print Off	ESC =	27 61
Vertical Tab, Execute	VT	11

FCC/IC/CE

Federal Communications Commission (FCC) Radio Frequency Interference (RFI) Statement for 120-Volt Models

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Plug the unit into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Note: *It is the responsibility of the user to obtain the required* ***shielded*** *cable in order to ensure compliance of this equipment with FCC regulations.*

Changes or modifications not expressly approved by OKIDATA may void your authority to operate this device.

Industry Canada (IC) Radio Interference (RI) Statement for 120-Volt Models

This OKIDATA apparatus complies with the Class B limits for radio interference as specified in the Industry Canada Radio Interference Regulations.

FCC RFI Statement for 230/240-Volt Models

WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Note: *It is the responsibility of the user to obtain the required* ***shielded*** *cable in order to ensure compliance of this equipment with FCC regulations.*

Changes or modifications not expressly approved by OKIDATA may void your authority to operate this device.

IC RI Statement for 230/240-Volt Models

This OKIDATA apparatus complies with the Class A limits for radio interference as specified in the Industry Canada Radio Interference Regulations.

European Union Council of the European Communities Statement of Electromagnetic Conformance for 230/240-Volt Models

This product complies with the requirements of the Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic compatibility.

Warranty

Limited Warranty

Okidata, division of Oki America, Inc. (Okidata) warrants this printer to be free from defect in material and workmanship and will remedy any such defect according to the terms of this *Limited Warranty.* This *Limited Warranty* does not extend to consumable items, including but not limited to ribbons, fuses, etc.

Okidata will repair (or at its option, replace) at no charge, any defective component(s) of the MICROLINE printer for one (1) year from the date of purchase. This *Limited Warranty* extends to the original purchaser only.

To make request or claim for service under this *Limited Warranty* the original purchaser must return the Okidata product, shipping prepaid, in the original shipping container or equivalent, to Okidata or an authorized Okidata service center and assume the risk of loss or damage in transit. A written receipt for the product, showing the date of purchase, dealer's name, and both the model and serial numbers of the Okidata printer must accompany *any* request or claim for work to be performed under this *Limited Warranty.*

This *Limited Warranty* shall not apply if the product has been damaged due to abuse, misuse, misapplication, accident, or as a result of service or modification by any other than an authorized OKIDATA service center.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE ON THE FACE HEREOF AND DESCRIBED ABOVE. NO WARRANTIES WHETHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY PARTICULAR PURPOSE, SHALL EXTEND BEYOND THE RESPECTIVE WARRANTY PERIOD DESCRIBED ABOVE OF ONE (1) YEAR. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

OKIDATA SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSS ARISING FROM THE USE OF THIS PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

Additional information on obtaining service under this *Limited Warranty* is available by contacting the Okidata

dealer from whom the product was purchased, by contacting Okidata directly at 1-800-OKIDATA (U.S. and Canada, English only) or at 1-609-222-5276 (Spanish only), or by contacting one of the following service locations:

UNITED STATES
OKIDATA
Tel: 1-800-OKIDATA (1-800-654-3282)
Fax: 1-609-222-5247

ARGENTINA
Megatech
Tel: (541) 371-4123
Fax: (541) 371-4123 (Touch-Tone® needed)

BRAZIL
Oki Data do Brasil, Ltda
Tel: (5511) 5589-1518
Fax: (5511) 5584-0267

CANADA
OKIDATA
Tel: 1-800-OKIDATA (1-800-654-3282)
Fax: 905-238-4427

CHILE
Teknos Comunicaciones
Tel: 56 (2) 555 5530
Fax: 56 (2) 550 2390

COLOMBIA
Soluciones Tecnologicas
Tel: (571) 218-2380
Fax: (571) 622-1280

MEXICO
Oki Data de Mexico,
S.A. de C.V.
Tel: 525-661-6860
Fax: 525-661-5861

VENEZUELA
MAI de Venezuela S.A.
Tel: 782.78.11
Fax: (02) 781.9390

This *Limited Warranty* applies to this Okidata printer. However, the procedure for obtaining service may vary outside the continental United States. Contact your Okidata dealer for such warranty service information.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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MSDS

Material Safety Data Sheet (MSDS) # 58064801
For Black Ribbon (P/N 52102001)

For more information, contact Okidata at:

2000 Bishops Gate Blvd.
Mount Laurel, NJ 08054-4620

For Emergency Information, call 1-800-OKIDATA.

Emergency First Aid Procedures

Emergency	Procedure
Contact occurs with eyes.	Flush eyes with large quantities of water for for 15 minutes, keeping eyelids open with fingers. Seek medical attention.
Contact occurs with skin	Wash thoroughly with soap and water.

Preparation Date: August 31, 1998

Hazardous Ingredients

Carbon Black
CAS# 1333-86-4
OSHA PEL 3.5 mg/m^3
ACGIH TLV 3.5 mg/m^3

Coloring Material
CAS# Not applicable
OSHA TWA Not applicable
ACGIH TLV Not applicable

Oil
CAS# Not applicable
OSHA TWA Not applicable
ACGIH TLV Not applicable

Additives
CAS# Not applicable
OSHA TWA Not applicable
ACGIH TLV Not applicable

Nylon 6-6 Fabric
CAS# Not applicable
OSHA TWA Not applicable
ACGIH TLV Not applicable

PSM Fiber
CAS# Not applicable
OSHA TWA Not applicable
ACGIH TLV Not applicable

Physical Data

Melting Point: N/A
Boiling Point: N/A
Vapor Pressure: N/A
Vapor Density (Air = 1): N/A
Evaporation Rate (Butyl Acetate = 1): Not applicable
Specific Gravity (H_2O=1): No data available
Solubility in Water: No data available
Appearance and Odor: Nylon 6-6 fabric impregnated with liquid black ink

Fire and Explosion Hazard Data

Flash Point (Method Used): N/A
Flammable Limits, LEL/UEL: N/A
Extinguishing Media: Water, CO_2, Dry Chemical or Foam
Special Fire and Explosion Procedures: N/A
Unusual Fire and Explosion Hazards: None

Health Hazard Data

Routes of Entry: Ingestion, Eyes, Skin
Health Hazards: None

Reactivity Data

Stability: Stable
Polymerization: Will not occur.
Hazardous Decomposition or Byproducts: None
Conditions to Avoid: N/A
Incompatibility (Materials to Avoid): None

Spill Cleanup and Disposal

Spill Cleanup: If the ribbon is inadvertently pulled out, it should be rewound on the reel using the take-up knob.

Waste Disposal: Follow appropriate federal, state and local regulations.

Safe Handling and Use

Respiratory Protection: Not applicable

Protective Gloves and/or Eye Protection: Not normally required. Protective gloves desirable in some cases.

Ventilation: Not applicable

Other Protective Equipment and/or Hygienic Practices: Not applicable

Special Precautions

Precautions for Handling or Storage: Store in a dark, cold place. Do not pull ribbon out of cartridge.

Other Precautions: Not applicable

The information contained in this MSDS is based on data considered accurate; however, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third person party proximately caused by the product if reasonable safety procedures are not adhered to as stipulated in the MSDS. Furthermore, vendor assumes no responsibility for injury to vendee or third person party proximately caused by abnormal use of the product even if reasonable safety procedures are followed. Additionally, vendee assumes the risk of his use of the product.