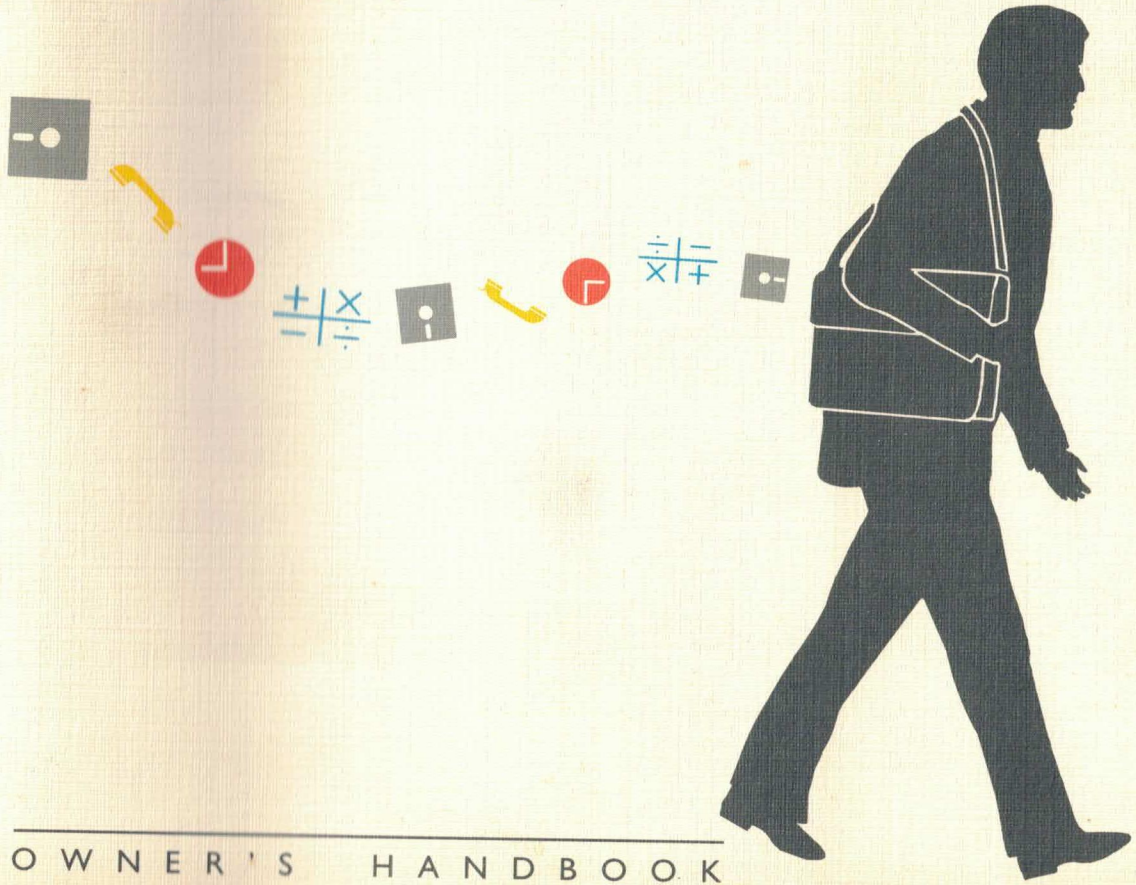
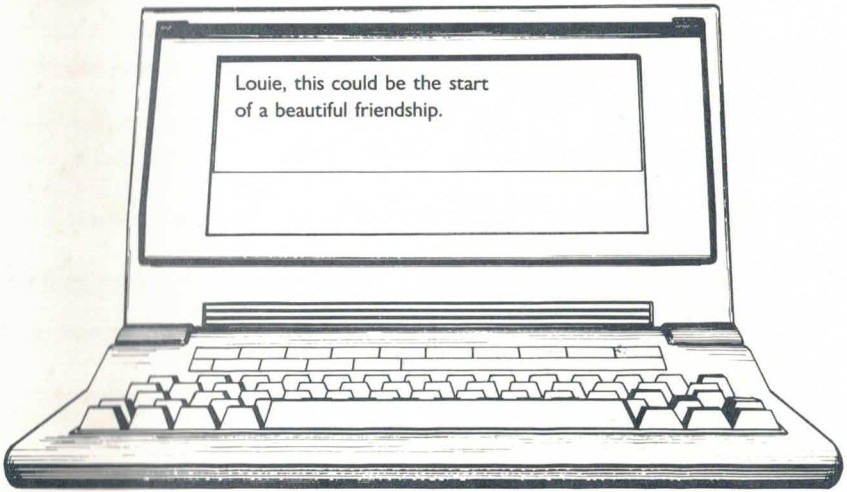
Pivot



OWNER'S HANDBOOK

Owner, meet your new Pivot.
Pivot, meet your new Owner.



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1-2-3 and *Symphony* are trademarks of Lotus Development Corp.

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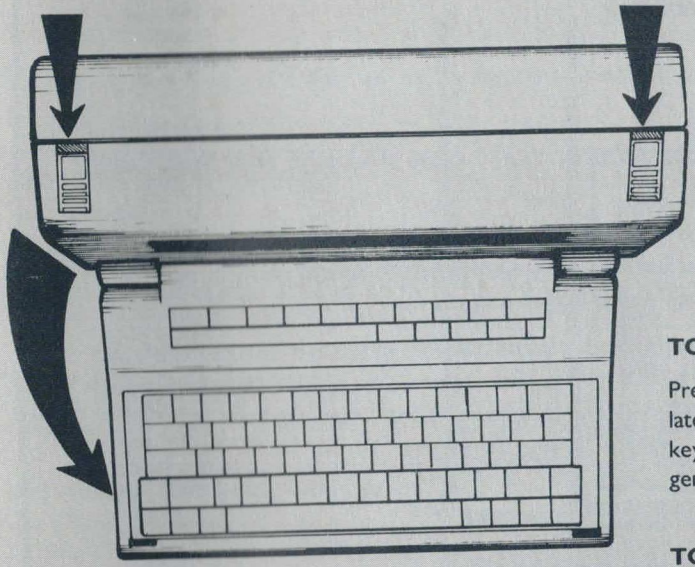
CONNECTING DEVICES TO PIVOT

Foreword to the Second Edition—This Handbook is complete and correct as humanly possible. We have included a uniquely exhaustive index; the text has been expanded considerably since the first edition; and when we refer you to related sections, we do so by page number, not by section title. These three factors contribute to the presence of several point pages (7.1 etc.), for which we beg your tolerance.

If you're someone who holds user manuals in contempt as a matter of principle, at least familiarize yourself with the contents of this first section. It's short, and there are lots of pictures.

Opening/Closing Pivot



TO OPEN:

Press the front edges of the keyboard latches on Pivot's top to release the keyboard. Swing the keyboard down gently.

TO CLOSE:

Swing the keyboard up. Hold it in its closed position and slide the latches forward until they click into place.

Basic Care and Feeding

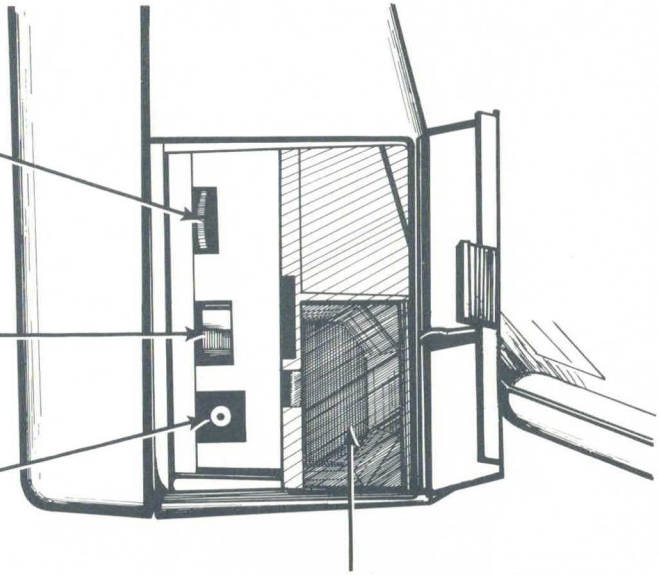
- Keep Pivot in its closed position when not in use. Be sure the power switch is turned off.
- Never connect or disconnect printers and other devices to Pivot with Pivot's power switch on.
- Open the disk drive doors *before* turning Pivot off or unplugging it. Leave them open while turning Pivot back on. This eliminates the danger to disks that comes with the voltage surge of powering up and down.
- When moving Pivot, always keep a spare diskette in the disk drives. This keeps the drives' heads from bumping into each other. You could also use the cardboard inserts that came in the drives when shipped from Morrow.
- Don't expose Pivot to excessive amounts of sunlight, or to extremely hot and cold environments.

Left Side: Controls & Switches

Viewing Angle Dial to adjust the crystals in the display to your working position. Can also be used as a contrast control.

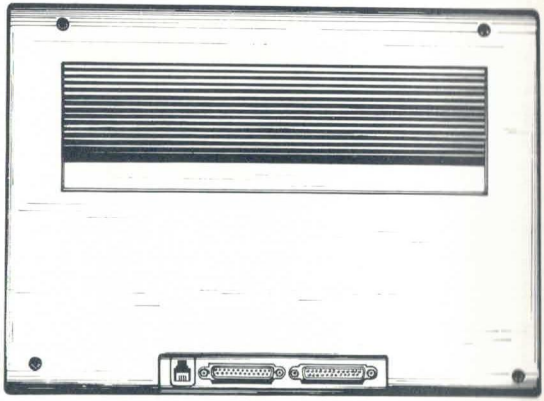
On/Off Switch —Down is off, up is on. When both the AC adapter and battery pack are installed, the batteries will be charged regardless of this switch's position.

AC Adapter Connector —Be sure the plug is inserted all the way.



Battery Pack Compartment — Disengage the door by pushing in on its tongue. Slide the battery pack in with the metal contacts going first.

Rear Panel: Device Connectors



Parallel Printer Connector for attaching Parallel or "Centronics-type" printers.

Telephone (RJ11-C) socket for connecting Pivot's built-in modem to the telephone line.

Serial Connector for attaching serial printers, external modems, and other serial devices. Can also be used to connect Pivot as a terminal for another computer.

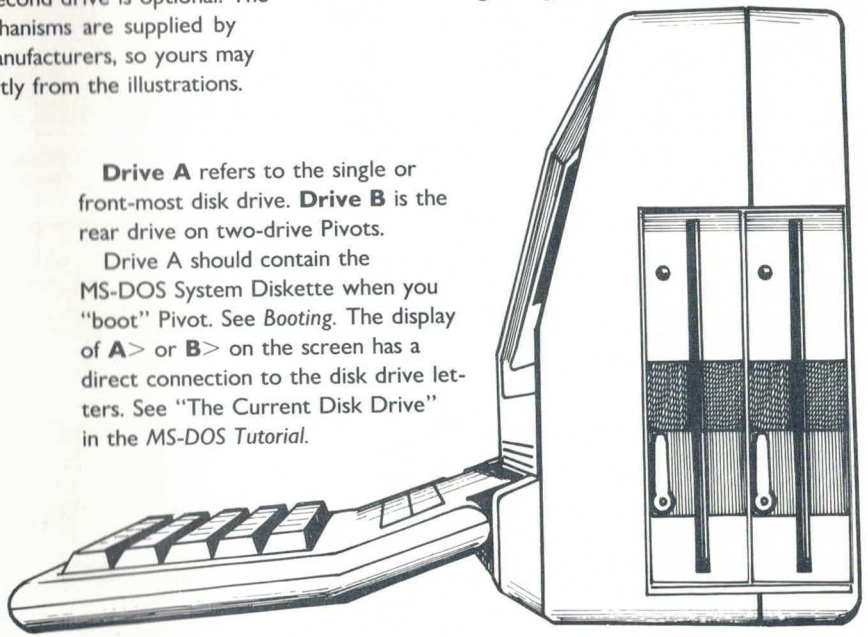
Right Side: Disk Drives

Disk Drives —Pivot has one 5¼" floppy disk drive as standard equipment. A second drive is optional. The drive mechanisms are supplied by various manufacturers, so yours may differ slightly from the illustrations.

Note that some disk drives won't let you open their doors while they're active (the red light on them is glowing).

Drive A refers to the single or front-most disk drive. **Drive B** is the rear drive on two-drive Pivots.

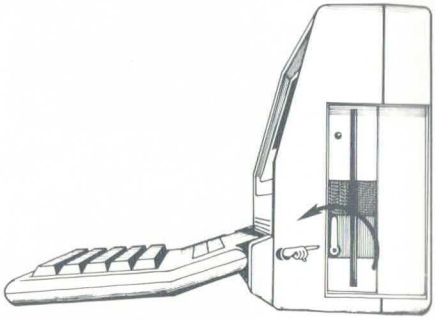
Drive A should contain the MS-DOS System Diskette when you "boot" Pivot. See *Booting*. The display of **A>** or **B>** on the screen has a direct connection to the disk drive letters. See "The Current Disk Drive" in the *MS-DOS Tutorial*.



Drive A **Drive B (optional)**

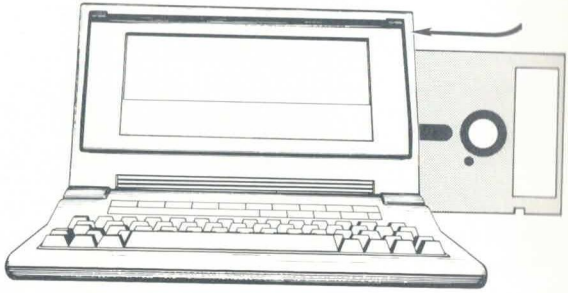
Inserting Disks

1. Open the disk drive door. Some models have a latch that swings over the disk slot when closed; others have a door that completely covers the front of the drive. With the latter types, open by pushing on the door and releasing.



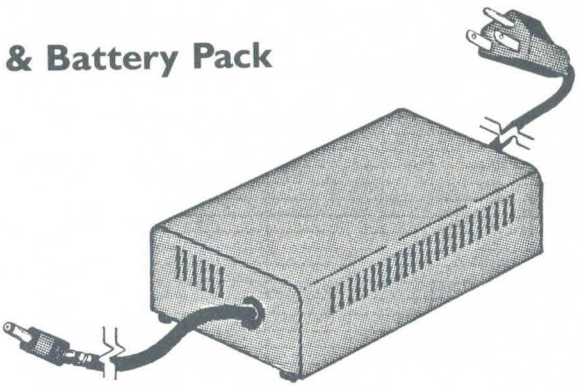
2. Hold the diskette with your thumb on the label, other fingers underneath.

3. Slide the diskette all the way in the drive, oblong opening first, label facing Pivot's front.



4. Close the latch or drive door. If you meet much resistance, the diskette is either inserted wrong or not inserted far enough. Back up and try again.

Accessories: AC Adapter & Battery Pack



AC Adapter —You will need to have the AC adapter plugged into the wall and connected to Pivot at all times when using Pivot, unless you have purchased the Battery Pack option.

Even if you have a battery pack, you should still use the AC adapter whenever possible. This will maintain a full charge on the batteries.

Battery Pack —Pivot's optional battery pack lets you use every Pivot function while on the road, just as if it were plugged into the AC adapter. When fully charged, the battery pack will give about 4 hours of continuous normal use, depending on how heavily you use your disk drive(s).

To charge the battery pack, leave Pivot plugged into the AC adapter with the power switch off for eight hours or more. It is impossible to over-charge the battery pack.

When you're running Pivot with the AC adapter, the battery pack is still being charged, except more slowly.

Note on batteries:

Like some cameras, Pivot can have two separate batteries. All Pivots have a small built-in battery to keep your clock and appointment calendar alive when power is disconnected. It does *not* have the power to run Pivot, as the battery pack does. This battery lasts about two years and must be replaced by a Morrow Service Center.

In contrast to the built-in battery, the battery pack is an optional extra. It is much larger; it *can* and does run Pivot; it is rechargeable; and you can replace it yourself after a period of years when its charge-ability wears out.

What Happens When the Battery Pack Runs Down?

This is a two-stage affair. First, a "Battery Low" message flashes on the display. When this happens you still have enough time to transfer any data you may be working with onto a disk. If possible, you should immediately connect the AC adapter.

Soon after "Battery Low" appears, you may see "Battery Dead." It's too late to save your data when that happens. Pivot locks up. To restart, connect the AC adapter.

The Inevitable Crash

Programmers have a lingo for all the strange things that normal, healthy computers can do. "It went off into the ozone." "It went south." Or, most commonly, "It crashed."

A computer crash usually means that it stops dead. No matter what keys you press, nothing happens. Other interesting effects include disk activity that continues ad infinitum and illegible squiggles that dance across the display. Crashes often result from a surge in the power supply; sometimes it's an obscure bug in the software; a full moon, bad bio-rhythms . . . who can say?

Here's what you do when Pivot crashes: take a deep breath, count to ten, and reset.

Resetting

See page 23. The short version is: Find the three keys labelled CTRL, ALT, and INSERT/DELETE. Hold down the CTRL and ALT keys, and while holding them both down, tap the INSERT/DELETE key.

About Memory, Disks, Programs, and Power

The precautions that follow make sense only when you understand a couple of basic computer principles.

You can use Pivot two ways: with only the built-in functions, and by running programs on disks. The built-in functions are the Calculator, Phone Directory/Modem, and Appointment Schedule. These conveniences are pretty limited, so it's almost certain you'll be using diskette programs like NewWord.

With the built-in functions, you can turn Pivot on and off all you like without losing any information. The functions are in memory banks called ROM and NVRAM, which don't rely on external power. See page 29.

With diskette programs, information is moved back and forth between the disk and the highly-volatile main memory bank, called RAM. The briefest interruption to Pivot's power supply wipes RAM clean. So you see that turning Pivot off at the wrong time can be hazardous.

When you use the program to manipulate data (like when you are typing a document with NewWord), the data does not go straight to the disk. It goes into RAM. The program you're using invariable has at least one command for transferring the data from RAM onto the disk, where it is safe and permanent.

It's okay to turn Pivot off when:

You haven't booted MS-DOS yet (see "Booting").
You're looking at MS-DOS' A> prompt.
You're looking at NewWord's Opening Menu, after saving any documents you've been editing.

It's NOT okay when:

You're editing a document with NewWord.
You're running an MS-DOS command like COPY.
You're in the middle of running any business program.

The rule of thumb is: Don't turn Pivot off in the middle of running programs or MS-DOS commands. When you've finished with them, then it's alright.

A Few Words of Caution Regarding The AC Adapter and Battery Pack

To continue with our let's-get-paranoid-about-losing-data theme, beware that you can inadvertently interrupt Pivot's power in a couple of ways.

Aside from turning the switch off . . .

- Don't remove the battery while running a program on the power supplied by the battery back.
- Don't disconnect the AC adapter while running a program, even if you have a fully-charged battery pack.

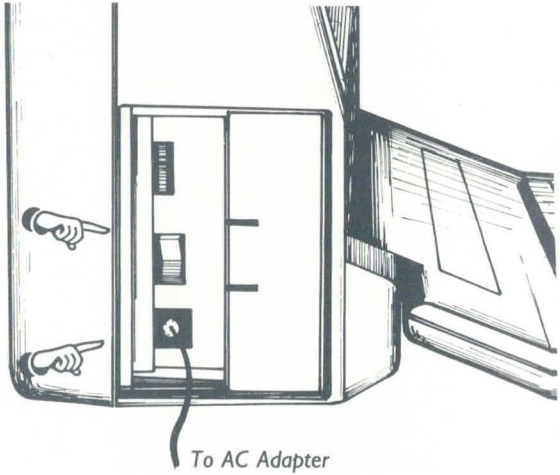
These actions abort the program, leaving any data you were working with in an unpredictable state (it has probably vanished). The effect is exactly the same as turning Pivot off or resetting it at the wrong time.

And Finally, To Give Your AC Adapter A Long and Healthy Life:

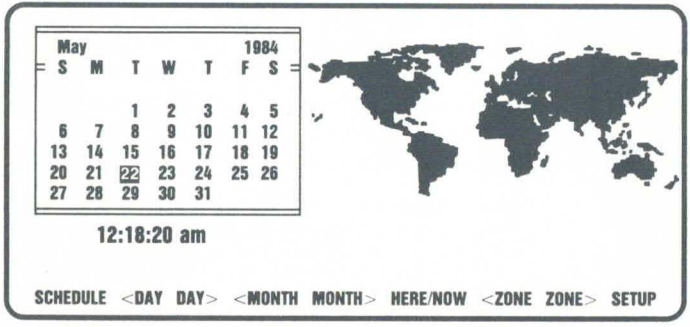
Unplug it from the wall when you're not using it to run Pivot or to charge the battery pack.

Powering Up:

Plug in the AC Adapter & Turn the Power Switch ON



Voilá!



You should be looking at the World Map display. If nothing happened, check your AC adapter connections, the wall socket, and the power switch. If something *appeared, but it's not recognizable, turn the power switch off and back on. Also, check the setting of the Viewing Angle Dial.*

If you're still having problems, contact your dealer.

What Do I Do Now?

Okay. So you've learned Who's Who as far as the disk drives and connectors go. The best thing for you to do next is:

1. Make sure your clock and calendar are set correctly.
2. Boot from your MS-DOS Master Diskette.
3. Make working copies of your MS-DOS and NewWord Master Diskettes.

Later you can hook up your printer and play with Pivot's built-in calculator, modem, and appointment calendar. You can run NewWord and perhaps other software you've bought. But let's take things a step at a time.

1. Make Sure Your Clock and Calendar are Set Correctly

When you turn Pivot on the first time, the odds are very high against the clock and calendar being set right. It is possible that your dealer has set them for you already. In any case, you should still follow these steps. There are only a couple of other things for you to check.

a) Look at the World Map Display. If you've been playing with the F1, F2, and other "F" (for "function") keys, you have probably changed the display to reflect a foreign time zone or future/past calendar day. Press F6 (HERE/NOW) to undo any of these changes. Press F6 even if you haven't pressed any other F keys.

b) Now press F10 for SETUP. The Setup Menu appears. You want to use SKIP (F1) to select an item and CHANGE (F3) to set its value. Using the Setup Menu may not require any explanation, but if you need help, see page 80.

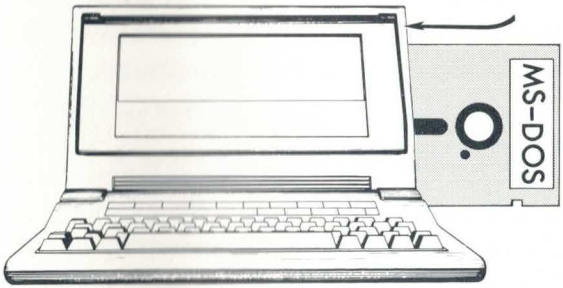
c) The items you are interested in, and their recommended settings, are shown below. Ignore everything else in the menu for now.

Time: (your current time)
Date: (your current date)
Time Zone: (your zone, as shown by city names displayed)
Display: 25 Line Auto

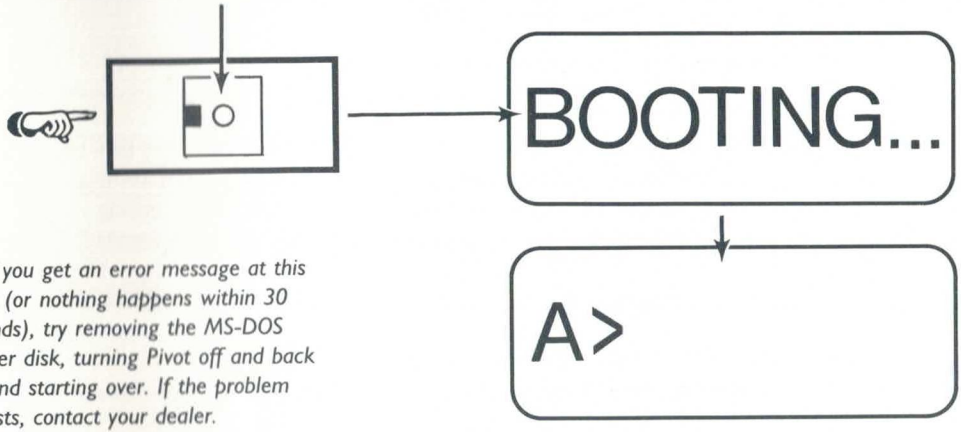
d) When the changes are made, press EXIT (F10) to get back to the World Map Display.

2. Boot From Your MS-DOS Master Disk

We won't attempt to explain here what booting is or why you do it. There are sections devoted to these topics elsewhere in this handbook.



Insert the MS-DOS Master diskette into the drive (front drive on two-disk models) and close the latch, if present. Then press the Diskette Icon. You should hear the disk drive spin and see a "Booting" message. Soon the MS-DOS system prompt (A>) appears.



If you get an error message at this point (or nothing happens within 30 seconds), try removing the MS-DOS Master disk, turning Pivot off and back on, and starting over. If the problem persists, contact your dealer.

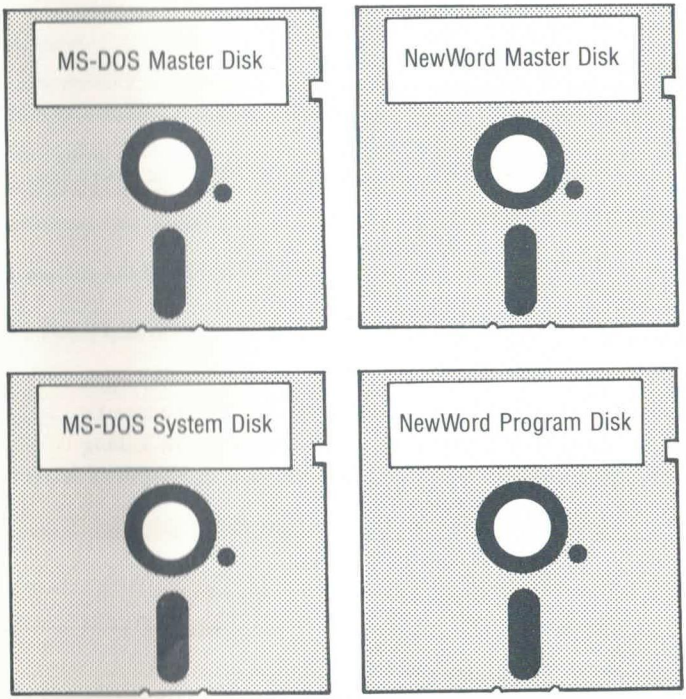
Before Proceeding, Notice This Symbol:

[RET]

It means "Press the RETURN key." The RETURN key is on the right edge of the keyboard, in the middle. You'll see *[RET]* repeatedly throughout this handbook, in the context of commands we're telling you to type. Commands for you to type appear in *italics*.

3. Make Working Copies of Your MS-DOS and NewWord Master Disks.

You'll need two new blank disks. Surely your dealer didn't let you slip out of the store without a box of 10. Label one disk **MS-DOS System Disk** and the other **NewWord Program Disk**. Use paper stick-on labels and a felt-tip pen.



These disks came with your Pivot. You don't use them except to make...

...THESE disks, which you'll use all the time.

If You Have One Disk Drive . . .

(If you have two disk drives, skip ahead to page 17.)

With the MS-DOS Master Disk in the floppy drive and "A>" on the screen, follow the steps below. When typing commands, backspace with the DEL key to correct typos (it's in the upper right corner). Hit [RET] (the Return key) when you've finished typing the command.

A>**format a:**

MS-DOS Diskette Format Utility
Version XXX
Insert new diskette for drive A:
and strike any key when ready

Type "format (space) a:" and hit [RET], the Return key.

Remove the MS-DOS Master Disk and insert the disk you labelled ***NewWord Program Disk.*** *Close the latch. You will probably have to wait for the drive motor to stop before the latch will open.*

Double-check that you've inserted the disk you labelled NewWord Program Disk, then ***press any key*** *to format it.*

Formatting . . . Track : XX	*Pivot is now formatting the disk from track 0 to 39.*
Testing for bad sectors . . .	*Making sure the disk is in good condition. If bad sectors are found, you will get "Data errors" a few steps below. If so, turn Pivot off, discard the disks you're making, and start over.*
Volume label . . . [RET] for none?	*Just hit [**RET**] here.*
362496 bytes total disk space 362496 bytes available on disk	*Statistics for a disk in good condition.*
Format another (Y/N)? **y**	*Type "y" for Yes.*
Insert new diskette for drive A: and strike any key when ready	*Remove the NewWord Program Disk and insert the disk you labelled **MS-DOS System Disk.** Then press any key to continue.*
(same sequence as above)	
Format another (Y/N)? **n** A>	*This time type "n" for No.*

Remove the MS-DOS System Disk and insert the original MS-DOS Master Disk. You're halfway home.

A>**diskcopy**

Insert formatted target . . .
Strike any key when ready

Insert source diskette . . .
Strike any key when ready

Insert target diskette . . .
Strike any key when ready

Copy complete.

Copy another (Y/N)? **y**

Insert formatted target . . .
(etc., same as above)

Copy another (Y/N)? **n**
A>

With the MS-DOS Master Disk back in the drive, type "diskcopy" and hit [RET].

The "target" disk for now is the one you labelled ***MS-DOS System Disk****. Insert it now and strike any key.*

The "source" is the original ***MS-DOS Master.*** *Insert it now and hit a key.*

Swap back to the ***MS-DOS System Disk.*** *Depending on how much memory your Pivot has, you may have to repeat this swap again.*

Type "y" for Yes. This time your target disk is the newly-formatted ***NewWord Program Disk.*** *The source is the* ***NewWord Master Disk.*** *Repeat the disk swapping, being careful to keep straight which disk is which.*

Type "n" for No. You're done!

Remove the NewWord Program Disk and insert your new MS-DOS System Disk. You are now set up for normal operation. Put both Master Disks away in a safe place.

If You Have Two Disk Drives . . .

(If you have one disk drive, go back to page 14.)

With the MS-DOS Master Disk in the A: (frontmost) disk drive and "A>" on the screen, follow the steps below. When typing commands, backspace with the DEL key to correct typos (it's in the upper right corner). Hit [RET] (the Return key) when you've finished typing the command.

A>**format b:**

MS-DOS Diskette Format Utility
Version XXX
Insert new diskette for drive B:
and strike any key when ready

Type "format (space) b:" and hit [RET], the Return key.

Insert the disk you labelled ***NewWord Program Disk*** *into the B: (rear) drive. Close the latch.*

Double-check that the disk you put in the rear drive is the one you labelled NewWord Program Disk, then ***press any key*** *to format it.*

Formatting . . . Track : XX	*Pivot is now formatting the disk from track 0 to 39.*
Testing for bad sectors . . .	*Making sure the disk is in good condition. If bad sectors are found, you will get "Data errors" a few steps below. If so, turn Pivot off, discard the disks you're making, and start over.*
Volume label . . . [RET] for none?	*Just hit **[RET]** here.*
362496 bytes total disk space 362496 bytes available on disk	*Statistics for a disk in good condition.*
Format another (Y/N)? **y**	*Type "y" for Yes.*
Insert new diskette for drive B: and strike any key when ready	*Remove the NewWord Program Disk and insert the disk you labelled **MS-DOS System Disk.** Then press any key to continue.*
(same sequence as above)	
Format another (Y/N)? **n** A>	*This time type "n" for No.*

You're halfway home.

```
A>diskcopy A: B:

Insert source diskette ...
Insert target diskette ...
Strike any key when ready

Copy complete.

Copy another (Y/N)? y

Insert source diskette ...
Insert target diskette ...
Strike any key when ready

Copy complete.

Copy another (Y/N)? n
A>
```

With the MS-DOS Master Disk still in the A: (front) drive, and the newly-formatted MS-DOS System Disk still in the B: drive, type "diskcopy (space) a: (space) b:", and hit [RET].

The appropriate disks are already in position. Press any key to proceed.

The MS-DOS Master has been copied onto the MS-DOS System Disk.

Type "y" for Yes.

Put the ***NewWord Master Disk*** *into the a: (front) drive, and the disk you labelled* ***NewWord Program Disk*** *into the b: drive. Double-check the disk positions, then press any key to copy.*

The NewWord Master has been copied the NewWord Program Disk.

Type "n" for No. You're finished!

Remove the NewWord Master and Program Disks. Insert your new MS-DOS System Disk in the A: drive. You are now set up for normal operation. Put both Master Disks away in a safe place.

That's All For Initial Setup!

You have made your working copies of the master disks; you know how to power up and "boot" Pivot; you've encountered the Setup Menu. What you do next is up to you.

You should put both of your Master Diskettes away in a safe place. The MS-DOS System Disk that you just made will be your boot diskette from now on. See Booting (p. 21) and Boot Diskettes (p. 49) in this Handbook. For running NewWord, start with the booklet *Pivot & NewWord.*

A Humble Suggestion

Before tackling anything else, get to know this Handbook a little better. Thumb through it for a sense of what's here. Be aware that it's *not* a teaching guide for MS-DOS and NewWord, since these have their own manuals. We did include basic information about MS-DOS as a beginner's supplement to Microsoft's documentation.

Most of the information on the next several pages has one thing in common: it all appears elsewhere in the book, hither and yon. It's collected here too because you really need to encounter it early on your learning curve.

If any of it's over your head right now, just remember where you saw it. Soon it will be right on your level.

Sixteen Line Displays

Most software written for the MS-DOS operating system assumes you have 25 lines for displaying information. Pivot has 16 lines. There are two ways of handling the overflow: 25-Line Manual and 25-Line Automatic modes.

With *Manual* mode, you always see either the top or bottom 16 lines, with the other nine offscreen. You can see the offscreen part by pressing the Diskette Icon. Press the Diskette Icon again to restore the display to its previous position.

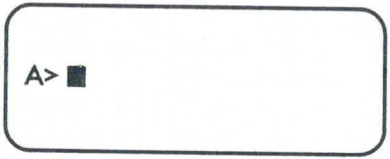
With *Automatic* mode, the display moves up and down automatically so that the cursor is always onscreen. You might be looking at any 16-line block, not just the top or bottom. You can still shift the display with the Diskette Icon. *25-Line Auto is the preferred display mode for general use.*

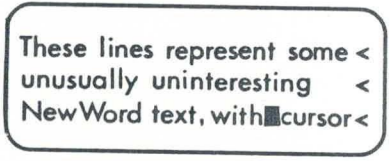
You select between Auto and Manual mode at the Setup Menu. See page 83.

The Cursor

The *cursor* is the small black rectangular block that is always onscreen when Pivot is running. It usually marks the position where anything you type will appear. So, when running NewWord, you use the *arrow keys* (page 68) to move the cursor around the display for typing and arranging text exactly as you want it.

When you're using Pivot's built-in functions, the cursor can have other duties. When you use the appointment calendar, it marks the calendar day you've chosen on the World Map Display prior to hitting SCHEDULE (F1). When the schedule appears, the cursor changes shape, marking the time slot for appointments you're adding or changing.





Note regarding 16-line displays: If you're running NewWord or entering MS-DOS commands and you can't find the cursor, one of two things has probably happened. Either you are in "25 Line Manual" or "16 Line" display mode (page 83), or you may have pressed the Diskette Icon, moving the Display. In either case the cursor is on one of the nine lines that are off the screen. Press the Diskette Icon the shift the display back. Also, we recommend 25 Line Auto mode in favor of the other display modes.

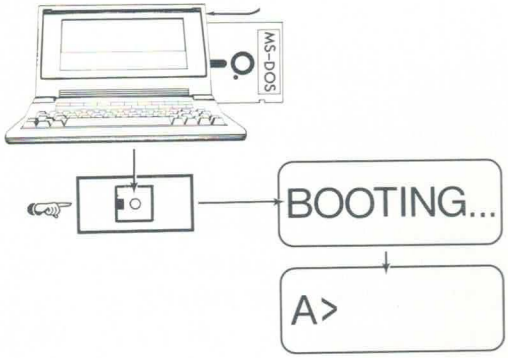
Booting MS-DOS: The Daily Ritual

"Booting" is to computers as coffee is to humans. They just can't seem to get started without it.

When you turn Pivot's power off or reset it (discussed later), everything in the main RAM memory bank disappears. When you turn it back on, certain information must be loaded from disk back into RAM before Pivot has enough sense to execute MS-DOS commands or run business programs. The calculator, appointment calendar, and phone directory will work without booting because their programs are stored in ROM. Unlike RAM, ROM is not affected by power interruptions.

When you boot, you put special "system information" into RAM by reading it from the MS-DOS System Disk. All you have to do is put the MS-DOS System Disk into drive A: (the front drive, if you have two). Then press the Diskette Icon.

See the next page, and pages 11 and 49.



1. Connect the AC adapter and turn the power switch ON.

2. When the World Map appears, insert the MS-DOS System Diskette in drive A and close the latch.

3. Press the Diskette Icon to boot MS-DOS. After a pause (20 seconds or so), a sign-on message and the A> prompt appear. MS-DOS is now ready to execute a command or run a program.

4. At this point you could run an MS-DOS command like TYPE, COPY, or CHKDSK. Or else, you would remove the MS-DOS System Disk and replace it with a program disk, for example, NewWord. Then you'd enter the command to start the program; in this case, *NW [RET]*.

Note: You can skip steps 2 through 4 if you just want to use the clock/calendar, appointment book, calculator, or modem. You need to boot MS-DOS for commands like DIR and COPY, or to run programs like NewWord. See the *MS-DOS Tutorial* later in this handbook for further info.

Resetting

"Resetting" is a process used in every computer. People reset computers in a variety of situations. It causes the computer to abandon everything it was doing.

Usually a computer is programmed to restart itself after being reset; however, it's guaranteed *not* to pick up where it left off. Many times you'll lose data to the wind when you reset, since the computer's RAM is wiped clean. Thus resetting is generally a last resort for getting past continuous errors and other situations.

How to Reset

One sure way to reset any computer is to turn it off and back on, or unplug it and plug it back in. This is not the preferred method.

Some computers have a Reset Button, which you simply push once. Pivot, IBM-PC, and others *don't* have a Reset Button. Instead, you reset with a special sequence of keystrokes on the regular keyboard. Hold down the CTRL and ALT keys at the same time, and while holding them down, press the INSERT / DELETE key:

What Happens

With Pivot, any program you were running is immediately abandoned. The World Map Display appears. To return to the program, you'll have to reboot MS-DOS and restart the program. This is exactly the effect you'd get by turning Pivot off and on; however, it's easier on the whole system because there's no power surge.

When to Reset

This might have been called "When NOT to Reset."

As mentioned, you run a high risk of losing data when you reset while running a program. For example, if you reset while typing a letter with NewWord, your text is gone. The same is true for data associated with just about any program. If you've *saved* the data on disk, then you're alright. But usually this won't have been the case if you're being forced to reset.

These are the situations that often call for a reset:

- An error message that keeps repeating to the point where you can't get anything done.
- Pivot locks up, that is, it won't do anything and doesn't respond to commands you type.
- The screen becomes full of unrecognizable gibberish.

Be aware that there are plenty of times when resetting is totally harmless. You're safe any time you're not running a program or MS-DOS command, that is, if the A> or B> prompt is onscreen, or if you're just using the Calculator and Appointment Calendar. Resetting while printing simply stops the printout. Resetting while talking through the Modem will break the phone connection.

If You Can't Reset–

When computers get absolutely whacked-out, they sometimes won't even respond to the CTRL-ALT-DELETE keystrokes. When that happens, open the disk drive door(s), turn Pivot off and leave it off for five seconds at least, then turn it back on.

Formatting Disks

The first thing you always have to do with new blank disks is format them. You can also recycle outdated diskettes by reformatting them. When you do that, you must be extra careful not to reformat the wrong disk by accident, since formatting erases everything on a disk. Thus you would *not* format new disks that contain software—just the blank ones.

The FORMAT Command

The basic command is always either *FORMAT A:* or *FORMAT B:*. There is a space between FORMAT and the disk drive letter "A:" or "B:". (Recall that you don't really need to type capital letters for MS-DOS commands.) FORMAT A: is the primary command for single-disk Pivots. The same command formats a disk in the A: (front) drive with two-disk Pivots; FORMAT B: formats a disk in the rear drive.

The command is always entered at MS-DOS' "A>" prompt. The MS-DOS System Disk or other disk containing the FORMAT.COM program must be present in the A: drive when you enter the command. You'll be told to insert the disk to be formatted. *Be sure not to format the wrong disk by accident!*

You can review the "Make Working Disks" procedure on pages 14–18 for examples of using FORMAT.

FORMAT Options

The FORMAT command has a variety of options that are covered in this Handbook on page 159. The most commonly used option is */S*, to make a "boot disk". See page 59. The basic command would then be *FORMAT A: /S*.

The MS-DOS User's Guide lists */V* as the "volume label" option for FORMAT. This option lets you put a title on the disk that is displayed with its directory. *The volume label option has been built into Pivot's version of the FORMAT program.* You will always be asked for a volume label. Just hit [RET] if you don't want one. See also page 137 in this Handbook.

Keeping Track of Disk Space

We're making a special entry on this because if you *don't* keep track of available disk space, there will come a time when you'll deeply regret it. This is especially true with Pivots that have single disk drives.

Consider this situation: You've spent four hours using NewWord to write the memorandum that will make your career. Now you try to save it on disk with NewWord's CTRL-K-D command, and all you see is "Unable to store file on disk." Your disk is full! You can use the CTRL-K-J command to make room on the disk, *if* you're lucky enough to find documents there that you can afford to erase. If not, you can kiss that memo goodbye.

How To Measure Available Disk Space

With the appropriate disk in either drive and the A> prompt onscreen, type *DIR [RET]* (or *DIR B: [RET]* if the disk is in drive B:). The bottom line of the resulting directory report tells you how many bytes are left for storing new data.

Rule of thumb: Each Pivot disk holds 360,000 (360 K) bytes of programs and data. A full page of single-spaced text takes about 3 Kbytes, but NewWord and some other programs maintain temporary disk files that raise the need for available space to about 6 Kbytes per page.

"Insufficient Disk Space"

That's what MS-DOS tells you when you try to put a file on a disk and there's not enough room. Usually this is not a catastrophe; you either just need a new disk, or you need to erase unneeded files from the disk with the ERASE command. See page 151.

When a Disk Gets Dangerously Full . . .

How full is "dangerous"? There's no hard and fast rule, but we recommend against using a disk after the DIR command reveals that less than 50 Kbytes are available. With single-disk Pivots, you will usually need to re-clone a master disk with FORMAT and DISKCOPY. If you have two disk drives, you're probably storing data on separate diskettes from the programs; therefore you'd just need to FORMAT a new data disk. See also pages 46–48.

The CTRL Key

The CTRL (control) key deserves special mention here because it's unique to computers, but it is used extremely often. You use it like a SHIFT key, that is, you hold it down while tapping some other letter key.

Usually a CTRL key combination turns a letter into a command. With NewWord, for example, the "save data" command *CTRL-K-D* transfers text you've typed from Pivot's memory into a disk file. This command is entered by holding down CTRL while tapping K and then D.

In the NewWord manual (and many others), CTRL is depicted as a caret (^). Thus the command above appears as "^KD."

In addition, CTRL activates the meanings of Pivot keys that are silk-screened onto their front edges. CTRL and the plus/equals key have the effect of entering a BREAK, which aborts certain MS-DOS commands in midstream.

That's enough details for now; we just want to be sure you're aware that CTRL is a very special key.

Two Common Examples

CTRL + K + D = "^KD" = Save a document with NewWord (p. 38)
CTRL + ALT + INSERT/DELETE = Reset = Start everything over (p. 23)

Naming Files

Whenever you write a new memo, create a graphics design, or concoct a new spreadsheet, you're generating a new data file. You are responsible for naming the file. The name should be descriptive of the file's contents, but it has to be fairly short, too. Here are the rules:

- Files always have a first name, from 1 to 8 characters long. If that's not long enough, add a period and up to three more characters as a last name. You can use last names even if the first name has fewer than eight characters.

- File names can include most characters on the keyboard, but certain punctuation marks are reserved because they have special meanings. Page 3-2 of the *MS-DOS User's Guide* has all the details on file name restrictions.

Acceptable:	Unacceptable:	
MOM	LETTERTOMOM	(too long)
LETTERTO.MOM	.MOM	(no first name)
LETTER!!	LETTER. . .	(period is only to separate first and last names)

- Finally, every file on a disk must have a unique name. It must differ from all others on the disk by at least one character. However, you can have as many files with the same name as you like, as long as they're on different disks (not a recommended practice). Advanced users know there's an exception to this rule that's beyond our level here.

The Three Types of Memory

Pivots come with three types of memory chips. They differ in what they're for, how they store information, and how much of each is included.

ROM

Read-Only Memory implies that Pivot can read the contents of these chips, but can't write anything new into them. ROM chips are permanently "burned" to hold information that Pivot needs all the time. Specifically, they store the instructions for waking Pivot up, showing the World Map Display, booting MS-DOS, and running the calculator, appointment calendar, and phone directory.

All Pivots currently have 32 thousand bytes (Kbytes) of ROM as standard equipment.

Dynamic RAM

This type of *Random Access Memory* holds information that changes very rapidly. We refer to it simply as *RAM*. When you run NewWord, the NewWord programs are copied from the program disk into RAM. A document you type is also stored in RAM. When power is lost, or when you reset, everything in RAM is lost. That is why data and programs are always stored on disks.

RAM storage for Pivots is available in 128, 256, and 640 Kbyte quantities. Some programs require large RAM capacities. Others just run more efficiently when more memory is available.

Non-Volatile RAM

NVRAM is a special type of RAM that is kept intact with a small battery built into Pivot. The contents of NVRAM are *not* lost with a power interruption or when you reset. Pivot's NVRAM stores your appointment schedule, phone directory, and a small amount of other information. 4 Kbytes of NVRAM is currently standard; it is possible that larger quantities will be available as a future option.

Tradeoffs between appointments and phone numbers—Pivot stores both of these in the same block of NVRAM. You can use the memory for appointments only, or phone numbers, but you'll probably have some of both.

At the top of the screen on both the Appointment Calendar and Phone Directory displays, a

message says "XXXX Bytes Free." XXXX is the number of NVRAM bytes still available for new appointments or phone numbers. As the months go by, the number will decline to a point where it approaches 0 Bytes Free. What then?

Pivot automatically deletes your oldest appointments, one at a time, to make room. The message will continue to hover around 0 Bytes Free. Presumably the deleted appointments will be long since past. This is Pivot's way of keeping the appointment calendar from growing indefinitely. You could delete outdated appointments yourself, but that's a headache and there's no reason for you to do so.

The net result is: You can add phone numbers until all of NVRAM is full, sacrificing the appointment calendar in extreme cases. However, the inverse is not true. If NVRAM is full, *no phone numbers are ever deleted to make room.* Pivot just beeps and refuses to let you add appointments *or* phone numbers. Before you can add anything new, you'll have to delete unneeded phone numbers yourself, one at a time. See page 105.

Realistic estimates of NVRAM capacity— We'll assume you have 4 Kbytes of NVRAM. As mentioned, higher capacities may be available as future options. If so, adjust the estimates in direct proportion.

Suppose an average appointment reminder has 20 characters (or 20 bytes). Pivot adds another 6 bytes for its own use. If all of NVRAM were dedicated to appointments, you'd have room for about 150 items.

Suppose that each name/number in the phone directory averages 30 bytes. Pivot adds two bytes for overhead. If NVRAM contained only phone directory items, you'd have space for 125.

Of course, you'll be mixing appointments and phone numbers, so you'll probably end up with enough room for between 100 and 200 total. The shorter an item of either type is, the more you can store.

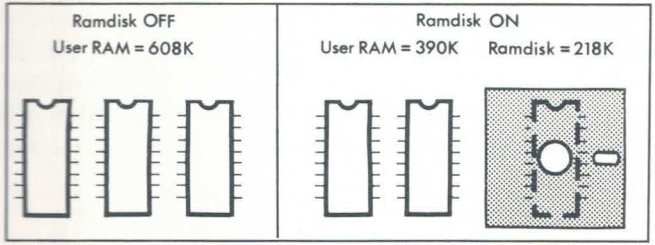
Backing up the Directory and Appointment Schedule onto a disk—Pivot includes a BACKUP function for saving the contents of NVRAM on a backup disk, and for reading them back if needed. It is accessed through the Phone Icon's Update Display. See page 105.1.

The Ramdisk (640K Models Only)

Pivots with 640 Kbytes of RAM (the current maximum) allow you to use some of RAM memory as an imaginary third disk drive. This Ramdisk feature is most useful for programs that access the disk frequently. Since information is manipulated in RAM instead of on disk, no mechanical parts are involved. The increase in running speed for some programs can be dramatic.

There is another side to the coin, however: data in the Ramdisk is subject to the same hazards as any RAM data. Power interruptions erase it. Therefore data must be copied onto a real disk before you turn Pivot off. And you must copy programs into the Ramdisk from real disks whenever you use them. Only experience will tell you whether the increase in speed is worth the copying back and forth.

The capacity of the Ramdisk is about 220K. This compares with 360K for standard real disks. You turn Ramdisk on and off at the Setup Menu. See page 84.1.



Note: 32K of the 640K RAM is dedicated to the display.

On Errors

Cartoonists often depict the onslought of technology gone berserk as a computer shouting "ERROR! ERROR!" at some hapless human. This and the fact that people are conditioned to associate mistakes with punishment give rise to a much exaggerated fear of doing things wrong.

When Pivot sends you an error message, it is not that it's annoyed with your incompetence. Rather, it's apologizing for its own ignorance of the idioms and idiosynchracies of humankind. Some day, computers will be smart enough to figure out what you mean. Until then, you have to meet the computer on its own terms, and expect the inevitable error message when you stray.

Where Error Messages Come From

It's helpful to be aware of this because you might incorrectly assume that all error messages come from Pivot. In fact, Pivot has only two error messages built into it. The first appears when you try to boot with no disk in the drive, or a non-bootable disk. (See "Boot Disks" in the Diskettes section of this handbook.) The other is a function of the calculator, when you've entered a number that's too big for Pivot to handle.

Most error messages you'll encounter come from MS-DOS. You'll see them after typing MS-DOS commands like TYPE, FORMAT, COPY and so on. Such messages usually indicate you've mistyped a command, or entered an impossible command (like trying to format a write-protected disk). MS-DOS error messages can also appear while you're running a business program, if you're reading or writing on a diskette. The messages issued by MS-DOS are typically meaningless to non- programmers, so we'll interpret the most common ones for you below.

Many other error messages are built into the business programs themselves. NewWord has a bunch, listed in Appendix E of the *NewWord User's Guide*. These too are also quite harmless, and infinitely more self-explanatory than those of MS-DOS. Every program will have its own library of error messages.

Types of Errors

The two fundamental types of errors are: when you try to do something that MS-DOS or the business program isn't equipped to handle, and when the computer or software is experiencing its own problems regardless of how properly you're doing things.

Cockpit errors (human imperfection)—In the case of MS-DOS, this nearly always means you've typed a command wrong. Say you want to format a disk. You type *FOMAT [RET]*. MS-DOS is too dumb to know you left out the R, so it goes happily along searching the disk for a program named FOMAT. When it fails to find one, it reports "Bad command or file name." Or say you wanted to use the */S* option, and you mistakenly typed */A*. Now MS-DOS tells you that you've specified an "Invalid parameter."

In such cases, there's almost no chance that anything bad will happen, outside of the 5 seconds lost to retyping. It is far more dangerous to enter the wrong command correctly (like formatting a disk that has valuable data on it).

With "user-friendly" business programs, error messages usually tell you specifically what you did wrong and how to do it right. With NewWord, for example, you may attempt to get 15 lines of space between lines of text (why?). NewWord responds "Spacing can only be from 1 through 9." Simple enough.

Hardware errors—These occur outside of your control. You may have a flakey chip or disk drive. For example, a "Sector Not Found" message can mean either the disk or the disk drive is defective. Your course of action depends on the specifics of the message. See below.

The More Common MS-DOS Error Messages and How To Respond

MS-DOS issues two general classes of error messages: those specific to a command, and those specific to a disk operation. The command types usually tell you that you entered the command wrong or asked it to do something it can't do. This class is pretty good about telling you how to respond. All of these command messages appear in alphabetical order in Appendix E of the *MS-DOS User's Guide*.

The disk errors are listed in Appendix B of the MS-DOS manual. They are considerably more troublesome, not just because they're cryptic, but because they often mean bad things are happening. For example, they might appear when you're trying to save a data file on a disk. When this happens, you run a high risk of losing the data.

These messages all look something like:

Not ready error reading drive A
Abort, Ignore, Retry:

You can always spot these because of the Abort, Ignore, & Retry options. We'll go over these options after looking at the more likely messages.

Write protect error—You tried to change something on a disk that has a write-protect sticker. Switch disks or remove the sticker and press R to retry.

Not ready error—The disk drive door is not shut, there's no disk in the drive, or it's inserted wrong. Fix the problem and press R to retry.

Data error—The data Pivot has read from a disk appears corrupted. Press R to retry 3 times, then A to abort.

Seek error—Usually indicates a bad disk drive. Retry 3 times and then Abort.

Sector not found error—The disk is in wrong, it hasn't been formatted properly, or it's been damaged. Can also mean a bad disk drive.

Write fault error—The disk is full or damaged.

Read fault error or Disk error—The disk or drive is defective.

When we say that the disk or disk drive is at fault, there's always the possibility that other buggy things are happening. These are only the most common causes.

Responding to Disk Errors

When a disk error occurs, you always have the Abort, Ignore, and Retry options. The messages neglect to tell you to press A, I, or R respectively. In a few cases, like Not Ready and Write Protect, you can quickly remedy the problem and retry. Most other times the response is not so clear-cut.

Rule of thumb: With errors that you don't know what to do, always press *R* to retry first. Press it again if the message re-appears. On the third occurence, don't press anything. Remove the disk, make sure it's inserted right, and close the latch. Hit *R* one more time. If you're still having problems, press *A* to abort. Generally this takes you back to the A> prompt. Whatever you were attempting to do has failed, and you'll have to start over.

What about the Ignore option? *Use Ignore with extreme caution.* The only time you might use Ignore is when you get continuous errors while trying to save an irreplaceable data file. You may need to use *I* several times. The resulting disk file will be full of little (or large) problems, but you may be able to repair it with a wordprocessor or debugging program.

Saving Data

It was mentioned above that the contents of Dynamic RAM (the main memory bank) are lost when you turn Pivot off or reset it. It's okay to lose the program that was in memory; it's on disk and you can reload it as many times as you like. But those inspired phrases you tapped out with NewWord, well, you can't afford to lose *them*.

Until you save the data (text or numbers) on a disk, there's always some slight chance that it will evaporate. That's why every program has a way of saving your data on a disk. Once the data is on disk it's safe, and you can get back to it whenever you like.

Example: Saving Data with NewWord

Every business program has its own keystrokes for saving data. As much as you may resist it, you'll need to refer to its documentation for the details. However, we'll give you a head start with NewWord, so you can be sure you know exactly what we're talking about.

NewWord has three save-data commands. They all appear on the Blocking and Saving Menu when you press CTRL-K while editing a document.

Save and return to the Opening Menu (^KD)—The main command for ending a document without exiting from NewWord. "^KD" means "Press the CTRL key (symbolized by ^), and while holding it down, tap K and then D."

Save and resume editing (^KS)—Also called "safety saving," use this command every now and then during lengthy sessions to minimize the loss that that would result from a power failure or other accident.

Save and exit to MS-DOS (^KX)—This saves the document when you're finished working on it, exiting from NewWord directly to MS-DOS' A> prompt.

See also page 5-13 in the "Do-It-Yourself" section of the *NewWord User's Guide*.

The Steps Involved in Hooking Up a Printer

Maybe you thought all you had to do was plug the printer into Pivot and go. In a few rare cases that will be true. But most of the time, things are not so simple.

1. Make sure you have the right cable.

If the cable will work on an IBM-PC, it will work on Pivot. Serial printers attach to the 25-pin male connector on the right of Pivot's rear panel. Parallel printers go on the female (left) connector. Chances are your printer is of the parallel variety.

2. Check the Setup Menu.

The Setup Menu appears when you press the SETUP key (*F10*) at the World Map Display. Set "Printer" to Parallel or Serial as appropriate. If serial, check all the items in the SERIAL PORT column to be sure they match the printer's expectations. Often, you will need to check switches inside the printer as well. See "The Setup Menu" in this handbook, and the printer's documentation. Ask your dealer for help if necessary.

3. Be sure the printer is on, online, and ready.

"On" means the printer's power switch is on, "online" means it is ready to communicate. Usually an Online lamp glows on the printer. If it's been taken offline for some reason, there's probably an obvious switch to get it back online. "Ready" means paper and ribbon (and printwheel for wheel printers) are installed, and packing screws or tape are removed.

4. Test the printer.

Most printers have a "self-test" mode where they sit and print meaningless patterns to show they work. This won't tell you if it's set up right for Pivot. A quick test is described under Printers in "Connecting Devices to Pivot" later in this handbook.

As an alternative, you could run NewWord and test-print one of its sample files, like PRACTICE.DOC. If you don't know how to run NewWord yet, here's a shortcut: Boot from the NewWord Program disk instead of the MS-DOS System disk. That is, turn Pivot on; when the World

Map appears, insert the NewWord program disk (front drive on two-disk Pivots), and close the latch. Then press the Diskette Icon.

When NewWord's Opening Menu appears, press *P* to print. Give *PRACTICE.DOC* as the file to print, and hit the *ESC* key. The printer should begin printing.

Possible Problems

The printer may produce garbage, it may print for a while and quit, or it may not do anything at all. We hope this is not the case. With parallel printers the probable cause is a defective cable, wrong switch setting in the printer, or wrong "Printer" setting on the Setup Menu. Serial printers could also have any of these problems, plus one or more of the items in the SERIAL PORT column of the Setup Menu could be at fault.

When you run out of things to try, call your dealer.

About NewWord

NewWord (like many other programs) is by its nature very sensitive to the brand and model of printer you're using. The code it sends out to a Diablo printer for underlining is different from the one it sends an Epson.

Therefore NewWord contains a library of *printer drivers*, or sections of the program that make different printers do what you want. NewWord comes from the factory set up for a generic "draft" printer. This will work fine for just about any printer, but certain advanced features like subscripts won't work.

There are two ways to get the full benefits from NewWord and your printer. Both involve employing a printer driver designed for your printer instead of the draft driver. The first way is pick your driver interactively by answering all of the print option prompts when telling NewWord to print something (hit *[RET]* instead of the *ESC* key). The other is to run the program NWINSTAL to reconfigure NewWord to use your printer driver by default.

See the booklet *Pivot & NewWord* for the essentials. The "Nuts & Bolts" section of the *NewWord User's Guide* is dedicated to this same topic.

A Word About This Handbook

The *Pivot Owner's Handbook* is not the last word on computers or MS-DOS, by any means. Book stores are overflowing with supplementary texts, geared mostly to the oh-so-similar IBM-PC. It won't hurt our feelings in the least if you acquire other books on this subject.

The only parts of this handbook that won't be covered elsewhere are the Setup Menu and Icon sections: Calculator, Modem, and Appointment Calendar.

Those Green Books

The *MS-DOS User's Guide, Programmer's Reference,* and *Debug* manuals were produced by Microsoft. Morrow takes no credit for them. Unless you're a programmer, put the latter two away and forget about them. The *User's Guide* is a necessary companion to the MS-DOS Tutorial in this Handbook. (The spine of that book says "*Microsoft* User's Guide," which is a printer error. However, when the books are stacked, it looks right.)

The Best Approach

Presumably you've read (or at least skimmed) this introductory section. You really should look over the "Diskettes" and "Keyboard" sections, unless you're a PC veteran. The Icon sections are there if you need them; the functions they describe are almost self-explanatory.

Finally, if you don't know MS-DOS, you should read the "MS-DOS Tutorial" carefully. It will prepare you for the *MS-DOS User's Guide.*

The Essential Facts About Diskettes

You better get used to dealing with diskettes whenever you use Pivot. At first, there will be two or three particular disks you'll constantly have on hand: your MS-DOS System Disk, your NewWord Program Disk, and if you have a two-drive Pivot, a NewWord Data Disk. When you buy more software, you'll get more program disks. And as you use the programs, you'll create an ever-growing stack of data disks. *So . . . Label your disks properly and take good care of them!*

What Kind to Buy

"Soft-sectored five-and-a-quarter-inch double-sided double-density, please." If you confidently quote those exact words to the salesman, he will be duly impressed by your computer literacy. You will then have to decide only how many and what brand you want.

Formatting

You always have to format new blank disks before you can use them in Pivot. Formatting lays down a special grid that tells Pivot how to find information on the disk. See "FORMAT.COM" on page 159 of this Handbook and page 5-27 of the *MS-DOS User's Guide*.

Formatting a disk erases everything on it! So be careful: One of the worst things that can happen is for you to format a valuable disk by accident.

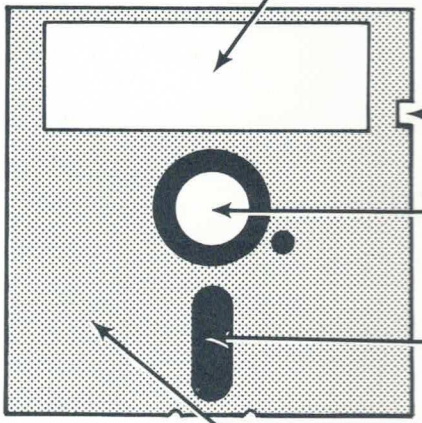
(The Obligatory)
DO'S and DONT'S of Disk-Etiquette

DO:

Format new blank disks.
Store them in their paper envelopes.
Keep them clean and dry.
Make backup copies of valuable diskettes.
Put write-protect stickers on valuable diskettes.
Label them with stick-on labels and a felt-tip pen.
Remove disks before turning Pivot off.

DON'T:

Reformat valuable diskettes.
Expose them to magnetism of any sort.
Touch the exposed surface.
Remove the black plastic packaging.



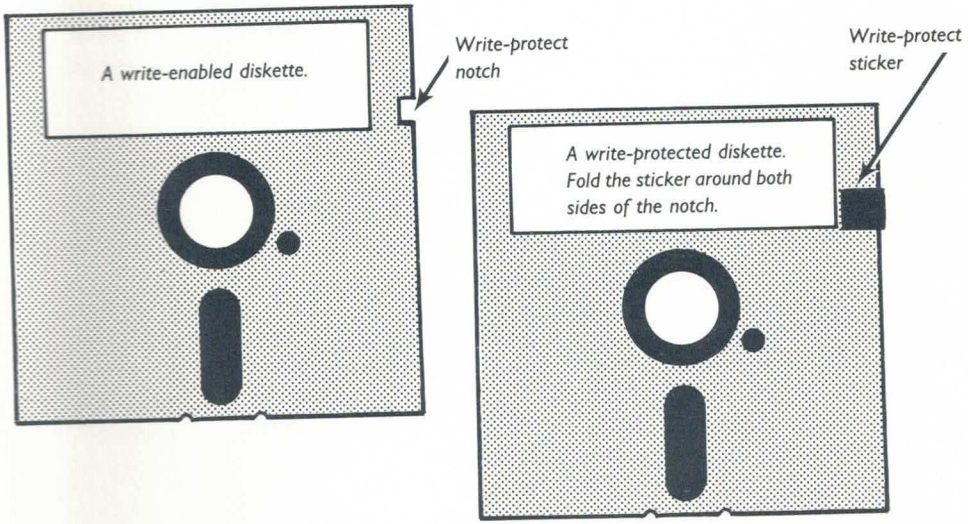
Stick-on label—*It's best to write on the label before putting it on the disk. If the label's already on the disk, be sure to use a felt-tip pen. Labels go on the smooth side of the disk—the side without the seams. When inserting the disk, the label side faces front.*

Write-protect notch—*See next page.*

Spindle hole

Exposed disk surface—*Don't touch! This end always goes in first.*

Plastic envelope—*This is a permanent part of the disk. Don't try to unwrap it. (Don't laugh—people have been known to do this.)*



Write Protection

Most disks have a small notch cut along their edges (see figure above). This is called the *write-protect notch.* When the notch is *uncovered,* you can put new files on the disk, or change information on it. When it's *covered* with a write-protect sticker, all you can do is read information off the disk; you can't change or erase anything.

You should always write-protect your most valuable disks. If the information changes frequently, make routine backup copies of the disks with the DISKCOPY program and write-protect *them.*

Write protection stickers usually come with blank disks when you buy them. The only disks you'll encounter without the notches are some software master disks. This keeps the masters from being changed in any way.

Nothing is Foolproof

Disks are vulnerable to heat, dust, oil, water, magnetism . . . in short, everything that's not clean and dry. These are things you can control with good work habits.

But there's another danger: Nothing but your own vigilance will stop you from erasing valuable information from disks. You might reformat the wrong disk by accident, copy one disk to another in the wrong direction, or enter the wrong file name in an ERASE command. We don't want you to be paranoid, just alert. Your best bet is to write-protect valuable disks, and always check a command you've typed before you hit [RET] (the Return key).

Types of Disks

The first paragraph mentioned three types of disks: system, program, and data. Don't be misled: a disk is a disk is a disk. It is a matter of convenience to divide your software into these three categories. A disk can actually hold system files, programs, and data all at once.

MS-DOS System Disk—This disk is special for two reasons: First, you can boot from it after turning Pivot on. Second, it contains the MS-DOS housekeeping programs, like FORMAT and DISKCOPY. Any disk that meets these criteria qualifies as an MS-DOS System Disk.

Program Disks—By this we mean business programs like NewWord or SuperCalc. If you have two disk drives, you would normally have one disk (the Program Disk) that contains all the files needed to run the program, and another (the Data Disk) that holds the words and numbers you're manipulating with the programs. If you have only one drive, you'd typically store data on the same diskette with the programs.

Data Disks—As mentioned above, these are the disks that hold the data you've generated by using a business program. Again, the real world is not really this clear cut—even with two drives, there's nothing to keep you from storing data on a program disk, or even on a system disk.

Real World Considerations—Nearly every disk you own will come about this way: You buy a program; let's call it "WhizWord." WhizWord's manual says the first thing you should do is copy the WhizWord master disk, and then put it away in a safe place. So you go out and buy a box of blank diskettes.

You take one out and format it with the FORMAT program. Then you make your own personal WhizWord Program Disk by using DISKCOPY to clone the one you bought. Everything's great for a while; you've written dozens of reports, storing them on the WhizWord Program Disk. Then it gets full. *Oh no!* What you'd do next depends on how many disk drives you have. Keep reading.

Second Generation Working Disks

Just as when you make your original working disks, the way to make additional copies depends on your number of disk drives.

One disk—You'd make another clone of the original "WhizWord" master disk with FORMAT and DISKCOPY, as on pages 14 through 17 of this Handbook. Now you have a fresh copy with room for dozens more reports. This makes a total of three disks: The original master, which is a pure Program Disk used only for making copies, and the two copies, which are combination Program/Data Disks. This is what you will probably do when your first NewWord Program Disk gets full.

Two Disks—You'll find it much more convenient to keep the WhizWord Program Disk free of data files. Instead, you would simply use FORMAT to prepare a blank disk as a new, empty Data Disk. Since the WhizWord programs aren't on the disk, there's much more room for documents (unlike the case for one-drive Pivots).

Where users of single-disk Pivots have to re-clone the master disk every time their working disk gets full, you'd keep using the same Program Disk you made way-back-when, formatting new Data Disks whenever necessary.

However . . . Re-cloning a master disk to make a second or third working disk is not always the way to go. NewWord, for example, lets you modify many details of its operation with a special program called NWINSTAL. If you customize your NewWord Program Disk and later make a new program disk by DISKCOPY'ing from the master, you'll have to repeat your customization steps. There is another method that makes new working disks by selectively copying files from existing customized working disks. See page 5 in the booklet *Pivot & NewWord.* Note that the format command is *FORMAT A: /S.* The "A:" is missing in that booklet's command.

And now, to really muddy the waters—In general, you would boot Pivot with the MS-DOS System Disk, pull it out, put in some other disk (like the WhizWord Program Disk), and enter the command to start the program. You can simplify this process by creating a combination MS- DOS System / WhizWord Program Disk. The procedure appears in the few pages that follow.

Boot Diskettes

If you try to boot Pivot with diskettes chosen at random, all you get is an error message telling you that the diskette is "non-system". You are probably using only two disks that qualify as boot or "system" disks: the MS-DOS System Disk and the NewWord Program Disk. As you may surmise, being able to boot from a certain disk has little to do with the general contents of the disk.

There are two main ways to make a bootable disk. By far and away the most common is to format the disk with the /S option. We'll cover it in a moment. The other way is by DISKCOPYing an existing boot disk. The latter method is how you made the two boot disks mentioned above.

Formatting with the /S Option

You can make any disk a boot disk by formatting it with this special option. But you have to think ahead; it's part of formatting, and formatting is the first step in creating a disk. Once a disk has valuable information on it, you can't turn it from a non-boot disk into a bootable one.

Example: The mythical WhizWord Program Disk—Suppose you went out and bought our imaginary WhizWord program. You followed the normal routine of using FORMAT and DISKCOPY to make a working copy of the master disk. Now every time you use it you have to boot with the MS-DOS System disk, pull it out, pop in the WhizWord Program disk, and enter the command for starting the program. Wouldn't it be nice to be able to boot directly from the WhizWord disk?

Here's how: When you're making the working copy of the Whizword master disk, instead of using the basic FORMAT command, enter:

FORMAT A: /S [RET]
(one drive Pivots)

or

FORMAT B: /S [RET]
(two drive Pivots)

The special /S option, in addition to formatting the disk, copies the MS-DOS files MSDOS.SYS, IO.SYS, and COMMAND.COM onto the disk you're making. The .SYS files are "hidden"—they won't appear in the disk's directory. These three files make the disk bootable.

Next, you would *not* use DISKCOPY to copy the contents of the master disk onto your program disk. Doing so would wipe out the three files needed for booting. Instead, you'd use the COPY command with a "wildcard" option:

COPY A:*.* B:

where drive A: holds the master disk and drive B: holds the newly-formatted program disk. This command means "Copy every file from the disk in drive A: to the disk in drive B:". (Wildcards are discussed on page 3-3 of the *MS-DOS User's Guide.)*

With single-disk Pivots, you will have to swap disks several times during this process. And unfortunately, you have to wait for the disk to stop spinning before you can open the drive door. So it's a little tedious, but you don't need to do this very often.

Boot Diskettes with DISKCOPY

Here's why you wouldn't use DISKCOPY when making a bootable WhizWord disk: DISKCOPY indiscriminately dumps everything from the source (master) onto the target (copy), erasing anything that may have been present on the target disk. And it's extremely unlikely that the WhizWord master contains the three special boot files. So even though you put those files on the target disk while formatting, the DISKCOPY program will erase them.

Now, back to your actual disks for a moment. By definition, your MS-DOS Master is bootable. It has to be. And Morrow made your NewWord Master bootable too for your convenience. But very few off-the-shelf programs use bootable masters. So DISKCOPY is not the route to take in most cases.

Rule of thumb: If you DISKCOPY from a boot disk, you get a boot disk, even if you didn't use the /S format option. If you DISKCOPY from a non-boot disk, you get a non-boot disk, even if you DID use the /S option.

Advanced Version

So you have created a theoretical bootable WhizWord Program Disk. You can boot from it and use it for certain "internal" MS-DOS commands like DIR and COPY. However, you still can't use it for other "external" commands like FORMAT and DISKCOPY. For this, just use COPY to transfer the appropriate programs from your MS-DOS System Disk onto the WhizWord disk, and you're in business. For example, copy FORMAT.COM to the WhizWord disk with *COPY FORMAT.COM B: [RET].* The MS-DOS System Disk would be in the A: drive, and the WhizWord disk would be in drive B:. See "COPY" and "Internal and External Commands" in the MS-DOS section of this Handbook.

Insert B: diskette and strike any key

A> copy A:*.* B:

■

Introducing Virtual Drive (One Disk Pivots Only)

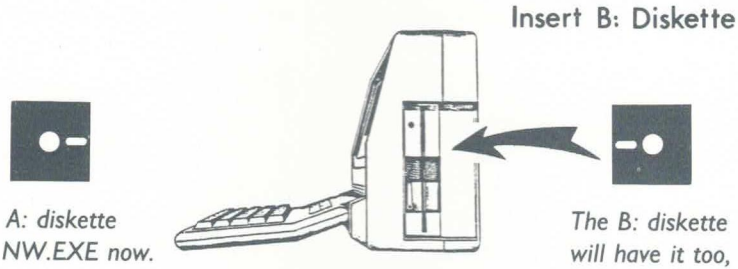
Single-disk Pivots pretend to have a "virtual" B: drive when performing tasks that normally require two disk drives. Copying files from one disk to another, as we did above, is a prime example. When Pivot needs the second drive, the "Insert B: diskette . . ." message appears in huge flashing letters across the top of the display. When it needs the first disk back again, the message reads "Insert *A:* diskette and strike any key."

The main consideration for you is keeping track of which disk goes with A: and which goes with B:. With the COPY command above, the A: disk is the WhizWord Master (the original) and B: is the Program Disk you're making (the copy).

continued—

Virtual Drive continued

Suppose you want to copy NW.EXE (the main NewWord program file) from the disk that's in Pivot to another disk. At the A> prompt, type **COPY A:NW.EXE B: [RET].** When you're told to insert the B: diskette, this means the diskette you're copying to. The A: diskette is the one you're copying from. You usually won't be told to re-insert the A: disk until you enter another command.



The A: diskette has NW.EXE now.

The B: diskette will have it too, after the COPY.

The virtual B: disk drive comes into play at other times. If you type "DIR B:" on a one-disk Pivot, you'll see the same effect. Or if you run NewWord and you want to save a block of text on a second disk, you'd use the ^KW command for saving blocks. When you're asked for the name to store with the block, you'd enter something like "**B:**BLOCK". The "B:" causes virtual drive to react, and the messages about inserting disks appear.

Automatic Boot Diskettes

In the previous sections you created a theoretical WhizWord Program Disk. You can boot from it, and you can execute MS-DOS commands from it too. It is now a combination MS-DOS System Disk / WhizWord Program Disk.

But suppose you find that you're nearly always booting from it and immediately entering the WhizWord startup command. It seems like there should be a way to boot and run WhizWord automatically, just by pressing the Diskette Icon at the World Map display.

And, of course, there is a way.

Introducing *AUTOEXEC.BAT*

You may have noticed that your NewWord Program Disk is an automatic boot disk. That is, you can boot from it; and if you do, NewWord begins automatically. If you look at the DIRectory of that disk you'll see a file called AUTOEXEC.BAT. If you TYPE the file out to the screen you'll see that it contains nothing but the NewWord startup command, *NW*.

"AUTOEXEC.BAT" is a very significant file name to MS-DOS. Whenever you boot MS-DOS, it looks to see if there's a file by that name on the boot disk. If not, it displays the A> prompt and patiently waits for your first command. However, if there is a file named AUTOEXEC.BAT on the boot disk, MS-DOS runs the commands it contains, one after another. See "Batch Files" in the *MS-DOS User's Guide* for a general discussion.

Creating an AUTOEXEC.BAT File for WhizWord

Let's say the startup command for WhizWord is *WHIZ [RET]*. Your goal, then, is to create a new file named AUTOEXEC.BAT on the WhizWord Program Disk (which has already been made bootable as described above). The contents of the file will be *WHIZ* and a carriage return. That's all.

There are several ways you can create the file, including using a word processing program like NewWord (or WhizWord!). The method below is the simplest for little files like this. Remember, *[RET]* means hit the RETURN key. Don't type "[RET]".

1. Boot with the WhizWord Program Disk. At the A> prompt, type:

   COPY CON: AUTOEXEC.BAT [RET]

2. Nothing obvious happens. Whatever you type now will go into a file named AUTOEXEC.BAT. Type:

   WHIZ [RET]

3. To signify that you're done, enter *CTRL-Z* (hold down the CTRL key while tapping Z). Then hit RETURN.

The next time you boot from this disk, WhizWord begins all by itself! AUTOEXEC.BAT files (and batch files in general) are really much more flexible than this example suggests. But this is a very useful example and it gives you a feel for using batch files.

Summary

This section intended to clear up some of the mystery surrounding diskettes for first-time computer owners. Details of how to insert and format diskettes appeared in earlier sections.

You learned how to *write-protect* diskettes with write-protection stickers. This keeps you from accidentally changing or erasing valuable information.

We've seen that disks can contain three general types of information: system files, program files, and data files.

System files are used by Pivot when booting MS-DOS. The only disk that *must* have system files is the MS-DOS System Disk. You can copy system files to other "bootable" disks by formatting them with the */S* option. *Program files* are the software you buy and run. NewWord is a set of program files. You create and change your own *data files* when running program files.

These three classes of files can be mixed freely on a given diskette. If you have a single-disk Pivot, you'll probably store data on the same diskette with programs. If you have two disk drives, it's more convenient to store data on its own diskettes, separate from the program disks.

Finally, we discussed how to make an automatic boot disk by creating a special new file on the disk named *AUTOEXEC.BAT*.

Pivot's keyboard is designed to duplicate the functions of the now-standard IBM-PC and "workalike" keyboards. Pivot's layout is as similar to those as possible within the design constraints of a lap-model computer.

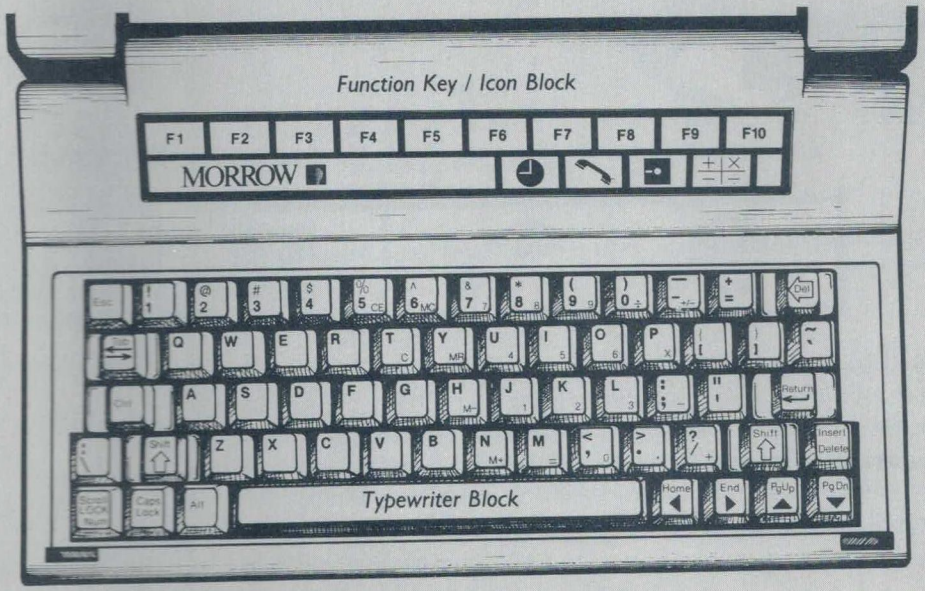
If you've never used a computer before, you'll have a general sense that such a keyboard is "almost like" a typewriter. But it's those few differences that can seem so foreboding--to some, they personify all that is pernicious and pestiferous about computers. This problem stems from the fact that a computer can do so many things, and there aren't enough keys to go around on a typewriter keyboard. You either have to add a bunch of new keys or make each key do a variety of tasks. Computer keyboard designers have done a little of both, to the confusion of novice users.

This section of the handbook describes the general nature of Pivot's keyboard. There will still be many keystrokes or sequences of keystrokes that are unique to whatever business program you're running. So, you'll inevitably have to dig into your software user's guides for all the details.

Overview

Pivot's keyboard has two major blocks of keys: the *function key / icon* block, and the *typewriter* block. Look at the figure below.

Note that every key on the keyboard has "auto-repeat." That is, it repeats itself if you hold it down. This is most useful with keys that move the cursor, like DEL, RETURN, the Space Bar, and the Arrow Keys.



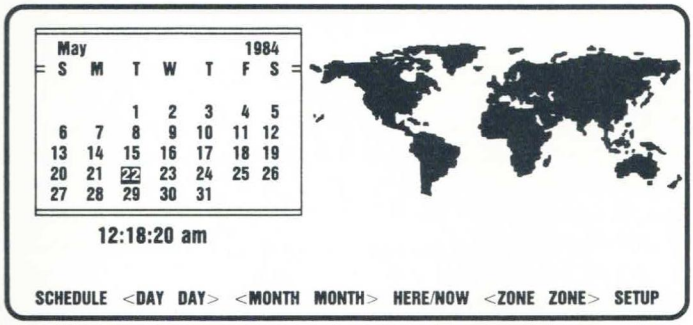
The Icons

Unlike the rest of the keys, the Icons are entirely unique to Pivot. They initiate the functions that make Pivot much more than a basic computer. Most of the Icon functions are available without booting MS-DOS, in other words, no diskettes are involved.

Some of the Icons have two different meanings. This depends on what you're doing when you press them. See the text that follows for details.

The Clock/Calendar Icon

Pressing this key takes you to your perennial Home Base, the World Map display. From there you can look at your appointment schedule (see "Appointment Calendar"), change your setup options (see "The Setup Menu"), or check the time in a foreign time zone (see "Home Base: The World Map Display").



The Clock/Calendar Icon has just the one effect described above. Normally you'd press it to check (and add to) your schedule, perhaps while running a program. Return to the program by pressing the Diskette Icon. The second most common use would be to change a setup option like current time, date, or display mode. Since the World Map display appears automatically when you turn Pivot on, you probably won't need to press this Icon very often.

The Phone Icon

Press this key when you want Pivot to dial a number for you from its directory. Or, press it when you want to make a modem call to database services like Dow Jones and CompuServe. As a final alternative, the Phone Icon can turn Pivot into a "dumb terminal" for use with a nearby (presumably bigger) computer.

The effect of the Phone Icon depends on two things: how you've set COM2 on the Setup Menu, and whether the number you're dialing (if any) has "M" as its last character.

COM2 (Setup Menu)—You can set COM2 to either MODEM or SERIAL. See page 87 for details. When you set it to MODEM (normal), Pivot shows the Phone Directory Display after you press the Phone Icon. Pivot is preparing to dial a number for you, or let you dial a number directly from the keyboard. The call can either be a regular voice call or a modem call. See below.

When you set COM2 to SERIAL (unusual), Pivot does not prepare to dial. Instead, it enters terminal mode. It assumes you have a cable connecting its serial connector to another computer. You'll use Pivot's keyboard and display to communicate with that computer. The immediate effect of pressing the Phone Icon when COM2 is SERIAL is a blank screen instead of the Directory Display.

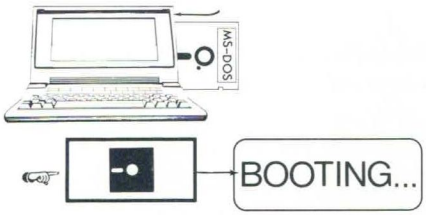
The special "M" character—When Pivot dials a number, either from the keyboard or from the directory, it looks to see whether the last character of the number is an M. (This is discussed at length in the Modem section of this Handbook.) If there's no M, Pivot knows this is a regular conversational call. If the M is there, Pivot knows this is a Modem call—that is, you'll be communicating through the keyboard instead of talking on the phone.

The presence or absence of the M makes no immediate difference when you press the Phone Icon. You'll see the difference after the number has been dialed.

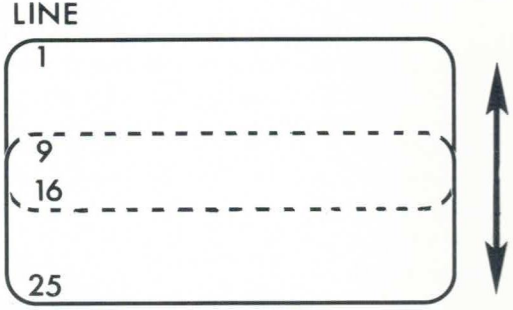
The Diskette Icon

This Icon has the widest range of effects. We'll cover them one at a time.

When you first turn Pivot on—The World Map display appears automatically. If you press the Diskette Icon now, Pivot boots MS-DOS. This is the normal routine at the start of a day. You need to have the MS-DOS System Diskette or other "bootable" diskette in Drive A when you press the Diskette Icon. See "Booting."



When you're "in" MS-DOS—This means you have booted MS-DOS and you're looking at its A> prompt, or you're running a business program like Symphony. The Diskette Icon has the effect of moving the display up and down. This feature is required when you're using software designed for 25-line displays on the 16-line Pivot screen. See "The SYSTEM Column" under the Setup Menu for more on the display options.

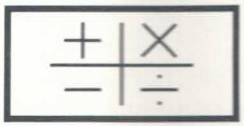


Effect of pressing the Diskette Icon when in 25 Line Automatic or 25 Line Manual Mode

After you've pressed another Icon—Another common use for the Diskette Icon is to get back to a program after interrupting it by pressing some other Icon. You may have been running NewWord and you pressed the Clock/Calendar to check your appointments. Press the Diskette Icon to return to NewWord.

The same is true if you have interrupted a program to use the modem or calculator. The Diskette Icon takes you back where you were.

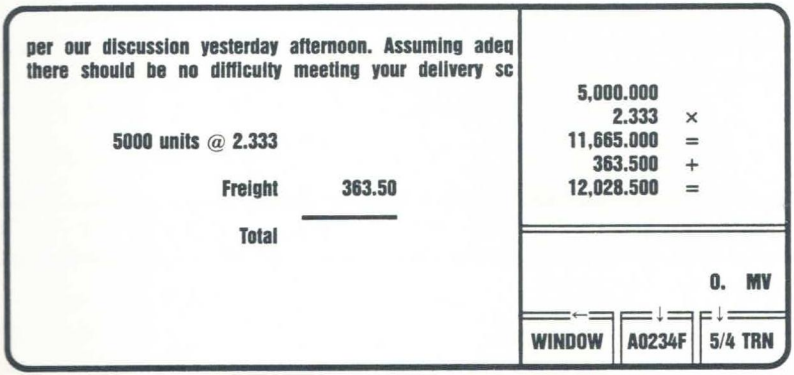
Other possibilities—Suppose you just turned Pivot on. The World Map appears. You then press the Calculator Icon to do some math. Now you hit the Diskette Icon. What happens? Pivot tries to boot MS-DOS just as if you hadn't used the calculator. In general, if you *haven't* booted MS-DOS yet, no matter what else you've done, the first time you hit the Diskette Icon is Pivot's signal to go ahead and boot MS-DOS. Again, the MS-DOS System Disk must be in Drive A for booting to proceed.



The CALCULATOR Icon

Press this Icon to activate Pivot's 10-key calculator. A calculator "window" appears on the right side of the display. If you're running a business program, its display stays on the rest of the screen, but you can't continue working with that program until you exit from the calculator by pressing the Diskette Icon.

The design of the calculator is a compromise between the operation of 10-key desktop calculators (too complex) and typical pocket calculators (too simple). See "Calculator."



The Function Keys

Your function keys make up the row above the Icons. They are labelled *F1* through *F10*.

Function keys have traditionally been the bane of documentation writers and customer support people because they almost never did what they were supposed to. This is a result of no standardization in the codes that the keys transmit.

Well, you can thank IBM for bringing some order to this issue. Your function keys will work *exactly* like they're supposed to. Still, learning what they're supposed to do can often present quite a challenge. With Pivot's built-in software, the meaning of a key always appears on the display right above the key.

Function keys can be confusing to new users because they never seem to do the same thing. For example, at the World Map screen, *F1* activates the Appointment Calendar. When you're looking at MS-DOS' A> prompt, F1 repeats your last command, one letter at a time. And when you're running NewWord, it means Find and Replace. With any software you buy, F1 and its companions will almost definitely have some predefined meaning.

The only function key activities we can speak of with certainty are what they do at the World Map display; when running the Appointment Calendar, Modem, and Calculator; when typing MS-DOS commands; and when using NewWord.

Meanings for Pivot's Function Keys, As Shipped

World Map Display—The meanings appear over the keys on the bottom line of the display. They change the active calendar date, activate the Appointment Calendar, move the Time Zone display, and call up the Setup Menu. See "Home Base: The World Map Display."

Calculator, Modem, and Appointment Calendar—The meanings of the keys appear on the bottom line of the display. Usually only some of the keys will be used. See the appropriate sections for details.

Typing MS-DOS Commands—The function keys have special editing powers when you're at the A> or B> prompt. The idea behind this is convenience: you can re-use all or part of the last command you entered. The meanings of the keys are listed on page 6-4 of the *MS-DOS User's Guide*. F1 is the top key in the table, and so on down to F9.

NewWord—As shipped, only three function keys do anything useful, and the logic behind their selection is dubious. F1 stands for for the "find" command (^QF). F2 is "find and replace" (^QA), and F3 is "find/replace again" (^L). You can easily use the program NWKEY.EXE to make all ten keys do whatever you like. The program is present on your NewWord Program Disk. See the booklet *Pivot & NewWord* for details.

SHIFT, CTRL, & ALT With Function Keys

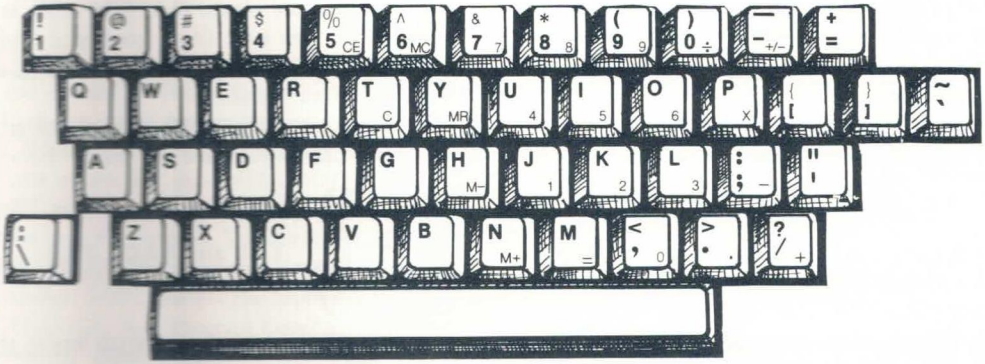
Some programs effectively double, triple, and even quadruple the number of function keys available by making them have different meanings when pressed simultaneously with the SHIFT, CTRL, or ALT Modifier Keys. That's their prerogative, but it seems a bit of a strain on the brain to us. None of Pivot's built-in software uses the function keys this way.

Function Key Overlays

Occasionally you may happen across a program that includes a paper or plastic function key overlay. It shows the meanings for the keys when running that program. Undoubtedly it will be shaped for 2 columns of 5 keys (IBM style) so it won't fit on Pivot's keyboard. There's nothing to keep you from rigging up your own overlays, though. In its most basic form, a piece of written-on masking tape will do the trick.

The Alphanumeric Keys

This is a fancy way of referring to the letter, number, and punctuation mark keys. These keys are the most familiar to typewriter graduates.



Some of the keys have secondary meanings. Those with small colored numbers are mainly used as the calculator keypad after pressing the Calculator Icon. You can also use them for typing numbers while running a program, like a spreadsheet. This is called Numeric Mode. See the NUM key on page 69.

A few alphanumeric keys deserve special mention because of their unique computer uses.

CAPS LOCK

This is almost the same as SHIFT LOCK on a typewriter: Press it once to start capitals, again to quit. The difference is that it affects *letters only*. With CAPS LOCK on, the numbers in the top row stay numbers. You have to use SHIFT to turn them into special symbols (!, @, etc.).

RETURN

This retains its traditional meaning of "move down a line and go all the way to the left edge of the screen" under most circumstances. It is further used to "put away" commands you've entered or answers you've typed to questions on the screen (prompts). For example, the last step in typing any MS-DOS command is to hit the RETURN key.

Usually you can correct mistyped commands and responses to prompts by backspacing and retyping, as long as you do so *before* hitting RETURN.

In this Handbook, RETURN is shown as *[RET]*. In other software manuals, RETURN may be called ENTER, or it may be shown as ↵.

DELETE

There was some debate as to whether this key should be labelled BACKSPACE. Its action varies, depending on what program you're using. In general, it moves the cursor back (left) while erasing whatever it runs into. Don't confuse it with the DELETE / INSERT key, which is covered under "Program Keys" up ahead.

In other manuals the DEL key may be labelled BACKSPACE, or may have just the symbol ←.

TAB and BACK TAB

This is similar to a typewriter's tab key in that it moves the cursor some number of spaces to the right or left. The number of spaces depends on the program that's running; NewWord lets you set and clear tabs wherever you like. Some programs won't use the BACK TAB capability. Those that do usually expect you to use SHIFT and TAB together to get this effect.

Modifier Keys

"Modifier keys" *modify* the meaning of some other key. SHIFT is a modifier because it turns a 7 into an ampersand (&). *Modifier keys are always used in conjunction with another key.* They don't do anything when pressed by themselves.

There are only three modifier keys: SHIFT, CTRL, and ALT.

SHIFT

You are already familiar with the normal uses of SHIFT: to get capital letters and extra punctuation marks. With CAPS LOCK active, SHIFT generates *lower case* letters. See also CAPS LOCK.

SHIFT gives secondary meanings to several multi-definition keys. For example, SHIFT interacts with the INSERT / DELETE key to activate the INSERT meaning. Likewise, SHIFT changes the NUM key to mean SCROLL LOCK. See "Program Keys" ahead.

CONTROL and ALT

The CONTROL (or CTRL) key has historically been the main key for entering commands while running a business program. In NewWord, you can move the cursor up and down with CTRL-E and CTRL-X.

Notations like *CTRL-X* appear at various places in this handbook. They mean for you to hold the CTRL key down while tapping another key (X in this example).

In many manuals, the CTRL key is symbolized by a caret (^). Thus CTRL-X would appear as ^*X*.

The CTRL key is also used to modify several of Pivot's keys to activate the meanings printed on the front edges of those keys. For example, CTRL and SCROLL LOCK / NUM activates the PAUSE function for temporarily freezing the display. See "Special Keys" and "Program Keys" for more.

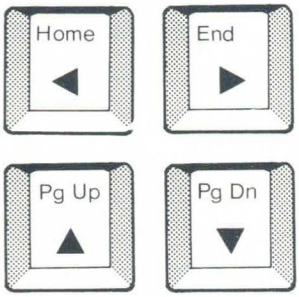
The ALT (ALTERNATE) key is almost identical in practice to the CTRL key. It is used in the same way for entering commands, but it is much less frequently encountered.

With the advent of reliable function keys, some programs downplay the use of CTRL and ALT key commands in favor of predefined function keys.

Program Keys

Pivot's keyboard includes a new category of keys, made possible recently by IBM's de facto standardization of keyboards. These "program keys" have meaning only to business programs that are designed specifically to use them. Such programs are becoming quite common. In addition, Pivot uses these keys to select a time slot on the Appointment Calendar.

You should refer to your program's documentation to see whether and how it uses the program keys.



The Arrow Keys

These are also called "cursor keys." The arrows on these four keys indicate the direction the cursor will move when you press them. With NewWord, you can either enter CTRL-key commands to move the cursor for typing and positioning text, or you can get the same effect much more simply by using these keys.

With many spreadsheets, these keys move the active cell in the direction they point. Other programs use the Arrow Keys in analogous ways.

Each of the Arrow Keys has a second meaning when used together with the SHIFT key, which appears at the top of the key. Again, for these keys to do what they say they'll do, the program you're using must have been designed with these keys in mind.

HOME—With NewWord, moves the cursor to the upper left corner of the screen. This is equivalent to the ^QE command. With spreadsheet programs, HOME usually puts the active cell indicator in the upper left corner of the spreadsheet (cell A1).

END—The opposite of HOME. Puts the cursor in the lower right corner under NewWord (^QX), or the most remote cell on a spreadsheet.

PAGE UP and PAGE DOWN—Moves the cursor some set number of lines upward or downward. The exact number has not been established for the 16-line version of NewWord, since that is still under development as this is being written. PAGE UP is functionally equivalent to NewWord's ^R command; PAGE DOWN equals ^C. They have similar effects on many spreadsheets.

NUM / SCROLL LOCK

This key has the NUM effect when pressed alone, and the SCROLL LOCK effect when used with SHIFT. Ignore the PAUSE meaning of this key for now; we'll get to it in "Special Keys" up ahead.

NUM—This turns the block of keys with colored numbers from letters into numbers ("Numeric Mode"). Then they do exactly the same thing as the regular number keys in the top row. This is a convenience feature for spreadsheet programs or whenever you're typing long lists of numbers.

In this way, Pivot's keyboard simulates the separate numeric keypad found on larger IBM-like keyboards.

The other colored-letter keys (CE, M+, x) retain their normal meanings. They change meaning only when you're running the calculator. See page 118.

If you want to type the letters that have been usurped by Numeric Mode, either exit from Numeric Mode, or simply press SHIFT to get the lower case letter. To get capitals, you'll need SHIFT *and* CAPS LOCK.

With some programs, the screen indicates you're in Numeric Mode by diplaying "NUM" or something similar. Otherwise you'll know you're in Numeric Mode only by typing the keys and seeing whether you get a number instead of a letter.

Cancel Numeric Mode by pressing NUM / SCROLL LOCK a second time.

SCROLL LOCK—This is used on some spreadsheets to keep the cursor on the same screen line, while moving the whole spreadsheet instead of the cursor. Press SHIFT and NUM / SCROLL LOCK simultaneously for this effect. Often the program will indicate onscreen that SCROLL LOCK is in effect. Cancel SCROLL LOCK by by pressing SHIFT and this key a second time.

INSERT and DELETE

DELETE is the regular meaning of this key; it means INSERT when used with SHIFT.

DELETE—We're going to have to fudge here, because we haven't encountered a program that regarded this key as anything special. It may do exactly the same thing as the DEL key in the upper right corner, namely, backspace while erasing whatever it crosses. In other programs, we're told it does something similar, like leave the cursor in one place while sucking text into it, erasing characters like a vacuum cleaner.

In any case, there's one definite *special* use for this key: resetting Pivot. This is when you press it simultaneously with the CTRL and ALT keys—the famous IBM-PC "control-alt-delete" sequence.

INSERT—(SHIFT + INSERT / DELETE) With NewWord, this turns Insert Mode off (and back on, the second time you press it.) Insert Mode determines whether text you type will push existing text aside to make room (on), or simply type over and replace existing text (off). With some spreadsheet programs, INSERT is part of a command sequence that inserts a new blank row or column into an existing spreadsheet.

If you keep getting NUMBERS or CAPITAL LETTERS without trying to:

In the case of numbers, they may appear when you type the letter keys with small colored numbers on them. You have accidentally entered Numeric Mode. Press the NUM key (lower left corner) to cancel it. With constant capital letters, you have accidentally activated CAPS LOCK. Press the CAPS LOCK key (also in the lower left corner) to return to lower case letters.

Special Keys

This is a catch-all for the keys that didn't fit into any of the previous categories. Generally, we mean the keys with additional labels printed on their front edges.

In all cases, this front-edge meaning is activated by pressing the special key simultaneously with the CTRL key.

PAUSE

(Used with CTRL key) This command freezes the display of text on the screen. If you enter a TYPE command, for example, the text of the file rolls up the screen faster than you can read it. Enter the PAUSE keystrokes to stop it temporarily, and any other key to resume.

Advanced users should note that "piping" into the MORE program is a pleasant alternative when viewing files with TYPE. For example, enter *TYPE JOKES | MORE [RET]* to display the file JOKES one screenful at a time. See MORE.COM in the Commands section of the *MS-DOS User's Guide* for details.

A final note: you may be familiar with the CTRL-S method of pausing the display. This will work in some cases, *if* you haven't entered any other keystrokes since the TYPE command. If you have, the CTRL-S is stuck in line in the keyboard buffer and won't have any effect. PAUSE overrides the keyboard buffer, so it always works.

PRINT SCREEN

(Used with CTRL key) This key sends whatever happens to be onscreen to your printer. Your printer must be turned on, online, and have paper ready; otherwise Pivot gets locked up and you have to reset.

You would usually use PRINT SCREEN to get a hard copy of one screenful's text, like a list of files from a DIR command, or a printout of your appointment calendar and phone directory.

As an example, here's how to print a week's appointments from your schedule: Start at the World Map Display. Select the first day of interest on the calendar. Then press SCHEDULE (F1). When the schedule for that day appears, press

CTRL-PRT SC. The schedule prints along with everything else on the display (a small price to pay). Move to the next day of the week with DAY> (F2), and press CTRL-PRT SC again. Repeat until you have all the days you want.

PRINT SCREEN does not send most graphic information (like the world map) to the printer. Most printers wouldn't be able to process pictures. And many times some graphic information like vertical and horizontal lines will be printed as letters.

PRINT SCREEN sends out up to a full 25 lines of information, even if you have a sixteen line display. See also PRINT ON below.

PRINT ON

(Used with CTRL key) In one way this function is more limited than PRINT SCREEN; in another it is more powerful. Your printer must be ready to receive as described above under PRINT SCREEN.

PRINT ON generates a continuous printout of whatever appears onscreen, not just one screenful as with PRINT SCREEN. However, the conditions where it works are much narrower. The main use for PRINT ON is to get a rough (unformatted) printout of a text file. Enter CTRL-PRT ON before entering a TYPE command.

The second use for PRINT ON is for printing whatever communications take place during a modem call. Enter CTRL-PRT ON before or during the communication session.

Turn the printing off by entering CTRL-PRT ON a second time. Resetting Pivot or turning it off also cancels PRINT ON.

PRINT ON usually has no effect while business programs like NewWord are running. They have their own ways of printing things. If PRINT ON is active when you start such a program, the effect is suspended until you exit from the program. PRINT ON also has no effect while using Pivot's Icon functions. Print with PRINT SCREEN instead.

BREAK

(CTRL key required) The BREAK command is used to stop certain programs in midstream. For example, if you begin a DISKCOPY routine only to realize that you can't find the diskette you want to copy, enter BREAK to quit. The A> prompt returns. BREAK is useful in stopping TYPE commands when you've seen enough. It is generally used with MS- DOS commands and *not* business programs.

Most business programs like NewWord won't respond to the BREAK keystrokes. This is a safeguard to prevent you from accidentally aborting before saving your data. If a business program locks up, you'll probably have to reset Pivot with CTRL-ALT-DELETE.

Keyboard Summary

Pivot's Icons perform unique functions not found in other IBM-PC workalike computers. Some have two different meanings, depending on what you're doing when you press them.

The rest of Pivot's keyboard is designed to be as IBM-alike as possible. There is a set of 10 standard Function Keys, whose effects vary enormously. Many business programs assign these keys particular meanings, which are in effect only while the program is running. Pivot also uses these keys with its Icon functions; the meanings of the active function keys appear on the bottom line of the display.

The majority of the keyboard is familiar to typewriter users. However, the SHIFT and CAPS LOCK keys are subtly different from their typewriter counterparts. Two other keys are used like SHIFT (CTRL and ALT) to turn letter keys into command keys.

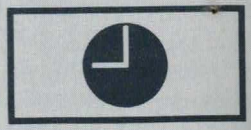
Pivot includes the recently-standardized Program Keys that are designed into many popular programs. The Arrow Keys, INSERT / DELETE, NUM, and SCROLL LOCK fall into this group.

Several keys have colored numbers and symbols on them in addition to regular characters. These are used in Pivot's Calculator function. A subset of these (those with colored *numbers*) are used in MS-DOS's Numeric Mode for typing extensive numbers while running business programs.

Finally, there is a small set of Special Keys that PAUSE the display, send screen information to the printer (PRINT SCREEN and PRINT ON), and abort MS-DOS commands in midstream (BREAK).

74 HOME BASE: THE WORLD MAP DISPLAY

We call this display your "home base" because it's where you begin when you turn Pivot on. Second, it's a point you always pass through on your way to booting MS-DOS, using the Appointment Calendar, or changing the Setup Menu.



The Clock / Calendar

The World Map Display includes a clock and calendar readout for the current time and date. Two function keys (<*ZONE* and *ZONE*>) let you check the time in foreign time zones. Four others (the *DAY* and *MONTH* keys) change the calendar. These select a date for the Appointment Calendar prior to hitting *SCHEDULE*.

Another key (*HERE/NOW*) returns the display to the present time, date, and time zone after you've used some of the other keys as mentioned above. The last key (*SETUP*) takes you to the Setup Menu. More detailed descriptions of what the keys do appear in the pages that follow.

SCHEDULE (*F1*)

Press the SCHEDULE key to activate the Appointment Calendar. The Appointment Calendar appears with the schedule for whatever day was highlighted on the World Map Display. Therefore you'll probably use the DAY and MONTH keys to select a date *before* you hit this key, unless you want to see today's schedule.

Once you press SCHEDULE and a daily schedule appears, you can add appointments, erase them, and change them. See the section called "Appointment Calendar."

When you press EXIT to return to the World Map from the Appointment Calendar, press HERE/NOW to reset the calendar, *if* you were checking the schedule of a day other than today.

<DAY and DAY> (*F2* and *F3*)

Use these keys to select a day for the Appointment Calendar. The highlighted day on the calendar moves accordingly. For example, to see tomorrow's schedule, press DAY> once and then hit SCHEDULE.

After leaving the schedule for a day other than today, reset the calendar to today with the HERE/NOW key.

These keys do *not* set the current date. Unless you're a world traveler, this is something that is normally done only once, at the factory. Changing the current date is a Setup Menu function.

<MONTH and MONTH> (*F4* and *F5*)

These two are very much like the DAY keys, except they change the *month* for the Appointment Calendar. You can also use these keys as if you were flipping through a regular calendar, without pressing SCHEDULE to activate the Appointment Calendar.

You can return to the present month either by using the MONTH keys or by pressing HERE/NOW.

HERE/NOW (*F6*)

This key resets the calendar, clock, and map to the present time, date, and time zone. Use it after you've checked a future/past date on the Appointment Calendar or the time in a foreign time zone. It also resets the date if you've been playing with the calendar to see what day of the week February 6 will be in the year 2453.

<ZONE and ZONE> (*F7* and *F8*)

These keys move a vertical bar across the world map, while changing the time display to show the time in foreign zones. In addition, key city names appear on the display. Pivot's time zone tracker makes a few compromises that are detailed under "The Setup Menu."

Press HERE/NOW to return to your present time zone. The city name display and vertical bar disappear. If you return to your zone with a ZONE key, the city name and vertical bar stay onscreen.

These keys do *not* set your current time zone when you're travelling. This is a function of the Setup Menu.

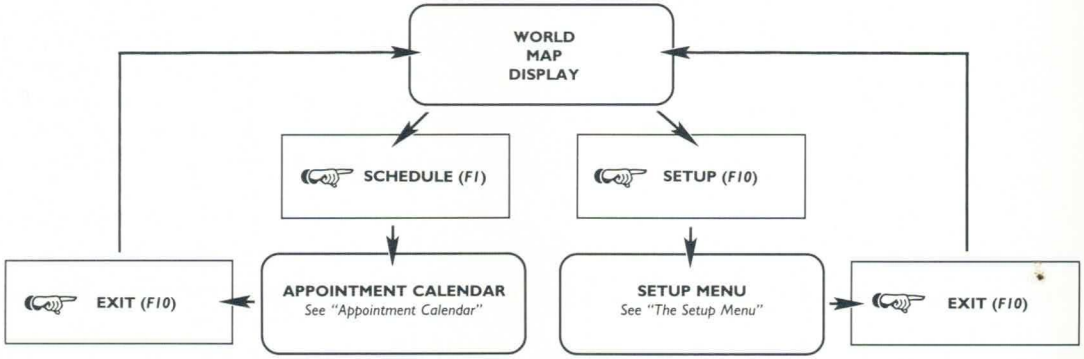
SETUP (*F10*)

Press SETUP to proceed to the Setup Menu. The Setup Menu controls certain details of Pivot's operation. We already mentioned that your present time, date, and time zone are set with the Setup Menu. It also has options for configuring your printer and modem. See "The Setup Menu" for more.

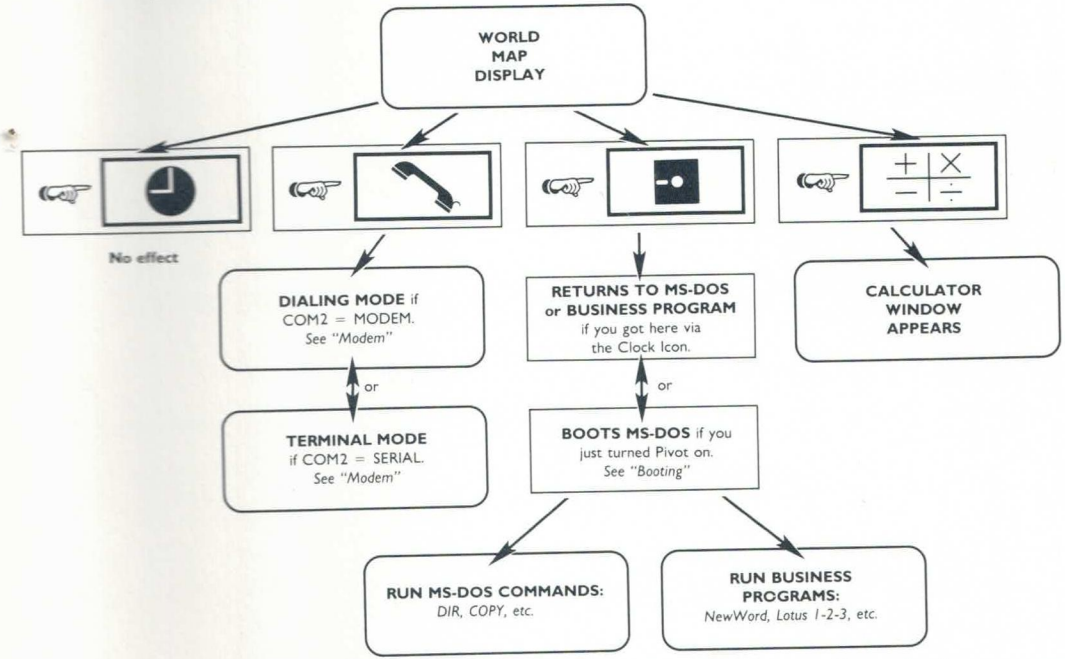
The Map of Pivot's World

The figures that follow are flowcharts of where you can go from the World Map Display, and how to find your way back.

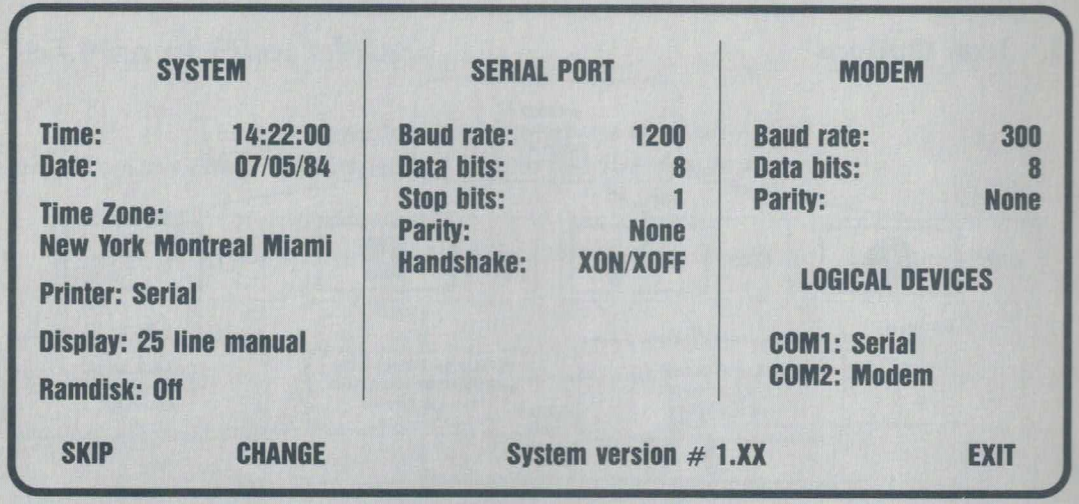
I. Function Key Options



II. Icon Options



Note: To get back to the World Map Display, you'd nearly always press the Clock Icon. The only other case is when you've experienced an error that has left the system "hung", that is, it doesn't respond to your commands. In that case, turn Pivot's power switch off and back on. Beware that you risk losing data when you're forced to do this.



How'd I Get Here?

By pressing the *F10* key under "SETUP" on the World Map display.

What's It For?

You don't use the Setup Menu often. You need it when you take Pivot home from the computer shop to set the TIME, DATE, and TIME ZONE. Your dealer may have already taken care of this for you. You'll set these again when you take Pivot on the road.

Then you'd make sure that some other settings are right for the particular printer you'll be using.

Later on you might check back into Setup if you want to try a different printer or if you make contact with a real old-timer through the modem. Finally, you may change the Display mode for certain programs.

Possible Actions

The item you're working with is shown onscreen in reverse. Go to another item by pressing the *F1* key for NEXT. If you move through them all, you go back to the first and recycle.

Change an item's value by pressing the *F3* key for CHANGE. F3 steps you through all the options for an item, starting over when it's done.

After you've made all the changes you want, press EXIT *(F10)* to return to the World Map display. Your changes take effect immediately and stay in effect until you go back to Setup and change them again.

The SYSTEM Column

These are the items most likely to need changing. Luckily, they are the least technical.

Time

Set the hours, minutes, and seconds separately in 24- hour format (e.g. 9:30 at night is 21:30). The seconds are not set to particular values other than 00. Reset the time as you would with any clock when you change time zones or when daylight savings time arrives.

Date

Set the month, day, and year separately. Pivot automatically adjusts for months with fewer than 31 days. It also adjusts for leap years (and leap centuries, so the programmers tell us).

Time Zone

Set this to reflect the time zone you're in right now. Knowing this lets Pivot figure out what time of day it is elsewhere on the globe. Don't change this if you just want to check the time in another time zone. Use the *F7* and *F8* keys at the World Map display instead.

Pivot's time zone tracker skirts the hairier details of time geography, dividing the world into 24 neat longitudinal slices. Pivot doesn't worry about time zones that are 15 or 30 minutes off. And if you've synchronized the clock to daylight savings time, Pivot assumes the whole world is on D.S.T. Not perfect, but at least you know when not to call your contact in Berlin.

Printer

Your printer is guaranteed to be of the either the serial or parallel variety. The selection you make here tells Pivot which of the 25-pin connectors on its rear panel will have a printer attached to it.

> *Note: If your printer connects to the serial (male) socket, you need to be sure this is set to Serial, and you'll have to check the settings of the middle column, Serial Port.*

If you have a parallel printer, it attaches to the female socket. Be sure Printer is set to Parallel, and ignore the Serial Port column unless you're attaching some other device to the serial connector (like an external modem or link to a big in-house computer).

Display

Pivot has a sixteen-line display. Unfortunately, most software expects you to have 25 lines for showing information. Pivot bridges this gap by keeping 25 lines of display material in memory, while only showing 16 at a time.

How you get access to the offscreen information depends on the setting of this item. The options are *25-Line Auto* and *25-Line Manual*.

> *Rule of thumb: 25-Line AUTO is the most general-purpose option. Use Manual mode for certain programs only if you find the Automatic mode is causing the display to move around excessively.*

You may find yourself changing the Display mode frequently as you experiment with various programs. However, you'll probably wind up leaving it set to 25-Line Auto.

25-Line Manual—When set to Manual, the screen will always show either the top or bottom 16 lines of a 25-line display. You can move from top to bottom as often as you please by pressing the Diskette Icon. See page 60.

Use this option after you've tried 25-Line Auto mode with a program. If the movement of the display in Auto mode is too distracting, it can be prevented by switching to Manual mode.

Notice in Manual mode that you can enter data even when the cursor is on one of the invisible nine lines, but you can't see what you're typing without using the Diskette Icon to shift the display.

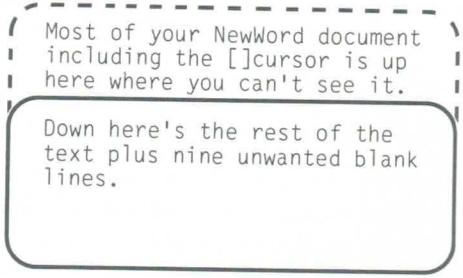
25-Line Automatic—When you select this option, the display automatically adjusts itself to keep the cursor onscreen. **This is the preferred setting for general use.** You can still shift the display with the Diskette Icon if you need to.

Most programs work best in Auto display mode. However, if the display moves around too much while running the program, try switching to 25-Line Manual.

Ramdisk (Pivots with 640K RAM only)

The Ramdisk feature lets you allocate a portion of RAM memory as a pseudo-disk drive. You can copy a program from a floppy into the Ramdisk and run it with a significant increase in speed. This is especially true for data-sorting programs and others that require extensive disk activity.

Be aware that when Ramdisk is turned ON, your usable RAM capacity is reduced from 600K to 390K. If you have a program that requires, for example, 512K, you'll need to turn Ramdisk OFF before running the program. See the box on page 84.1.



Shifting the display by accident can be confusing until you realize what has happened. See below.

If the display is doing strange things—Suppose you're running NewWord. Suddenly you can't find your cursor, and there are nine blank lines at the bottom of the display. Or, you have entered a DIR command at the A> prompt. Now all you see is the first few files listed and no cursor or fresh A> prompt.

In both cases you have probably inadvertently shifted the display with the Diskette Icon. Press the Diskette Icon again to move the display back.

Also make sure you're in *25 Line Auto* display mode at the Setup Menu. Avoid 25 line manual mode except when programs make the display shift excessively.

The SERIAL PORT Column

Note: If all you want to do is setup your printer, and you have a PARALLEL-type printer, ignore this section. The discussion assumes you are connecting a serial printer. For other serial devices, see "Connecting Devices to Pivot" later in this handbook. (→ page 85)

Using Pivot's Ramdisk (640K Models Only)

If your Pivot has 640K of RAM (the current maximum), you can choose to allocate about a third of it as an imaginary C: disk drive. You would then copy programs or data from real floppies into the "Ramdisk" and use it as a souped-up turbo-charged disk drive. (Don't confuse Ramdisk with "virtual drive", which is how one-drive Pivots reassign drive A: as drive B:. See page 50.1.)

If you're just beginning to learn how to use Pivot, you might save Ramdisk for later.

The speed advantage of Ramdisk depends on how heavily a program uses the disk drives. You'll have to try it to see whether the speed and convenience of having the third drive is worth the inconvenience of copying Ramdisk information back and forth from real disks.

Enabling/Disabling Ramdisk—Turn Ramdisk on and off at the Setup Menu. When it's ON, 218K of user memory (equal to about two-thirds of a normal disk) is automatically given to Ramdisk whether you use it or not. This leaves 32K for the display and 390K for normal RAM use. This *may* have an impact on the efficiency of programs that aren't using the Ramdisk; in extreme cases, there may not be enough memory left for some very large programs to run. Therefore you should turn Ramdisk off when you're not using it.

Don't turn Ramdisk off (or turn Pivot off) until you've copied any data from the Ramdisk onto a real disk. Information in Ramdisk is subject to the same hazards as any data in RAM.

Example: Running NewWord From The Ramdisk—NewWord's program files require about 120K of Ramdisk space. Since 218K is available, there is room to spare. (This won't always be the case; if you see "Insufficient disk space" while loading a program into the Ramdisk, you won't be able to use it for that program.)

continued—

Ramdisk continued

Your steps are: 1) Turn Ramdisk ON at the Setup Menu, if you haven't already *
2) Copy the NewWord programs from drive A: to drive C: (the Ramdisk)
3) Change the current drive to C:
4) Run NewWord to edit a document on real disk A: or B:

Copy The Programs Into Ramdisk—At the A> prompt, insert the NewWord program disk into drive A:. Now type this command: **COPY A:NW*.* C: [RET]**

Change The Current Drive to C:—After the copy, the A> prompt returns. Log onto drive C: by typing: **C: [RET]**

Run NewWord—The A> has changed to C>. Type: **NW [RET]**

NewWord begins, considerably faster than usual. You have several options for working on documents. We recommend keeping your documents on real drives A: and B: rather than Ramdisk C: (see page 146). You *can* create new documents on drive C:, but remember to COPY them to A: or B: before turning Pivot or Ramdisk off. You can also revise existing documents in the Ramdisk by copying them from real disk A: or B: to Ramdisk C:, but this is unnecessarily risky. Note that when you're finished you *don't* need to copy the NewWord programs back to drive A:.

There are many other applications for Ramdisk that will occur to you as you gain experience with MS-DOS and your own favorite programs.

* Last minute note: You have to reset Pivot (CTRL+ALT+DELETE) after turning Ramdisk on, for it to take effect. Reset again after turning it off.

The items in the Serial Port column govern the operation of the 25-pin serial (male) connector on Pivot's rear panel. You'll need to check and possibly change these settings if you're using a serial printer or external modem, and if you're using Pivot as a terminal with another computer. See "Connecting Devices to Pivot" later in this Handbook for further information.

Normal Settings For Newer Serial Printers

Baud rate: **300** or **1200**
Data bits: **8**
Stop bits: **1**
Parity: **None**
Handshake: **Hard+XON**

Baud Rate

This is the speed at which a printer (or other serial device) and Pivot will communicate. The main thing for you to do is make sure both Pivot and the printer are set to the same baud rate.

Printers usually have switches for setting the baud rate. A few serial printers are fixed at one rate, say, 300. Consult its manual (or your dealer), and set the printer's switches for the highest baud rate possible. Then set Pivot's baud rate to match.

Standard baud rates are 110, 300, 600, 1200, 2400, 9600, and 19,200. The most common for printers are 300, 1200, and 9600.

Data Bits

This is the number of bits the printer expects Pivot to send for representing a letter or other character. Eight bits is normal for modern printers. This number does not include Stop Bits, which are setup separately.

Stop Bits

The stop bits tell the printer "That's it for this character!" You can have 1 or 2 stop bits. One is normal. Two is unusual, but when in doubt, check the printer's documentation to be sure.

Parity

Some devices use the eighth data bit for a special purpose. Without going into details, it provides a crude means of telling whether a character made it across the communication line okay. If the device is a serial printer, it may have a switch that enables and disables parity checking. To complicate matters, it may have another switch that says parity is either odd or even.

> **RULE OF THUMB:** If your printer has such switches, set them so parity is *disabled*. Then set Pivot's parity option to *None*.

The only time you should select Odd or Even parity on the Pivot end is when the device on the other end demands it, and this won't be often. When parity is required, it should be clear from the device's specifications whether Odd or Even is appropriate.

Handshake

This item reflects how the printer tells Pivot that it's too busy to receive any more characters for a while. There are four possible settings, with one (Hardware + XON/XOFF) that is the 99% probable choice.

Hardware—Used by some older devices, this method employs a special wire in the cable to tell Pivot when the printer is busy. It attaches to pin 20 on the Pivot end; the pin number for the other end varies.

XON/XOFF—This is often called "software handshaking". It is in very common use. The printer sends Pivot special codes to stop and restart transmission. The extra wire used in hardware handshaking is not needed.

Hardware + XON/XOFF—*The preferred setting for normal use.* If the printer uses hardware or XON/XOFF handshaking, this setting will work. Which begs the question, Why offer the two options above at all? A good question with no good answer.

No Handshake—An unusual selection for devices that don't support any method of handshaking (rare indeed).

There is a final antiquated type of handshaking known as ETX/ACK. Pivot does not use this method at all.

The MODEM Column

These items control Pivot's built-in modem. They have no effect on external modems connected to the serial port. See "Connecting Devices to Pivot" later in this handbook for more information on external modems.

Normal Modem Settings

Baud Rate:	**300**
Data Bits:	**8**
Parity:	**None**

Baud Rate

This is the speed at which Pivot's modem and the modem at the other end will communicate. Modems on both ends of the phone line have to be set for the same baud rate. Your options are 300 and 110 baud. 300 is normal; 110 is excruciatingly slow but if the other guy can't go any faster, you'll have to put up with it.

Data Bits

This is how many bits Pivot will use to represent one letter or other character. Eight is by far and away the norm. As few as five may be used in special cases. It depends on the equipment at the other end.

Stop Bits

There is no stop bit option for the built-in modem. At 110 baud, 2 bits are used. At 300, one bit.

Parity

Normally this should be set to None. If your partner's software demands that you employ parity processing, he should specify whether it's Even or Odd. Set Pivot's option accordingly.

The LOGICAL DEVICES Column

COM1 and *COM2* are fictional devices that Pivot uses for routing information to and from the outside world. The settings you pick for these have two independent effects.

When You're Using the Phone Icon

COM2 is the only device that matters here. Forget COM1. When COM2 is set to MODEM, Pivot shows your Phone Directory after you press the Phone Icon. It is preparing to dial a number, either for a voice call or for a modem (data) call.

If you set COM2 to SERIAL, Pivot does not show the directory. It clears the screen and enters "terminal mode", for communicating with another computer through Pivot's serial connector instead of through the modem.

COM2 = MODEM: Pivot dials a number and communications are routed through the RJ-11C (modular phone) connector. ***Normal setting.***

COM2 = SERIAL: Pivot does not dial; communications are assumed to be local. Input and output are routed through the RS-232 (serial/male) connector.

When You're Using Other Communications Software

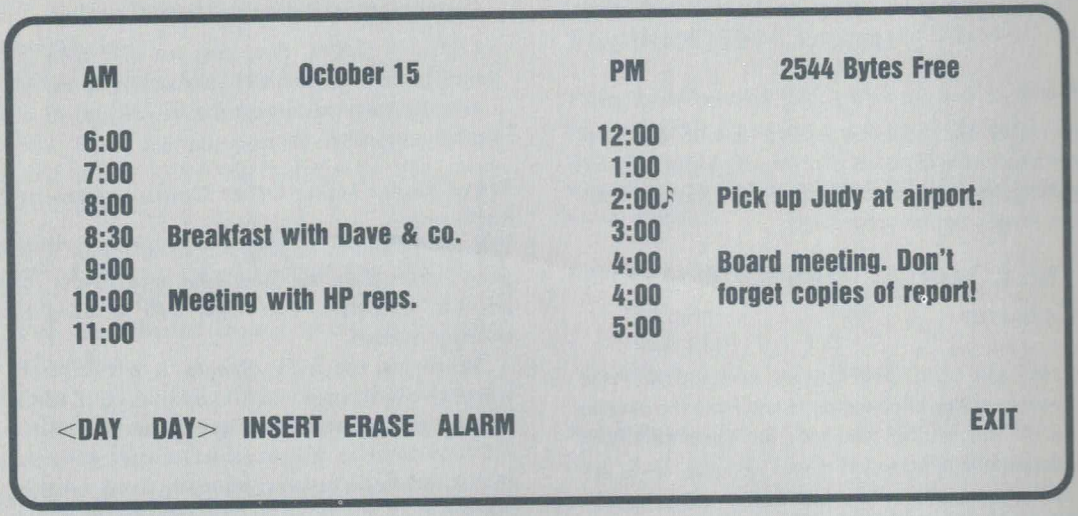
This means you're running a communication program other than the one built into Pivot, for example, Crosstalk. You might also be using an external modem.

When you use such software, it will probably want to talk through COM1, or possibly COM2. Suppose the software sends a character to COM1. If COM1 is set to SERIAL, the character goes out Pivot's serial connector, presumably to an external modem. If COM1 is set to MODEM, the character goes to Pivot's internal modem and out the RJ-11C (phone) connector. The normal configuration is:

COM1 = Serial COM2 = Modem

You'd set COM1 to MODEM only if the communications software has been "patched" to use Pivot's built-in modem. This requires considerable programming expertise. It is possible that Morrow will offer advanced communication programs already patched for Pivot's modem.

COM1 and COM2 cannot be set to the same thing. One is always SERIAL, the other MODEM. All you can do is flip-flop them.



How'd I Get Here?

By pressing the SCHEDULE key (*F1*) at the World Map Display. Had you been running a program, you would hit the Clock Icon first to bring up the World Map, *then* press SCHEDULE. When you're done with the Appointment Calendar, press the EXIT key (*F10*) to return to the World Map, and then the Diskette Icon to return to the program.

Pick the Day First!

You should always select the day for the Appointment Calendar at the World Map Display *before* you press SCHEDULE. Use the MONTH and DAY keys until the day of interest appears in reverse on the calendar. Then hit SCHEDULE to look at or add to that day's appointments.

After you activate the Appointment Calendar, you can still move to other "pages" a single day at a time, without returning to the World Map.

When you do return to the World Map, it may be necessary to press the HERE/NOW key to re-synchronize the calendar display.

Using the Appointment Calendar

Here's what you can do once you've activated the Calendar with the SCHEDULE key:

- Add, change, and erase appointments.
- Insert appointments or reminders for times other than on-the-hour.
- Set the alarm indicator for advance notice of special appointments.

Active Keys

The keys for the Appointment Calendar include the regular keyboard, for typing appointments and messages; the arrow keys and [RET] for moving around the screen; and some of the function keys (*F1* etc.) for setting the alarm, adding and erasing, and moving through the Calendar a day at a time.

The Function Keys

<DAY and DAY> (*F1* and *F2*)—These keys step you through the Calendar by days. If you had activated the calendar without selecting a day at the World Map, you'd begin with today's schedule. Use these keys to see tomorrow's or yesterday's appointments. You can step as far as you want into the past or future this way, no matter what day you begin with.

INSERT (*F3*) — Notice the 8:30 breakfast appointment on the sample display two pages back. *The initial (empty) display for a day's schedule includes only hourly entries from 6:00 am to 5:00 pm. Any other entries are inserted with the INSERT key.*

This user had 8:00 as the active time slot (it was shown in reverse) when he pressed INSERT. This creates a blank line underneath, with the same hour as the one above.

Type in the minutes, then continue typing the text for the appointment. The minutes must be between 01 and 59. This explains the 4:01 appointment on page 88. That's how the user got a second line of text for his 4:00 meeting. One exception: When you insert appointments after 5 p.m. (where you must also type the hour) the minute setting can be 00.

You can insert seven extra slots per column, until the screen gets full.

ERASE (*F4*) — There are two ways to change the text for an appointment: typing over old text, or erasing it with the ERASE key. The ERASE key also completely deletes inserted time slots.

ALARM (*F5*) — This key sets the alarm for an appointment. It also un-sets it if you change your mind.

When you've set the alarm for an appointment, Pivot beeps and displays "Appointment Alarm" five minutes before the appointment. It continues beeping for 10 seconds or until you press the ESC key or until you press SCHEDULE to activate the calendar.

If you don't do any of those things, Pivot beeps again, once per minute for 10 minutes. By then you're already five minutes late. So Pivot cancels the alarm and you have no-one to blame but yourself. *Pivot has to be turned on for the alarm to work!*

EXIT (*F10*)—Press this key to return to the World Map Display. From there, press the Diskette Icon to continue with a program, if you were running one when you activated the Appointment Calendar.

Moving Around the Schedule Display

Use the four arrow keys in the lower right corner of Pivot's keyboard, or step through the time slots with [RET] (the RETURN key).

Typing the Text for an Appointment

When you arrive at the time slot you want (shown in reverse), just begin typing. You can correct mistyped entries either by erasing the whole entry with ERASE, or by using the DEL key in the upper right corner to back up and erase a character at a time.

What if I need more room?

Use INSERT to create a "dummy" time slot below the one you filled up. See "INSERT" in the Function Key section. You can also just type into unused slots.

How do I set the alarm?

See "ALARM" in the Function Key Section.

How do I get rid of inserted slots, if I decide not to use them?

See "ERASE" in the Function Key section.

What does "XXXX Bytes Free" Mean?

Pivot has 4,000 bytes of special memory as standard equipment for storing appointments and phone numbers. As you add appointments and phone numbers this memory (NVRAM) fills up. The Bytes Free display tells you how much is left.

When NVRAM gets full ("0 Bytes Free"), Pivot makes room for new appointments and phone numbers by erasing your oldest appointments one at a time. Practically speaking, they should be so far in the past that it wouldn't matter.

However, bear in mind that if you have an extremely large phone directory (more than 200 entries), it will limit your appointment space. See also page 30 for more specific details.

Modems are a combination of hardware and software that let computers talk to each other over telephone lines. Using its built-in modem, Pivot can call data bases like The Source and CompuServe, electronic bulletin boards, and other personal computers. Using Pivot this way is quite simple; the main thing that may confuse you at first is using Pivot's Phone Directory for automatic dialing.

Note that you can use the Phone Directory for automatic dialing of voice calls, not just modem (computerized) conversations. We'll use the term *voice calls* throughout this section to mean regular telephone calls that you let Pivot dial and/or time for you. *Modem calls* are those in which your exchange is carried out through the keyboard and display. With these, your physical telephone stays hung up.

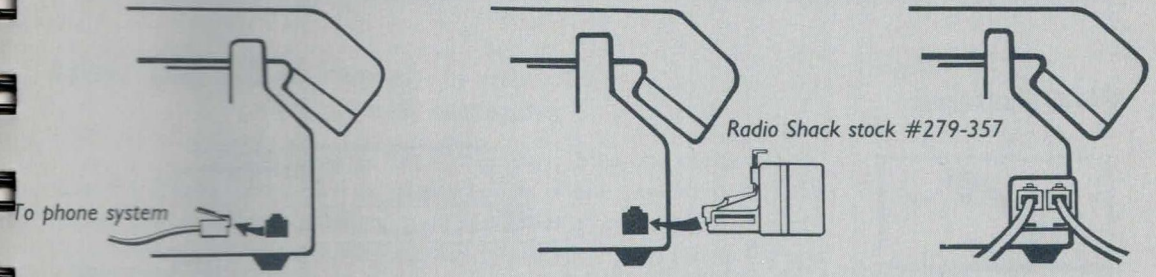
The purpose of the actual modem device is to convert data into sounds and back again (MOdulation/DEModulation). We're using the term "modem" more liberally in this handbook to mean the device, plus the program that runs it, and the programs for the Phone Directory and automatic dialer.

Connecting Pivot to the Telephone System

Under the best circumstances, the only required hardware is a piece of telephone cable with modular (standard RJ11-C) connectors. You may need other items, depending on the hardware used in the existing phone system. In any case, everything you need is readily available from Radio Shack and other computer suppliers.

Refer to the figures on this and the next page. Notice that Pivot is wired *in parallel* with your telephone, not in place of it. This lets you use Pivot as a directory/dialer for regular voice calls.

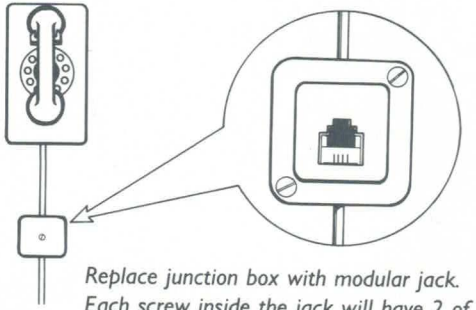
Modular Phones (Domestic and Commercial)



1. *Disconnect modular plug from telephone.*
2. *Install duplex jack on telephone.*
3. *Connect phone cable to one socket, modem cable to the other (it doesn't matter which).*

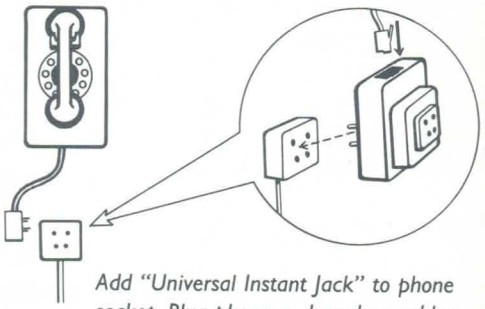
Junction Box and 4-Pin Plugs (Mostly Domestic)

Radio Shack stock #279-353A



Replace junction box with modular jack. Each screw inside the jack will have 2 of each color wire attached to it.

Radio Shack stock #279-360

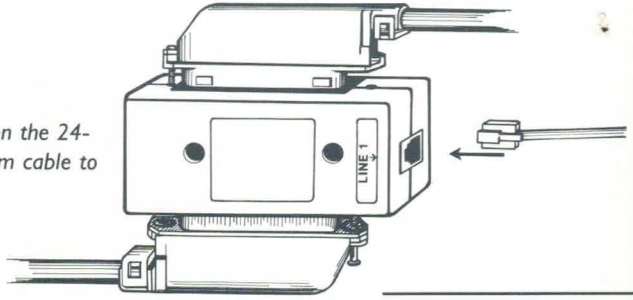


Add "Universal Instant Jack" to phone socket. Plug phone and modem cables into universal jack.

PBX Systems

Radio Shack stock #43-271

Install "Line One Tap" between the 24-pin connectors. Connect modem cable to tap.



```
Area Code: (415)      Prefix: 9      Call Timer: 00:00:00      2488 Bytes Free

  #1 - Sprint                          (415)555-4242WWWWW12345+
  #2 - Harry's Bookie Service          (415)555-6783
Action Graphics                        (408)555-2609
Al's Auto                              (415)555-7653
Allen, Vera                            (209)555-0228
American Photo                         (415)555-2900
Beta Bulletin Board                    (415)555-7272M

Dialed so far: 555-7272M

 PREFIX  DIAL  #1  #2  KEYBOARD  REDIAL  HANGUP  TIMER  UPDATE
```

How Did I Get Here?

By pressing the Phone Icon. With one minor exception, the Phone Icon *always* takes you to the phone directory. You can come here to make a call in the middle of editing a memo. The call can be a modem call, like checking a stock quote with Dow Jones. Or you can make a regular voice call, letting Pivot dial from its directory automatically.

To return to what you were doing, press another Icon. For example, press the Diskette Icon to return to MS-DOS or a business program.

Press the Clock Icon to go to the World Map Display. If this was a modem call, you'll first need to press the Phone Icon to return to the directory display for hanging up.

What Does It All Mean?

Admittedly, this a relatively complex display. But it's really simple when you learn to focus on only the elements appropriate to what you want to do. Before looking at some examples, we'll first define every element on the Phone Directory display.

Area Code

This is the number you've entered as your local area code at the Update Display. Pivot uses this information to find out whether to dial an area code.

If the area code shown at the top of the display is the same as the area code contained within the number you've selected for dialing, Pivot knows this is a local call and skips dialing the area code. If the numbers *don't* match, Pivot knows this is long distance and includes the area code when dialing.

See the Update Display section (ahead) for instructions on setting the current area code.

Prefix

Like area code, the prefix is another item that is entered only now and then, at the Update Display. It is mainly for situations where you "have to dial 9 to get an outside line." Alternatively, you could set it to "1" for situations where a 1 must precede long distance numbers. The prefix is dialed when you press the PREFIX function key (F1) at the Directory Display.

If you use the prefix for an outside line, your dialing sequence inside an office building or hotel would be: put the black bar on the number in the directory you want to dial; press PREFIX; then press DIAL. When the prefix isn't needed, just skip pressing PREFIX and go straight to DIAL.

See the Update Display section for instructions on entering or changing the prefix. There are other less common uses for the prefix, also discussed there. It is optional, so if have no use for it, don't wrack your brain trying to invent one.

Call Timer

This is a nice little feature that does just what it says. You stop and restart the timer yourself with the TIMER function key (F9—more on this later). Lawyers and consultants can use the timer for billing purposes. You can also compare your time records with the bills you get from the phone company and any data base services to which you may subscribe.

Pivot keeps no permanent record of elapsed times. It's up to you to write this information down. And remember: unless you stop the timer, it goes merrily along ticking off the seconds, even after you've hung up and gone on to other things. It resets itself to zero when you dial another number or turn Pivot off.

XXXX Bytes Free

The names and numbers for the phone directory are stored along with your appointment schedule in the special memory bank called NVRAM. This memory is kept intact when Pivot is turned off by a small built-in battery. Pivots currently have 4000 bytes of NVRAM as standard. Larger capacities may be available as a future option.

The "Bytes Free" indicator appears here and on the appointment schedule. It tells you how much of NVRAM is still available for new appointments and phone numbers.

When Bytes Free approaches zero, outdated appointments are automatically deleted to make room. If the phone list continues to grow, it's conceivable that even current and future appointments will be deleted. At the extreme, all of NVRAM becomes dedicated to the phone directory, and you cannot add appointments or phone numbers until you delete unneeded phone numbers to free up space. See page 30 for further details.

#1 and #2

The directory has two special places at the beginning of its list called #1 and #2. Use them for very frequently-called numbers. You can dial them conveniently with the #1 and #2 function keys (F3 and F4) without having to position the black bar on top of them.

In the sample display, the user has set #1 to the local access number and ID code for a long-distance carrier. #2 is an oft-called business associate. Other uses might be a second long-distance service or your home phone.

The numbers for #1 and #2 are entered at the Update Display, as discussed on page 104.

Names and Numbers

The restrictions and options for typing names and numbers are covered later under the Update Display. They are automatically sorted in alphabetical order whenever you add a name to the list.

"Dialed so far:"

When you press PREFIX, DIAL, or REDIAL, the number being dialed by Pivot appears in this line.

Directory Display Function Keys

PREFIX (*F1*) — Use this key if you need a prefix as part of the dialing sequence. Typical use is for dialing "9 to get out." After PREFIX, press DIAL to dial the rest of the number from the directory, or KEYBOARD to dial the rest from the keyboard. When you don't need the prefix, just skip pressing this key.

DIAL (*F2*) — Press this key to begin dialing, after moving the black bar to the number in the directory you want to dial. If you need the prefix, press PREFIX before pressing DIAL.

With modem calls (those ending with "M"), Pivot dials the number and waits for the computer on the other end to send an acknowledgement. With voice calls (no "M"), Pivot dials and tells you to pick up the phone. Do so, and then press HANGUP (F7). HANGUP is discussed on the next page.

#1 and #2 (*F3* and *F4*) — Use these for speed-dialing the numbers you've put into the special #1 and #2 slots. Pressing the #1 key is exactly the same as moving the black bar to that slot and pressing DIAL, but it's more convenient.

KEYBOARD (*F5*) — Press this key to initiate keyboard dialing. That is, you can type the number to dial on the keyboard instead of selecting one from the directory. A feature to be aware of: you can assemble long dialing sequences (like long distance by way of MCI) by picking part of the sequence from the directory and dialing the rest from the keyboard. Keyboard dialing is covered on pages 110 and 117.1.

REDIAL (*F6*) — This key redials exactly the same number that was last dialed. Pivot saves the number even after being turned off. If you used PREFIX with the last number, the prefix is included in the redialing.

REDIAL is especially useful when you're repeatedly dialing the same number, for example, when it's busy.

HANGUP (*F7*) — Pressing this key is always the last step in making *any* call, voice or modem.

With voice calls, Pivot tells you to press HANGUP as soon as you pick up the telephone handset.

That's strange; won't that break the connection?

No it won't, as long as your phone is off the hook. All it does is take Pivot out of the circuit. This eliminates any noise or interference that Pivot might inject into your conversation.

With modem calls, you should press HANGUP after logging off from the computer you're talking to. You'll have to press the Phone Icon and return to the Directory Display first.

If you don't press hangup with either of these calls, your phone will appear to be off the hook to the rest of the world.

What if the number was busy, or there's no answer? You still need to press HANGUP. For voice calls, hang up the phone and press HANGUP; for modem calls, just press HANGUP.

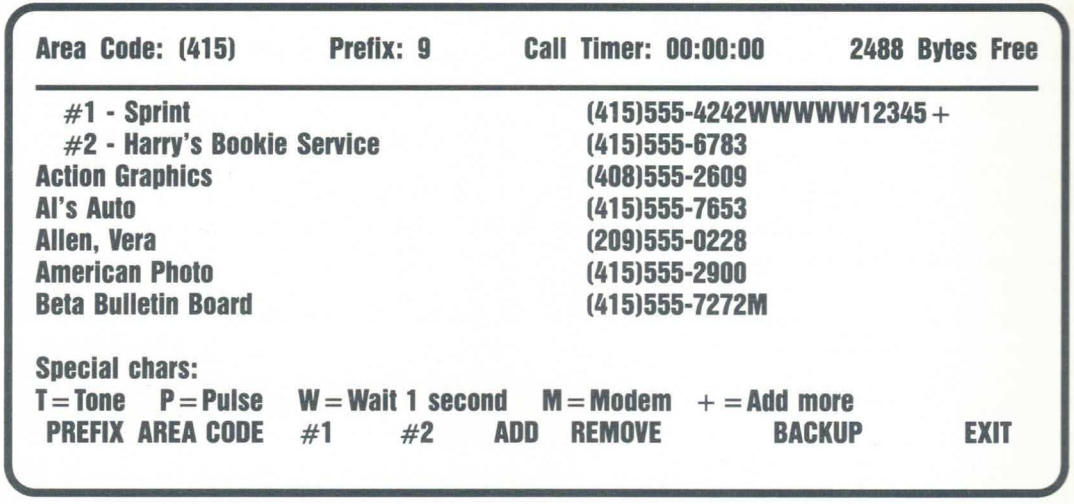
TIMER (*F9*) — This key stops the call timer, which started automatically after Pivot dialed a number. Use the timer to keep time on voice or modem calls. Pressing it again resets and restarts it. Of course, you can use the timer for any purpose, not just call timing. When the timer is idle, pressing TIMER starts it.

The timer is onscreen constantly during voice calls, unless you press an Icon to do something else during the conversation. It is not visible during modem calls until you press the Phone Icon and return to the Directory Display for hanging up.

Remember that Pivot does not keep a record of call times. It's up to you to write this information down yourself.

UPDATE (*F10*) — This key takes you to the Update Display for adding new phone numbers, erasing old ones, and changing current ones. You also set the values for the area code, prefix, and special numbers #1 and #2 at the Update Display.

The Update Display is shown on the next page. Its elements will be discussed before we move along to some practical examples.



The Update Display

The Update Display

The Update Display (previous page) is your tool for creating your customized phone directory. Initially the directory is blank except for the empty #1 and #2 slots. You build it by ADDing new entries. You can also REMOVE old ones to conserve space in memory. Finally, you update existing numbers by typing over them.

You get to the Update Display by pressing the UPDATE key (F10) at the main Directory Display. You get back to the directory by pressing F10 again; this time it means EXIT.

Top Line (Area Code through Bytes Free)

All of these elements were covered earlier in the context of the Directory Display.

Names and Numbers, Including #1 and #2

These were also discussed under the Directory Display.

A mild word of warning: At the Update Display it's easy to hit stray keys and accidentally change a phone number. Note that on the Update Display, the black bar covers only the phone number instead of the name and number. We mention this so you'll recognize quickly when you're at the Update Display (since it looks so much like the main Directory Display).

Phone Number Elements

The next-to-bottom line lists some characters that you can use within phone numbers to perform certain functions. You can also use them in the Prefix if you like.

When adding phone numbers (or when dialing from the keyboard) Pivot lets you type only a certain set of characters, specifically, the digits *0-9*, the letters *M,P,T,* and *W,* the plus sign *(+)*, parentheses, and dashes. Usually you'll just use digits and parentheses; dashes are optional for attractiveness; the letters are a little more specialized—whether you use them depends on your circumstances.

T = Tone and P = Pulse—The discussion of these letters takes more space than it really deserves. Chances are you'll never use either of these.

There are two ways that telephones can dial a number: rotary (dial) phones use "pulse" dialing, while pushbutton phones use "tone" dialing. Pulse dialing is becoming something of a dinosaur, but there are still some localities where pulse dialing is required.

Pivot always dials numbers with tones unless you use a *P* in the number to signify Pulse dialing. The only time you'd use *T* for tone is when part of a dialing sequence is pulse, and then it switches to tone. If the whole number can be dialed in tone (by far the norm), neither T nor P is needed.

Force yourself to wade through this unlikely but conceivable scenario: You're in one of those places where pulse dialing is required (there are no pushbutton phones). You want to make a long-distance call with Sprint or MCI. In this case, you have to dial Sprint's local number in pulse mode, then switch to tone for entering your account number and the number of the party you're calling. Your number would then look something like:

P555-1234WWWWT9999WWWW555-6789

The first seven digits are Sprint's local access number, dialed in pulse. The *W's* (described below) tell Pivot to wait before dialing any more. The *9999* is your ID code, dialed in tone. The last seven digits are the number you're calling (at last!), also tone-dialed.

Incidentally, that gargantuan number above is a true worst-case example. Most numbers will consist of only an area code and seven digits, with no letters.

Note that you *don't* need a T in numbers that are dialed all in tone, which is the normal situation.

If you live in an area where local calls must be dialed in pulse, every one of your directory numbers might have to begin with a *P*. Preferably, you could enter *P* as all or part of your Prefix on the Update Display. If you're just visiting a pulse-dial area, making *P* your prefix is the simplest approach.

Note that pulse dialing is used for digits *after the P*, so be sure to position it accordingly.

W = Wait 1 second—Notice the *W's* in the example under "T = Tone" above. What are they for? They tell Pivot to wait 1 second each before dialing the next digit. In that example, Pivot gives Sprint's computer 4 seconds to answer the phone. Then it allows another 4 seconds for processing of the account number before dialing the destination's number. You'll have to use your own experience in determining the optimum number of *W's* to put in such sequences.

In another common situation, you might need to dial *9* to get an outside line from your office. Perhaps there's a delay between dialing 9 and getting the second dial tone. In such a case, you may set your prefix (on the Update Display) to *9WWW*. This gives your PBX system three seconds to get you an outside line before dialing resumes.

M = Modem call — Unless you put an *M* as the *last character* in a phone number, Pivot assumes it's a voice call. It dials and tells you to pick up the handset. M is used with modem calls. Pivot dials and waits for an acknowledgement from the computer on the other end.

There will rarely be a case where a number goes back and forth between voice and modem (requiring you to add and remove the M frequently). This *would* occur when you're calling a friend, sometimes to talk, sometimes to exchange messages through the modem. In this case, use M anyway. If you're calling just to talk, dial with the telephone.

Notice on the Directory Display at the start of this section that none of the numbers but one has an M at its end. This is an electronic bulletin board service, which is universally a modem call. The rest are business associates to which calls would be conversational.

+ = Add more — The plus sign means this is only the first half of a long dialing sequence. You would usually use it at the end of a Sprint or MCI access number. The Sprint number in the sample illustrations is an example.

Like *M*, the plus sign *must be last character of the number.* This will not cause conflicts, since there wouldn't be a number that uses both *M* and +.

When Pivot dials a number that ends in +, it beeps and pauses. You would then move the black bar to a number in the list (the second half) and press DIAL, or press KEYBOARD to dial the second half from the keyboard. You can actually chain more than two numbers this way by using multiple plus signs, but doing so is probably not very useful.

Update Display Function Keys

PREFIX (*F1*) — Press this for establishing any sequence of numbers or special letters that you need consistently at the beginning of calls. The primary use for this is in an office, to dial "9" for an outside line. Type any sequence of characters (10 max) or leave it blank. Clear an existing prefix by typing over it with spaces. Press [RET] when done.

PREFIX appears on both the Update and main Directory displays. Pivot dials the prefix when you press the PREFIX key at the Directory Display.

The special characters that you may use in a prefix (*W* and *P* particularly) were covered in the previous sections. An example of using *W* is an outside-line prefix of *9WW*. After dialing 9, Pivot waits two seconds for the second dial tone before dialing the number.

AREA CODE (*F2*) — Press this key to set up the area code for your current location. You must enter *three digits only.* If you make a mistake press AREA CODE again and retype. Change this setting whenever you move to a location with a different area code.

The area code you enter here automatically appears in parentheses. When you include area codes in phone directory numbers (which you should always do, even with local numbers), the area codes must be enclosed in parentheses. You type the parentheses yourself in those cases.

#1 and #2 (*F3* and *F4*) — Use these keys to set the names and numbers in the special #1 and #2 slots. These slots are the first two in the Directory Display. They have their own function keys on the Directory Display for quick selection without having to position the black bar.

When you press either of these Update function keys, the cursor goes to the upper left corner, ready to accept a name. Type in a name; replace an old name by typing over it. If the new name is shorter, replace the leftover letters with spaces. Use the DEL key to correct typos. Hit [RET] when done.

Proceed to type the number. Hit [RET] again when done. The name/number stays at the head of the directory; it is *not* moved to an alphabetical position.

Remember that if this is a Sprint or MCI access number, you will probably want to use a plus sign (+) as the last character.

ADD (*F5*) — This key opens a blank line toward the top of the screen, with the cursor positioned for adding a new name. It doesn't matter where you are in the directory when you press ADD; the name will be positioned in its alphabetical sequence after you finish adding it.

Type the name of the party. Backspace (DEL key) and retype to correct typos. Hit [RET] (the RETURN key) when the name is typed correctly. The name can be any sequence of characters, up to 39 long, counting spaces.

When you hit [RET], the name automatically appears in its alphabetical position. Proceed to type the number. Remember that area codes are recommended for all numbers, and *they must be enclosed in parentheses.* You can also use any of the special letters described previously, and dashes to divide the number visually. The total length of the number cannot exceed 39 characters, including spaces.

If you notice now that you made a mistake, there are two possibilities: If the name is wrong, you'll have to REMOVE the whole entry and start over (see below). If only the number is wrong, just position the cursor on it with [RET], or an Arrow key, and type the correct number over the wrong one. Type the whole number. If the correct one is shorter than the one it replaces, hit the SPACE BAR to remove the remaining digits.

Quick note regarding area codes and parentheses: Pivot is capable of matching your current area code against an area code included in a directory number. If they match, Pivot knows the call is local and skips dialing the area code. If you travel frequently, you can use this to advantage, but it's strongly recommended that you include area codes for all numbers in the directory, even local numbers. THE AREA CODES MUST BE ENCLOSED IN PARENTHESES FOR THE MATCHING TO WORK. Parentheses are Pivot's way of distinguishing the area code from the rest of the number.

REMOVE (*F6*) — This key permanently deletes names and numbers from the directory. Remove them if you're running out of memory (less than 500 "Bytes Free"), or if they're no longer useful. You may also need to REMOVE an entry if you mistyped the name. Correcting only a number does not require deleting the entry.

To delete, simply position the cursor on the number of the offending entry with [RET] or an Arrow key, and hit REMOVE. The line disappears and the gap closes up. If this was part of correcting a mistyped name, you'd then press ADD (F5) to retype the entry.

BACKUP (*F8*) — Use this key to begin the program that copies your phone numbers and appointments from NVRAM onto a disk. The same program reads them back in from the disk if needed. See the box on page 105.1.

EXIT (*F10*) — This key takes you back to the main Directory Display when you're finished updating the directory.

Backing Up the Phone Directory and Appointment Schedule

The BACKUP function key (F8) on the Update Display is an extremely important feature of Pivot. It lets you make a backup copy of your phone directory and appointment schedule on a disk. It also reads them back into memory if needed.

Pivot stores this information in a special bank of memory called NVRAM. There is a small battery inside Pivot that keeps this memory current. However, if your Pivot needs servicing, and especially if you're replacing the small battery, you will want to copy the contents of NVRAM onto a disk. Imagine the headache of losing all the appointments and phone numbers you've so patiently entered over a period of months!

Well worry no more. Press BACKUP to begin the program. It is very simple so we won't bother stepping you through it. However:

> **The disk you use must have been formatted at some point. It need not be empty, but *everything on it will be erased.* DO NOT USE A DISK THAT HOLDS ANY VALUABLE INFORMATION.**

continued—

Backing Up continued

When the backup is finished, be sure to label the disk with the name "Directory & Schedule Backup" or equivalent, and the date of the backup. You can recycle this disk when you decide it's time for another backup. Just change the label date.

The backup disk is unreadable by MS-DOS programs. The information on it is in a special format that only the BACKUP program can interpret.

How often should you back up the contents of NVRAM? If you're adding a lot of information frequently, once a week is advisable. Otherwise it's alright to do it less often. As mentioned, you should do a backup before taking Pivot to be serviced, if Pivot begins to issue frequent error messages, and whenever Pivot acts "flakey".

Don't read the backup disk back into memory unless you need to. Doing so undoes any changes you've made to your schedule or directory since you made the backup.

Okay, So I've Digested All That Stuff. Now What?

We don't really expect that you've absorbed all of the preceding details. We'll refer you back to them occasionally in the context of practical examples. Before proceeding, you should have connected Pivot to the telephone line as described towards the beginning of this section.

1. Tend to a few minor details.

You first need to check some settings on the Setup Menu. By now you're probably familiar with the Setup Menu. You'll be interested in the Modem column. All of the details should be set correctly already; nonetheless you'll verify the settings and change them if necessary.

Then you'll type in your current area code and prefix (if needed) at the Update Display.

Follow the steps below. Refer to the sections The *Setup Menu* and "The Update Display" earlier in this handbook if you want more details than those given in the steps.

- Turn Pivot on. The World Map Display appears. If Pivot was already on, press the Clock Icon to go to the World Map.
- Press the SETUP function key (*F10*) to proceed to the Setup Menu.

- At the Setup Menu, press SKIP (F1) until the cursor is next to Baud Rate in the *Modem* (not Serial Port) column. It should show "300". If not, press CHANGE (F3) until it does. Then press SKIP again to move down to Data Bits.
- Verify that Data Bits equals "8." Use CHANGE if necessary. Press SKIP to move to Parity. Be sure it's set to "None."
- Step down to COM/COM2 under Logical Devices. Verify that COM1 is SERIAL and COM2 is MODEM. Double-check this one.
- Press EXIT (F10) to leave the Setup Menu when you're finished. You should be back at the World Map Display.
- Now proceed to the Update Display by pressing the Phone Icon, and then the UPDATE function key (F10).
- At the Update Display, press AREA CODE (F2). The cursor moves to the area code part of the top line. Type in your present area code (3 digits only), and RETURN when done. You'll change this again whenever you want to use the automatic dialer while travelling outside of this area code.
- Press PREFIX (F1) to move to "Prefix." If you are in an office where you need to dial 9 or some other code to get an outside line, type that prefix here. Otherwise leave it blank. Hit RETURN when done. (See page 104 if you need help.)
- Press EXIT (F10) to get back to the main Directory Display.

2. Put something real in the directory

Try adding a regular voice number to the directory. Make it someone you're sure will be there to answer the phone (positive reinforcement). Then you can let Pivot dial the number for you.

- Activate the Phone Directory by pressing the Phone Icon.
- Press UPDATE (F10) to proceed to the Update Display.
- Press ADD (F5) to add a name/number to the empty list. For details, see "ADD" on page 104. *Remember that you should include the area code, even for local numbers! Enclose the area code in parentheses.* Your last keystroke should be RETURN after typing the phone number.
- Press EXIT (F10) to get back to the main Directory Display.

3. Tell Pivot to call the number for you.

After pressing EXIT (F10), the number you just entered at the Update Display should now appear in the Directory, with the black bar already positioned over it. If so, you're ready to dial. If not, press the UP or DOWN arrow key to put the black bar on the number.

If you're in an office or anywhere else that requires the prefix you (may have) entered in the last steps, press PREFIX (F1) now to dial it.

Now press DIAL (F2). Pivot begins dialing, as indicated on the "Dialed so far" line. When the number has been dialed, pick up your phone and press HANGUP (F7). You should hear ringing or a busy signal. From here on, pretend that everything is as if you dialed yourself.

(You might be wondering why you press HANGUP *before* your conversation. As long as you've lifted your telephone receiver, the connection isn't broken when you press HANGUP. It just takes Pivot out of the circuit, to eliminate any interference that it might cause during the call.)

Always press HANGUP after Pivot dials a voice call for you, even if it was busy or there was no answer.

4. Call Morrow's Bulletin Board from the keyboard.

This exercise serves three purposes: You'll see what electronic bulletin boards are like, you'll get a feel for communicating through the modem, and you'll learn to dial from the keyboard. You should be looking at the main Directory Display. Did you press HANGUP at the end of the last exercise? If you're not at the Directory now, press the Phone Icon to get there.

- Press the KEYBOARD function key (F5). You'll be prompted to type a number into the "Number to Dial" line.
- Type: *415-632-1951M* with or without the dashes, but don't forget the *M!* (Leave off the 415 if you happen to live in the 415 area, and type your prefix if you need one.) Use the number keys in the top row of the typewriter keypad. Back up with the DEL key if you make a mistake, and retype. When the number's exactly right, hit DIAL (F2).
- Pivot keeps you informed of the dialing. If you get through (which is sometimes hard to do with busy bulletin boards), you'll proceed into communication with Morrow's computer. It's their move now—your options will be sent by Morrow to your display. Incidentally, you can pick up your phone and listen for whether the call went through; if it did, you can also listen in on the tones exchanged by the computers.
  If you *don't* get through, the "Waiting for signal" stays on the screen until you press HANGUP. You could then use REDIAL (F6) to try again in a moment.
- When you're through with the Bulletin Board, log off according to its instructions, and then press the Phone Icon to get back to the Directory Display. Then press HANGUP. The end.

More General Information on the Modem

The preceding 18 or so pages, especially the last five, serve as a good introduction to using the modem and automatic dialer. You should make a point of doing everything they say. You'll learn how to add entries to the Directory with the Update Display, plus how to dial from both the directory and the keyboard. Finally, you'll experience making both voice and modem calls.

The following sections expand on some of the details of using the directory, modem, and dialer.

Moving Around the Directory

There are two situations for moving around in the directory: selecting a number to *dial* on the Directory Display, and selecting a number to *change* on the Update Display. You move around both displays in exactly the same way.

The keys for moving are: RETURN (or [RET]), the Up and Down Arrow keys (with and without SHIFT), and the letter keys.

RETURN—Pressing [RET] moves you down through the directory list, one line at a time.

Up and Down—These Arrow keys appear in the lower right part of your keyboard. Only Up and Down work; Right and Left have no effect. Down is interchangeable with [RET]. Up moves up, of course.

Up and Down with SHIFT—If you press these arrow keys while holding down the SHIFT key, you'll move through the directory a screenful at a time. This is the "Page Up / Page Down" effect.

Letter Keys—If you type a letter key while looking at the main directory display, the cursor moves to the first entry in the list that begins with that letter. For example, press z to move directly to "Zanzibar Night Club." This feature works only at the main directory, not at the Update Display.

> **Notice the discussion of "Letter Keys" above. It's an extremely useful aspect of the Directory and we want to make sure you're aware of it.**

Building a Useful Directory

In the earlier "What Now" section, you added the first name and number to your Directory Display. You would use exactly the same technique to add more entries. Notice how the number before "Bytes Free" gets slightly lower with each new entry. Keep track of this—when it gets to zero you begin to lose space for Appointment Calendar items.

Changing Names / Numbers—You make all changes to the Directory Display by way of the Update Display. You get to the Update Display by pressing the UPDATE function key (F10) at the Directory Display.

There are Update function keys for adding and removing name/number entries, but what about changing an existing entry? This depends on whether the name, number, or both need changing.

To change a *number only,* just position the cursor on it at the Update Display. Then type the new number over the old one. Add spaces if the new one is shorter than its predecessor.

To change a *name* or *both name and number,* it is necessary to remove the current entry and add the new revised one.

Using #1 and #2—By now you know what the special slots *#1* and *#2* are for: speed-dialing your most commonly used numbers. You set the values for these slots with the #1 and #2 function keys at the Update Display. Then you can quickly select one of them for dialing with the Directory Display's #1 and #2 keys.

The numbers you pick for #1 and #2 can be voice or modem numbers. They can also be *part of* a dialing sequence, as in the example where Sprint's local number and your access code made up #1. (Don't forget the *M* if it's a modem call, or the + if it's the first half of a long sequence).

To make a call, simply press the #1 or #2 key. If you need the prefix, press PREFIX first.

Formatting Your Entries—There are no restrictions on what a name in the directory should look like, beyond the size limit of 39 characters (including spaces).

Phone numbers also have considerable formatting freedom, but there are a few restrictions: Area codes must consist only of three digits between parentheses; and the special character *M* or +, if used, must be the last character in the number.

In formatting phone numbers, you should try to be uniform, if only for aesthetic reasons.

Pivot's Sorting Method—When you add a new name/number, Pivot automatically puts it in its proper alphabetical sequence. This is not true only for #1 and #2, which are always the first two items in the directory.

Pivot sorts by a modified "ASCII value" of the first character in the name. Pivot doesn't distinguish between upper and lower case, so apple and APPLES will appear together in the list. Names that begin with something other than a letter might go at the beginning or end of the list. "54, Studio" would appear towards the beginning, while "\\JOE'S BAR//" would go towards the end.

Special Characters—These were already covered on pages 102 & 103, but here's a quick summary. Use *P* and *T* if a number has to be pulse dialed. Use *W* to wait one second between dialing parts of a number. Use *M* as the last character of modem-call numbers. Use + at the end of numbers that require additional dialing, like an MCI access number. With +, you can dial the rest of the number from the directory with DIAL (F2), or from the keyboard with KEYBOARD (F5).

Limitations of the Modem

Pivot's built-in modem is designed specifically for contacting remote data bases (e.g. The Source) and bulletin boards. It also works well for conversational transmissions with other microcomputer owners.

Pivot's modem software does *not* allow you to send and receive disk files. You cannot send or receive programs, for example. When receiving text, the only permanent way of capturing it is to enable PRINT ON before making the call. More on this below. When sending text, you must type it on the keyboard during the call.

Pivot's modem does not answer calls from other computers. It always originates calls. Finally, the maximum baud rate is 300.

All of these limitations are no hindrance when the modem is used as noted above. But you may have a need for file transmission, auto-answer, or a higher baud rate. If so, you can always purchase an external modem and matching MS-DOS software. The modem would connect to Pivot's serial port (male 25-pin connector). See page 171 for further info on using external modems.

There is some possibility that Morrow will offer additional modem software on disk as a Pivot option. It would use the internal modem (so it would still run at 300 baud) but would allow file transfer. Consult your Morrow dealer.

Sixteen-Line Screens

When using the modem on Pivots with 16-line screens, 16 lines of information is all that is available at any given time. Unlike the way it works during MS-DOS functions, the Diskette Icon does not shift the display up and down to show another nine lines.

Pressing the Diskette Icon takes you back to the A> prompt or business program, if you've booted MS-DOS since turning Pivot on. If you haven't booted yet, Pivot attempts to boot when you hit this Icon.

Using the Directory or Modem While Doing Other Things

Suppose you're working with an investment spreadsheet. You discover that your optimum strategy includes selling 10,000 shares of Ewing Oil if it hits 21½. It's been hovering just below there for a few days now. Quick . . . call Dow Jones on the modem. "21⅝? Terrific! Sell at market!"

You can switch from a program like a spreadsheet or NewWord to the modem, or make a voice call for that matter, without exiting from the program. Just hit the Phone Icon and proceed as usual.

Switching back and forth between the modem and a program—If you're in the middle of a modem call, you can switch back to your program for a moment without breaking the connection (say, to read a passage from a report onscreen). You do this by pressing the Diskette Icon.

To return to the call, press the Phone Icon. *This* time, you go straight back to your modem call without passing through the directory. To get

to the directory for hanging up, press the Phone Icon one more time, and then press HANGUP. Press the Diskette Icon again to return to the program.

Regarding Terminal Mode

Up to this point we haven't discussed Pivot's Terminal Mode. This mode lets you wire Pivot to another computer, using Pivot's keyboard and display as if Pivot were a simple terminal instead of a complete computer.

The wire would be an RS-232 serial link between the external computer and Pivot's serial (male) rear panel connector. You configure the operational details with the Setup Menu's Serial Port column.

Terminal Mode is covered at length on page 172.

Printing What's Onscreen

To get a hard copy or printout of your modem conversation, activate PRINT ON before dialing the number.

First, be sure the printer is on, online, with paper, ribbon, etc. in place. Then hold down the CTRL key and tap the PRINT ON key (quotation mark key). Now whatever appears onscreen also gets printed. Be aware that if your printer goes at less than 30 characters per second, doing this will slow down your communication.

To cancel printing either during or after the call, enter the PRINT ON keystrokes a second time.

Final Notes on Keyboard Dialing

You were introduced to keyboard dialing in the "Call Morrow's Bulletin Board" exercise. You would dial from the keyboard when you want to make a modem call to a number that's not in your directory. If it's a voice call, you may as well dial with the regular telephone.

After pressing the KEYBOARD function key (F5) at the Directory Display, you proceed to type the number into the "Number to Dial" line.

Prefixes—If you need your prefix, press PREFIX (F1) before pressing KEYBOARD, *or* just type the prefix as part of the keyboard number.

Area codes—When dialing from the keyboard, Pivot doesn't match any area code you've typed against the local code. Presumably you wouldn't bother to type one if the call is local. Therefore when you *do* type an area code, parentheses are not required as they are for area codes within the directory list.

Typing only part of the number—You can type part of the number, with the rest coming from the directory. The most likely case is when the first part comes from the directory (like Sprint or MCI). The number in the directory should then have a plus sign (+) as its last character. See page 103. Put the black bar on the number and press DIAL (or just press #1 or #2 if appropriate). When it's been dialed, press KEYBOARD and type the rest.

If you want to dial the *first half* of a sequence from the keyboard and select the rest from the directory, type a plus sign as the last character in the keyboard number.

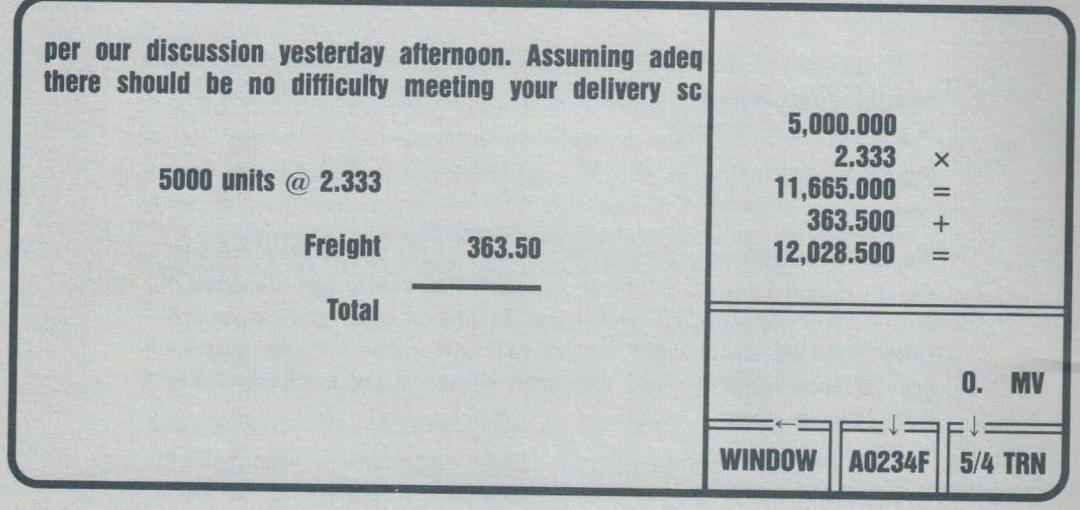
Modem calls—Type an *M* as the last character of the keyboard number.

Special characters—You can include any of the special characters *W*, *M*, +, *P*, and *T* in the "Number to Dial" line. We've just discussed *M* and +. You will probably need to use the *M* in all cases, since keyboard-dialed calls are presumably modem calls (otherwise why not just use your telephone's dial?). Any characters besides these and digits are ignored by the dialer.

Typing details—Use the DEL key to correct mistakes. Pressing [RET] is equivalent to pressing the DIAL function key: dialing begins. So fix mistakes before hitting DIAL or [RET].

The entire dialing sequence must be shorter than 39 characters. This should never be a problem; we can't imagine a situation where a number would approach that length.

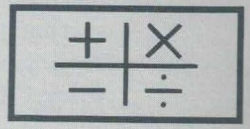
Finally, you can use the calculator digit keys (those with small colored numbers) instead of the number keys in the top row if you really want to. Enter Numeric Mode first by pressing the NUM key. Cancel Numeric Mode the same way.



Pivot includes a four-function, 16-digit calculator that may be used while an application program is running. To activate the calculator at any time, simply press the Calculator Icon.

To return to a program from the calculator, press the Diskette Icon. Otherwise, press the Clock Icon to return to the World Map.

Pivot can store the result of a calculation in a special *Memory Value* that can later be transferred to another program, such as a word processor or data base.



Calculator Keys

Digit keys Shown in the examples as [0] – [9]. The **Space Bar** can also be used as a zero key.

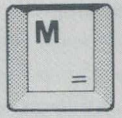
Plus key for addition. Shown in the examples as [+].

Minus key for subtraction. Shown in the examples as [–].

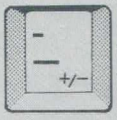
Multiply key for multiplication. Shown in the examples as [×].

Divide key for division. Shown in the examples as [÷].

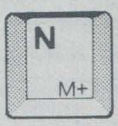
Decimal point key Shown in the examples as [.].



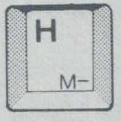
Equal key for obtaining the results of operations. The result may be used in subsequent calculations. This key is also used for repeated multiplication/division and repeated addition/subtraction. Shown in the examples as [=].



Change Sign key to change a positive number to be negative and vice versa. *Note: many Pivot keyboards have the +/– notation missing from the key, but it works.*



Memory Plus key for adding an entry to the Memory Value. Can also be used instead of the equal key to finish a calculation while adding the result to the Memory Value. Shown in the examples as [M+].



Memory Minus key for subtracting an entry from the Memory Value. Can also be used instead of the equal key to finish a calculation while subtracting the result from the Memory Value. Shown in the examples as [M–].

Memory Recall key for including the Memory Value in calculations. Shown in the examples as [MR].

Memory Clear key for resetting the Memory Value to zero. Shown in the examples as [MC].

Clear Entry key for correcting erroneous entries and error conditions such as overflow. Shown in the examples as [CE].

Clear key empties the display, total, and constant registers, but *not* the Memory Value. Shown in the examples as [C].

Display Symbols

\+ This number will be added to the one above it.

− This number will be subtracted from the one above it.

× This number will be multiplied by the one above it.

÷ This number will be divided into the one above it.

= This number is the result of a calculation performed on the numbers above it.

+M, −M, ×M, ÷M The Memory Recall [MR] key was used to bring the Memory Value into a calculation.

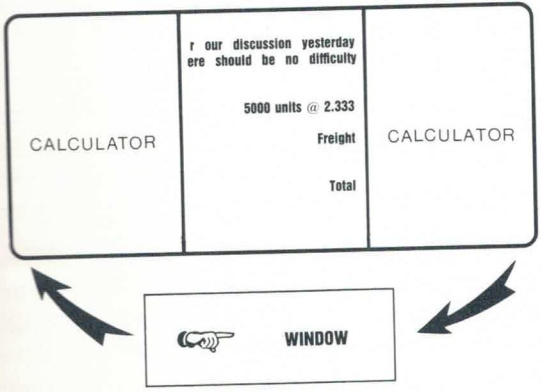
MV Means "the current Memory Value is . . .".

*** ERROR *** An error has occurred. You have typed or calculated a number longer than 16 digits or have entered a sequence of keystrokes that Pivot can't understand. Press [CE] to clear the error condition.

Calculator Setup

Pivot's calculator has three function keys for setting up calculator operation. One determines which half of the screen will display the calculator. The others are common desk-top calculator adjustments for decimal point treatment and rounding or truncating.

<WINDOW Unless you tell it otherwise, Pivot puts its calculator display "window" over the rightmost 24 columns of the display. If you are editing a document when you activate the calculator, you'll still see most of its display. However, you may have typed a column of numbers on the right edge of the display that you now wish to total on the calculator . . . and you can't see them any more! Press <WINDOW to push the calculator over to the left edge of the display.



A0234F (Decimal Switch) Pressing the function key under this item determines how many decimal places will be allowed in the results of calculations.

A—Automatic Decimal. This is used for totalling large columns of monetary figures. All items are assumed to have two decimal places. If you type "525," Pivot will treat and display the number as 5.25.

0—Zero decimal places. Results of all calculations will be rounded to the nearest whole number or truncated (rounded down), depending on the setting of the 5/4 TRN switch. If you enter a number with decimal places, they will be displayed and considered during calculations. Only the result is rounded or truncated.

2, 3, 4—Similar to zero, these allow two, three, or four decimal places in results. If you enter a number with fewer decimal places than the setting, it is expanded with zeros up to the limit. (At a 4 setting, if you type 67.3, Pivot displays it and treats it as 67.3000.)

F—Floating decimal. Pivot will display the results of calculations with as many decimal places as necessary, up to 16 digits maximum. At this setting (the most common for general calculations), numbers onscreen will not usually be aligned by the decimal point, but rather by the last digit.

5/4 TRN Press this switch to tell Pivot to round numbers or truncate them. Rounding is based on whether the least significant digit is 4 or less, or 5 or greater. Truncating simply "chops off" the decimal places beyond the limit set with the decimal switch. Thus the two switches interact.

The table below illustrates the results obtained by entering **100 ÷ 18** at all possible settings.

	A	0	2	3	4	F
5/4	5.55...6	6	5.56	5.556	5.5556	5.55...6
TRN	5.55...5	5	5.55	5.555	5.5555	5.55...5

NOTE: Whenever you change the setting of the decimal or 5/4 switches, you must press the C *(Clear) key to make the changes take effect.*

Examples

The examples below illustrate the key sequences involved in a variety of common calculations. The *Setup* given for an example is not mandatory—it merely shows the results of that setup.

If you wish to transfer the results of calculations to other programs, you have to be sure that the Memory Value contains the correct result before leaving the calculator function. See *Transferring Results to Other Programs* after the examples.

Addition / Subtraction 512 + 22 − 32

Setup: A0234F 5/4 TRN

Keystrokes	Display
5 1 2	512.
+ 2 2	22. +
− 3 2	32. −
=	502. =

Multiplication 12 × 12 × 3.14

Setup: A0234F 5/4 TRN

Keystrokes	Display
1 2	12.000
× 1 2	12.000 ×
× 3 . 1 4	3.140 ×
=	1419.782 =

Division 100 ÷ 6

Setup: A0234F 5/4 TRN

Keystrokes	Display
1 0 0	100.
÷ 6	6. ÷
=	16. =

Note: The example above would have resulted in 17 if the setup had been 5/4 (round) instead of TRN (truncate).

Repeated Addition 9 + 5 + 5 + 5

Setup: A0234F 5/4 TRN

Keystrokes	Display
9 + 5 = = =	9. 5. + 14. = 5. + 19. = 5. + 24. =

Repeated Mulplication 179.00 × .20
660.89 × .20
33.44 × .20

Setup: A0234F 5/4 TRN

Keystrokes	Display
1 7 9 ×	179.00
. 2 0 =	.20 × 35.80 =
6 6 0 . 8 9 =	660.89 .20 × 132.18 =
3 3 . 4 4 =	33.44 .20 × 6.68 =

Repeated Division 179.00 ÷ 5
660.89 ÷ 5
33.44 ÷ 5

Setup: A0234F 5/4 TRN

Keystrokes	Display
1 7 9 ÷ 5 =	179.0000 5.0000 ÷ 35.8000 =
6 6 0 . 8 9 =	660.8900 5.0000 ÷ 132.1800 =
3 3 . 4 4 =	33.4400 5.0000 ÷ 6.6800 =

Note: For constant division with the same dividend (i.e. a number divided by various other numbers), store the dividend as the Memory Value with MC & M+ and recall it as needed with MR.

Repeated Subtraction 150 − 13 − 13 − 13

Setup: A0234F ↓ 5/4 TRN ↓

Keystrokes	Display
1 5 0 − 1 3	150. 13. −
= = =	137. = 13. − 124. = 13. − 111. =

Percentage Add-On Sales tax of 6.5 % on sale of $100.00
Approach: 1.065 × 100.00

Setup: A0234F ↓ 5/4 TRN ↓

Keystrokes	Display
1 . 0 6 5	1.065
× 1 0 0 =	100. × 106.5 =

Percentage Discount Discount of 10 % on sale of $345.00

Approach: (1.00 − .10) × 345.00
= .90 × 345.00

Negative Numbers −3 × −2

Setup: A0234F ↓ 5/4 TRN ↓

Keystrokes	Display
3 +/− × 2 +/− =	−3. −2. × 6. =

Memory Calculations

NOTE: Remember to reset the Memory Value to zero with [MC] *before starting new memory calculations.*

Example 1. (5 × 3) + (6 ÷ 2) − 7

Setup: A0234F 5/4 TRN

Keystrokes	Display
[5] [×] [3] [M+]	5. 3. × 15. =
	Memory Value = 15.
[6] [÷] [2] [M+]	6. 2. ÷ 3. =
	Memory Value = 18.
[7] [M−]	7.
	Memory Value = 11.

Example 2. (5.11 + 2.75) × (0.2 − .099)

Setup: A0234F 5/4 TRN

Keystrokes	Display
[5] [.] [1] [1]	5.110
[+] [2] [.] [7] [5] [M+]	2.750 + 7.860 =
	Mem Val = 7.860
[.] [2] [−]	0.200
[.] [0] [9] [9] [=]	0.099 − 0.111 =
[×] [MR] [=]	7.860 ×M 0.872 =

Using the Automatic Decimal Feature

Automatic Decimal is activated when you select the "A" in the decimal setup (see the sample setup below). The calculator then assumes that numbers you enter will have two decimal places, saving you the effort of hitting the decimal point key for each item. This feature applies only to addition and subtraction. It is used primarily for totalling large columns of monetary values.

15.56 + 19.95 − 42.80 + 6.12

Setup: A0234F 5/4 TRN

Keystrokes	Display
[1] [5] [5] [6]	15.56
[+] [1] [9] [9] [5]	19.95 +
[−] [4] [2] [8] [0]	42.80 −
[+] [6] [1] [2] [=]	6.12 + − 1.17 =

The Memory Value

The Memory Value is shown in the lower portion of the calculator window, indicated by the characters " MV ". Initially it contains zero. You can add to it by pressing [M+] after typing a number or calculation. You can subtract from it the same way by pressing [M−]. You can use the Memory Value in calculations by pressing [MR] (for Memory Recall). Reset it to zero with [MC] (Memory Clear).

The Memory Value is kept in battery-supplied RAM. Once established, a number in the Memory Value stays there even if power is interrupted or you run other programs. You can change the Memory Value only as described in the previous paragraph.

Those are standard memory calculator functions. Pivot further employs the Memory Value as a holding area that lets you transfer the results of calculations into other programs. The most common application would be to add some numbers with the calculator and insert the sum into a document being edited.

NOTE: Whenever you begin a calculation involving the Memory Value, you should first reset it to zero by pressing the [MC] key.

Transferring Results to Other Programs via the Memory Value

Suppose you're writing a report with a NewWord. Included in the report is a list of personal expenses with a total.

Pivot allows you to add the expenses on the calculator without leaving the word processing program. The result can be moved directly into your report by way of the [ALT] key and the Calculator Icon. This is an alternative to jotting the result down and typing it into the report yourself.

For this to happen, you must first be sure that the Memory Value (shown in the lower right corner of the calculator window) contains the result you wish to transfer. There are two ways to do this.

Plug the result into the Memory Value yourself. In the previous examples, the Memory Value will still be zero after the calculations. (Two exceptions: the Memory Calculation examples.) This is because no memory keys were used during the calculations. Let's say the total is $8,423.77. If that number is the last one on the screen and you haven't begun new calculations, you can change the Memory Value to 8,423.77 by simply pressing [M+] .

If you've done some other calculations since the 8,423.77 appeared, change the Memory Value to 8,423.77 by typing:

[8] [4] [2] [3] [.] [7] [7] [M+]

The Memory Value now contains the value to be transferred. You can press the Diskette Icon to continue editing the report. Position your cursor where you want the total to be inserted and hold down the [ALT] key while tapping the Calculator Icon. The Memory Value appears at the cursor.

Use the [M+] and [M−] keys instead of [+] [−] and [=] during the calculations. For example, to calculate six days of meal allowances at $35.00 per day, plus air fare at 725.00, plus 12 taxi rides at $18.00 each:

$$(6 \times 35) + 725 + (12 \times 18) = ?$$

Setup: A0234F 5/4 TRN

Keystrokes	Display
[6] [×] [3] [5] [M+]	6.00 35.00 × 210.00 = Mem Val = 210.00
[7] [2] [5] [M+]	725.00 Mem Val = 935.00
[1] [2] [×] [1] [8] [M+]	12.00 18.00 × 216.00 = Mem Val = 1151.00

You can now return to the report by pressing the Diskette Icon. Position your cursor where you want the total to be inserted and hold down the [ALT] key while tapping the Calculator Icon.

For Beginners Only

If Pivot is your first computer, be prepared for an adjustment period. It is an unfortunate fact at this stage of computer evolution that users must often adapt themselves to the demands of the software.

Take NewWord. When you're first tackling it, the sheer number of its commands may send you into fits of nostalgia for the good old days of the Selectric. But that phase passes rather quickly, and soon you'll be wondering how you ever got by without a word processor.

MS-DOS, your operating system, is yet another layer of computer-thought for you to master. Every command has a very precise *syntax*, or way of being typed. And most commands have loads of options, geometrically increasing the probability that you'll get the syntax wrong. Just keep in mind that error messages like "Bad command or file name" and "Invalid parameter" are all part of the adventure—it's truly difficult to make a mistake that matters.

Operating System Defined

Every manufacturer's computer has its own arrangement of chips and wires. Otherwise lawsuits would abound. (They do anyway, but that's another story.) In the absence of operating systems, a programmer would have to produce a new version of his program for every different model of computer.

Instead, an understanding has taken shape wherein computer makers design their hardware to run a certain operating system, and programmers write their software to run "under" a certain operating system. The operating system is the golden spike that joins the twain.

That explains the "why" of operating systems, but not the "what". From the user's point of view, an operating system controls:

- what software the machine will run
- what peripherals (disk drives, printers, etc.) the machine can use
- what commands can be entered at the operating system's prompt (A>, B>).

Other things are under the operating system's control too, like how files are laid out on a disk. But few users take much interest in such details.

MS-DOS Defined

MS-DOS stands for *MicroSoft Disk Operating System*. The name is a bit misleading. MS-DOS controls more than just the disk drives; but disk control is extremely important in computers and the method of disk control is the main distinguishing feature among operating systems.

MS-DOS is very similar to IBM's PC-DOS, which is no coincidence, since MicroSoft wrote both systems. When a computer uses MS-DOS, you're guaranteed some degree of IBM-PC compatibility. There are other factors that affect compatibility, which we won't go into here. But in general, you should be able to take a PC-DOS or MS-DOS diskette out of an IBM, stick it in Pivot, and go.

Here Are the Essentials You Must Master to Survive in the Computer World:

1. How to format and care for diskettes.
2. How to use the extra keys on the keyboard.
3. The concept of *files*.
4. How to read a disk directory.
5. How to run program files.
6. How to name, rename, save, copy, and erase data files.

You do not need to know computer programming in the least. Nor should you have to get involved in the technical problems of connecting a one-of-a-kind printer to Pivot. That's the responsibility of the person selling you the printer.

1. Formatting and Caring for Diskettes See "Diskettes" toward the beginning of this handbook.

2. Using the Special Keyboard Keys See "Keyboard."

3. The Concept of *Files*

As you use Pivot, you'll get a feeling for files. For now, plant this thought in your mind: *Everything on a disk is a file*. Everything is files. Everything is files. Files, files, files.

Files are loaded from disk into memory, you edit files, print files, erase, copy, and rename files.

MS-DOS itself is a set of *program files*. So is NewWord. When you go out and buy software, you're getting program files. Unless you're a programmer, you'll never create your own program files. You'll just *run* them . . . and perhaps make a few copies.

The files you *create* are *data files*. When you type a memo, you're creating a new data file. When you add a name to an address list, you're changing a data file you created earlier.

Program and data files exist symbiotically. The whole purpose of program files is to make it easy for you to create and use certain types of data files. NewWord exists to make it easy for you to create and change data files full of words. Lotus 1-2-3 makes it easy to create and change data files full of numbers.

In summary, when you run a program, you're nearly always dealing with both program and data files. The part that always stays the same—like commands, menus, and help messages—are the domain of a program file. The parts that you change at will—like text in a word processing program or numbers on a spreadsheet—are the contents of a data file.

4. Reading a Diskette's Directory

Doing this tells you what files are on a disk, how much room each one takes, and the time and date it was last changed.

See "MS-DOS Commands" up ahead and the *MS-DOS User's Guide* for details on the DIR (directory) command. For now, suffice it to say that all you have to do is type *DIR [RET]* with a disk in the drive. When you do, you'll see something like:

```
A> DIR

Volume in drive A has no label
Directory of A:  \

COMMAND  COM      17800    6-6-84    1:35 p
FORMAT   COM       6900    6-6-84    1.35 p
         (more files)
      19 files          35989 bytes free

A>
```

A> DIR The "A>" is the system prompt that's put there by MS-DOS when it's ready for a command. "DIR" (and [RET]) is what you typed to get the directory of a disk—in this case the disk in drive A, since the system prompt is A>.

Volume in drive A has no label. You can put a "volume label" on a disk magnetically as well as putting a paper label on the outside. Note that you can do this only while formatting the disk, when you are asked by the FORMAT program for the label. You could have the label read "INVENTORY". The only restriction is the maximum length of 11 characters. Hit [RET] if you don't want a volume label. That's what the person who formatted this disk did.

Directory of A: This tells you the lines that follow are the files on the disk in drive A. The backslash (\) means you are in A's "root directory." Unless you are using hierarchical directories, the backslash is all you will ever see here. Hierarchical directories are an advanced feature beyond our present purposes.

COMMAND COM The list begins. First is a file named COMMAND.COM. When *you* type file names, you divide the first and last names with a period. When they are displayed in a directory, the period is replaced by enough spaces to push the first and last names against the sides of the column.

17800 COMMAND.COM takes up 17,800 bytes on the disk. A standard Pivot disk can hold about 360,000 bytes. One of the skills you'll develop is keeping track of disk space.

6-6-84 1:35 p COMMAND.COM was copied onto this disk at 1:35 p.m. on June 6, 1984. Or, it was changed on that date. This so-called "time and date stamping" occurs whenever a file is originally put on a disk and whenever it's changed from then on. MS-DOS looks at Pivot's built-in clock calendar for this information.

You can use time and date stamping to find the most recent version of a file when several versions are laying around. Since program files are seldom changed, they'll keep the same time and date. But every time you edit the data file MEMO, it gets a new time and date. Printing a file or just looking at it onscreen won't revise its date because you haven't changed anything.

19 files 35989 bytes free There are nineteen files on the disk. There are almost 36,000 bytes of room left on the disk. If it's almost full, you'll need a new disk. Or you can make room on this disk by erasing unneeded files. Rule of thumb: a typical page of single-spaced text uses about 3,000 bytes.

5. Running Program Files

The short answer to "How does one run a program?" is: You type some brief command at MS-DOS' A> or B> prompt and hit [RET] (the RETURN key). That's it. The exact command depends on the program, of course.

To get the larger picture, you need a little background info. . .

When you look at the directory of your MS-DOS System Disk or other program disk, you'll see many files with the endings .COM and .EXE. What do all these files have in common, and how are they different?

Files ending in .COM are **command files**. MS-DOS includes many of these, for example, FORMAT.COM for formatting disks and DISKCOPY.COM for copying them. NewWord comes with an installation program called NWINSTAL.COM.

Files ending in .EXE are **executable files**. MS-DOS has the sort and find programs SORT.EXE and FIND.EXE. NewWord's main program file is NW.EXE.

You should be told that both .COM and .EXE files are command files, and they are both executable. Thus the nomenclature is just a matter of convention—they're all program files. The difference between the types lies in how they are loaded from disk into memory.

Running Programs—What Happens

When you run a program, MS-DOS reads a .COM or .EXE file from the disk into memory. Then MS-DOS points to the beginning of the program and says "Take it away."

The program is now in control. If it were NewWord, it would go through the steps leading to its Opening Menu and then sit and twiddle its thumbs while you decide what to do first. The intelligent part of MS-DOS is asleep now, but its primal elements are busily doing grunt work for NewWord.

When you quit the program (as by typing X at NewWord's Opening Menu), the human-interactive part of MS-DOS wakes up again. The A> or B> prompt returns.

Running Programs—When and How

You'll nearly always run a program when the system prompt (A> or B>) is onscreen with the cursor next to it. You may also run programs by selecting from certain software packages' menus, but you still have to run an initial program at the system prompt to get to those menus.

The letters you type to get a program running depend on the program itself, but the general rule is:

> **When the system prompt is A>, you can type the name of any file on the disk in drive A that ends in .COM, or .EXE (or .BAT, which we won't go into here), and *something* should happen. The same is true of the disk in drive B when B> is the system prompt. You *don't* have to type the .COM, .EXE, or .BAT part of the file name.**

So, taking Lotus 1-2-3 version 1A as an example, it's no surprise to note its System Disk contains files named LOTUS.COM and 123.EXE. You could put this disk in drive A, and at the A> prompt, type either *LOTUS [RET]* or *123 [RET]*. The first program file is a menu system for the rest of 1-2-3. The second is the main spreadsheet program.

6. Naming, Renaming, Saving, Copying, and Erasing Files

You may not have realized it at the time, but you bought a computer for the sole purpose of creating and manipulating data files.

Naming & Renaming — Every document you type with NewWord is a new data file. You have to come up with the name. Situations will arise where you'll want to change a file's name. "Naming Files" appears earlier in this handbook. Renaming files is under "MS-DOS Commands" up ahead. Look for the REN command.

Saving — What exactly is meant by "saving files"? We don't mean hoarding them for posterity or rescuing them from disk-eating disk drives. Saving a file means making a permanent copy of it on a diskette. When you're typing the Great American Novel, the letters are going into the computer's memory, not straight to the disk. New Word has several save-file commands for getting the precious words safely on the disk, where they won't be lost when the dog chews through your power cord.

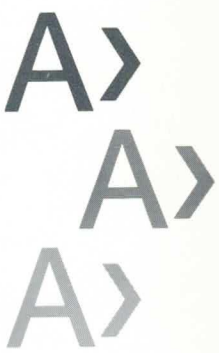
Virtually every business program has some command for saving your data on the disk. Once saved, you can get back to it immediately or ten years hence.

There is no MS-DOS command as such for saving a file. This is always a function of the business program.

Copying — This is something you'll probably do every day. You copy files to make backups, to share them with others, and to move a file from one diskette to another. See COPY under "MS-DOS Commands."

Erasing — Diskettes may be cheap, but they're not free. When they get full (as they always do) you'll probably want to clear out some space by erasing files you don't need any more—like those letters to your mistress. See ERASE under "MS-DOS Commands."

When You See This, What Does It Mean and What Can You Do?



That little symbol appears on the left edge of your screen to tell you MS-DOS has been loaded into Pivot's memory and together they're ready to go to work. It appears when you press the Diskette Icon at the World Map display—all part of the daily booting ritual.

A> is called the "system prompt" or more specifically "A-prompt." *Prompt* means the computer wants you to enter some information; in this case MS-DOS wants a command. An example of a different kind of prompt is when you're finished copying a disk, and the DISKCOPY program asks you whether you want to make another copy.

When you see the system prompt, you can enter one of MS-DOS' commands (like FORMAT, COPY and TYPE) or the command that starts a business program like NewWord or Lotus 1-2-3. To run a business program or certain MS-DOS commands, you must first be sure that you've inserted the appropriate disk.

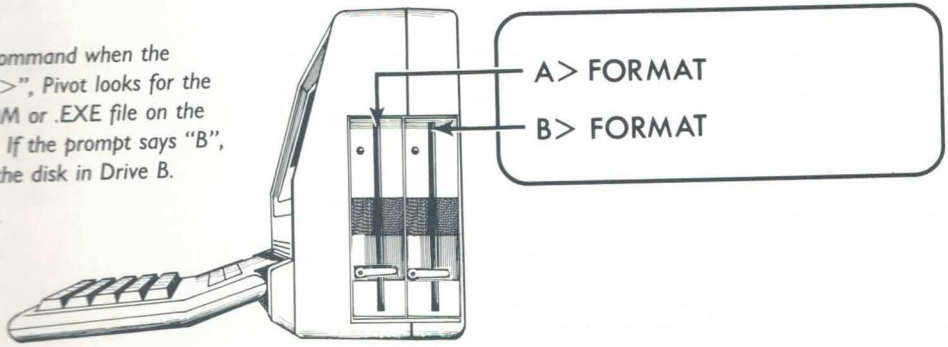
The Current Disk Drive (Two-Disk Models)

If you have two disk drives, take a moment to think through something that otherwise is certain to baffle you. We'll see how to change the system prompt from A> to B>, and consider the significance of doing so.

Suppose you have a NewWord program disk in one drive, and a data disk in the other drive to hold the documents you've written with NewWord. When you enter *NW [RET]* to run NewWord, how does Pivot know which disk holds the NewWord programs? In theory, MS-DOS could have been designed to search both disks. But that would be too slow compared with the method that actually came to pass.

Where's FORMAT.COM?

If you enter a command when the prompt says "A>", Pivot looks for the command's .COM or .EXE file on the disk in Drive A. If the prompt says "B", Pivot searches the disk in Drive B.



MS-DOS always assigns one disk drive to be the *current drive*. If you enter a program name without specifically telling MS-DOS which disk it's on, MS-DOS assumes it's on the disk in the current drive. If it isn't there (or if you mistyped it), MS-DOS responds "Bad command or file name." If it *is* there, MS-DOS runs the program.

Other terms for current drive are *default drive* and *logged drive*.

The letter for the current drive appears in the system prompt. "A>" means that Drive A is the current drive. "B>" means that Drive B is the current drive. Pivots with one disk drive will always have Drive A as the current drive.

B>

Changing the Current Drive

When you load MS-DOS into Pivot, A is automatically set to be the current drive. To change the current drive to B, type *B: [RET]*. To set it back to A, type *A: [RET]*.

What if a program's not on the current drive?

To run a program on a disk in the other (not current) drive, you have to tell MS-DOS to look on that other disk. Suppose you want to format a disk in drive A, and the FORMAT.COM program is on a disk in drive B. Your system prompt says "A>", so if you simply type *FORMAT A:* (meaning, format a disk in drive A), MS-DOS mistakenly looks in Drive A for the FORMAT program, since A is the current drive. Result: "Bad command or file name" error message.

You can do one of three things:

Switch disks. Unlike some other operating systems, MS-DOS lets you swap disks around with relative freedom. Any time before hitting *[RET]*, you can put the disk with FORMAT.COM in drive A and things will work. You'd be given the opportunity to switch disks again before the formatting begins, to keep you from erasing FORMAT.COM and everything else from that disk.

Make B the current drive. Simply type *B: [RET]*. The system prompt changes to B>. Now type *FORMAT [RET]*.

Type the drive letter as part of the command. This is how you tell MS-DOS where to look for the program. The command takes the format X:PROGRAM, where X is the letter for the drive holding the program, and PROGRAM is the program name. The colon always follows the drive letter. In our case the command would be *B:FORMAT*.

More on Drive Letters

We just saw how you can type *B:PROGRAM* to run PROGRAM on Drive B. The same prefix can be used with other types of files, like documents. If your system prompt reads A> and you want to take a quick look at MEMO on Drive B, enter *TYPE B:MEMO [RET]*.

Drive letters are required in some instances, as when using COPY to copy a file from one disk to another. Suppose A is the current drive (the prompt reads "A>"), and you want to copy ZORK.COM from Drive A to Drive B. Your command would be *COPY ZORK.COM B:*, meaning: Copy the file ZORK.COM from the current drive to Drive B.

Finally, there is an exception to using the drive letter as part of the command. When a large program is broken up into several files, it often *must* be run from the current drive. NewWord is one such program. If you enter *B:NW [RET]* at the A> prompt, NewWord will not work. In that situation you'd either need to move the disk or, more simply, change B to the current drive first with *B: [RET]* before typing *NW [RET]*.

To illustrate the use of drive letters, suppose you have a NewWord program disk in Drive A. You want to edit a document named SCHEDULE on a data disk in Drive B.

First, be sure that A is the current drive (enter *A: [RET]* if it's not). NewWord is one of those programs that must be run from the current drive.

The following three sequences are completely interchangeable. Your entries are shown in italics; screen responses are not.

I. A>*NW [RET]*
NewWord Opening Menu appears. . . *D* to open a document
Name of document? *B:SCHEDULE [RET]*

II. A>*NW [RET]*
NewWord Opening Menu appears. . . *L* to change logged drive. New logged drive? *B [RET]*
Opening Menu returns. . . *D* to open a document on Drive B
Name of document? *SCHEDULE [RET]*

III. A>*NW B:SCHEDULE*

Be aware in the last example that NewWord can be modified to treat SCHEDULE as either a document or non-document when started this way. See the *NewWord User's Guide* for details.

MS-DOS Commands: The Basics

MS-DOS provides a number of commands for you to use when you're not running a business program like NewWord. They're all aimed at "housekeeping" chores. The DIR command shows you the directory of files on a disk. Copy them with the COPY command, erase them with the ERASE command, display or print them with the TYPE command, and so on.

Other commands apply to whole disks, like FORMAT and DISKCOPY. Then there are miscellaneous system commands like TIME and DATE. Only the commands essential to the basic operation of Pivot will be covered in any detail in this handbook. Some will have options that we won't mention. See the *MS-DOS User's Guide* for further information.

Note to CP/M Users

Those of you who are already familiar with the CP/M operating system may be pleasantly surprised by its similarity to MS-DOS. Below is a table of CP/M commands and their MS-DOS counterparts.

CP/M	*MS-DOS*	*CP/M*	*MS-DOS*
DIR	DIR	SYSGEN	FORMAT /S
TYPE	TYPE	COPYSYS	FORMAT /S
ERA	ERASE or DEL	STAT/SHOW	DIR and CHKDSK
REN	REN	CTRL-P	CTRL-PRINT ON
FORMAT	FORMAT	CTRL-S	CTRL-PAUSE
BACKUP	DISKCOPY	CTRL-C	CTRL-BREAK
SUBMIT	.BAT (batch) files	AUTO file	AUTOEXEC.BAT
		PROFILE.SUB	AUTOEXEC.BAT

Typing the Commands

We saw already that programs are run when you type the first part of a .COM or .EXE file's name and hit [RET] (the RETURN key). This is true regardless of whether it's a business program like dBase II or an MS-DOS command like DISKCOPY.

In the examples that appear throughout the following sections, you'll see things like *FORMAT B: [RET]*. Remember:

- These are always typed at the A> or B> prompt.
- They *don't* need to be typed in upper case. We printed them that way for contrast.
- [RET] means hit the key marked "RET" for RETURN.
- If you get an error message after the command, you probably made a typo, or your MS-DOS disk isn't in drive A. Check these and retype.

Function Keys and Command Typing

Your function keys (F1, F2, etc.) have special editing powers when typing MS-DOS commands. A good one to try is F3, which repeats the previous command. The meanings of the keys can be found under "MS-DOS Editing and Function Keys" in the Commands section of the *MS-DOS User's Guide*. In the table with the blank "Your Keyboard" column, put "F1" in the top square, "F2" in the next, and so on down to F9.

Using the function keys this way is probably too much for novice users, but we want to let you know the capability's there when you're ready.

Internal and External Commands

One of the programs on your MS-DOS System Disk is called COMMAND.COM. Amidst other duties, it displays the A> or B> prompt. COMMAND.COM is automatically loaded into memory when you boot MS-DOS with the Diskette Icon. Its purpose is to look at the commands you type—it can carry out some directly; it handles the rest by loading another .COM or .EXE file from a disk into memory first.

The commands that COMMAND.COM can handle itself are called *internal commands*. DIR, ERASE, RENAME, TYPE, and COPY are the most commonly used internal commands. You will not see DIR.COM or ERASE.COM on your MS-DOS disk because these are built into COMMAND.COM.

The other class is known as *external commands*. FORMAT, DISKCOPY, and PRINT are the most used among these. You *will* see FORMAT.COM and other external .COM or .EXE files on the MS-DOS disk.

> **You must have the MS-DOS system disk (or other disk with the appropriate program) in Pivot whenever you want to run an external command. You don't need such a disk to run an internal command.**

Internal Commands

Note: Unless otherwise stated, all examples assume drive A is the current drive (the prompt reads "A>"). Hit [RET] after typing any MS-DOS command.

COPY

Makes a duplicate of a file on the same disk or a different disk.

The general command format is COPY SOURCE DESTINATION. "Source" is the original file; "destination" is its clone. Source and destination include the file's name and the disk it's on in the format A:FILENAME or B:FILENAME. If the destination is on the same disk as the source, it has to have a different name. If it goes on another disk, it can have the same *or* a different name.

Whenever either the source or destination file (or both) is on the current disk drive, you can leave off the A: or B: part of the command. When the destination has the same name as the source, you can leave off the destination's filename.

If you have only one disk drive, MS-DOS will pretend you have a second "B" drive. You're told onscreen when to change disks.

Examples—prompt reads "A>"

COPY COMMAND.COM B:
Copies COMMAND.COM from drive A to B.

COPY B:NW.* A:*
Copies every file on drive B that begins with NW to drive A. The asterisk is a special "wildcard symbol" that is discussed in the *MS-DOS User's Guide*.

*COPY *.* B:*
Copies every file regardless of its name from drive A to drive B.

COPY ONEFILE OTHER.FIL
Makes a duplicate of ONEFILE on the same disk (drive A) while naming the copy OTHER.FIL. You can use this renaming technique when copying from one disk to another as well.

DIR

Shows a directory of the files on a disk.

At the A> prompt, type *DIR [RET]* to see what's on the disk in drive A. Type *DIR B: [RET]* to check out the disk in drive B. For a shorter summary list, use *DIR /W [RET]* instead.

ERASE

Permanently removes a file from a disk.

This is also called DEL for delete—either term will work, but we thought "erase" was easier to remember.

To get rid of the file TRASH on the current drive, enter *ERASE TRASH [RET]*. If A were the current drive and TRASH were on drive B, you'd enter *ERASE B:TRASH [RET]*.

You can use wildcards in filenames. To erase all the backup files on a disk in drive B that have been generated by NewWord, enter *ERASE B:*.BAK [RET]*.

REN

Changes the name of a file

REN is short for RENAME. You may want to rename a file if you originally gave it an unwieldy or non-descriptive name. Also, you can't edit a NewWord backup (.BAK) file without renaming it first.

The general format is REN OLDNAME NEWNAME. If the file is not on the current drive, add its drive letter as in B:OLDNAME. The new name must not already be in use on the disk.

To rename GOBBLDIG.OOK to GOOK, enter *REN GOBBLDIG.OOK GOOK [RET]*.

TYPE

Displays or prints a text file.

By "text file" we mean files generated with NewWord or other text editors. They could be anything from letters to program source code listings. If you try to TYPE a program file (.COM and others), your screen will behave very strangely and the system will probably lock up.

You can use this command to examine text files without running NewWord, or to get rough (unformatted) printouts of the files.

To *print* the file, enter PRINT ON before entering the TYPE command. This involves holding down the CTRL key while tapping the PRINT ON (quotation mark) key. Be sure your printer is on, online, paper in place, etc.

The command has a very simple form. To view or print TEXTFILE on drive A, enter *TYPE TEXTFILE [RET]*.

Other helpful details:

- *CTRL-PAUSE* pauses the scrolling of the text as it rolls up the screen. Hold down the *CTRL* key while tapping the *SCROLL LOCK / NUM / PAUSE* key. Any other keystroke resumes the scrolling.
- A second PRINT ON sequence after the command is finished disables the printing.
- *BREAK* aborts the display or printout in midstream. Hold the CTRL key while tapping the BREAK (plus and equal sign) key.

Other Internal Commands

As a typical user, you may very likely never enter any of these commands. They're included here mostly for completeness. See your *MS-DOS User's Guide* for instructions on using them.

You'll find various references below to *hierarchical directories* and *.BAT (batch) files*. These are both advanced features that you might try out after you get some experience with MS-DOS.

Hierarchical directories let you organize your disk files in a more sophisticated way. Instead of a single directory for the entire disk, you can have a central "root" directory that contains some files plus other "subdirectories." The subdirectories in turn contain files, lower-level subdirectories, or both. This technique takes a while to get used to. It really pays off only on systems with hard disks where hundreds of files are on the same disk, or when several people are sharing the same floppy disks.

Batch (or .BAT) files are text files whose contents are a sequence of MS-DOS commands. They let you perform multiple tasks by entering a single command. Simple batch files execute their commands one after the other. Several of the commands in the list below let you construct very ornate batch files with loops, jumps, and conditional logic.

There is one special .BAT file called AUTOEXEC.BAT. If MS-DOS locates a file by that name when you boot it with the Diskette Icon, it automatically runs the commands in AUTOEXEC.BAT without you having to do anything. See "Automatic Boot Diskettes" in the Diskettes section of this handbook for further information.

BREAK determines whether certain programs will be aborted if you enter CTRL-C.

CHDIR or CD changes the current directory when you're using hierarchical directories.

CLS clears the screen.

CTTY lets you issue commands from a device other than the Pivot keyboard.

DATE changes the date for MS-DOS and for Pivot's clock/calendar. Same as changing the date with Pivot's Setup Menu.

ECHO In batch (.BAT) files, this turns on or off the display of the batch commands being executed.

EXIT to get out of COMMAND.COM when you run it from an application program. Takes you back to the application.

FOR allows iteration within .BAT files in a FOR / DO syntax.

GOTO for looping and jumping in .BAT files.

IF for conditional logic in .BAT files.

MKDIR or MD makes new directories within hierarchical directory systems.

PATH establishes the search path for program files in hierarchical directories.

PAUSE pauses execution of .BAT files until the user presses a key to resume.

PROMPT lets you change the system prompt from A> and B> to some other string of characters, including the time or date.

REM for including remarks in .BAT files.

RMDIR or RM removes (erases) existing directories within hierarchical directory systems.

SET assigns values to variables within subsequently-run programs, or within .BAT files.

SHIFT lets you have 20 parameters on a .BAT command line instead of the normal 10.

TIME changes the time of day for MS-DOS and Pivot's clock/calendar. Same as setting the time with Pivot's Setup Menu.

VER displays your MS-DOS version number.

VERIFY turns the read-after-write verification on or off when using the COPY command. Same as COPY's /V flag.

VOL displays the volume label of a disk, if you gave the disk a label when formatting it.

External Commands

In contrast to the internal commands, external commands are *not* part of COMMAND.COM. They exist on the MS-DOS System Disk as distinct .COM or .EXE files. The MS-DOS disk must be in one or the other disk drive for external commands to work, since they are loaded into memory from disk when you enter the command. Alternatively, *any* disk to which you've copied the right .COM or .EXE file will work—it doesn't have to be the MS-DOS system disk per se.

We'll discuss the more common external commands. The remainder are of interest primarily to programmers and other techie-types. There is one special command called CHKDSK that you should be aware of but will probably not use very often.

Most of the comands have options that are not covered here. Refer to the *MS-DOS User's Guide* for all the details.

> *Note: Unless otherwise stated, the examples assume drive A is the current drive (the prompt reads "A>"). Always follow MS-DOS commands with [RET].*

CHKDSK.COM

Checks the condition of a disk's directory.

An MS-DOS disk directory has a system of double-checks to be sure the locations of files are definite and consistent. CHKDSK.COM reads the disk's directory for inconsistencies and issues a status report. It also has an option for repairing errors. This is especially important if you're using hierarchical directories. See CHKDSK in the Commands section of the *MS-DOS User's Guide* for instructions.

DISKCOPY.COM

Makes exact duplicates of a disk.

You would use this command to generate backup copies of valuable disks or to create working copies of master disks.

The *target* disk (the copy) must be formatted already before you run DISKCOPY. It has to be in the same format as the *source* disk (the original—see FORMAT.COM below). This doesn't mean that you need to format the target disk immediately before copying; it just has to have been formatted at some point in its life.

If the target disk has anything on it, *it will be erased* dring the copy process.

For Pivots with one disk drive, enter *DISKCOPY [RET]*

You'll be told which disk to insert when. Depending on how much RAM you have, you may have to swap disks several times. Be sure to keep the source and target disks straight.

For Pivots with two disk drives, enter *DISKCOPY A: B:*

Follow the onscreen instructions to continue. Unless you're copying the disk that contains DISKCOPY.COM, you'll have to swap disks at least once.

FORMAT.COM

Prepares new disks for use with MS-DOS; recycles old disks. Drive letter required.

Every blank disk you buy will have to be formatted before Pivot can use it for storage. Formatting lays out a special grid on a blank diskette that serves as a road map to files.

You can re-use old diskettes by reformatting them. This has the same effect as erasing all the files with ERASE *.* but it has the advantage of checking the condition of the disk's magnetic material.

Pivot's format program differs from the normal MS-DOS FORMAT.COM in two ways: 1) The volume label option (*/V*) is built into the program, so Pivot always asks for a volume label. 2) FORMAT does not assume you mean the current drive if you don't specify "A:" or "B:". You have to specify one drive or the other in the command.

Caution: Formatting a disk erases EVERYTHING on it. Be careful not to format the wrong disk by accident.

FORMAT A: [RET] formats a disk in drive A. You're told to insert the right diskette before it proceeds so you can avoid reformatting the disk with FORMAT.COM on it. This is the primary format command for Pivots with one disk drive.

FORMAT B: [RET] formats a disk in drive B.

FORMAT A: /S [RET] in addition to formatting, puts essential MS-DOS files on the disk that let you boot from it. See "Boot Diskettes" on page 49 for further information.

FORMAT /1 [RET] (that's a *one* after the slash) formats the disk as single-sided. You'd use this option when the disk will be used in non-Pivot machines that have single-sided disk drives. Such disks have half the capacity of normal (double-sided) disks.

You can use any combination of options, with one requirement: the /S has to be last.

PRINT.COM

Lets you print files while running other programs.

"Background printing" is the term for what happens when you issue a PRINT command and then go on to other things while the file is printing. You can line up several files for printing one after the other. Be aware that background printing often has a noticeable negative impact on the speed of whatever else you're doing.

If you're printing NewWord documents this way, they will not be formatted into pages and special printing effects will not work.

To print POETRY on drive B in the background, enter *PRINT B:POETRY [RET]*.

Entering several of these commands in a row builds a printing "queue" that gets printed on a first-in first-out basis. To pause the printout, enter *PRINT /C [RET]*. There will probably be a slight lag before the pause. To resume, enter *PRINT /P [RET]*.

To abandon the printing and get rid of the queue of files, enter *PRINT /T [RET]*.

Other External Commands

The following commands are relatively arcane. See the *MS-DOS User's Guide* for details. The one you might find most useful is MORE.COM.

DATETIME.COM is *not* part of normal MS-DOS and isn't discussed in its manual. It synchronizes MS-DOS' time-and-date stamper (page 137) with Pivot's clock. It is run automatically when you boot MS-DOS since it is contained in the AUTOEXEC.BAT file on your MS-DOS and NewWord disks. The only apparent output of DATETIME is a brief flash of the time and date on the display.

DEBUG.COM is a special utility used by programmers when writing and editing programs. It has its own small manual and is not mentioned in the *MS-DOS User's Guide*.

EDLIN.COM is a truly obsolete program, except to a few die-hards who were weaned on it. It is a "line editor." That means it is used for generating text files, just like NewWord. However, you can only work on one line of the file at a time instead of a whole screenful.

EXE2BIN converts .EXE program files to .COM files.

FC.EXE compares two files and points out the differences. Use it to verify that a copy of a file is an exact duplicate of its original.

FIND.EXE looks for a particular sequence of characters in a file.

LINK.EXE is another "programmer's program." It prepares new or modified programs for execution. However, the sister-program ASM or MASM is *not* included with Pivot, and must be obtained separately. See "MS-LINK" in the *MS-DOS User's Guide*.

MORE.COM is used in conjunction with a TYPE command to divide the output into screenfuls. MORE pauses and waits for you to hit a key before moving to the next screenful.

RECOVER.COM reworks files and directories that have been corrupted with bad sectors.

SORT.EXE sorts data alphabetically and numerically. The data can come from a file or the keyboard. The sorted data goes to the screen or a disk file.

SYS.COM is useful if you want a bootable disk and you forgot to use the /S option when formatting the disk. The disk can not have any files on it. SYS moves the un-COPYable files IO.SYS and MSDOS.SYS to the destination disk. You'll still need to copy COMMAND.COM.

Things We Have Covered

We've seen how computers deal with the world in terms of files. There are program files, which you buy, and data files, which you generate and manipulate with the help of your program files.

As far as most users are concerned, MS-DOS is a set of program files for doing general computer housekeeping. The program through which you access all others is COMMAND.COM. It has its own library of *internal commands*. COMMAND.COM is also involved in the running of all the remaining *external* MS-DOS commands.

External commands have their own .COM or .EXE files on disk.

Business programs are run in exactly the same way as an MS-DOS command—by typing the appropriate .COM or .EXE file's name at COMMAND.COM's system prompt (A> or B>). MS-DOS does invisible busy-work while you're using a business program.

This section has addressed every standard MS-DOS version 2.0 command there is. It's not so vast an amount to digest, after all. Special emphasis was placed on the commands that are frequently entered by the businessperson or professional. The more technical commands were simply listed and defined.

Things We Haven't Covered

Two advanced features that we just want to make you aware of are *I/O redirection* and *piping*. I/O (input/output) redirection is used mostly to get input from or send output to disk files. For example, *DIR B: > DIRFILE* sends the directory listing of drive B into a file called DIRFILE instead of to the display. You could then edit the file or insert it into a document.

Piping occurs when you use the output of one command as input to another. For example, *TYPE NOVEL | MORE* sends the text file NOVEL to the program MORE.COM. This divides the output into screenfuls instead of one long scroll.

We said a little about hierarchical directories and batch files. These are other advanced features that you may never use. They are described in the *MS-DOS User's Guide* and other MS-DOS books if you're interested. You should check your local book store. Remember that books geared to the IBM-PC will be mostly correct for Pivot.

Finally, be aware that some options were omitted from the in-depth command discussions. The *MS-DOS User's Guide* has the last word on these.

This section goes into the connection of printers and external modems only. For any of the other compatible devices, it's up to the company selling you the device to handle the details. They should just pretend they're working with an IBM-PC.

We'll also cover using Pivot as a terminal with an external computer.

Finally, we've included diagrams of the signal lines for the serial and parallel connectors on Pivot's rear panel.

Devices: Yes or No?

Pivot incorporates most of the standard computer components that are usually packaged as separate modules: keyboard, monitor, CPU, disk drive(s), and modem.

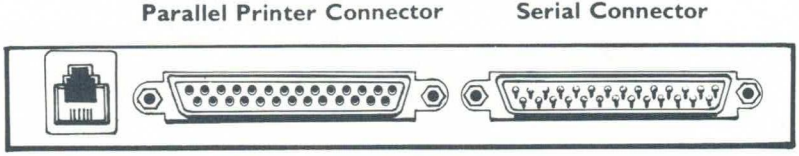
The pair of 25-pin connectors on Pivot's back panel allow you to attach printers, plotters, and external modems. In most instances a printer is the only one of these you would use.

On the next page is a list of peripherals that you might wish to connect to Pivot. It tells whether the connection is possible, and if so, whether extra software is needed. (When extra software is needed, it usually comes with the device.)

Device	Connectable?	Other Software Needed?
Serial printer	Yes	No
Parallel printer	Yes	No
External modem	Yes	Yes
External computer	Yes	No
External terminal	No	
External disk drives	No	
Monochrome monitor	No	
Color monitor	No	
TV set	No	
Joystick/mouse	Yes (serial types)	Yes
Graphics tablet	Yes (serial types)	Yes
Plotter	Yes	Yes
Sensing devices	Yes (serial types)	Yes

Pivot's Connectors

Pivot's back panel contains three connectors. One is an RJ11-C socket for connecting Pivot's modem to the phone system. This is discussed under "Modem."



Serial (male) connector—Used for serial printers, plotters, and external modems. *Serial printers* are quite common; "serial" simply indicates their mode of talking to Pivot (more on this under "Printers"). *Plotters* are special printers that are used to draw graphs and pictures. *External modems* may be used instead of Pivot's built-in modem to get 1200 baud transmission rates or other enhancements like file transfer and auto-answer.

The serial connector may also be used with certain joysticks, mice, and graphics tablets. The software that comes with the device should be written for MS-DOS. The device itself must be designed to attach to the IBM-PC Asynchronous Communications Adapter (or equivalent) serial connector. It should *not* come with its own circuit board for mounting inside the computer.

Since Pivot's connectors are totally compatible with those on an IBM-PC, you should have no trouble locating cables for your printer or other device. (Getting the right cable to match a computer with a printer has traditionally been one of the most horrifying experiences of computer-ownership.)

Parallel (female) connector—Used almost exclusively for *parallel* or *Centronics-style* printers (more on this under "Printers"). Parallel printers are becoming increasingly more popular; chances are your printer is of this type. A parallel printer cable for the IBM-PC and its compatibles should be readily available from the printer manufacturer.

This connector is compatible with the 25-pin female connector on an IBM-PC Parallel Printer Adapter board.

Printers

Making a printer and computer work together can be a pain in the neck. In some cases, however, it's a breeze. Keep in mind that setting up your printer is the least your dealer should do to earn his margin. Here are the things that must be done:

- Make sure you have the right cable. *Serial printers require a "null modem cable", where pins 2 and 3 are criss-crossed.*
- Set Pivot's serial port (serial printers only) and the printer's switches correctly.
- Install your software for the printer, if necessary.

We'll go through the steps listed above after a quick discussion about printers in general.

Serial vs. Parallel

Serial transmission means each letter is sent to the printer in a stream of 11 bits, some of which are the code for the letter while the rest say "here it comes" and "there it goes". In its simplest form, a serial printer cable has only 3 wires.

In parallel transmission, the character is sent all at once across eight wires. Both serial and parallel cables use additional wires to let the printer or computer detect when the other is busy.

Parallel printers have the advantage of being cheaper than their serial counterparts, since fewer components are needed to handle parallel signals. The disadvantage of parallel printers is their cables tend to be bulky and must be kept relatively short. Parallel cables are typically six feet or less, while serial cables can reach 250 feet with no problems.

Quick Note on Parallel Printers

If you have a parallel or "Centronics-type" printer, your job is simpler than if you had a serial printer. Just plug it in and it should work. Be sure PRINTER on the Setup Menu is set to PARALLEL. See below.

You may still need to re-install NewWord (and install some other programs you may have bought) to take advantage of all your printer's features. See "Nuts and Bolts" in the *NewWord User's Guide* for further information.

Setup Menu Considerations

Pivot must know whether you're using a serial or parallel printer before you can print anything. This is done by setting PRINTER in the Setup Menu's System column to either SERIAL or PARALLEL. See "The Setup Menu" earlier in this handbook if you need help. (You get to the Setup Menu by pressing SETUP (*F10*) at the World Map Display.)

If you have a *serial* printer, there are several other details to attend to. They are all part of the Serial column on the Setup Menu.

Handshaking—The computer has to quit sending letters when the printer is busy or off-line. Some serial printers have a wire in the cable that tells the computer to send letters when it's charged, and stop them when it's discharged. This scheme is called *hardware handshaking*. You have to be sure that the wire is connected to the right place on both the computer and printer sockets.

Since IBM-PC-compatible cables should be available off-the-shelf from any printer maker with a survival instinct, this should not be a matter of too much concern. But it's the place to start investigating if your system locks up when you try to print, or if things print okay for a few lines and then turn to "garbage."

The other method of handshaking in serial printers is *software* or *X-ON/X-OFF handshaking*. Instead of a voltage on a wire, the transmission of characters is stopped when the printer sends a special code to the computer. The printer sends a second special code when it's ready for more.

Baud Rate—Virtually every printer, serial and parallel, has a set of tiny switches that determine the details of its operation: paper length, character size, and so on. Pivot doesn't really care about that stuff—that's between you, the printer, and its manual.

There *is* one printer switch you have to set on most *serial* printers to make it work with Pivot, namely, the baud rate switch. Set it for the highest possible value (probably 9600), and then set Pivot's serial port to the same value with the Setup Menu.

If the printer prints but none of it is recognizable, suspect a baud rate mismatch.

> ***Note:*** *At the time of writing, Morrow was in negotiations with several printer makers for an ultra-compact "Pivot Printer." Whatever printer is selected will come with its cable and simple explicit instructions for setting it up properly for Pivot. The text above is more general to let it apply to all printers.*

Testing the Printer

Here's a quick test to see if your printer is hooked up and all settings are correct. *Be sure the printer is turned on, online, with paper and ribbon in place.*

With MS-DOS booted and the A> prompt onscreen, enter *CTRL-PRINT ON [RET]*, that is, hold down the CTRL key while tapping the PRINT ON key, then hit RETURN. Now anything that appears onscreen should go to the printer too. Try entering *DIR [RET]*. (Enter the CTRL-PRINT ON command again when you're done.)

If the printing is garbage, serial printers are probably set to a different baud rate than Pivot's serial port. Parallel printers may have a defective cable. *No* printing points to the cable or the PRINTER setting on the Setup Menu, and perhaps the printer is not online. Some good printing and then lockup or garbage indicates a handshaking problem.

It may be necessary to reboot Pivot to clear a locked-up condition. Open the disk drive door(s), turn it off and back on, and start over.

External Modems

Pivot comes with a 300 baud modem built-in. It is ideally suited for communications with data retrieval services like CompuServe and The Source.

The main reason you'd want to attach an external modem is to communicate at 1200 or 2400 baud. In addition, Pivot's built-in modem software does not allow the sending and receiving of files. For this you'd buy a separate software package like Crosstalk. To use such software with the built-in modem requires considerable programming expertise, so many people would probably opt to purchase an external modem already matched to the extra software.

Connecting and Configuring the Modem

Pivot's serial port is already configured for a modem. No switches, jumpers, or null-modem cables are involved. You must set certain options in the Serial Port column of the Setup Menu to match the expectations of the modem on the other end: baud rate, stop bits, and data bits. Data bits is likely to be 8, stop bits 1, and handshaking is universally XON/XOFF. See "The Setup Menu" for further details.

Finally, you should verify that COM1 under "Logical Devices" is set to MODEM. Ignore the items under "Modem" in the Setup Menu, as these pertain only to the internal modem.

Terminal Emulation Mode

When you use a modem to communicate with a remote data base, Pivot is pretending it's a simple terminal connected to a big mainframe computer. It's not processing or storing information; it simply sends what you type and displays what it receives.

You can use this so-called Terminal Mode *without* the modem, by hooking Pivot up to a local computer by way of its serial connector. COM2 on the Setup Menu has to be set to SERIAL for this function; otherwise Pivot assumes you're using the built-in modem and proceeds with the steps for dialing a telephone number when you press the Phone Icon. With COM2 as SERIAL, the phone directory is bypassed, and the Phone Icon puts Pivot directly into terminal mode.

Setup Menu Considerations

As mentioned, COM2 under "Logical Devices" must be set to SERIAL. Then you must set all the items under "Serial Port" to match the expectations of the host computer. Baud rate is likely to be 9,600 or 19,200. Data bits will probably be 8, with 1 stop bit. However, some older equipment (especially IBM) will depart from this scheme. We're assuming that if you're using Pivot this way, you're technically inclined enough to handle the details.

Icon Actions

When COM2 is SERIAL, Pivot enters terminal mode as soon as you press the Phone Icon. If you press the Phone Icon again while in terminal mode, the phone directory appears, although you can't dial a number from it. This is strictly to let you see the phone list without having to log off from the host computer. Press the Phone Icon one more time to get back to terminal mode.

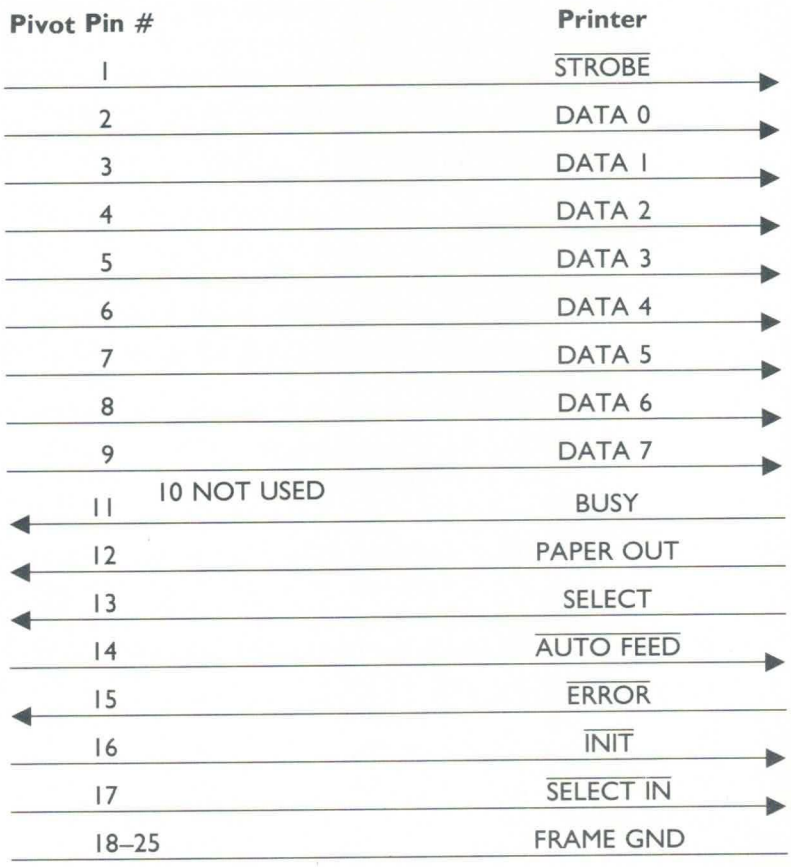
Emulation Details

When in terminal mode, Pivot's control codes and escape sequences emulate those of the Lear Siegler ADM-3A. This is a relatively primitive terminal, including all the basic operations plus direct cursor addressing and clear screen / home cursor.

Operation	*Control Code or Escape Sequence*
Cursor up	^K
down	^J
left	^H
right	^L
home	^^
home + Clear	^Z
Tab	^I
Carriage Return	^M
Bell	^G
Cursor Position	ESC = R+32,C+32 (decimal)

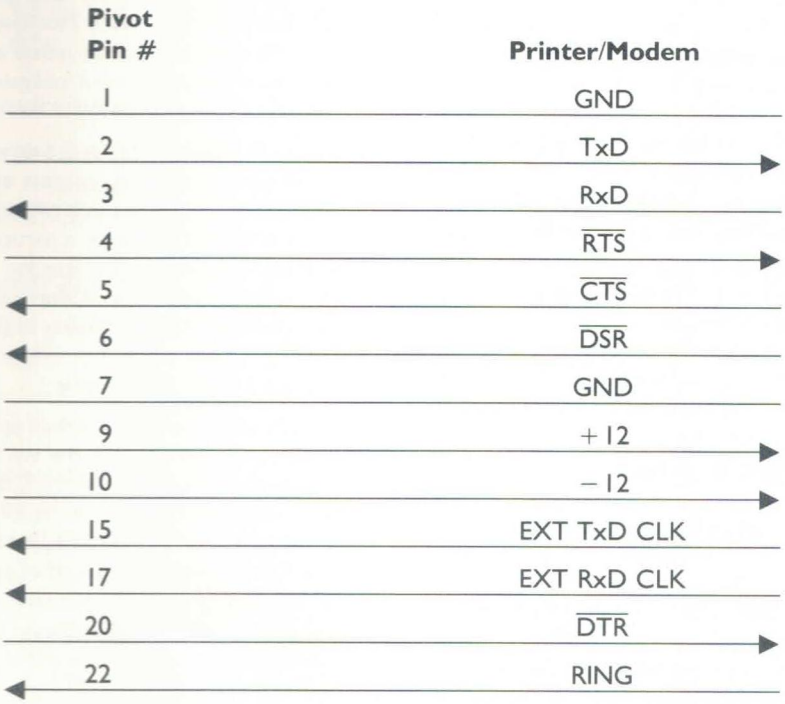
Parallel (female) Connector Pinouts

All signals are at TTL level.



Serial (male) Connector Pinouts

All signals are at TTL level. Pins not shown are not used.



Limited Warranty

Morrow Designs Inc. warrants its products to be free from defects in workmanship and materials for the periods indicated below. This warranty is limited to the repair and replacement of parts only.

This warranty is void if, in the sole opinion of Morrow Designs Inc., the product has been subject to abuse or misuse, or has been interconnected to other manufacturer's equipment for which compatibility has not been established in writing.

Circuit boards–Parts, including the printed circuit board, purchased as factory assemblies, are warranted for a period of ninety (90) days from the original invoice/purchase date.

Electro-mechanical peripherals–Peripheral equipment such as floppy or hard disk drives, etc., not manufactured by Morrow Designs Inc. are included in the limited warranty period of 90 days from the original invoice date when sold as part of a Morrow system.

Exception–Expendable items such as printer ribbons, software media, and printwheels are not covered by any warranty.

Software/Firmware–Morrow Designs Inc. makes no representations or warranties whatsoever with respect to software or firmware associated with its products and specifically disclaims any implied or expressed warranty of fitness for any particular purpose or compatibility with any hardware, operating system, or software/firmware. Morrow Designs Inc. reserves the right to alter or update any program, publication or manual without obligation to notify any person of such changes.

Limitation of Liability: The foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. In no event will Morrow Designs Inc. be liable for consequential damages even if Morrow Designs Inc. has been advised of the possibility of such damages.

Warranty Return Procedure

Should a buyer experience a defect in either workmanship or materials during the warranty period, any Morrow Authorized Service Center will replace or repair the product at its expense only if the product is promptly returned to the dealer or Service Center with dated proof of purchase.

Should factory repair be necessary, the Service Center shall contact Morrow Dealer Support for a Return Materials Authorization (RMA) number.

Dimensions

Height:	9.5 inches (24.1 cm)
Width:	13 inches (33.0 cm)
Depth:	5.6 inches (14.2 cm) closed 13 inches (33.0 cm) open
Weight:	9.5 lbs (4.3 kg) with one disk drive

Power Requirements

+15 VDC @ 2.5 A (38 watts)
AC Adapter is switchable for
115 / 220 VAC, 50 / 60 Hz.

Environment Operating:

Operating: 50° - 104° F (10° - 40° C)
Storage: −40° - 125° F (−40° - 52° C)

Disk Drives

$5\frac{1}{4}$ inch double-sided double-density
One standard, second optional
9 sectors/track, 360 Kbytes formatted
IBM-PC standard

Liquid Crystal Display

16 line: 480 × 128 dot-addressable pixels
25 line: 640 × 200 dot-addressable pixels
Both versions have 80-character width

Modem

300 Baud direct-connect with auto-dial

Processor

80C86 CMOS 16-bit processor operating at 3.33 MHz

Memory

ROM: 16 or 32 Kbytes, includes Icon software
Dynamic Ram: 128, 256, or 512 Kbytes
Non-volatile RAM: 4, 8, or 16 Kbytes
Memory capacity depends on model purchased

I/O Ports

Serial:	Male DB25 RS-232 connector, compatible with IBM-PC Asynch Communications Adapter. Baud rates from 110 - 19,200 Hardware / XON-XOFF handshaking
Parallel:	Female DB25 connector, compatible with IBM-PC Parallel Printer Adapter
Modem:	RJ11-C modular connector

PIVOT WARRANTY REGISTRATION

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Phone: _____

Dealer: _____

Dealer City/State: _____

Pivot Serial Number: _____

Date Purchased: _____

Pivot purchased by: ☐ Self ☐ Company ☐ Other

I learned about Pivot from: ☐ Dealer ☐ Another user ☐ Other
☐ Advertisement in: _____

I plan to use Pivot mainly for: _____

PLACE
STAMP
HERE

Morrow
600 McCormick
San Leandro, CA 94577

Attn: Pivot Registration

Manual #270-0119-00

MORROW