INSTALLING THE INBOARD™ 386/PC PIGGYBACK MEMORY BOARD

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REGISTRATION CARD FOR INBOARD™ 386/PC PIGGYBACK MEMORY BOARD

Important! To register your new board and receive valuable information on future products, please fill out and return this card.

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Did you purchase your Piggyback Memory board at the same time as your Inboard 386/PC?

❑ Yes ❑ No

In what equipment did you install the Piggyback Memory board?

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Model (PC AT, etc.) _____

What software package(s) do you use most of the time?

_____

Where did you learn about the Piggyback Memory board? (Check all that apply)

❑ Dealer ❑ Another user

❑ Corporate Information Center ❑ Direct Mail

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Article in _____

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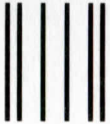
What other Intel products do you own?

❑ Above Board ❑ Math Coprocessor ❑ Other



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WHAT'S YOUR OPINION?

Installing the Inboard™ 386/PC Piggyback Memory Board
301451-001

We've tried to make this book accurate, complete, and readable. Please use this form to let us know whether we've met or fallen short of these objectives.

1 How useful was the manual?

Poor Average Good Excellent

2 Rate the following, based on the manual's information and ease of use:

Board Installation Poor Avg. Good Excellent

Software Installation Poor Avg. Good Excellent

3 Did we leave out any useful infomation? If so, what?

_____

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_____

4 What inaccuracies did you find? (Please provide page numbers.)

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NOTE

Intel's limited warranty covers boards only as Intel delivers them. If you or your dealer adds memory chips or other accessories, this warranty will not cover the additions. Furthermore, if you damage the board while installing it in your computer or while adding accessories, this warranty does not cover repair or replacement. Intel recommends that you have your Authorized Intel dealer install this board and any accessories.

FIVE-YEAR LIMITED WARRANTY

Intel Corporation warrants this board to be in working order for five years from the date you purchased it from your authorized Intel dealer. If the board fails to be in working order during these five years, Intel will, at its option, repair or replace the board at no charge except as set forth below.

Intel furnishes warranty service on an exchange basis. Intel may repair or replace your board with new or reconditioned parts, and any replaced boards or parts become Intel's property.

This limited warranty does not cover repair of boards damaged by abuse, accident, disaster, misuse, or incorrect installation.

To obtain warranty service, deliver the board, along with proof of purchase date, to the dealer from whom you bought it. If you choose to ship the board to your dealer rather than delivering it in person, you must assume the risk of damage or loss in transit. You also must use the original shipping container (or the equivalent) and pay the shipping charges.

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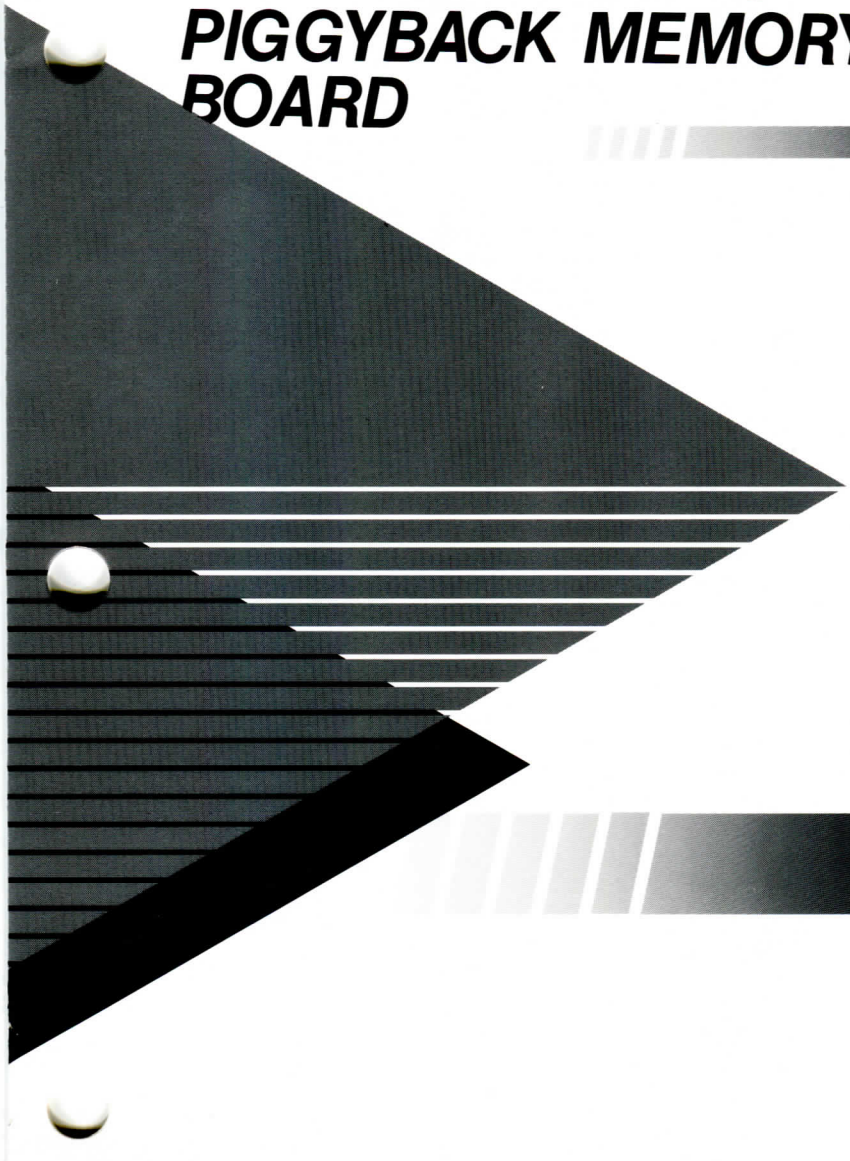
INSTALLING THE
INBOARD™ 386/PC PIGGYBACK MEMORY BOARD



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CONTENTS

1 INTRODUCTION

If you're in a hurry to install the Inboard 386/PC Piggyback Memory board, reading this chapter can save you time. It tells you what you can skip, so you can focus on the information you need.

Here's what you'll find in this manual:

Chapter 1 Introduction
Summarizes the Piggyback Memory board's features, explains some of the terms used in the manual, and tells where to find Customer Support information.

Chapter 2 Adding memory to the Piggyback Memory board
This chapter explains how to add memory chips. If your Piggyback Memory board already has enough memory, skip this chapter.

Chapter 3 Attaching the Piggyback Memory board to the Inboard™ 386/PC
This chapter describes attaching the Piggyback Memory board to the Inboard 386/PC.

What is the Piggyback Memory board?

The Piggyback Memory board is a half-length board that can add up to 2M bytes of extended memory to your computer. As its name suggests, the Piggyback Memory board attaches to the Inboard 386/PC. Figure 1-1 shows the two boards attached.

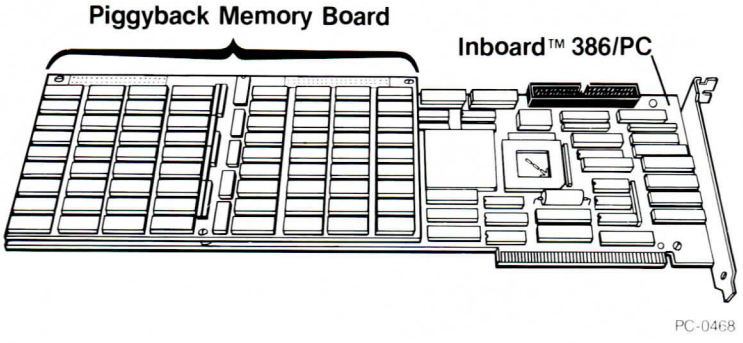

Figure 1-1 *The Piggyback Memory board attached to an Inboard™ 386/PC*

NOTE

Intel makes three Piggyback Memory boards: one for the Inboard 386/PC, one for the Inboard 386, and one for the Above Board. Attach only the Inboard 386/PC Piggyback board to the Inboard 386/PC.

When attached, the two boards plug into one connector in the computer's system unit. Together they use just one slot inside the computer.

Benefits of the Piggyback Memory board

The Piggyback Memory board provides these benefits:

- **Increased memory.** The Piggyback Memory board lets you add up to 2M bytes of extended memory to the 1M byte of memory on the Inboard 386/PC. You can also turn the extended memory on the Piggyback Memory board into expanded memory. (The Inboard 386/PC manual explains how.)
- **Increased performance.** The Inboard 386/PC and the Piggyback Memory board provide the fastest memory in your computer.

- **Saved money.** The Piggyback Memory board costs less than full-size expansion boards with the same amount of memory.
- **Saved space in the computer.** The Piggyback board supplies a full-size board's worth of memory without using another slot.

Terms this book uses

Throughout this book, the terms "Piggyback," "Piggyback board," and "Piggyback Memory board" all refer to the Inboard 386/PC Piggyback Memory board.

The "Inboard 386/PC manual" is *Installing the Inboard™ 386/PC Personal Computer Enhancement*, the book from the Inboard 386/PC installation kit.

Other terms are defined in the Inboard 386/PC manual's glossary.

Call us

After you read this manual, you may have opinions or questions about how to install or use the Piggyback Memory board. If so, please call Intel's Customer Support. Appendix B in the Inboard 386/PC manual lists the number.

Where to go from here

If you're adding memory to the Piggyback Memory board, turn to Chapter 2. If the Piggyback board already has enough memory, turn to Chapter 3.

2 ADDING MEMORY TO THE PIGGYBACK MEMORY BOARD

This chapter explains how to add memory chips to the Piggyback Memory board. The Piggyback Memory board comes with either 1M byte or 2M bytes of memory. If you have all the memory you need or if all the sockets are full, skip this chapter and turn to Chapter 3.

Selecting the chips

Follow these rules when selecting memory chips:

1. You must use only 256K-bit chips.
2. The chips must operate at 120 nanoseconds or faster. For example, 150-nanosecond chips are too slow, but 120- and 100-nanosecond chips are fine. You can mix chips of different speeds as long as they operate at 120 nanoseconds or faster.
3. Buy thirty-six 256K-bit chips. Intel has verified that the chips listed in Table 2-1 work correctly with the Piggyback Memory board. Other chips may work, but they haven't been verified.

Table 2-1 *Verified memory chips*

Manufacturer	Part number
Fujitsu	MB81256-12
Hitachi	HM50256-12 HM50256G-12 HM50256UG-12
Intel	51C256-12
Micron Technology	MT1259-12
Mitsubishi	M5M4256-12 M5M4256P-12
Toshiba	TMM41256P-12

Adding the chips

1 Gather the materials you'll need -- the computer, manual, Piggyback Memory board, and chips -- and arrange them on a clean, dry work surface.

CAUTION

Memory chips can be damaged by static discharge. You're less likely to discharge static electricity if you ground yourself by touching the metal back or side panel of the computer's system unit before you touch the chips. Moving around increases the possibility of static discharge, so limit your movements while installing the memory chips.

2 Remove the static electricity from your hands by touching the metal back or side panel of the computer's system unit.

3 Take the Piggyback Memory board out of its anti-static bag, and remove the protective foam that covers the board. Set aside the packet of nylon screws and stand-offs. You'll need them to attach the Piggyback Memory board to the Inboard 386/PC.

4 Orient the board and chips as shown in Figure 2-1. The notched or dotted edge of each chip should point to the left.

Insert the chips. If you've never put a chip in a socket, read Appendix A for instructions.

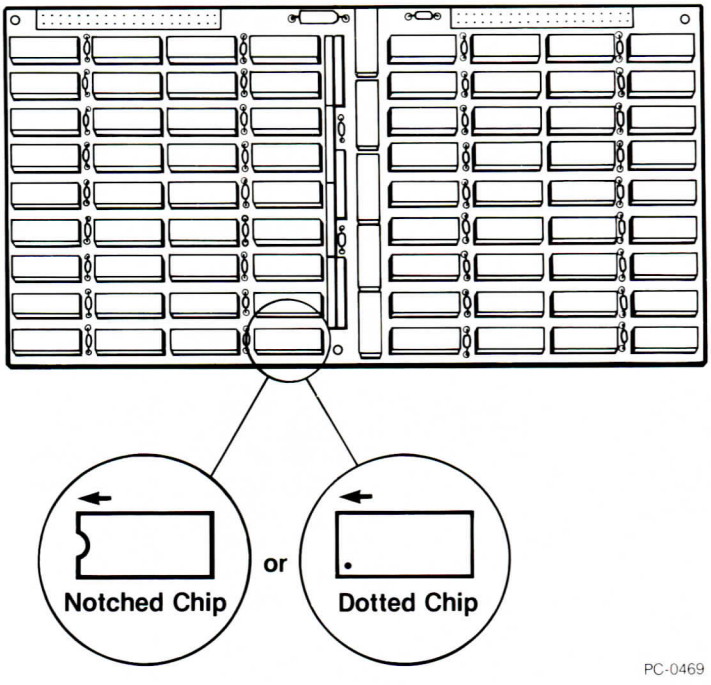

Figure 2-1 *Orienting chips correctly*

5 Verify that the chips are installed correctly. Check the following:

- All columns are filled.
- None of the pins are bent.
- The notch or dot on each chip points to the left.
- Each chip is pushed all the way into its socket.

After the chips are inserted, the Piggyback board is ready to attach to the Inboard 386/PC. Turn to Chapter 3 for attachment instructions.

3 ATTACHING THE PIGGYBACK MEMORY BOARD TO THE INBOARD™ 386/PC

This chapter contains instructions for attaching the Piggyback Memory board to the Inboard 386/PC. The only equipment you may need is a pair of needle-nose pliers and (if the Inboard 386/PC is in the computer) a flat-blade screwdriver.

Preparing your work area

1 Gather the materials you'll need -- the computer, manual, boards, nylon screws and stand-offs, and tools -- and arrange them on a clean, dry work surface.

CAUTION

Memory chips can be damaged by static discharge. You're less likely to discharge static electricity if you ground yourself by touching the metal back or side panel of the computer's system unit before you work inside the computer. Moving around increases the possibility of static discharge, so limit your movements while installing the Piggyback Memory board.

2 If you haven't done so already, turn off the power switch on the system unit and any attached equipment (such as the printer and screen), unplug the system unit's power cord from the wall outlet, and remove the cover from the computer.

Preparing the Inboard™ 386/PC

1 If the Inboard 386/PC hasn't been installed yet, skip the rest of this step and go to step 2.

If the Inboard 386/PC is already installed, detach the Inboard 386/PC cable from the Inboard 386/PC and take the Inboard 386/PC out of the computer.

2 Push a nylon screw through one of the holes on the Inboard 386/PC, as shown in Figure 3-1. The head of the screw should be on the under side of the board, and the threads should protrude through the hole.

Press the head of the screw against the board. Then attach one of the stand-offs to the screw, turning the stand-off clockwise until it's finger-tight.

Repeat for the other two holes.

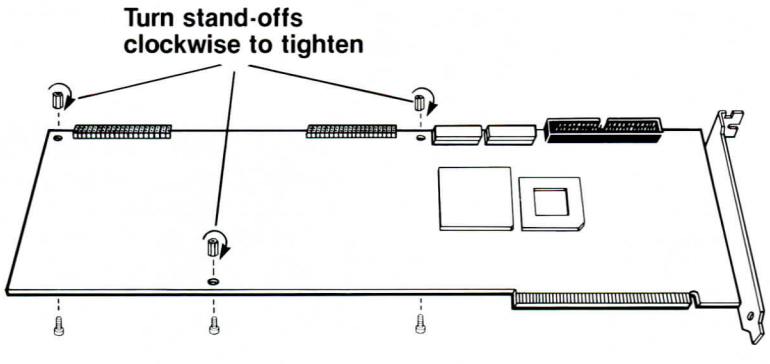

Figure 3-1 *Attaching screws and stand-offs to the Inboard™ 386/PC*

CAUTION

You could damage the Inboard 386/PC if you don't attach the stand-offs.

3 Lay the Inboard 386/PC aside.

Attaching the Piggyback Memory board

1 If you haven't done so already, take the Piggyback board out of its anti-static bag and remove the protective foam that covers the board.

2 Pick up the Piggyback board by its edges and examine the connector pins on the board's underside. (See Figure 3-2.) If any of the pins are bent, carefully straighten them with needle-nose pliers.

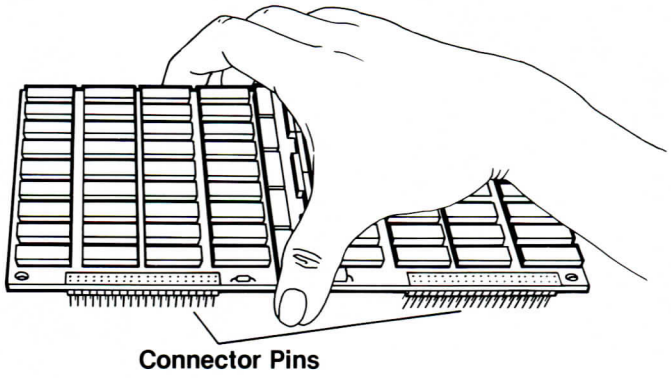

Figure 3-2 *The Piggyback Memory board's connector pins*

3 Align the connector pins on the Piggyback board with the connector sockets on the Inboard 386/PC, as shown in Figure 3-3. The pins are properly aligned when the two boards are parallel and all the pins are halfway into the socket holes.

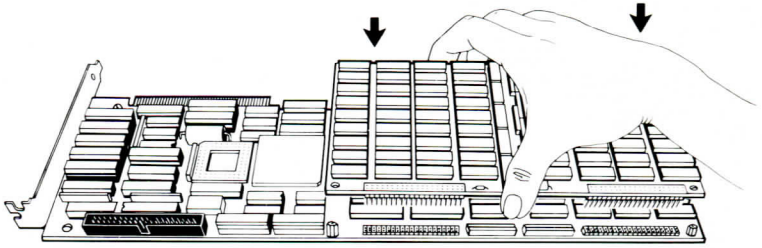

Figure 3-3 *Aligning the Piggyback Memory board connector pins with the Inboard™ 386/PC connector sockets*

CAUTION

Exerting force on any one bank of connector pins could bend the pins and damage them.

4 After the pins are aligned, press them all the way into the sockets by pushing down firmly and evenly on the corners of the Piggyback Memory board as shown in Figure 3-4. When you press the connector pins into the socket, use a gentle rocking motion, pressing alternately on the top corners of the Piggyback Memory board.

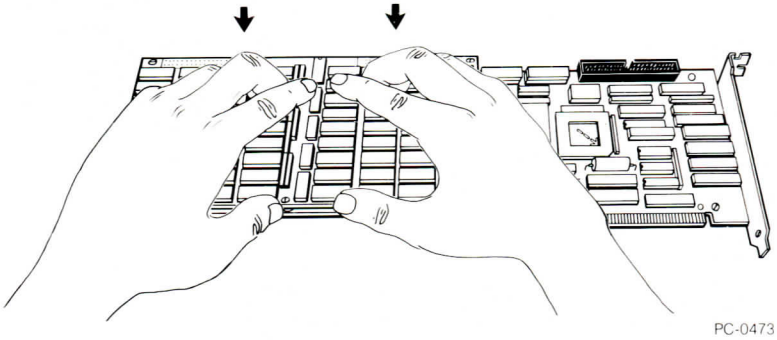

Figure 3-4 *Pressing the Piggyback Memory board connector pins all the way into the Inboard™ 386/PC connector sockets*

5 Attach the three remaining nylon screws as shown in Figure 3-5.

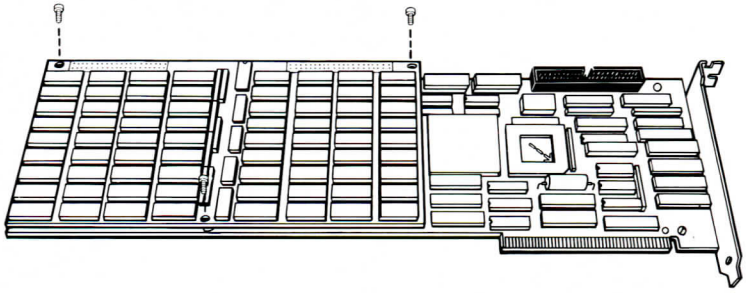

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Figure 3-5 *Attaching the nylon screws*

Where to go from here

Now that the Piggyback board is attached, you're ready to install the Inboard 386/PC. If you've never installed the Inboard 386/PC, you must prepare the computer. Turn to the Inboard 386/PC manual for instructions.

If you removed the Inboard 386/PC from the computer to attach the Piggyback Memory board, reinstall the Inboard 386/PC in your computer. The Inboard 386/PC manual describes installing the Inboard 386/PC.

If you have problems with your computer immediately after installing the Piggyback board, refer to Appendix B in the Inboard 386/PC manual for troubleshooting advice. (Note that because of the extra memory added by the Piggyback board, the computer's diagnostics take longer to run at power-on. This isn't a problem.)

A PUTTING A CHIP IN A SOCKET

This appendix explains how to insert a chip into a socket. If you've successfully put chips in sockets before, you can skip this appendix.

CAUTION

Unless you follow step 1, you can ruin your chips.

1 Before touching any chips, remove the static electricity from your hands by touching the metal back or side panel of your computer. See Figure A-1.

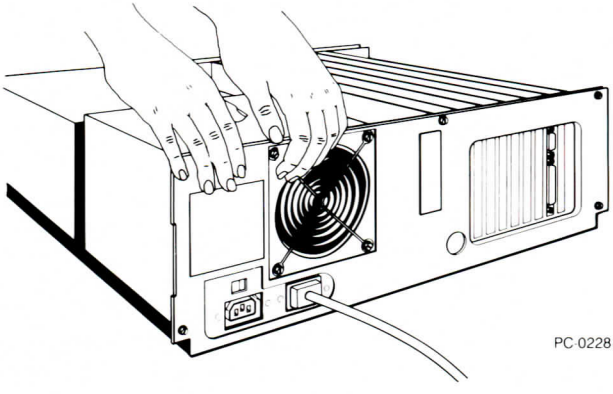

Figure A-1 *Removing static electricity from your hands*

2 Orient the Piggyback Memory board as shown in Figure A-2. Before you put a chip in a socket, make sure the notched edge of the chip points to the left. If the chip has a dot instead of a notch, make sure the edge with the dot faces left.

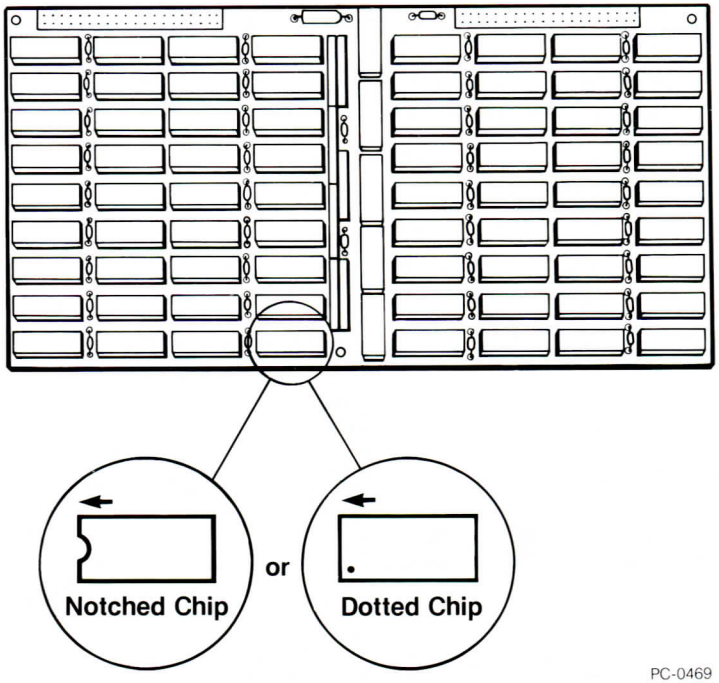

Figure A-2 *Orienting the chip correctly*

3 Sometimes a chip's pins don't line up with a socket's holes. Before you install a chip, verify that its pins line up with the holes in the socket. If they don't, straighten the pins by laying the chip on its side on a table and *gently* pressing its top *edge* (not the pins) as shown in Figure A-3. Repeat for pins on the other side of the chip.

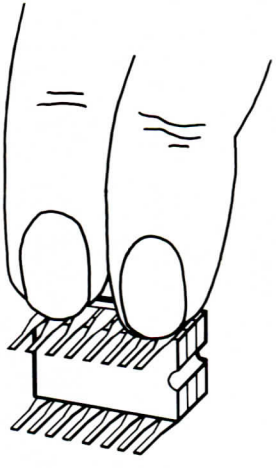

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Figure A-3 *Straightening the chip's pins*

4 Carefully insert the pins on one side of the chip halfway into the holes on the same side of the socket. See Figure A-4.

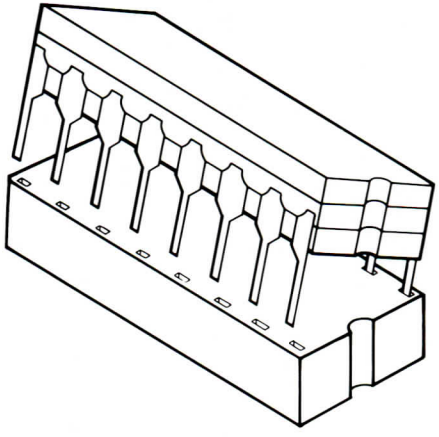

Figure A-4 *Inserting pins halfway into one side of the socket*

5 Insert the pins from the other side of the chip halfway into the holes on that side of the socket. See Figure A-5.

If the pins don't line up with the holes, remove the chip from the socket, gently straighten the pins, and go back to step 3.

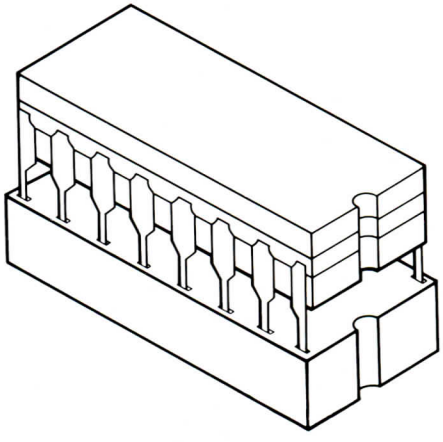

Figure A-5 *Inserting the remaining pins halfway into the socket*

6 Carefully examine the chip's pins. Look for any pins that are bent under or out. (See Figure A-6.) If you find bent pins, remove the chip, gently straighten them, and go back to step 4.

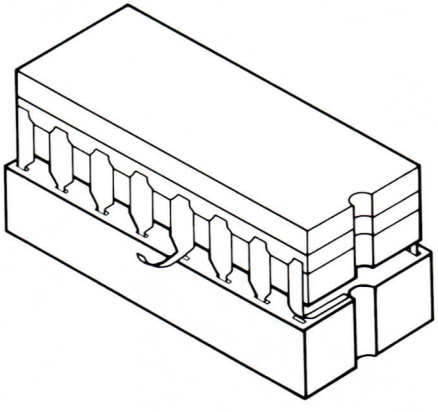

Figure A-6 *Bent pins*

7 When all pins are in the socket holes, apply gentle, even pressure with two fingers until the chip settles into the socket. Then apply firm pressure with both fingers until the chip will go no farther. See Figure A-7.

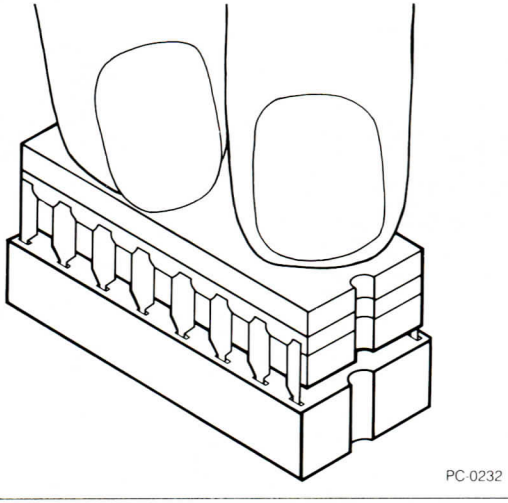

Figure A-7 *Pressing the chip into the socket*

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