

**MINDSET**

# Graphics Tablet Operation Guide

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Printed in U.S.A.

100521-001

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## **FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT**

### **INSTRUCTIONS TO USER**

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna.

Relocate the computer with respect to the receiver.

Move the computer away from the receiver.

Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio-television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

# Contents

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## **Section 1**

### **Introduction**

What Does a Graphics Tablet Do?  
How Does a Graphics Tablet Work?  
How to Use This Guide

---

## **Section 2**

### **Setting Up the Graphics Tablet**

Checklist  
System Components Needed  
Setup Instructions

---

## **Section 3**

### **Using the Graphics Tablet**

Some General Guidelines  
The Pen Cartridge  
The Pen Switch  
The Tablet's Sensitivity  
The Lexan Writing Surface  
The Tablet Switches  
The Tablet's Active Area

---

## **Section 4**

### **Care and Maintenance**

The Tablet  
The Pen  
The Lexan Writing Surface

---

## **Section 5**

### **Solving Problems**

---

**Appendix A**  
**Hardware Configuration**

- Switch Settings
- Mode/Baud Switches
  - Modes of Operation
  - Baud Rates
- Program Switches
  - Output Format
  - Baud Rate
  - Resolution
  - Remote Mode
  - Internal and External Menu Operations
  - Origin

---

**Appendix B**  
**The Menu Keyboard**

- The Control Keys
- The Function Keys

---

**Appendix C**  
**The RS-232-C Interface Connector**

---

**Appendix D**  
**Specifications**

# Figures

---

- 
- Figure 1: The components of the Graphics Tablet
  - Figure 2: The back panel of the Graphics Tablet
  - Figure 3: The back panel of the Mindset Personal Computer
  - Figure 4: The components of the pen
  - Figure 5: The location of the mode/ baud switches and the program switches
  - Figure 6: The mode/ baud switch settings
  - Figure 7: The program switch settings
  - Figure 8: The menu keyboard
  - Figure 9: The menu keyboard

# Tables

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Table 1: Setup matrix for mode/ baud switches

Table 2: Setup matrix for program switches

Table 3: Setup matrix for program switches 6 and 7

Table 4: Pin configuration of the RS-232-C connector

# Section 1

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## Introduction

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### What Does a Graphics Tablet Do?

A graphics tablet (also sometimes called a digitizing tablet) is an electronic version of a pen and paper, with a little something extra. You can use it to write, draw, even paint – electronically, of course. You can also use the tablet for tracing – its removeable lexan writing surface can be placed over your original to protect it from getting marked up. And the pen that comes with your tablet can be fitted with an ink-filled cartridge, so you can draw on a piece of paper placed on the tablet surface and have the drawing “translated” onto your screen.

You can also use the tablet to make a selection from a menu – just by pointing to it. Because the Mindset Graphics Tablet has a strip of programmable menu keys, a software program can transform it into the command center of your entire system – one key to start the printer, another to save files, and so on.

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## How Does a Graphics Tablet Work?

The surface of the tablet is divided into a grid – something like electronic graph paper – with as many as 40,000 squares per square inch. When you bring the pen near the writing surface, the tablet senses its position and translates it into a pair of x-y coordinates. The tablet then sends that information to the computer, which uses it to pinpoint a corresponding position on your television or monitor screen. If you press the pen down on the tablet, a switch inside the pen is activated; the tablet then sends another piece of information to the computer, which might in its turn put a dot on the screen at the corresponding location.

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## How to Use This Guide

This Operation Guide consists of five sections (one of which is this Introduction), and four appendices. If you've never used a graphics tablet before, you'll find the rest of this Introduction and Sections 2, 3, and 4 especially helpful.

Section 2, "Setting Up the Graphics Tablet," shows you how to attach the tablet to your Mindset Personal Computer System.

Section 3, "Using the Graphics Tablet," provides information on how to operate the tablet and some suggestions on how to make the best use of it.

Section 4, "Care and Maintenance," will help you keep your tablet in good operating condition.

Section 5, "Solving Problems," can help you diagnose any problems that may arise when you're using your tablet.

The appendices deal with technical matters: the hardware configuration, the menu keyboard, the RS-232-C interface connector, and tablet specifications. If you're unfamiliar with technical terminology, the only part that you need to read is "Switch Settings," at the very beginning of Appendix A.

For convenience, place this guide under the Options tab of your Mindset Personal Computer System Operation Guide.

## Section 2

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# Setting Up the Graphics Tablet

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### Checklist

Before you connect the Graphics Tablet to your Mindset Personal Computer System, make sure that your tablet has:

- an RS-232-C cable with a D-shaped connector attached to the tablet;
- a pen with a cable and connector attached to it;
- a removeable lexan writing surface over the active area of the tablet.

If any of these items are missing, contact your dealer.

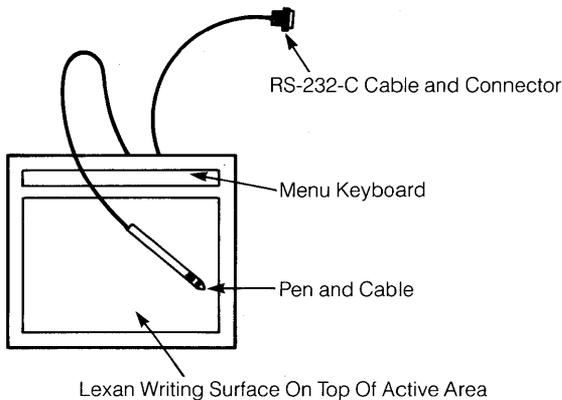


Figure 1: The components of the Graphics Tablet

## System Components Needed

To make use of the Graphics Tablet with your Mindset Personal Computer, you'll need:

- an RS-232-C Module With Power Option (model M-2006);
- a software program, such as Lumena, designed for use with a graphics tablet.

The amount of RAM you need in order to use the tablet with a particular program is determined by the requirements of the program, not those of the tablet.

## Setup Instructions

1. Make sure that your computer is turned off.
2. The tablet draws power directly from the computer through the RS-232-C Module With Power Option (see Figure 2). If necessary, remove your RS-232-C Module from your computer, make sure that the power switch is in the ON position, and reinstall the module. (See Section 3, "Installation," in the RS-232-C Module With Power Option Operation Guide and to Section 6, "Enhancing Your System," in the Mindset Personal Computer System Operation Guide for module installation instructions.) If your RS-232-C module doesn't have a power switch on it, you'll have to replace it with an RS-232-C Module With Power Option – contact your dealer.

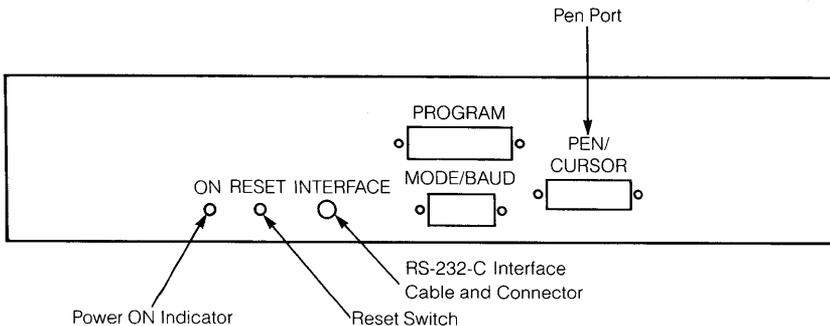


Figure 2: The back panel of the Graphics Tablet

3. Connect the D-shaped RS-232-C connector on the tablet cable to the connector on the back of the RS-232-C module (see Figure 2). Tighten the two screws that hold it in place.

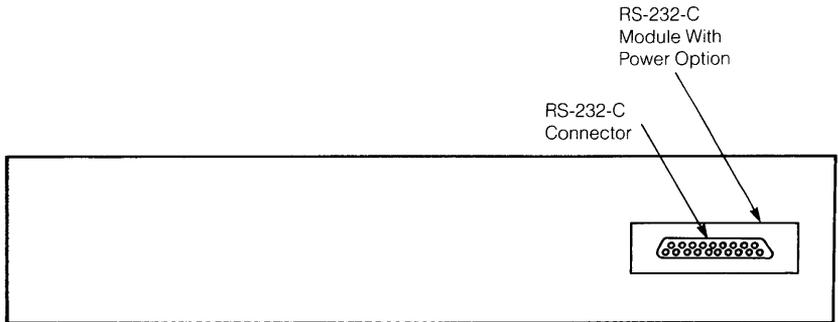


Figure 3: The back panel of the Mindset Personal Computer

4. Plug the pen into the pen port on the back panel of the tablet (see Figure 3). Tighten the two screws that hold the connector in place.
5. Turn your computer on.
6. Check the power ON light on the tablet to make sure that it is lit.
7. Load the program you want to use into your computer. If the tablet fails to work at this point, see Section 5, "Solving Problems."

## Section 3

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# Using the Graphics Tablet

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### Some General Guidelines

You'll find that, unless you're tracing a picture or using a drawing guide, using the tablet is easier if you look at your television or monitor screen rather than at the tablet.

Ordinarily, there are three basic gestures for using the pen and tablet:

- *Brief pressure* – pressing down with the pen, then immediately releasing it – is used to locate a point on the screen, select a color, or initiate a command.
- *Sustained pressure* – pressing down with the pen while moving it – is used to draw onscreen.
- *A gliding motion* – keeping the pen in contact with the tablet but without any pressure – moves the cursor on the screen without leaving a line.

Don't use anything that conducts electricity (metal rulers, paper clips, even ordinary pencil lead) on the writing surface. Also, be careful not to let the cable attached to the pen touch or lie on the writing surface.

Never write or draw on the active area of the tablet without the lexan covering – you might permanently damage the tablet.

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## The Pen Cartridge

The cartridge that comes in the pen with your tablet is inkless. If you find it easier to work with a real writing instrument, you can replace the inkless cartridge with a Fisher Space Pen ink cartridge, available at most stationery stores. But if you decide to use an ink-filled cartridge, don't write directly on the lexan writing surface with it.

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## The Pen Switch

A switch inside the barrel of the pen is activated when you press the pen down on any surface. Normal writing pressure is enough to activate the pen switch.

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## The Tablet's Sensitivity

In certain modes of operation, the pen doesn't have to be pressed against the writing surface at all to activate the tablet – the tablet can sense the pen's location even if the pen is only near the writing surface. It's because the tablet is so sensitive that the cable attached to the pen should not be allowed to touch or lie on the writing surface.

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## The Lexan Writing Surface

The lexan writing surface is designed to protect the active area of the tablet. You can use it to cover a picture or sketch that you want to trace without marking up. You can also, of course, use drawing templates on top of it. But don't use anything that conducts electricity, such as a metal ruler or even pencil lead, on the writing surface.

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## The Tablet Switches

The switches on the back panel of the tablet are preset at the factory. If your tablet doesn't work as it should with a particular software program, it may be that the switch settings need to be changed for that program; check the manual that came with the software for the right switch settings (see Appendix A).

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## The Active Area

The boundaries of the active area on the tablet probably won't coincide exactly with the screen area of your television or monitor. You can easily map out where the edges of the screen coincide with the tablet's active area:

- (1) Put a piece of paper over the writing surface.
- (2) Starting to the left of the writing surface near the top, move the pen to the right until the cursor appears at the edge of the screen. Mark the position of the pen on the paper.
- (3) Repeat the same procedure near the bottom left of the writing surface. Then draw a line from the top to the bottom of the paper through the two marks.
- (4) Repeat the process on the other three sides.

You should now have a rectangle. Slip the paper under the lexan surface and use it as a reference. You can use any such drawing guide that you find useful by just slipping it under the writing surface.

## Section 4

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# Care and Maintenance

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### The Tablet

The tablet does not require any regular upkeep other than normal cleaning. Keep anything that can conduct electricity – for example, metal rulers, paper clips, even pencil lead – away from the writing and menu areas of the tablet.

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### The Pen

The cartridge supplied with the pen is inkless. If you want to write or draw with ink, replace the inkless cartridge with a Fisher Space Pen cartridge, which you can buy at most stationery stores. (If you decide to use an ink-filled cartridge, don't write directly on the lexan writing surface with it.) You may need to replace even an inkless cartridge periodically to maintain a smooth tip.

To take the pen apart:

1. Turn the pen tip counterclockwise.
2. Take the cartridge out of the barrel. Be careful not to lose the spring.

To put the pen back together:

1. Slide the cartridge into the barrel.
2. Place the spring back on the cartridge.

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3. Put the pen tip back in place and turn it clockwise to tighten it.

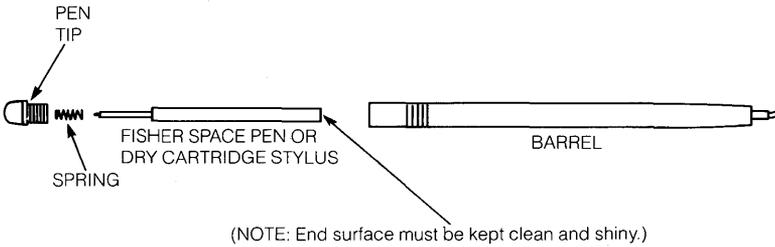


Figure 4: The components of the pen

The top end of the pen cartridge should be kept clean and shiny at all times – it can be lightly polished with an ordinary pencil eraser.

Although the pen is rugged and is designed for years of use, it's still a precision instrument. Jamming the switch or abusing the pen may damage it.

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## The Lexan Writing Surface

The lexan writing surface may eventually become marred or broken, and when it does it should be replaced. Don't write or draw on the active area of the tablet without the lexan covering – you might permanently damage the tablet. To obtain a new lexan writing surface, contact your dealer.

## Section 5

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# Solving Problems

With proper care and handling, your Mindset Graphics Tablet should give you trouble-free operation. However, when problems do occur, you can use the procedures below to identify many of the sources of problems yourself.

**PROBLEM:** The power ON light doesn't light or the tablet doesn't appear to operate.

1. Your computer may not be plugged into a working outlet. Check the red LED on the front panel of your System Unit. If it isn't lit, make sure that the computer's power cord is correctly plugged into an outlet that works.
2. Your computer may be turned off. Check the red LED on the front panel of the System Unit. If it isn't lit, check the computer's on/off power switch on the back of the keyboard. For more information, see Section 2, "Setting Up the Mindset Personal Computer System," in the Mindset Personal Computer System Operation Guide.
3. Your keyboard might not be plugged into your computer. Check the connections on the back panel of the keyboard and on the left side of the computer. For more information, see Section 2, "Setting Up the Mindset Personal Computer System," in the Mindset Personal Computer System Operation Guide.
4. The tablet's RS-232-C D-shaped connector may not be properly connected to the RS-232-C Module With Power Option. Plug the tablet's RS-232-C connector firmly into the RS-232-C module,

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and then tighten the two screws that hold it in place. See Section 2 of this guide, "Setting Up the Graphics Tablet," for instructions.

5. The power switch on your RS-232-C module may be turned off. Turn off your computer, remove the module, and check the switch setting. For help, see Section 3, "Installation," in the RS-232-C Module Operation Guide.
6. Your RS-232-C module may not be properly inserted in the back panel of your computer. Make sure that it is seated firmly in its I/O module port. For help, see Section 6, "Enhancing Your System," in the Mindset Personal Computer System Operation Guide.

**PROBLEM:** The tablet is on, but no onscreen output is apparent.

1. The pen may not be in the active area. Move the pen toward the center of the lexan writing surface. (The perimeter of your tablet will probably not match the screen area of your television or monitor exactly. See Section 3 of this guide, "Using the Graphics Tablet.")
2. The pen switch may not be activated. Move the pen to the active area and press the tip down firmly on the writing surface.
3. The pen may not be plugged in securely. If it isn't, plug it in firmly and tighten the screws that hold it in place. See Section 2 of this guide for instructions.
4. The program you're using may not be operating correctly. Load the program again, and make sure that it's working as it should.
5. The switches on the back panel of the tablet may not be set correctly. Check to see if they're set as shown in "Switch Settings," at the beginning of Appendix A of this guide. If they are, press the RESET button on the back panel of the tablet. If the tablet still fails to respond, check the manual that came with the software you're using for the correct switch settings – if necessary, change the switch settings according to the directions in Appendix A of this guide. Be sure to press the tablet's RESET button after you change the switch settings.

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**PROBLEM:** The onscreen output from the tablet seems to be intermittent.

1. You may be moving the pen across the writing surface too quickly. Try moving the pen more slowly. The tablet is limited in how quickly it can send information to your computer. If you're moving the pen too fast, data will be lost just because the tablet is unable to process it fast enough.
2. The pen cartridge may not be conducting the signal. Remove the cartridge of the pen and polish its top end with an eraser until it's clean and shiny. See Section 4 of this guide, "Care and Maintenance," for information on disassembling the pen.
3. The tip of the pen may be loose. Make sure that the spring inside the pen is properly seated. (See Figure 4 in Section 4 of this guide, "Care and Maintenance.") Turn the pen tip clockwise and tighten it firmly.
4. You may have let the pen's cable come too near the active area of the tablet.
5. You may be using a material that conducts electricity on or near the writing surface. Don't use things such as metal rulers, paper clips, or even pencil lead on or near the writing surface.

**PROBLEM:** The output on the screen is distorted.

The switches on the back panel of the tablet may not be set correctly. Check to see if they're set as shown in "Switch Settings" at the beginning of Appendix A of this guide. If they are, press the RESET button on the back panel of the tablet. If the tablet still fails to perform properly, check the manual that came with the software you're using for the correct switch settings, and change the settings according to the directions in "Switch Settings" at the beginning of Appendix A. Be sure to press the RESET button on the back panel of the tablet after you change the switch settings.

PROBLEM: The pen will not write with a Fisher Space Pen cartridge.

1. The cartridge you're using may be an inkless cartridge. Replace it with a Fisher Space Pen cartridge containing ink.
2. The ink cartridge may be empty. Replace it with a new one.

PROBLEM: The menu at the top of the tablet does not operate.

1. The menu works only if the software program you're using is designed to use it. Check the manual that came with your software to see if the program uses the menu. If it does, the problem may be that the switches on the back panel of the tablet aren't set correctly. Check the software manual for the proper switch settings, and change them according to the directions in Appendix A of this guide. Once the switches are set correctly, press the RESET button on the back panel of the tablet.

## Hardware Configuration

### Switch Settings

The switches on the back panel of the tablet should be set as shown in Figures 6 and 7, unless the software you're using calls explicitly for different settings. The mode/baud switches set the tablet's mode of operation (the way it responds) and the baud rate (the speed) at which it sends data to the computer. The settings of the program switches determine the form in which information is transmitted to the computer and the rate at which it is transmitted, the resolution of the tablet, whether the tablet will transmit information continuously or only when the computer asks for it, how the menu keyboard operates, and where the origin of the x-y coordinate system is located.

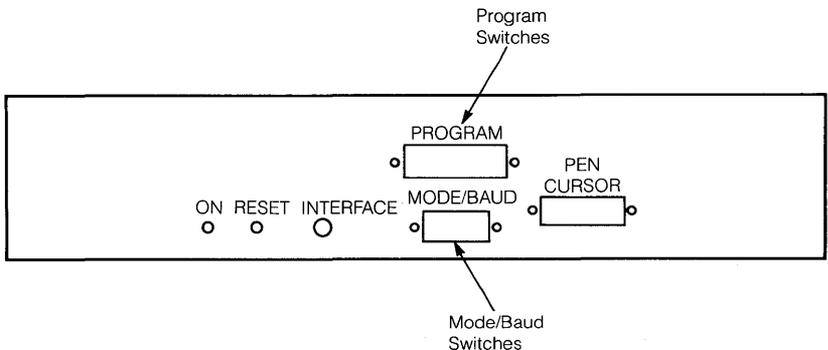


Figure 5: The location of the mode/baud and program switches

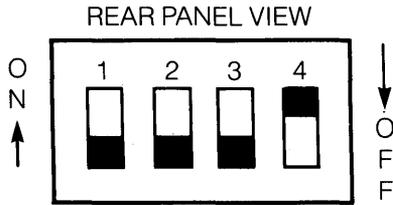


Figure 6: The mode/baud switch settings

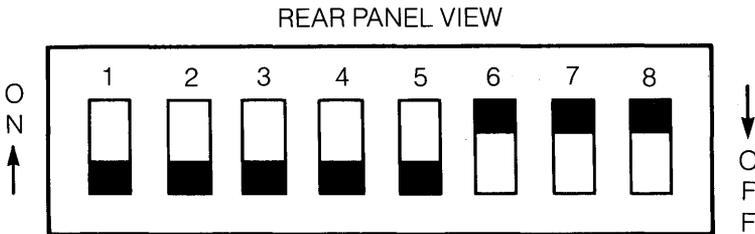


Figure 7: The program switch settings

## Mode/Baud Switches

The settings of the mode/baud switches determine the tablet's baud rate and its initial mode of operation when power is first turned on or when the RESET button is pressed. Once set, the baud rate cannot be changed during operation. The mode of operation, however, can be changed by activating one of the keys on the menu keyboard – provided that the menu keyboard itself has been activated, either by a program switch or by a command from the computer. The mode may also be set by a command from the computer.

- The default mode for the tablet is the AUTO mode: switches 1 and 2 should be in the off position (that is, they should be moved as far as possible toward the bottom of the tablet).
- The default baud rate is 9600: switch 3 should be off (down) and switch 4 on (up). (Program switch 3 must also be set correctly to get the proper baud rate.)

MODE/BAUD		SWITCH POSITION			
		1	2	3	4
SELECTION					
Modes:	Auto	OFF	OFF		
	Draw	OFF	ON		
	Point	ON	OFF		
	Delta	ON	ON		
Baud Rate:					
High	Low				
19200	1200			OFF	OFF
9600	600			OFF	ON
4800	300			ON	OFF
2400	150			ON	ON

Table 1: Setup matrix for the mode/baud switches

## Modes of Operation

The Mindset Graphics Tablet can operate in four modes, depending on the requirements of the software you're using. Again depending on the software, these modes of operation can be set and changed in three ways: by the mode switch settings on the rear panel of the tablet (these determine the initial, or default, mode of operation at the time the computer is turned on); through the menu keyboard above the drawing area; or by command from the software by way of the computer.

The mode switches on the Mindset Graphics Tablet are preset at the factory for the AUTO mode, since this is the most commonly used mode of operation. When different switch settings are required for a particular software program, refer to the software manual for guidance.

**AUTO Mode.** Data is transmitted continuously –

- (1) as long as the pen is near the surface of the active area of the tablet, or
- (2) when the pen switch is activated.

The tablet is operating in the AUTO mode, for example, if a cursor appears on the screen and moves around it whenever you have the pen near, but not necessarily touching, the writing surface.

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**DRAW Mode.** Data is transmitted continuously only when the pen switch is activated. The tablet is in the DRAW mode, for example, when what you're drawing, writing, or tracing appears on the screen only when you press down with the pen.

**POINT Mode.** A single unit of data is transmitted only when the pen switch is activated. If, when you press down with the pen and move it across the tablet, a dot appears on the screen only at the point where you first pressed down on the pen, then the tablet is in the POINT mode.

**DELTA Mode.** When the pen switch is activated, the tablet will transmit a unit of data. After that, the tablet will send a unit of data only when the pen has moved 0.01 inch from its last position.

## Baud Rates

The tablet can transmit information at any one of eight standard baud rates. The rate at which the tablet transmits information is determined by the settings of mode/baud switches 3 and 4 and of program switch 3.

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## Program Switches

The program switches determine the tablet's output format (see next section) and its baud rate, its initial resolution and origin, and the initial state of its menu operation and its I/O protocol when power is first turned on or when the RESET button is pressed. Except for the baud rate and the output format, the major aspects of the tablet's operation can be changed through one of the keys on the menu keyboard or by a command from the computer.

- The default output format for the tablet is binary: switches 1 and 2 should be in the off position (that is, they should be moved as far as possible toward the bottom of the tablet).
- The default baud rate is high: switch 3 should be off (down).
- The default resolution is 200 PPI (points per inch): switch 4 should be off (down).
- The default remote mode is inactive: switch 5 should be off (down).
- The default internal menu operation is inactive: switch 6 should be on (up).

- The default external menu operation is inactive: switch 7 should be on (up).
- The default origin is in the lower left corner of the active area: switch 8 should be on (up).

PROGRAM SELECTIONS	SWITCH POSITIONS							
	1	2	3	4	5	6	7	8
Output Format:								
1	OFF	OFF						
2	ON	OFF						
3	OFF	ON						
4	ON	ON						
Baud Rate:								
High			OFF					
Low			ON					
Resolution:								
200 PPI				OFF				
100 PPI				ON				
Remote Mode:								
Inactive					OFF			
Active					ON			
Internal Menu Operation:								
Active						OFF		
Inactive						ON		
External Menu Operation:								
Active							OFF	
Inactive							ON	
Origin:								
Upper left								OFF
Lower Left								ON

Table 2: Setup matrix for the program switches

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## Output Format

The tablet can transmit information to the computer in any of four formats. Formats 1 and 2, which are binary coded, are standard formats for graphics tablet output. Formats 3 and 4 are nonstandard, but they make possible the tablet's special features, such as the control menu and programmable function keys, variable resolution, and so on.

## Baud Rate

Two ranges of baud rate are available:

switch 3	range	baud rates
off (down)	high	19200, 9600, 4800, 2400
on (up)	low	1200, 600, 300, 150

Mode/ baud switches 3 and 4 must also be set correctly to produce the right baud transmission rate – see Table 1 under “Mode/Baud Switches.”

## Resolution

The tablet can respond to the position of the pen at one of two resolutions:

switch 4	points/inch	x-y range
off (down)	200	x = 0 to 2200 y = 0 to 1700
on (up)	100	x = 0 to 1100 y = 0 to 850

## Remote Mode

When switch 5 is off, the remote mode is inactive, and the tablet transmits data to the computer according to the mode of operation (AUTO, DRAW, POINT, or DELTA) –

- (1) determined by the setting of mode switches 1 and 2, or
- (2) selected from the menu keyboard.

When switch 5 is on, however, the remote mode is active, and the tablet will transmit data only when it receives a command to do so from the computer.

## Internal and External Menu Operations

Switches 6 and 7 together control the operation of the menu keyboard. The menu keyboard may be divided into control keys and function keys:

- Control keys (AUTO through CLEAR) can change the tablet's operations or send a character to the computer when they are selected.
- Function keys (F0 through F9) can only send a character to the computer.

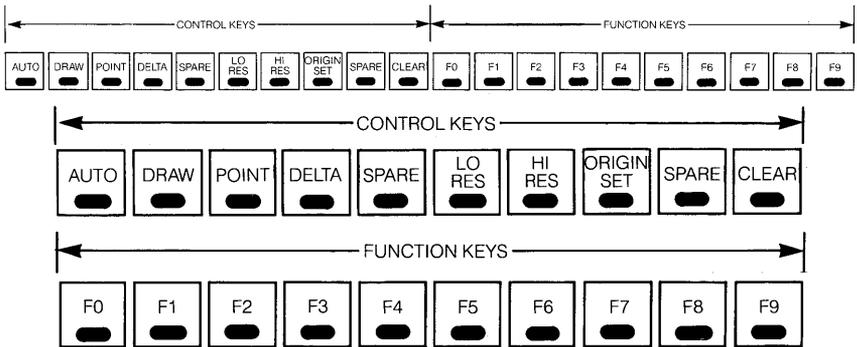


Figure 8: The menu keyboard

If switch 6 is off (down), the control keys, when you touch them with the pen, will change the way the tablet functions. If switch 7 is off (down), the function keys will send one byte of data to the computer. If switch 6 is on at the same time switch 7 is off, the control keys will send a byte of data to the computer rather than change the way the tablet functions. See Appendix B, "The Menu Keyboard," for a more detailed description of the control keys. Table 3 shows the setup matrix for switches 6 and 7.

INTERNAL Switch 6	OFF	OFF	ON	ON
EXTERNAL Switch 7	OFF	ON	OFF	ON
CONTROL KEYS	CHANGE OPERATION	CHANGE OPERATION	SEND MESSAGE	—
FUNCTION KEYS	SEND MESSAGE	—	SEND MESSAGE	—

Table 3: Setup matrix for program switches 6 and 7

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## Origin

The origin is the point of the active area of the tablet where the values of x and y coordinates are zero. You can select one of two origins through switch 8:

- When switch 8 is off (down), the origin is in the upper left corner of the tablet's active area.
- When switch 8 is on (up), the origin is in the lower left corner.

# Appendix B

## The Menu Keyboard

Although some of the menu keyboard control keys have the same names as aspects of the tablet's operation that are determined by the mode/baud and program switches, the results obtained by activating a control key and by setting the corresponding program switch are not necessarily the same. The differences and similarities are noted below.

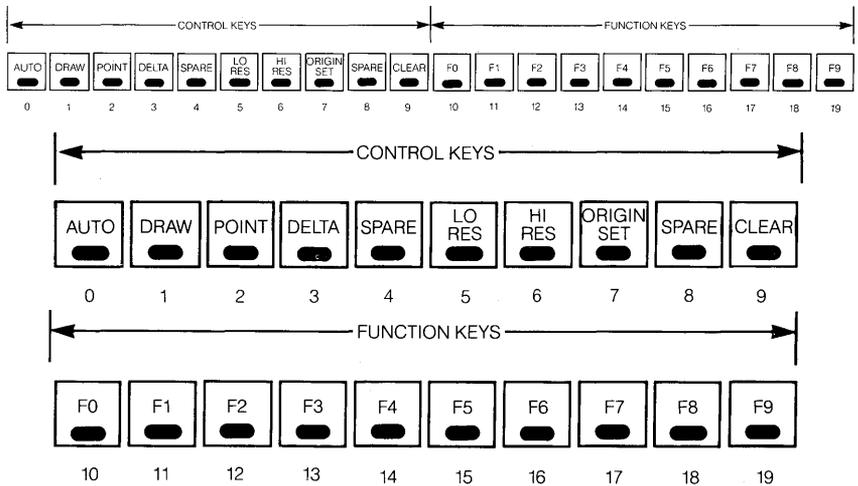


Figure 9: The menu keyboard

### The Control Keys

**AUTO Key.** Data is transmitted continuously as long as –

- (1) the pen is near the surface of the active area of the tablet, or

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(2) the pen switch is activated.

The tablet is operating in the AUTO mode, for example, if a cursor appears on the screen and moves around it whenever the pen is near, but not necessarily touching, the writing surface. The AUTO mode activated through the keyboard is identical to the AUTO mode activated when mode/baud switches 1 and 2 are off.

**DRAW Key.** Data is transmitted continuously only when the pen switch is activated. The tablet is in the DRAW mode, for example, when what you are drawing, writing, or tracing appears on the screen only when the pen switch is activated. The DRAW mode activated through the keyboard is identical to the DRAW mode activated when mode/baud switch 1 is off and switch 2 is on.

**POINT Key.** A single unit of data is transmitted only when the pen switch is activated. If, when you press on the pen and move it across the tablet, a dot appears on the screen only at the point where you first pressed down on the pen, then the tablet is in the POINT mode. The POINT mode activated through the keyboard is identical to the POINT mode activated when mode/baud switch 1 is on and switch 2 is off.

**DELTA Key.** When the pen switch is activated, the tablet will transmit a unit of data. After that, the tablet will send a unit of data only when the pen is moved 0.01 inch from its last position. The DELTA mode activated through the keyboard is identical to the DELTA mode activated when mode/baud switches 1 and 2 are on.

**SPARE Key.** The function of this control key is unspecified by the tablet's microprocessor. Its function can be defined by software. However, the character that it sends to the computer is predefined.

**LO RES Key.** Activating this key sets the resolution of the tablet to one half the resolution determined by program switch 4. Because the effect of switch 4 is absolute and that of the LO RES key is relative, setting program switch 4 to the on position and activating the LO RES key do not always produce the same result:

- If switch 4 is set to off (in which case the resolution is 200 PPI), then activating the LO RES key reduces the resolution to 100 PPI. In that case, activating the LO RES key and setting switch 4 to on produce the same effect: resolution is 100 PPI.

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- But if switch 4 is set to on (in which case the resolution is already 100 PPI), activating the LO RES key reduces the resolution to 50 PPI.

**HI RES Key.** Activating this key sets the resolution of the tablet to the resolution determined by program switch 4. Like that of the LO RES key, its effect is relative, and so it does not always produce the same result as setting switch 4 to on. The only purpose of the HI RES key is to reverse the effect of the LO RES key.

- If program switch 4 is off (in which case the resolution is 200 PPI), activating the HI RES key has no effect whatsoever unless the LO RES key has been activated to reduce the resolution to 100 PPI. Otherwise, even after the HI RES key is activated, the resolution remains at 200 PPI.
- Similarly, if program switch 4 is on (in which case the resolution is 100 PPI), activating the HI RES key has no effect unless the LO RES key has been activated to reduce the resolution to 50 PPI.

**ORIGIN SET Key.** After you've activated the ORIGIN SET key, the point at which you first press down with the pen within the tablet's active area will become the origin ( $X=0$ ,  $y=0$ ). The values of  $x$  and  $y$  will increase and decrease from the new origin depending on where program switch 8 has located the origin (that is, in the upper left or lower left corner of the tablet's active area) and on the tablet's current resolution.

**SPARE Key.** The function of this control key is unspecified by the tablet's microprocessor. Its function can be defined by software. However, the character that it sends to the computer is predefined.

**CLEAR Key.** Activating this key resets the origin to the location defined by program switch 8 (that is, in the upper left or lower left corner of the tablet's active area).

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## The Function Keys

Activating keys F0 through F9 sends a predefined character to the program you're using with the tablet. Function keys can be used by a software program for a variety of purposes, such as printing or plotting operations, saving data to a disk or loading it from a disk, calling new programs or subroutines, or requesting tablet setup delimiters to be downloaded from the software.

# Appendix C

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## The RS-232-C Interface Connector

The RS-232-C cable that comes with your Graphics Tablet is equipped with a 25-pin female connector (type DB-25S).

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PIN #	TABLET FUNCTION	PIN #	TYPICAL COMPUTER FUNCTION
1	Ground/Return (Shield)	1	Ground
2	Receive Data In	2	Transmit Data Out
3	Transmit Data Out	3	Receive Data In
4	Clear to Send (Optional)	4	Request to Send
5	Tied to +12VDC, 300 Ohms	5	Clear to Send
6	Tied to +12VDC, 300 Ohms	6	Data Set Ready
7	Signal Ground	7	Signal Ground
8	Tied to +12VDC, 300 Ohms	8	Carrier Detector
20	Tied to +12VDC, 300 Ohms	20	Data Terminal Ready
9	+12VDC	9	+12VDC
10	+5VDC	10	+5VDC
18	-12VDC	18	-12VDC

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Table 4: The pin configuration of the RS-232-C connector

The connector is normally shipped as shown above, with pin 4 disconnected. The tablet does not require a "clear to send" signal to operate. If pin 4 is connected, you must have a logic one input or the tablet will be inhibited.

# Appendix D

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## Specifications

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Performance	Resolution	Programmable to 200 points per inch
	Accuracy	± .025 inch
	Conversion rate	To 200 x and y coordinate pairs plus status per second
Active Area	Writing area	8.5 x 11 inches (216 x 280 mm)
	Menu keyboard	20 positions on 1 x 11-inch area (34 x 280 mm)
Transducer	Pen	Equipped with dry stylus (can be replaced with Fisher Space Pen cartridge with ink)
Modes of operation	Switch selectable power on or reset (default) modes	Auto, Draw, Point, Delta, and external
	Menu selectable	Auto, Draw, Point, Delta, Resolution, and Origin

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Interface	Serial RS-232	6-foot cable equipped with DB-25S female connector
	Formats	Binary or ASCII (BCD) (switch selectable)
	Baud rate	To 19200 Baud (switch selectable)
Microprocessor	Z8	Factory programmed
Technology	Electrostatic	
Mechanical	Tablet with electronics	12 x 13.5 inches (305 x 343 mm)
	Weight	3.5 lbs
Active/total area ratio	65%	
Environment	Ambient temperature	60°F to 104°F (15°C to 40°C)
	Shock and vibration	Withstands normal office or computer room operation
	Duty cycle	Continuous
Electrical	DC power	+5VDC, 250 mA +12VDC, 100 mA -12VDC, 100 mA