Operating Instructions

MSX TABLET
PX-TB7

Thank you for buying this Pioneer product.
Please read through these operating instructions and then you will know how to operate your model properly. After you have finished reading the instructions, put them away in a safe place for future reference.
In accordance with the power and voltage requirements of differing areas, the following model names are used to designate models with differing electrical specifications.

PIONEER®

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CONTENTS

Introduction 2
Applications 2
Before Operation 3
Connections 4
Panel Facilities 5
Operation 5
Specifications 6
Troubleshooting 6
Interface 7

This unit is made to function by commands sent from a personal computer. In order to obtain optimum performance from your unit, read through these instructions together with the "BASIC INSTRUCTIONS" accompanying the personal computer.

INTRODUCTION

Thank you very much for having purchased this PX-TB7 tablet manufactured by PIONEER.
The PX-TB7 tablet has been developed by PIONEER using the latest advances in technology as a simple input device for PIONEER's personal computer (the PX-7) and for MSX personal computers in general. It features superb operational ease as a digitizer and handwritten input device.

Before proceeding to operate your tablet, take the time to read through all the instructions in this manual. This will enable you to use the functions of your tablet to maximum effect.
Place these instructions in a safe place for future reference. Should you need to consult them, you will then know where they are.

APPLICATIONS

What the tablet can do for you

This tablet is a simple input device. By means of a personal computer, it allows you to print out using a printer, or display using a monitor or TV screen, characters, letters and pictures exactly as they were written or drawn by hand on the tablet, without complicated operations and procedures. Drawing graphics and patterns using a keyboard demands a great deal of both time and effort since the coordinates of the picture elements making up the graphics or patterns must be calculated or measured. The tablet, on the other hand, frees you from this tedium: all you have to do to draw a picture or pattern is input a simple program.

The PX-TB7 has been designed to display top-notch operational ease, and it has the following features.

- A5 size plain paper can be used.
  A5 size paper (148 x 210 mm), which is easily obtainable at a stationery store, can be used as it is. If it is not easy to obtain A5 size paper, simply cut A4 size paper in half. Each half will then have dimensions identical to those of A5 size paper.
- A clamp is provided to secure the paper.
  The paper can be held firmly with the clamp provided. There is less chance that the paper will move while a picture or pattern is being drawn.
- The "touch pen" has a switch function.
  The pen is provided with a switch which functions in exactly the same way as the switch on the tablet itself. This means that, while moving the pen, you can easily operate the switch with the same hand. This also comes in handy when using the overlay sheet with the accessory ROM cartridge.

MSX is a trademark of Microsoft Corp. of the U.S.

BEFORE OPERATION

① **Do not press down hard on the pen when writing.**
The surface of the panel, on which the graphics, pictures and patterns are created, is structured with thin resistive sheets piled on top of one another with very small intervals between. Therefore, it does not take kindly to rough use or extremely firm or strong pressure.

② **Place the paper over the surface for use.**
For use, first place a sheet of A5 size paper on top of the panel surface to prevent the surface from being scratched or marked.

③ **Use a pen with a soft tip.**
Use the accessory "touch pen" to write on the panel. This will prevent the surface from being scratched or marked. If you want to use a felt-tipped pen, make sure that the tip is round and soft. Avoid using ball-point pens, fountain pens and all other pens with a sharp or hard point.

④ **When disconnecting the connecting cord, hold the plug—not the cord itself—and pull free.**
The cord may break if the cord is tugged instead of the plug. Do not pass the cord underneath furniture or between objects which might damage it. Do not allow knots to be formed in the cord.

Refer to the separate Video Art Operating Instructions for details on how to handle the accessory ROM cartridge and overlay sheet.

⑤ **Avoid use in very hot or very humid locations.**
Do not place the unit in a location where it will be exposed to direct sunlight or by the side of a heating appliance. This may adversely affect the cabinet and the internal parts. Placing the unit in an excessively damp or dusty place will invite breakdowns and failures. (Avoid placing or using the unit on a kitchen table or in a place subject to soot, steam or heat.)

⑥ **Do not attempt to inspect or modify the inside parts.**
Do not open the cabinet to inspect inside or make adjustments. PIONEER will not be held responsible for any deterioration in performance resulting from remodeling or a modification conducted by a customer.

⑦ **Take care when using the unit near water.**
If water is spilled over the panel surface, first wipe it off with a dry cloth and then allow the unit to dry out in a normal temperature before use.

Cabinet maintenance

Use a soft, dry cloth to clean the cabinet. If the cabinet is badly stained or soiled, dip a soft cloth into a diluted solution of water and neutral detergent, wipe off the stains and then wipe dry with a dry cloth. Do not use benzene, thinners, insecticides or other volatile chemicals on or near the cabinet or panel surface since these substances will corrode the surface.

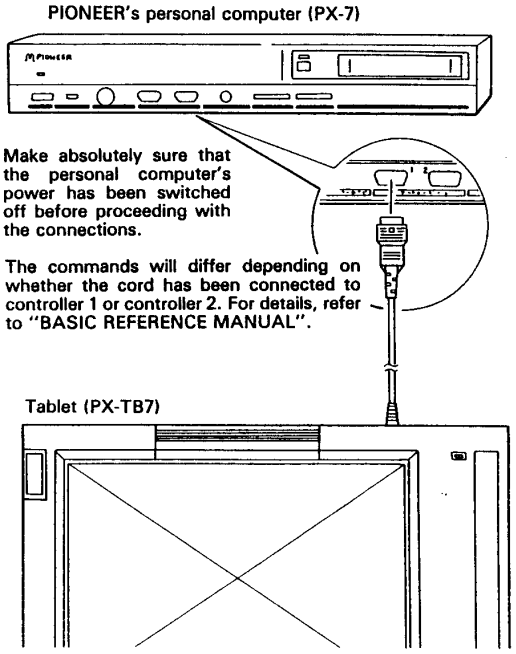
CONNECTIONS

Connection with PIONEER's personal computer (PX-7)

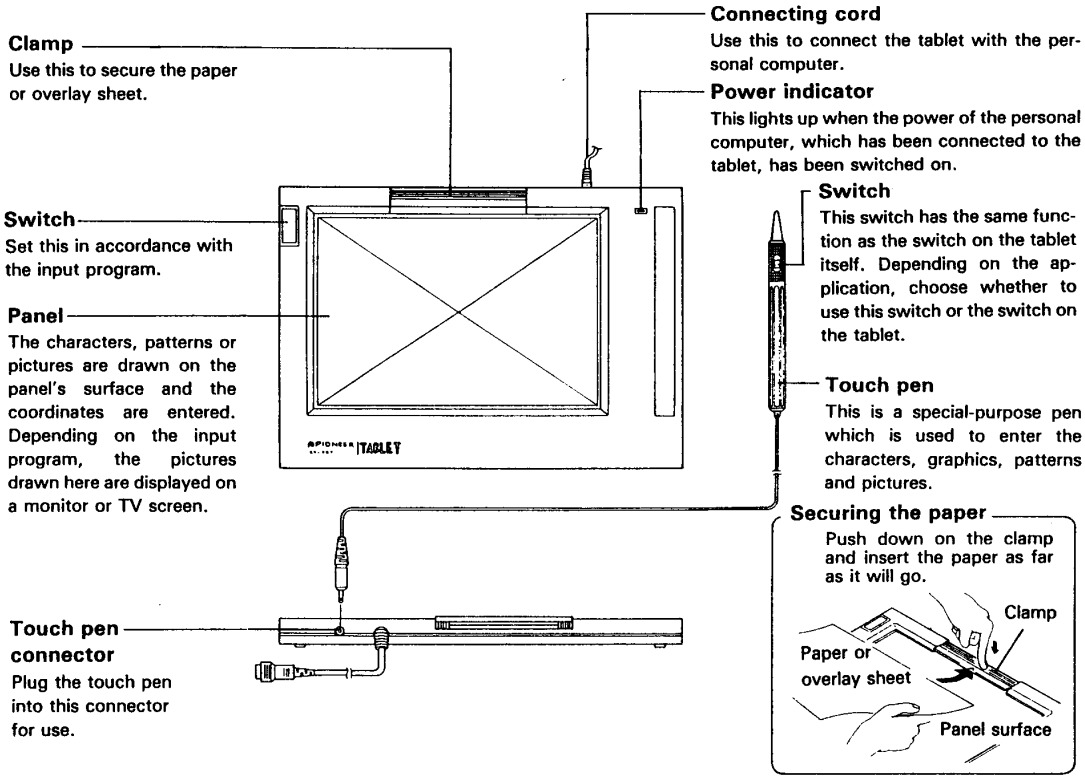
Connect the other end of the connecting cord to the controller 1 or controller 2 on the PX-7 personal computer. The commands will differ depending on whether the cord has been connected to controller 1 or controller 2.

Connection with an MSX personal computer of another make

Connect to the joystick connector when connecting the tablet to an MSX personal computer made by another company.
For details, refer to the Operating Instructions of the personal computer in question.



PANEL FACILITIES



OPERATION

1. Ready the paper.
   Ready a sheet of A5 size plain paper (with a thickness of about 0.1 mm).
2. Push down on the clamp and insert the paper.
3. Proceed to use the touch pen for input.
   When a point on the panel is pushed with the pen-tip, its coordinates are input from the tablet to the personal computer. When the pen is moved while it is pressed down on the panel, the coordinates of the respective points will be continuously input as long as the pen is moved.

- Pressing down on the panel at two points simultaneously will prevent the coordinates from being input properly. Always press down at one point at a time.
- The coordinates being input will become imprecise if the pen tip is moved too rapidly.

NOTE:

- *Even when a straight line is drawn on the panel, there may be gaps in the line which is displayed on the monitor or TV screen. This is due to the fact that the lowest order bits of the coordinate data are changed by an error in the analog-to-digital conversion of the panel input. It does not indicate that anything is wrong with the tablet.*
- *If the cabinet casing is subjected to a strong pressure, the panel may be pushed down around the edges of the casing which will interfere with proper input.*
- *If the panel surface is held while something is drawn or written on the panel, more than one point will be input. This means that the proper coordinate data will not be input. Always use the pen-tip for input.*

SPECIFICATIONS

Effective panel dimensions ..... X axis: 205 mm
Y axis: 140 mm
Resolution ..... 8 bits X axis: 0.7 mm (typical value)
Y axis: 0.54 mm (typical value)
0—255 (00—FF in hexadecimal format) are output as the coordinate data for both the X and Y axes.
A/D conversion error ..... ± 2 LSB (maximum)
Dimensions ..... 296(W) x 18(H) x 210(D) mm
Weight ..... 720 g
Power requirements ..... DC 5 V ± 5%
Load current: 50 mA or less
Operating conditions ..... Operating temperature:
0°C to +40°C
Storage temperature: −15°C to +60°C

Accessories

Operating instructions 2
After-sales servicing network 1
Touch pen 1
ROM cartridge 1
Overlay sheet 1

NOTE:
Specifications and design subject to possible modifications without notice due to improvement.

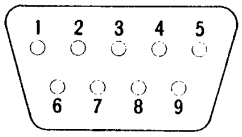
TROUBLESHOOTING

Incorrect operations are often mistaken for trouble and malfunctions. If you think that there is something wrong with your tablet, check out the points below. If the trouble cannot be rectified even after carrying out the checks below, contact your nearest PIONEER authorized service center or your dealer.

① Has the connecting cord been disconnected?
② Has the program been input properly?
③ Have you used the touch pen properly?
④ Has the personal computer been operated properly?
⑤ Is the paper being used too thick? (it should be about 0.1 mm thick.)
⑥ Has the ROM cartridge been inserted properly?

INTERFACE

<Connector>



Pin no.	Symbol	Signal	I/O
1	$\overline{\text{SENSE}}$	Touch sense signal	Output
2	EOC	A/D conversion end signal	Output
3	SO	Serial output signal	Output
4	$\overline{\text{SW}}$	Switch signal	Output
5	DC5V	DC5V power input	
6	$\overline{\text{SCK}}$	Serial clock signal	Input
7	SI	Serial input signal	Input
8	$\overline{\text{CS}}$	Select signal	Input
9	GND	Signal ground	

① **$\overline{\text{SENSE}}$**

This is the detection signal for panel input. When a panel input is present, a low-level signal is output in synchronization with the select signal ($\overline{\text{CS}}$).

② **EOC**

This signal indicates that the A/D conversion of the panel input has been completed. A high-level signal is output. A/D conversion starts as soon as the select signal ($\overline{\text{CS}}$) is released and it is completed in about 150 sec. The EOC signal is set low when the select signal is input, and it reverts to high when the select sigal is released and A/D conversion is completed.

③ **SO**

When the select signal ($\overline{\text{CS}}$) has been input, the 8-bit A/D converted data are output in sequence starting with the most significant bit at the fall of the serial clock signal ($\overline{\text{SCK}}$). When the select signal is high, the SO signal is kept in the high-level output state.

④ **$\overline{\text{SW}}$**

This signal indicates the status of the tablet's switch or the status of the switch on the touch pen. The signal is low when the switch is "on."

⑤ **DC5V**

This is the input pin of the DC 5V power supply.

⑥ **$\overline{\text{SCK}}$**

The serial clock signal controls the shift operation of the serial input/output.

⑦ **SI**

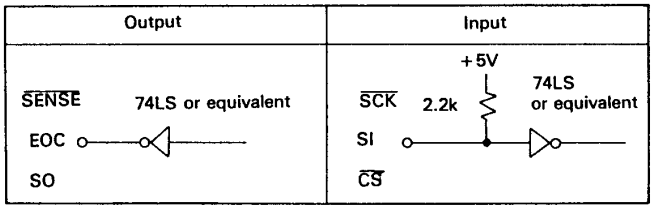
This serial input signal specifies the X and Y coordinates entered from the panel. A low signal is input when reading the X coordinate and a high signal is input when reading the Y coordinate.
When the select signal ($\overline{\text{CS}}$) is input, the SI input reads in the coordinates at the 7th and 8th rises of the serial clock signal.

⑧ **$\overline{\text{CS}}$**

This is the select signal. A low signal is input with serial input/output. When it is high, the A/D conversion mode is established and serial input/output is inhibited.

⑨ **GND**

This is the signal ground. It applies a ground potential to all the signals.

■ All input and output operations are executed at the TTL level.

Input/output circuitry