GENERAL INFORMATION - Portable PC

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Product Description

The IBM Portable Personal Computer consists of a variety of options to meet present and future needs.

The following are features of the IBM Portable Personal Computer:

- Power Supply
  - Manually switched to support 115 Vac or 230 Vac
  - 114 Watts.
- System Board (XT)
  - 8088 Microprocessor
  - 7 Expansion Slots(with 62-pin card edge sockets)
  - 256K base Random Access Memory (RAM).
- Speaker
- 360K Diskette Drive (Slimline)
- 83-Key Keyboard
- Composite Amber Internal Display.

Note: An IBM Color Display may be attached with no modifications to the system.

Option Compatibility

Incompatible Adapters and Terminating Resistors

Incompatible Adapters

Certain option adapters are not compatible when used in the same system.

1. The following adapters should not be installed together in the system unit:

   - Synchronous Data Link Control (SDLC)
   - Alternate Binary Synchronous Communications (Alt BSC).

2. Possible problems may occur in the system because of adapters that share the same interrupt level. Check the adapter interrupt levels to be sure that they do not conflict. If the adapters have selectable interrupt levels, be sure their jumpers are not set for the same level.

Terminating Resistors

Terminating resistors are required on certain diskette and fixed disk drives for proper operation of the drive.

These drives always require a terminating resistor:

- Diskette Drive A
- Fixed Disk Drive C.

Always remove the terminating resistor from:

- Diskette Drive B
- Fixed Disk Drive D.

The IBM Portable Personal Computer can have a total of only 640K of RAM installed in the system unit, regardless of where the memory is installed (system board or on memory expansion cards).

IBM Portable Personal Computer

The following may be installed only in the system unit:

- Color/Graphics Monitor Adapter
- Memory Expansion Options
- Diskette Drive Adapter
- PC Network Adapter.

The following may be installed only in the expansion unit:

- Monochrome/Printer Adapter
- Professional Graphics Controller.

The Enhanced Graphics Adapter is not supported for use in the Portable.

All other adapters may be installed in either the system unit or expansion unit.

Operating Requirements

This describes the operations that take place from the time the system is turned on until the minimum operating requirements have been met.

Power Supply

The power supply for the IBM Portable Personal Computer is a manually switched, 115 Vac or 230 Vac supply. The ac current is converted to dc outputs which supply the system with proper operating voltages.

Whenever the power supply has been off for a minimum of one second and then switched on, the power supply generates a 'power-good' signal. The 'power-good' signal resets system logic, indicates proper operation of the power supply, and gives the system board advance warning of voltage loss when the system is switched off.

The 'power-good' signal ranges from 0.0 to 0.4 Vdc when any output is below its minimum undervoltage (UV) sense level and increases to 2.4 to 5.25 Vdc when all power supply output voltages are present and above their minimum UV sense levels.

Output (Vdc)	Minimum UV Sense Level (Vdc)
+ 5.0	+ 4.5
− 5.0	− 4.3
+12.0	+10.8
−12.0	−10.2

Once the minimum UV sense levels are established and the 'power-good' signal has risen to its active level, all system board power requirements have been met.

System Board

The major components of the system board that will be discussed are the 8088 microprocessor and ROM BIOS.

Microprocessor

The microprocessor is the action center of the system. It interprets and carries out instructions. The 8088 is an 8-bit microprocessor, with a clock speed of 4.77 MHz.

ROM BIOS

The ROM BIOS contains instructions and routines that make the system perform in a particular manner. It is responsible for the major I/O devices (such as keyboard, diskette, fixed disk drives, and video) in the system. Some adapters may have their own ROM modules that contain extended routines that work in conjunction with the system board ROM BIOS. The routines for performing the power-on self test (POST) are also contained in the ROM BIOS.

Power-On Self Test (POST)

The POST is initiated automatically with each power-on of the system. The POST can be invoked at any time by pressing the Ctrl key, the Alt key, and the Del key at the same time, then releasing them.

The POST is a series of system checks and initialization which verifies the correct operation of the base system. There are two classifications of malfunctions which may be detected during the POST: critical and non-critical.

Critical malfunctions are those which prevent the system from operating at all or which could cause incorrect results that are apparent to the user. Examples of critical errors include processor or interrupt controller malfunctions.

Non-critical malfunctions are those which could cause incorrect results which may not be apparent to the user. An example of a non-critical error would be a memory chip failure.

If a critical error is detected during the POST, an attempt will be made to indicate the error and all testing will halt. On a non-critical error, an error code will be displayed and testing will

continued. On a Portable PC a non-critical error may be bypassed by pressing the F1 key.

After a successful POST, where no critical errors were detected, a single short beep will be generated. Control is then given to the system boot strap loader.

It is important to remember that the POST does not test all areas, but only those that allow the system to be operational enough to run the "Advanced Diagnostics" program.

System Memory

The following figure shows an example of how memory is assigned on a system board. The address is an identifier for a particular part of memory. The addresses run sequentially (in hexadecimal notation) starting at 000000 and ending at FFFFFF.

Address in Hex	Memory	Function
00000	BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB	256K RAM On System Board
to 7FFFF	BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB	256K RAM On System Board
8000 to 9FFFF	BBBBBBBBBBBBBBBB BBBBBBBBBBBBBBBB	128K RAM On I/O Adapter
A0000 to BFFFF	RRRRRRRRRRRRRRR RRRRRRRRRRRRRRR	128K Video RAM Reserved For Graphics Display Buffer
C0000 to DFFFF	RRRRRRRRRRRRRRR RRRRRRRRRRRRRRR	192K Reserved For ROM on I/O Adapters
	RRRRRRRRRRRRRRR	Reserved
F0000 to FFFFF	RRRRRRRRRRRRRRR	Reserved ROM on System Board

B=Base Memory

R=Reserved

Environmental Specifications

IBM Portable Personal Computer

Size

- Length: 508 millimeters (20 inches)
- Depth: 432 millimeters (17 inches)
- Height: 203 millimeters (8 inches).

Weight

- 13.7 kilograms (30 pounds)

Environment

- Air Temperature
  - System On: 15.6 to 32.2 degrees C (60 to 90 degrees F)
  - System Off: 10 to 43 degrees C (50 to 110 degrees F).

- Humidity
  - System On: 8% to 80%
  - System Off: 20% to 80%.

- Altitude
  - Maximum altitude: 2133.6 meters (7000 feet)

Heat Output

- 717 British Thermal Units (BTUs) per hour

Noise Level

- 49.5 decibels average-noise rating with Monochrome Display and Expansion Unit attached

Electrical

- 115V Power Supply
  - Nominal - 120 Vac
  - Minimum - 104 Vac
  - Maximum - 127 Vac.
- 230V Power Supply
  - Nominal - 230 Vac
  - Minimum - 200 Vac
  - Maximum - 240 Vac.

IBM Personal Computer Expansion Unit

Size

- Length: 500 millimeters (19.6 inches)
- Depth: 407 millimeters (16.1 inches)
- Height: 140 millimeters (5.5 inches).

Weight

- 14.9 kilograms (33 pounds)

Environment

- Air Temperature
  - System On: 15.6 to 32.2 degrees C (60 to 90 degrees F)
  - System Off: 10 to 43 degrees C (50 to 110 degrees F).

- Humidity
  - System On: 8% to 80%
  - System Off: 20% to 80%.

- Altitude
  - Maximum altitude: 2133.6 meters (7000 feet)

Heat Output

- 717 British Thermal Units (BTUs) per hour

Electrical

- 115V Power Supply
  - Nominal - 120 Vac
  - Minimum - 104 Vac
  - Maximum - 127 Vac.
- 230V Power Supply
  - Nominal - 230 Vac
  - Minimum - 200 Vac
  - Maximum - 240 Vac.

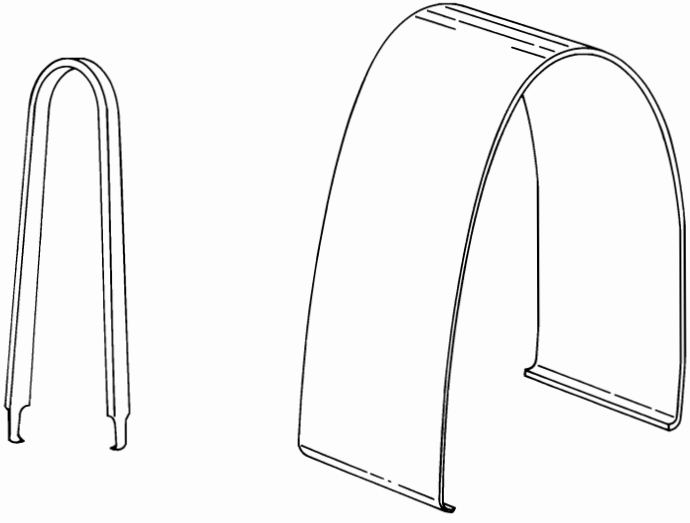
Special Tools

The following special tools are required to service the IBM Portable Personal Computer:

A meter similar to the Triplett Model 310.[1]

Module Pullers

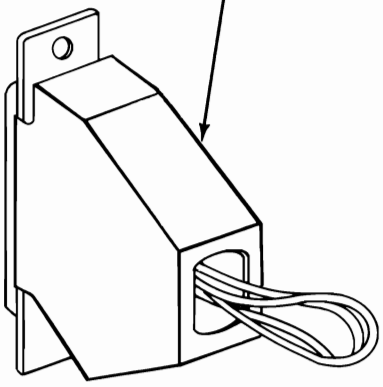
A tweezer-like module puller similar to those shown below. (Used to remove the memory modules.)



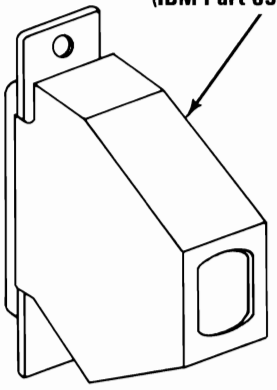
[1] Manufactured by Triplett Corporation, Bluffton, Ohio 45817

Wrap Plugs

IBM Communications Adapter
Wrap Plug (IBM Part 8529280)



Printer Adapter
Wrap Plug
(IBM Part 8529228)



Cluster
Terminating
Plug
(IBM Part 6323481)

Notes: