FRONT

PICTURE 1

October 22, 1991

Part Number 04G5111

Form Number S04G-5111-00

EDITION Edition Notice
Safety Information

Refer to the *Hardware Maintenance Reference General Information*
pamphlet in this manual for the following information:

    General Safety

    Electrical Safety.

First Edition (October 1991)

**The following paragraph does not apply to the United Kingdom or any
country where such provisions are inconsistent with local law.**
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION
"AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED,
INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF
MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do
not allow disclaimer or express or implied warranties in certain
transactions, therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical
errors. Changes are periodically made to the information herein;
these changes will be incorporated in new editions of the publication.
IBM may make improvements and/or changes in the product(s) and/or the
program(s) described in this publication at any time.

It is possible that this publication may contain reference to, or
information about, IBM products (machines and programs), programming,
or services that are not announced in your country. Such references
or information must not be construed to mean that IBM intends to
announce such IBM products, programming, or services in your country.

Requests for technical information about IBM products should be made
to your IBM Authorized Dealer or your IBM Marketing Representative.

IBM may have patents or pending patent applications covering subject
matter in this document. The furnishing of this document does not
give you any license to these patents. You can send license
inquiries, in writing, to the IBM Director of Commercial Relations,
IBM Corporation, Armonk, NY 10577.

FRONT_1 Notices
References in this publication to IBM products, programs, or services do
not imply that IBM intends to make these available in all countries in
which IBM operates. Any reference to an IBM product, program or service
is not intended to state or imply that only IBM's product, program, or
service may be used. Any functionally equivalent product, program, or
service that does not infringe any of IBM's intellectual property rights
or other legally protectible rights may be used instead of the IBM
product, program, or service. Evaluation and verification of operation in
conjunction with other products, programs, or services, except those
expressly designated by IBM, are the user's responsibility.

IBM may have patents or pending patent applications covering subject
matter in this document. The furnishing of this document does not give
you any license to these patents. You can send license inquiries, in
writing, to the IBM Director of Commercial Relations, IBM Corporation,
Purchase, NY 10577.

Subtopics
FRONT_1.1 Trademarks and Service Marks

FRONT_1.1 Trademarks and Service Marks

The following terms, denoted by an asterisk (*) in this publication, are
trademarks of the IBM Corporation in the United States and/or other
countries:

```
IBM                 Personal System/2
PS/2                Micro Channel.
```

The following terms, denoted by a double asterisk (**) in this
publication, are trademarks of other companies:

```
80386SX     Intel Corporation.
```

1.0 Product Description

The IBM (*) Personal System/2 (*) Model N51 SX (hereafter called Model N51) is a notebook-size computer that uses the IBM Micro Channel (*) architecture. With an internal rechargeable battery, the Model N51 operates outside an office environment as well as where external power source is available. The features of the Model N51 include:

    Security: power-on password and keyboard password
    System board:
-   16-MHz 80386SX (**) microprocessor
-   Minimum of 2MB (MB equals 1 048 576 bytes) random access memory
    (RAM), up to 10MB expandability on the system board
-   Complementary metal-oxide semiconductor (CMOS) RAM with a
    real-time-clock and an 8KB (KB equals 1024 bytes) CMOS RAM
    extension, to store configuration and status information
-   Read-only memory basic input/output system (ROM BIOS)
-   Diskette-drive controller
-   Hard disk drive (fixed disk drive) with system partition supported
-   Video Graphics Array (VGA) with Liquid Crystal Display (LCD)
    controller
-   LCD panel connector
-   Serial port
-   Parallel port
-   External-display port
-   System-expansion port
-   Keyboard controller
-   External input device port
-   Optional communication-interface connector for:
        Internal data/fax modem (U.S./Canada only)
        Secondary serial adapter.
-   Suspend and resume functions
    A maximum 640 by 480 PELs, 32 shades of gray addressable LCD with a
    back light
    Reverse video switch
    Power source:
-   Rechargeable battery pack
-   AC adapter, automatically switches to the 90 - 137 V ac or the 180
    - 264 V ac range, 50 or 60 Hz
-   Car battery adapter, 12 V dc.
    84/85-key keyboard physically unique to the Model N51
    Speaker with a volume control.

 (*) IBM, Personal System/2, and Micro Channel are trademarks of
    the International Business Machines Corporation.

 (**) 80386SX is a trademark of the Intel Corporation.

Subtopics
1.1 Security
1.2 System Board Features

1.1 Security

Subtopics
1.1.1 Power-On Password and Keyboard Password

1.1.1 Power-On Password and Keyboard Password

System access can be denied by using a power-on password or keyboard
password. To service a system with an active and unknown password,
power-off the system and do the following.

1. Remove the battery pack and the bottom cover (see "1010 Bottom Cover"
    in topic 6.1).
2. Identify the password-override connector on the system board (see
    "System Board" on page 7.5).
3. Install a jumper over the pins at position 1.

    PICTURE 2

4. To cancel the password, power-on the system and leave it until the
    POST ends.
5. Power-off the system and remove the jumper.
6. Reinstall the bottom cover and the battery pack.

```
+--- Important ----------------------------------------------------------+
¦                                                                        ¦
¦ Remove the jumper from the password-override connector.  Otherwise, a  ¦
¦ power-on password can never be reactivated.                            ¦
¦                                                                        ¦
+------------------------------------------------------------------------+
```

To reactivate the password, you must start the system, select the **Set
features** option from the Main Menu, then select **Set password and
unattended start mode** and follow the instructions.

1.2 System Board Features

The major features of the system board are:

    80386SX Microprocessor
    CMOS RAM and CMOS RAM extension
    ROM BIOS
    Diskette-drive controller
    VGA with LCD controller
    Serial port
    Parallel port
    External input device port
    Optional communication-adapter slot
    Suspend and resume functions
    System-expansion port

Subtopics
1.2.1 Microprocessor
1.2.2 CMOS RAM and CMOS RAM Extension
1.2.3 ROM BIOS/POST
1.2.4 System Partition
1.2.5 Errors during POST
1.2.6 Diskette-Drive Controller
1.2.7 VGA with LCD Controller
1.2.8 Serial Port
1.2.9 Parallel Port
1.2.10 External Input Device Port
1.2.11 Optional Communication-Interface Connector
1.2.12 Suspend and Resume Functions
1.2.13 System-Expansion Port

1.2.1 Microprocessor

The microprocessor interprets and carries out instructions. The 80386SX
microprocessor is a 32-bit processor with a 16-bit external data bus and a
24-bit external address bus. The microprocessor operates in two modes:
real-address mode and virtual-address (protected) mode. The
microprocessor speed is selectable and its maximum speed is 16 MHz.

1.2.2 CMOS RAM and CMOS RAM Extension

The CMOS RAM provides 64 bytes of storage. The real-time clock uses the
first 14 bytes of this storage to track the date, time, and battery level.
The remaining 50 bytes are assigned to store system configuration and
security information. The 8KB CMOS RAM extension stores additional
configuration and system status information.

The data stored in CMOS RAM and CMOS RAM extension is kept active by the
backup battery when the system is powered-off. If the stored data is lost
due to a depleted or removed battery, the data can be restored using one
of the following methods:

    If the user has a customized configuration that uses settings other
    than the default, run the **4. Restore configuration** option from the
    system utility programs stored on the hard disk.

    If the configuration settings use the default, run the **5. Automatic
    configuration** option from the system utility programs stored on the
    hard disk.

1.2.3 ROM BIOS/POST

Read Only Memory - Basic Input/Output System (ROM BIOS) contains the
instructions and routines that control the keyboard, diskette drive, hard
disk drive, displays and other major I/O devices in the system. Some
adapters have their own ROM modules containing extended BIOS routines that
work with the system board ROM BIOS. The routines for performing the
power-on self-test (POST) are also contained in the ROM BIOS.

1.2.4 System Partition

The Model N51 has a protected partition, called the system partition, on
the hard disk that contains system setup and utility programs, customer
and advanced diagnostics, and system-configuration data set. All
necessary functions provided by the Reference Diskette are also on this
partition and can be loaded by pressing and holding Ctrl+Alt+Delete and,
as soon as the cursor moves to the upper right corner of the screen,
pressing and holding Ctrl+Alt+Insert. The Reference Diskette is reserved
to restore its contents on the system partition when you replace a hard
disk drive or when a hard disk problem prevents the system from starting
from this partition.

The system-configuration data set holds up to nine different configuration
data. The configuration data allows you to use the system without running
the automatic configuration after the system configuration has been
changed by attaching or removing a communications cartridge to or from the
system expansion port. On each power-on-reset, the POST compares the
current system configuration with the one stored in the CMOS RAM and CMOS
RAM Extension. If both configurations are the same, the POST continues to
test the system. If any differences are found, the POST looks for the
same configuration in the system-configuration data set on the system
partition, and selects the right configuration, then updates the
configuration in the CMOS RAM and CMOS RAM Extension. The
system-configuration data can be updated and removed by using the system
utility programs. Any format command provided by an operating system has
no effect on formatting the system partition.

1.2.5 Errors during POST

If the POST detects a problem during access on the system partition, an
I99800XX or **I9990303** error code is displayed. If this happens, do the
following:

1. Start the system with the customer's backup copy of the Reference
    Diskette installed.

    Note: The languages of the Reference Diskette and the system must
          match.

2. Select the **2. Backup/Restore system programs** from the Main Menu.
3. Select the **3. Restore the system partition** option to load the system
    setup and utility programs, and the customer and advanced diagnostic
    programs onto the system partition of the hard disk.

1.2.6 Diskette-Drive Controller

The controller connects to the diskette drive through two interface
connectors on the system board using a flexible cable. Both signals and
voltages, are supplied through this cable. These signals and voltages can
only operate one IBM 3.5-inch diskette drive.

1.2.7 VGA with LCD Controller

The VGA with LCD controller is on the system board and supports color and
monochrome analog direct-drive displays in a variety of alphanumeric (A/N)
text and all-points-addressable (APA) graphics modes. The VGA with LCD
controller supports a maximum of 720 by 400 (640 by 400 on LCD) picture
elements (PELs) in text mode, and a maximum of 640 by 480 PELs in graphics
mode. The VGA with LCD controller is capable of displaying 256 colors or
64 (32 on LCD) shades of gray at one time. Composite video is not
supported.

1.2.8 Serial Port

The serial port is fully programmable and is capable of asynchronous
communications at a maximum speed of 19.2 kb/s. The 9-pin D-shell
connector provides the signals to drive a standard EIA-232D device. The
connected device is identified by the system configuration as either
SERIAL_1 or SERIAL_2. If an optional communication slot with a serial
adapter is installed, the device address must be different from the
primary one.

Note: Conflicts occur when two or more devices have the same address.
Use the **4. Set configuration** option from the system utility
programs stored on the hard disk. Select **1. View configuration** to
verify that no two ports have the same address.

1.2.9 Parallel Port

The parallel port allows the attachment of devices that accept 8 bits of
parallel data at standard transistor-transistor logic (TTL) levels. The
port has a 25-pin, D-shell connector and is designed primarily for
printers. However, the port can be used as a general input/output port
for any device or application that matches its input/output capabilities.
The system can support four different devices, each addressed separately
as PARALLEL 1, PARALLEL 2, PARALLEL 3, or PARALLEL 4.

1.2.10 External Input Device Port

The external input device port is located at the rear of the system and
accepts a mouse or 17-key numeric keypad. The Model N51 has only one
input-device connector. However, it is possible to connect the numeric
keypad and the mouse at the same time through another input-device
connector located at the rear of the numeric keypad.

1.2.11 *Optional Communication-Interface Connector*

This option connector can accept either a secondary serial adapter or an
internal data/fax modem. The serial adapter complies with EIA-232D
standard and provides alternative input/output capabilities that have the
same function as the primary serial port on the rear of the system. The
internal data/fax modem is a dual-function modem that can operate as a G3
facsimile as well as a data modem.

1.2.12 Suspend and Resume Functions

The suspend and resume functions are unique methods to minimize the use of
power from the battery. When the computer enters suspend mode, all tasks
are suspended and their present states are stored in memory to save power.
In suspend mode, the system is placed in a sleep state where only a
minimum amount of power is consumed.

When the system returns to normal operational mode using the resume
function, the system restores the same states as when it entered suspend
mode.

The system enters suspend mode when:

    Closing the lid.
    Spending the time specified by ***System power off*** option in the Set
    Advanced Features program.
    Detecting a battery-low condition (an orange LED is blinking).
    Entering *PS2 OFF* command in the Set Advanced Features program
    The operating temperature is outside the range.

The system returns to normal operational mode when:

    Opening the lid.
    Getting *PS2 ON HH:MM:SS* command set in the Set Advanced Features
    program before entering suspend mode.
    Detecting the ring indicator on the communication interface.

Note: If the battery pack is replaced during suspend mode with the lid
        opened, close the lid and open it again to return to normal
        operational mode.

1.2.13 System-Expansion Port

This port has a 120-pin connector that can accept a communications
cartridge to support various communication capabilities provided with a
16-bit Micro Channel adapter installed in the cartridge.

2.0 Option Compatibility

The Model N51 has no internal expansion slot to accept any existing
adapters for the IBM Personal System/2. However, a half-size
communication adapter in the communications cartridge, which is designed
for IBM Personal System/2 computers that use Micro Channel architecture,
can be attached to the system expansion port. The communication adapters
that the Model N51 supports are:

    IBM 3270 Connection

    IBM System 36/38 Workstation Emulation Adapter/A

    IBM Token-Ring Network Adapter/A.

Subtopics
2.1 Hard Disk Drive
2.2 Diskette Drive and Diskette

2.1 Hard Disk Drive

The Model N51 has one 2.5-inch 40MB hard disk drive directly attached to
Micro Channel bus. The hard disk drive automatically positions the
read/write heads in nondata areas when the system is powered off or the
system enters suspend mode. No special precautions are required regarding
parking the heads when moving the computer.

Warning: Power-off the system or close the lid whenever moving the
computer to prevent damage to the hard disk.

Subtopics
2.1.1 Replacing the Hard Disk Drive

2.1.1 Replacing the Hard Disk Drive

A replacement hard disk drive is shipped without any preloaded system
information. Start the system with the customer's backup copy of the
Reference Diskette, select **2. Backup/Restore system programs** from the Main
Menu, and run the **3. Restore the system partition** option to load the
system utility programs, the advanced diagnostics programs, and the
system-configuration data set onto the new hard disk.

Notes:

1. If the Reference Diskette has been loaded onto the hard disk drive but
    the customer's operating system has not been loaded, the Insert
    Diskette icon appears on the screen.

2. The languages of the Reference Diskette and the system must match.

For information on system utility programs, see the *Diagnostic Information
for Micro Channel Computers* pamphlet.

2.2 Diskette Drive and Diskette

The Model N51 uses a 1.44MB formatted diskette drive. (It has **1.44** on the
eject button). Both 1.0MB (formatted 720KB) and 2.0MB (formatted 1.44MB)
capacity diskettes can be used in this drive.

3.0 System Memory Requirements

The Model N51 has a minimum of 2MB of memory installed on the system board
at the time of shipment. One additional memory-module kit, 2MB, 4MB, or
8MB, can be installed into the memory module connector on the system
board. The maximum system-board memory capacity is 10MB.

If a memory error occurs, the Model N51 relocates system-board memory in
1MB blocks. If the POST detects a memory error in the first 640KB of
system-board memory, the entire 1MB of memory is deactivated and an error
code is displayed.

Note: Customer diagnostics is capable of logically eliminating defective
        memory so that no memory error code appears at power-on reset.

After replacing a defective memory module kit, or whenever memory is added
or removed from the system, run the **5. Automatic configuration** to store
the new system configuration.

Note: If you configure the system using the **4. Set configuration** from the
        Reference Diskette, make sure the languages of the Reference
        Diskette and the system must match.

4.0 Specifications

Subtopics
4.1 System
4.2 AC Adapter

4.1 System

<u>Size</u>

```
Depth:   210.0 mm (8.3 in.)
Height:  53.5 mm (2.1 in.)
Width:   297.0 mm (11.7 in.).
```

<u>Weight</u>

```
Approximately 2.8 kg (6.2 lb.) with a battery pack.
```

<u>Environment</u>

```
Air Temperature:
-   System On:  5.0° to 35.0°C (41.0° to 95.0°F)
-   System On (with diskette):  10.0° to 35.0°C (50.0° to 95.0°F)
-   System Off:  0.6° to 45.0°C (33.1° to 113.0°F)
-   System in storage:  -20°C to 60°C (-4.0° to 140.0°F).
Relative Humidity:
-   System On:  5% to 95%
-   System On (with diskette):  8% to 80%
-   System Off:  5% to 95%
-   System in storage:  5% to 95%.
Maximum altitude:  2437 m (8000 ft.).
```

<u>Heat Output</u>

```
61.4 British Thermal Units (BTUs) per hour (18 watts per hour).
```

4.2 AC Adapter

Input Voltage

Low Range
- Minimum: 90 V ac
- Maximum: 137 V ac.
High Range
- Minimum: 180 V ac
- Maximum: 264 V ac.
Frequency Range
- Minimum: 47 Hz
- Maximum: 63 Hz.

Output Voltage

+20 V dc

Minimum: +19 V dc
Maximum: +21 V dc.

Maximum Current

1.2 A

5.0 Special Tools

The following special tools are required to service the Model N51.

Volt-Ohm Meter

A meter similar to the Triplet Model 310 (1).

Screwdriver Kit

Use small screwdrivers (IBM part 95F3598) when removing and replacing
FRUs.

Wrap Plug

The Tri-Connector wrap plug (IBM part 72X8546) is used during advanced
diagnostic tests of:

    Parallel Ports
    Serial Ports.

                            PICTURE 3

 (1) Manufactured by Triplett Corporation, Bluffton, Ohio 45817,
     U.S.A.

6.0 Removals and Replacements

This section contains information on removals and replacements, and
locations.

   The arrows in the "Removals and Replacements" section show the
   direction of movement to remove a field replaceable unit (FRU), to
   turn a screw to release the FRU. The arrows are marked in numeric
   order to show the correct sequence of removal.

   When other FRUs must be removed before removing the failing FRU, they
   are listed at the top of the page. Go to the removal procedure for
   each FRU listed, remove the FRU, and then continue with the removal of
   the failing FRU.

   To replace a FRU, reverse the removal procedure and follow any notes
   that pertain to replacement. See "Locations" for internal cable
   connection and arrangement information.

CAUTION:
Before removing any FRU, power-off the system, unplug all power cords from
electrical outlets, remove the battery pack, then disconnect any
interconnecting cables.

CAUTION:
The battery pack contains small amounts of nickel and cadmium. Do not
disassemble it, throw it into fire or water, or short-circuit it. Dispose
of the battery pack as required by local ordinances or regulations.

Warning: The hard disk drive has sensitive parts. Improper handling of
it can cause damage to, and permanent loss of data on, the hard disk.
Before removing the hard disk drive, have the user back up all the
information from the hard disk.

Warning: The system board, adapters, and memory modules are sensitive to,
and can be damaged by, electrostatic discharge. Establish personal
grounding by touching a ground point with one hand before touching these
units.

Note: An electrostatic discharge (ESD) strap can be used to establish
      personal grounding.

Subtopics
6.1 1010 Bottom Cover
6.2 1020 Optional Communication Adapter
6.3 1030 Memory Module Kit
6.4 1040 Voltage Converter
6.5 1050 Hard Disk Drive
6.6 1060 Diskette Drive
6.7 1070 System Board and Keyboard Control Card
6.8 1080 Keyboard Assembly
6.9 1090 I/O Panel Assembly
6.10 1100 Backup Battery
6.11 1110 Standby Battery
6.12 1120 LCD Bezel
6.13 1130 LCD Inverter
6.14 1140 LCD Panel

6.1 1010 Bottom Cover

CAUTION:
Before removing any FRU, power-off the system, unplug all power cords from
electrical outlets, remove the battery pack, then disconnect any
interconnecting cables.

Note: Before removing the bottom cover, invert the system and place it on
its top on a flat surface.

PICTURE 4

PICTURE 5

CAUTION:
Before removing any FRU, power-off the system, unplug all power cords from
electrical outlets, remove the battery pack, then disconnect any
interconnecting cables.

Note: Before removing the bottom cover, invert the system and place it on
its top on a flat surface.

6.2 1020 Optional Communication Adapter

Notes:

1. The optional communication adapter can be either a serial adapter or
    an internal data/fax modem.

2. Disconnect any communication cable from the adapter.

PICTURE 6

PICTURE 7

6.3 1030 Memory Module Kit

PICTURE 8

PICTURE 9

Note: When installing a memory module kit, carefully insert the kit into
the connector, then press it down firmly until both edges snap into
place.

6.4 1040 Voltage Converter

   Bottom Cover **(1010).**

Notes:

1. The voltage converter consists of three printed-circuit boards that
    are shown as shaded in the illustration. Remove these three boards as
    an assembly when you replace the voltage converter.

2. When you do Step 8, remove the voltage converter upward to unplug the
    two connectors under the voltage converter from the system board.
    6.4 - 1

PICTURE 10

PICTURE 11

6.5 1050 Hard Disk Drive

Warning: The hard disk drive has sensitive parts. Improper handling of
it can cause damage to, and permanent loss of data on, the hard disk.
Before removing the hard disk drive, have the user back up all the
information from the hard disk.

     Bottom Cover **(1010)**
     Backup Battery **(1100)**
     Voltage Converter **(1040)**.

Warning: The flexible cables extending from the hard disk drive are
fragile. Be very careful when you unplug the two connectors from the
system board to remove the hard disk drive.

PICTURE 12

Note: When you replace the hard disk drive with a new one, make sure the
        system information is restored onto the system partition using the
        customer's backup copy of the Reference Diskette (see "Replacing
        the Hard Disk Drive" in topic 2.1.1).

6.6 1060 Diskette Drive

    Bottom Cover **(1010)**
    Voltage Converter **(1040).**

Warning: To avoid damaging to the flexible cables, carefully unplug the
four connectors 1 from the system board.

PICTURE 13

6.7 1070   System Board and Keyboard Control Card

        Optional Communication Adapter, if installed **(1020)**
        Bottom Cover **(1010)**
        Memory Module Kit, if installed **(1030)**
        Voltage Converter **(1040)**
        Hard Disk Drive **(1050).**

Notes:

1.   When a new system board is installed, be sure to set the time and
     date, and restore the system configuration data.

2.   When you replace the keyboard control card or install a new one, make
     sure that the switch setting on the card is suitable for the type of
     keyboard (see "Keyboard Control Card" in topic 7.6).

PICTURE 14

PICTURE 15

Note: To disconnect the flexible cables 4, release the locking plate with
         your finger nails and disconnect the flexible cable from the
         connector.

                              PICTURE 16

6.8 1080 Keyboard Assembly

    Optional Communication Adapter, if installed **(1020)**
    Bottom Cover **(1010)**
    Memory Module Kit, if installed **(1030)**
    Voltage Converter **(1040)**
    Hard Disk Drive **(1050)**
    Diskette Drive **(1060)**
    System Board and Keyboard Control Card **(1070).**

PICTURE 17

6.9 1090 I/O Panel Assembly

Optional Communication Adapter, if installed **(1020)**
Bottom Cover **(1010)**
Memory Module Kit, if installed **(1030)**
Voltage Converter **(1040)**
Hard Disk Drive **(1050)**
Diskette Drive **(1060)**
System Board and Keyboard Control Card **(1070).**

PICTURE 18

6.10 1100 Backup Battery

CAUTION:
The backup battery is a lithium battery and presents a fire, explosion, or
sever burn risk. Do not recharge it, remove its polarized connector,
disassemble it, heat it above 100°C (212°F), incinerate it, or expose its
cell contents to water. Dispose of the battery as required by local
ordinances or regulations. When replacing the backup battery, use only
Part No. 07G1225. Use of another battery could result in ignition or
explosion of the battery. Replacement batteries can be ordered from IBM
or IBM Authorized Dealers.

   Bottom Cover **(1010).**

PICTURE 19

Note: When you replace the backup battery, align the wires 3 with the
        edge 4 of the voltage converter. Do not extend the wires beyond
        the edge, otherwise the wires can be damaged when you replace the
        bottom cover.

PICTURE 20

6.11 1110 Standby Battery

CAUTION:
The standby battery contains a small amount of nickel and cadmium. Do not
disassemble it, recharge it, throw it into fire or water, or short-circuit
it. Dispose of the battery as required by local ordinances or
regulations. Use only Part No. 07G1240, when replacing the standby
battery.

   Bottom Cover **(1010).**

PICTURE 21

6.12 1120 LCD Bezel

Removal

1. Fully open the lid of the computer.

2. Press down on the hinge cover and slide it forward to remove when the
    two tabs 1 clear the bezel 2. Make sure the other hinge cover is also
    removed.

    PICTURE 22

3. Remove the two screws 3 and pull the LCD bezel 4 away from the lid.

    PICTURE 23

6.13 1130 LCD Inverter

   LCD Bezel **(1120)**.

PICTURE 24

6.14 1140 LCD Panel

LCD Bezel **(1120)**
LCD Inverter **(1130).**

PICTURE 25

7.0 Locations

Subtopics
7.1 Front View
7.2 Rear View
7.3 Interior View
7.4 System Status Indicators
7.5 System Board

7.1 Front View

```
1    Release Lever
2    Contrast Control
3    Brightness Control
4    LCD Inverter
5    Power-On Light (green)
6    System Power Switch
7    Diskette-Eject Button
8    Diskette Drive
9    Battery Pack
10   Keyboard
11   Bottom Cover
12   Reverse Video Switch
13   Speaker Volume
14   LCD Panel
```

PICTURE 26

7.2 *Rear View*

       1   External Power Jack
       2   Communication Interface Connector
       3   Machine Identification Label
       4   System Expansion Port
       5   I/O Panel
       6   Power Control Switch for Communications Cartridge
       7   External Display Port
       8   Parallel Port
       9   Serial Port
       10   External Input Device Port
       11   Lid

                        PICTURE 27

7.3 Interior View

    1   Diskette Drive
    2   I/O Panel Assembly
    3   Voltage Converter
    4   System Board
    5   Speaker
    6   Hard Disk Drive
    7   Backup Battery
    8   Optional Memory Module Kit
    9   Battery Presence Switch
   10   Standby Battery
   11   Keyboard Assembly

                        PICTURE 28

7.4 *System Status Indicators*

PICTURE 29

7.5 System Board

PICTURE 30

```
+-----------------------------+
¦ Key       ¦ Connector        ¦
+----------+-------------------¦
¦ 1, 5, 6  ¦ LCD Interface     ¦
+----------+-------------------¦
¦ 2        ¦ System-Expansion  ¦
¦          ¦ Port (120-pin)    ¦
+----------+-------------------¦
¦ 3        ¦ Keyboard-Control  ¦
¦          ¦ Card              ¦
+----------+-------------------¦
¦ 4        ¦ Battery Presence  ¦
¦          ¦ Switch            ¦
+-----------------------------+
```

PICTURE 31

```
+-----------------------------+
¦ Key       ¦ Connector        ¦
+----------+-------------------¦
¦ 1, 11,   ¦ I/O Panel         ¦
¦ 12       ¦                   ¦
+----------+-------------------¦
¦ 2, 7     ¦ Voltage Converter ¦
+----------+-------------------¦
¦ 3        ¦ System Expansion  ¦
¦          ¦ Port (120-pin)    ¦
+----------+-------------------¦
¦ 4        ¦ Password-Override ¦
¦          ¦ Connector         ¦
+----------+-------------------¦
¦ 5        ¦ Memory Module Kit ¦
+----------+-------------------¦
¦ 6, 8     ¦ Hard Disk Drive   ¦
+----------+-------------------¦
¦ 9, 10    ¦ Diskette Drive    ¦
+-----------------------------+
```

7.6 Keyboard Control Card

PICTURE 32

```
+----------------------------+
¦ Key     ¦ Connector        ¦
+---------+------------------¦
¦ 1       ¦ Numeric-Key      ¦
¦         ¦ Control Switch   ¦
+---------+------------------¦
¦ 2       ¦ System Board     ¦
¦         ¦ Interface        ¦
+---------+------------------¦
¦ 3       ¦ Speaker          ¦
+---------+------------------¦
¦ 4, 5    ¦ Keyboard         ¦
+---------+------------------¦
¦ 6       ¦ Lid Switch       ¦
+----------------------------+
```

Note: The numeric key control switch 1 must be set to ON if the part
        number of the keyboard is 07G1735 (U.S. English). For other
        keyboards, set it to OFF.

```
+----------------------------+
¦ Key     ¦ Connector        ¦
+---------+------------------¦
```