2.3 Power Supply Troubleshooting

The power supply controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

Procedure 1: Power Status Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Quick Charge Check

Procedure 5: Replacement Check

Procedure 1 Power Status Check

The following LEDs indicate the power supply status:

- Battery LED
- DC IN LED

The power supply controller displays the power supply status through the Battery and the DC IN LEDs as listed in the tables below.

Table 2-1 Battery LED

Battery LED	Power supply status
Lights orange	Quick charge
Lights green	Battery is fully charged and AC adaptor is connected
Blinks orange (even intervals)	The battery level becomes low while operating the computer on battery power.*1
Doesn't light	Any condition other than those above.

*1 AutoResume Off will be executed soon.

Table 2-2 DC IN LED

DC IN LED	Power supply status
Lights green	DC power is being supplied from the AC adaptor.
Blinks orange	Power supply malfunction*2
Doesn't light	Any condition other than those above.

*2 When the power supply controller detects a malfunction, the DC IN LED blinks and an error code is displayed.

To check the power supply status, install a battery pack and connect an AC adaptor.

Check 1 If the DC IN LED blinks orange, go to Procedure 2.

Check 2 If the DC IN LED does not light, go to Procedure 3.

Check 3 If the battery LED does not light orange or green, go to Procedure 4.

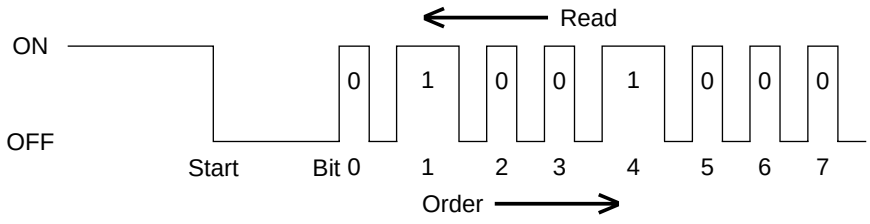
Procedure 2 Error Code Check

If the power supply microprocessor detects a malfunction, the DC IN LED blinks orange. The blink pattern indicates an error as shown below.

- ❑ Start — Off for 2 seconds
- ❑ Error code (8 bit)
  - "1" — On for one second
  - "0" — On for half second
  - Interval between data bits — Off for half second

The error code begins with the least significant digit.

Example: Error code 12h (Error codes are given in hexadecimal format.)



Check 1 Convert the DC IN LED blink pattern into the hexadecimal error code and compare it to the tables below.

- ❑ DC IN

Error code	Meaning
10h	AC Adaptor output voltage is over 16.5V.
11h	10/100 Network Port Replicator II or Enhanced Port Replicator II output voltage is over 16.5V.
12h	Current from the DC power supply is over the limit (6.16A).
13h	Current from the DC power supply is over the limit (0.5A) when there is no load.
14h	Current sensing IC is not normal.

- ❑ Main Battery

Error code	Meaning
20h	Main battery voltage is over 13.46V. (Not supported)
21h	Main battery charge current is over 5.06A.
22h	Main battery discharge current over 0.5A.
23h	Main battery charge current is over 2.70A.
24h	Current sensing IC is not normal.
25h	Main battery charge current is over 0.3A when there is no charging.

- ❑ Secondary Battery

Error code	Meaning
30h	Secondary battery voltage is over 13.46V.
31h	Secondary battery charge current is over 5.06A .
32h	Main battery discharge current over 0.5A.
33h	Secondary battery charge current is over 2.70A.
34h	Current sensing IC is not normal.
35h	Secondary battery charge current is over 0.3A when there is no charging.

- S5V output

Error code	Meaning
40h	S3V voltage is under or equal to 3.14V.

- EVER5V output

Error code	Meaning
50h	EVER5V voltage is over 6.0V.
51h	EVER5V voltage is under or equal to 4.5V when the computer is powered on.
52h	EVER5V voltage is under or equal to 4.5V when the computer is booting up.
53h	EVER5V voltage is abnormal when the computer is suspended.

- EVER3V output

Error code	Meaning
60h	EVER3V voltage is over 3.96V.
61h	EVER3V voltage is under or equal to 2.81V when the computer is powered on.
62h	EVER3V voltage is under or equal to 2.81V when the computer is booting up.
63h	EVER3V voltage is abnormal when the computer is suspended.

- PCOREV output

Error code	Meaning
70h	PCOREV voltage is over 2.04V.
71h	PCOREV voltage is under or equal to 1.08V when the computer is powered on.
72h	PCOREV voltage is under or equal to 1.08V when the computer is booting up.
73h	PCOREV voltage is over or equal to 1.08V when the computer is powered off.

- PGTLV output

Error code	Meaning
80h	PGTLV voltage is over 1.725V.
81h	PGTLV voltage is under or equal to 1.275V when the computer is powered on.
82h	PGTLV voltage is under or equal to 1.275V when the computer is booting up.
83h	PGTLV voltage is over or equal to 1.275V when the computer is powered off.

- B1R8V output

Error code	Meaning
90h	B1R8V voltage is over 2.16V when the computer is powered on.
91h	B1R8V voltage is under or equal to 1.53V when the computer is powered on.
92h	B1R8V voltage is under or equal to 1.53V when the computer is booting up.
93h	B1R8V voltage is abnormal when the computer is suspended.

- BVGAV output

Error code	Meaning
A0h	BVGAV voltage is over 2.28V when the computer is powered on.
A1h	BVGAV voltage is under or equal to 1.53V when the computer is powered on.
A2h	BVGAV voltage is under or equal to 1.53V when the computer is booting up.
A3h	BVGAV voltage is abnormal when the computer is suspended or over 1.53V when the computer is powered off.

Check 2 In the case of error code 10h or 12h:

- ❑ Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If the cables are connected correctly, go to the following step:
- ❑ Connect a new AC adaptor and AC power cord. If the error still exists, go to Procedure 5.

Check 3 In the case of error code 11h:

- ❑ Make sure the computer is firmly connected to the 10/100 Network Port Replicator II or the Enhanced Port Replicator II. If it is connected correctly, go to the following step:
- ❑ Check the connector visually to make sure no pins are bent. If a pin(s) is bent, go to Chapter 4, *Replacement Procedures*. If the connector is not physically damaged, go to the following step:
- ❑ Connect another 10/100 Network Port Replicator II or Enhanced Port Replicator II. If the error still exists, go to Procedure 5.

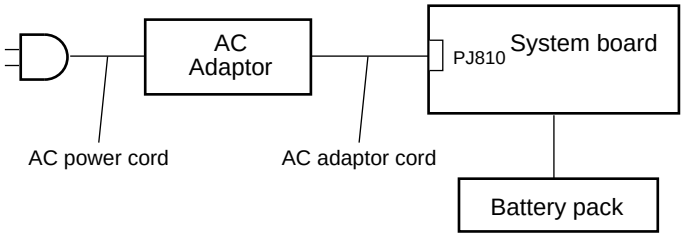
Check 4 In the case of error code 2Xh and 3Xh:

- ❑ Make sure the battery pack is correctly installed in the computer. If the battery pack is correctly installed, go to the following step:
- ❑ Replace the battery pack with a new one. If the error still exists, go to Procedure 5.

Check 5 For any other error, go to Procedure 5.

Procedure 3 Connection Check

The power supply related wiring diagram is shown below:



Any of the connectors may be disconnected. Perform Check 1.

Check 1 Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If these cables are connected correctly, go to Check 2.

Check 2 Connect a new AC adaptor or AC power cord.

- If the DC IN LED does not light, go to Procedure 5.
- If the battery LED does not light, go to Check 3.

Check 3 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery LED still does not light, go to Procedure 4.

Procedure 4 Quick Charge Check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.
2. Attach the AC adaptor and turn on the power. (If you cannot turn on the power, go to Procedure 5.)
3. Run the Diagnostic test, go to System test and execute subtest 06 (quick charge) described in Chapter 3.
4. When quick charge is complete, the diagnostics test displays the result code. Check the result code against the table below and perform any necessary check.

Result code	Contents	Check items
0	The battery is quick charging normally.	Normal
1	The battery is fully charged.	Normal
2	The AC adaptor is not attached.	Check 1
3	The AC adaptor's output voltage is not normal.	Check 1
4	The Battery is not installed.	Check 2
5	The battery's output voltage is not normal.	Check 3
6	The battery's temperature is not normal.	Check 4
7	A bad battery is installed.	Check 2
8	The battery voltage is over the limit.	Check 2
9	Another battery is charging.	Normal
A	Any other problems.	Check 5

Check 1 Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN socket and the wall outlet. If these cables are connected correctly, replace the AC power cord and AC adaptor.

Check 2 Make sure the battery is properly installed. If the battery is properly installed, replace it with a new one.

Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack. If the battery pack is still not charged, replace the battery pack with a new one.

Check 4 The battery's temperature is too hot or cold. Return the temperature to normal operating condition. If the battery pack still is not charged, replace the battery pack with a new one.

Check 5 Go to Procedure 5.

Procedure 5 Replacement Check

The System board or CPU may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. Check the connection between the CPU and system board. After checking the connection, perform the following checks:

Check 1 Replace the system board with a new one. If the battery pack is still not functioning properly, perform check 2.

Check 2 Replace the CPU with a new one.