HP StorageWorks
XP12000/XP10000 Disk Arrays

Disassembly Manual
for
AE002A Disk Controller (DKC)
and
AE045A/AU Disk Unit (DKU)

Part Number: AE002-96045
Edition: First
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Purpose of This Manual

This manual describes procedures to remove components that must be separately disposed of as required by *DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).*

Intended Audience

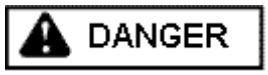
This procedure manual is intended for the workers in the facilities that perform the treatment operation, the employees of the contractor, or any other persons involved in the disassembly procedure.

Safety Guidelines

Safety precautions are indicated by the following notation. The notation consists of the safety symbol and/or one of the three keywords: **Danger**, **Warning**, and **Caution**.

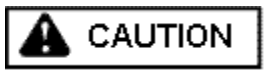
Safety Notation

General safety symbol. This symbol is used to alert the user to a potential hazard that may result in personal injury. To avoid possible injury or death, comply with the safety notice following this symbol.

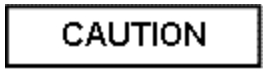


The DANGER notice is used to indicate the presence of an imminent danger that is highly likely to cause serious or fatal injury.

The WARNING notice is used to indicate the presence of a potential danger that may cause serious or fatal injury.



The CAUTION notice (with the safety symbol) is used to indicate the presence of a potential danger that could cause minor or moderate injury.



The CAUTION notice (without the safety symbol) is used to indicate the presence of a potential danger that could cause serious damage to the equipment or damage to property in the vicinity.

The following are general precautions that you should follow to enable you to perform disassembly work safely. Read these precautions carefully and comply with them during work.

Before Starting Work

- Read the safety instructions and procedures described in this manual carefully and comply with them during work.
- The system labels and the manual show the precautions necessary to prevent injury. Understand these precautions fully and comply with them.
- While every consideration has been given to the precautions shown on the system and in this manual, there is always the possibility of unforeseeable situations. When working, take care beyond following the instructions in this guide to avoid injury.

General Precautions

- Be sure to follow the indicated work method and sequence.
- Always use any special tool or material that is specified. If none is specified, use one suited to the purpose.
- Wear protective glasses if there is a possibility that components could scatter or liquid could splash.
- When lifting heavy components, bend your knees and use your leg muscles, keeping your back straight, so as not to injure your spine or back muscles. For heavy components with a safety notice, use machinery or work with another person, observing the instructions in the notice.
- When using an edged tool, take care to keep your fingers and other body parts away from the sharp edge.

Avoiding Electric Shock

- Shut off the power supply from the system.
- Be aware that electrical charge may remain in some parts of the system after the power supply is shut off.
- Before beginning work, remove all metal jewelry or accessories to prevent electrical shock.
- Keep your hands and arms dry during work.

Batteries

- Ignoring the following precautions could cause the battery to overheat, explode or ignite.
    - Do not connect a battery to the power outlet.
    - Do not place the battery pack near a heat source.
    - Do not throw the battery pack into a fire or heat it.

    - Do not use a wire or anything metallic to connect the battery connector's positive and negative terminals. Do not carry or store the battery together with metal parts.
    - Do not put the battery pack into water or let it get wet.
    - Do not puncture the battery with a nail, hit it with a hammer, or step on it.
    - Do not solder the battery directly.
- The electrolyte of this battery is a high-density alkaline solution.
    - If the electrolyte from the battery gets into your eyes, do not rub them. Use tap water or other clean water to wash your eyes thoroughly. Immediately ask for medical treatment. If you fail to follow these instructions, the battery liquid may damage your eyes.
    - If the electrolyte sticks to your skin, it may cause burns. Wash the skin thoroughly with plenty of water and immediately ask for medical treatment.

Moving the System

- To move the system, remove the skirt and raise the leveling bolts.
- When you move the system to a different level, use a temporary bridge that makes the slope angle not more than 8 degrees.
- When raising or lowering the system, use an anti-slip device to stabilize it.

Other Precautions

- Do not lean against the rear cover.
- To avoid injuring your fingers, follow the specified procedure when doing any of the following:
    - Removing the front bezel
    - Removing the rear cover

1. Overview

1.1. External Appearance

The following figures show the exterior of the system to be disassembled.

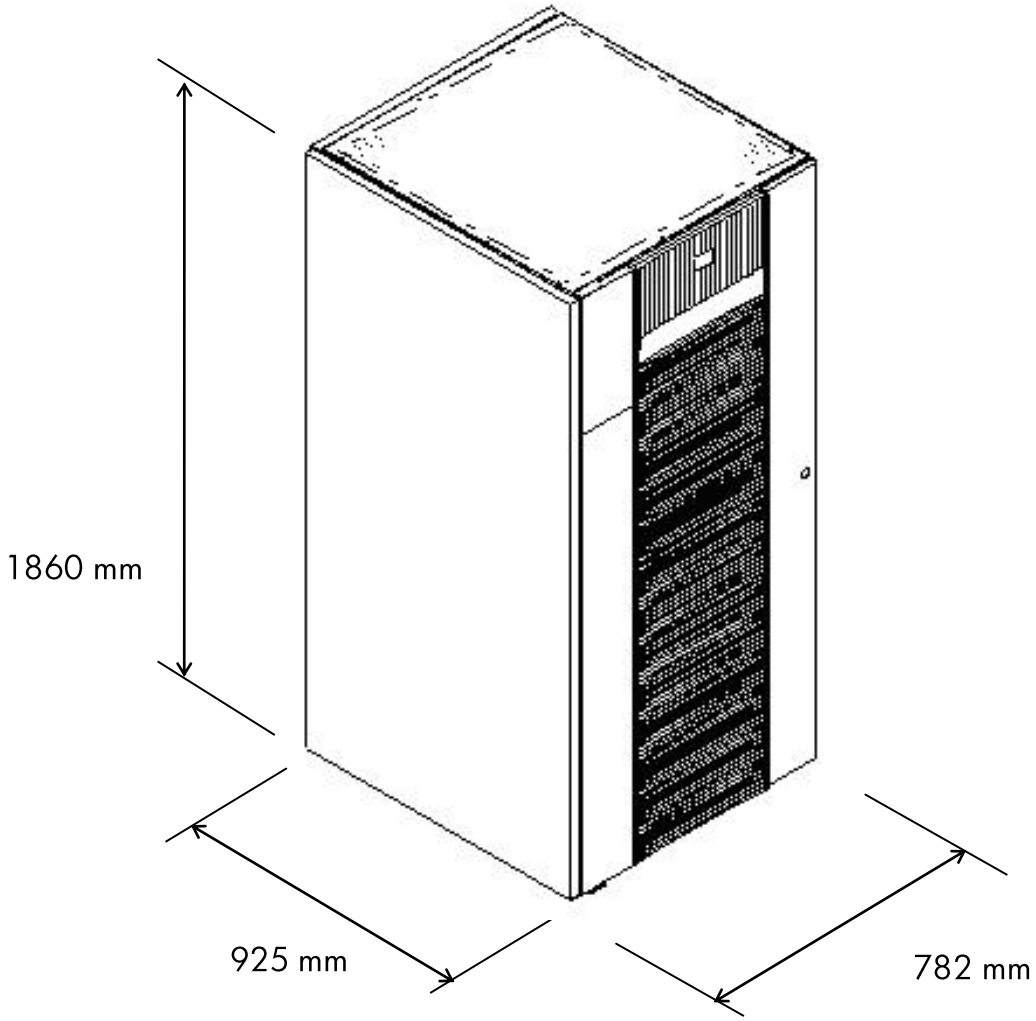


Figure 1. Exterior of the AE002A DKC

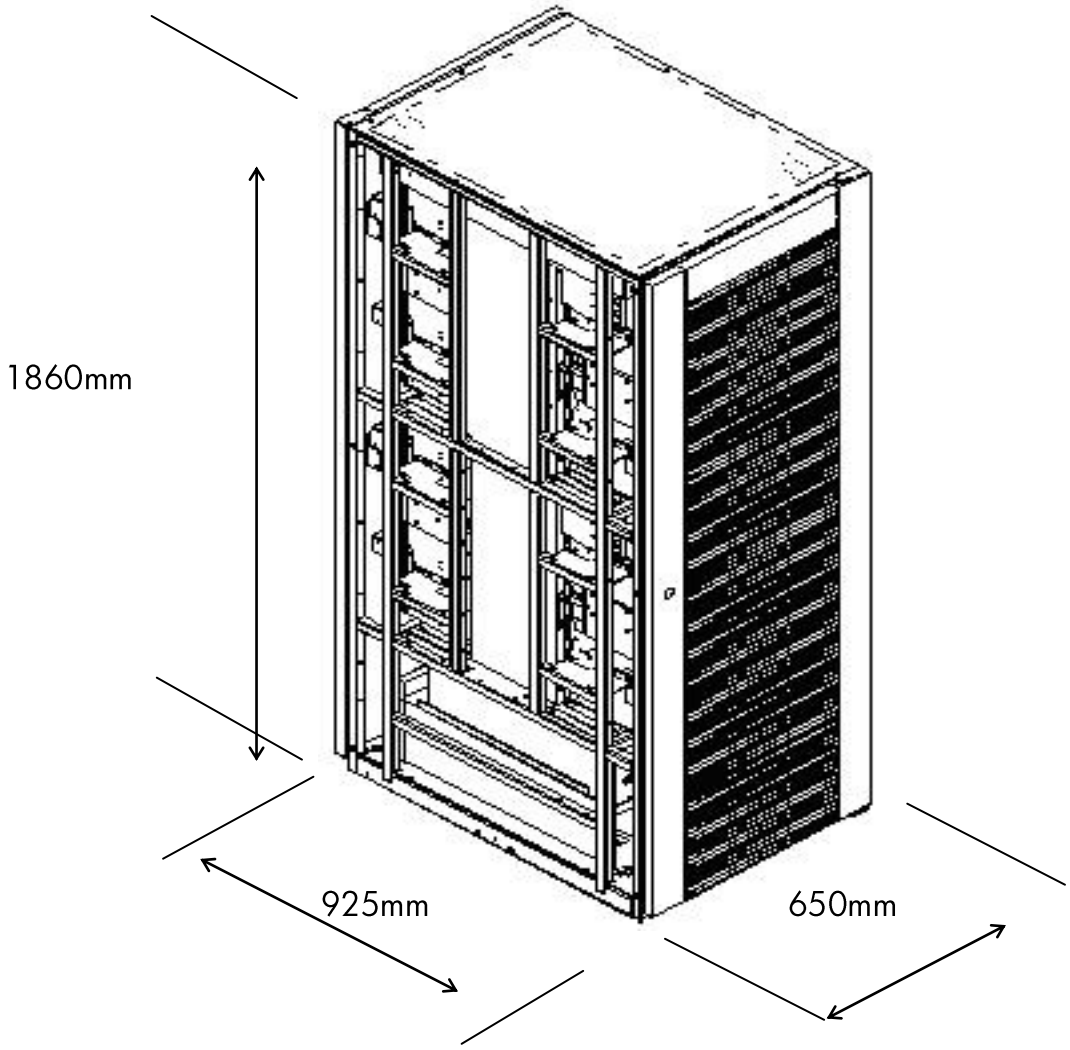


Figure 2. Exterior of the AE045A/AU DKU

1.2. Components and Parts to be Removed

Table 1 Components and Parts to Be Removed for the AE002A DKCTable 1 lists the components and parts to be removed.
The numbers in figures correspond to those in tables.

Table 1 Components and Parts to Be Removed for the AE002A DKC

No.	Component to be removed	Part to be removed[1]	Is disassembly work required?	More information
1	OP-PANEL	Printed circuit board	Yes	Disassembling the OP-PANEL
2	SVP	Printed circuit board HDD Battery	Yes	Disassembling the SVP
3	Fan	Printed circuit board	Yes	Removing the Fan
4	HDD	HDD	Yes	Removing the Hard Disk
5	WP-Printed circuit board	Printed circuit board	No	--
6	SH-Printed circuit board[2]	Printed circuit board	No	--
7	B/B	Printed circuit board	No	--
8	Power supply	Printed circuit board	Yes	Removing and Disassembling the Power Supply HS0102 Removing the Power Supply HS0102 and Disassembling the Power Supply HS0102
9	Battery	Battery	Yes	Removing the Lithium Battery
10	External cable	AC power cable, etc.	Yes[3]	--

[1] The parts to be removed are shown with the shaded enclosure characters in **Front of the AE002A DKC** and **Error! Reference source not found.**.

[2] Some models of the SH- printed circuit board need disassembly work.

[3] Disassembly work is required if the external cable is connected.

1.2.1. Components to Be Removed

The following figures show the installed location of the components to be removed. The numbers in the figures correspond to those in **Table 1 Components and Parts to Be Removed for the AE002A DKC.**

Installed Location of the AE002A DKC Parts

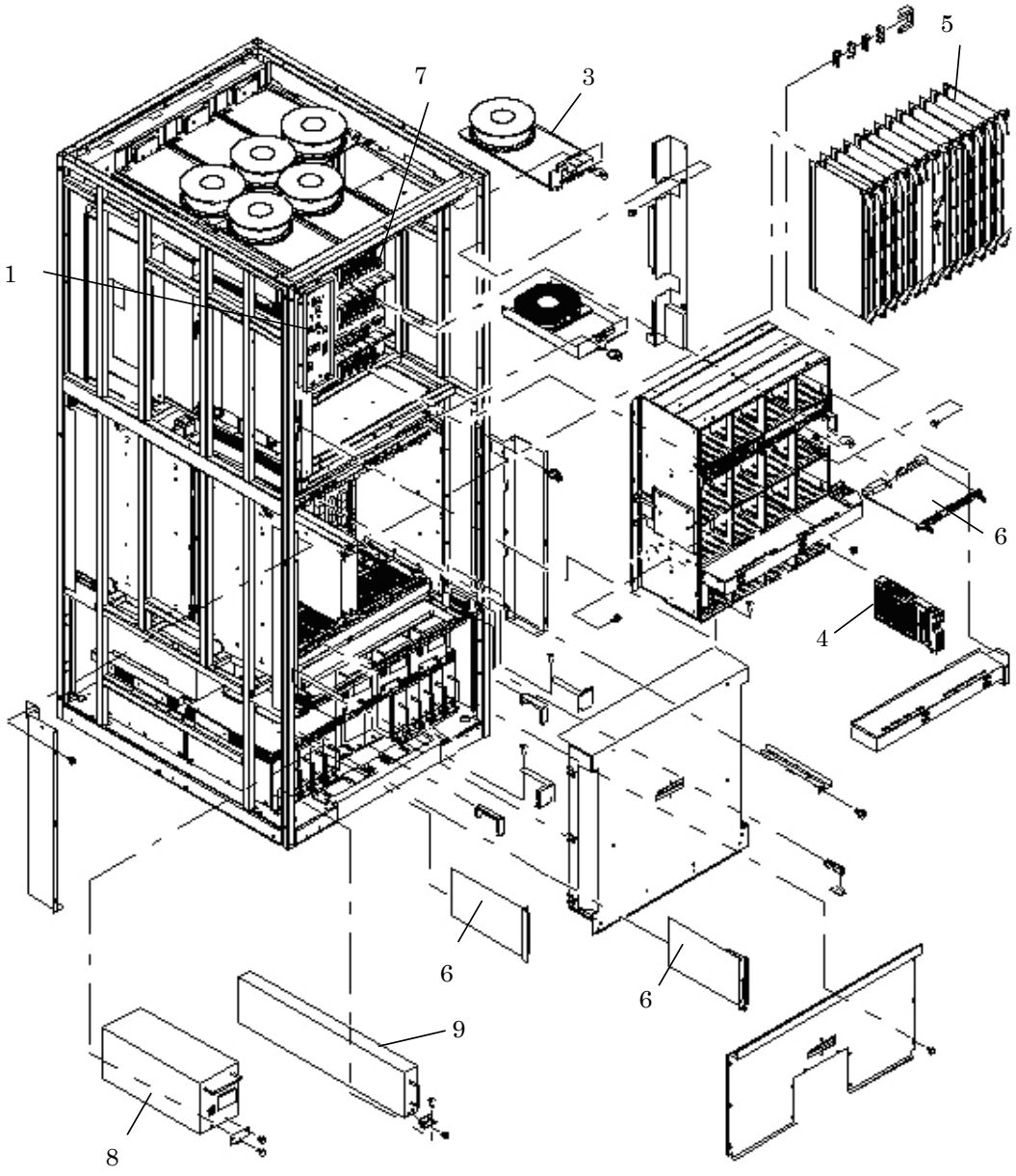


Figure 3. Front of the AE002A DKC

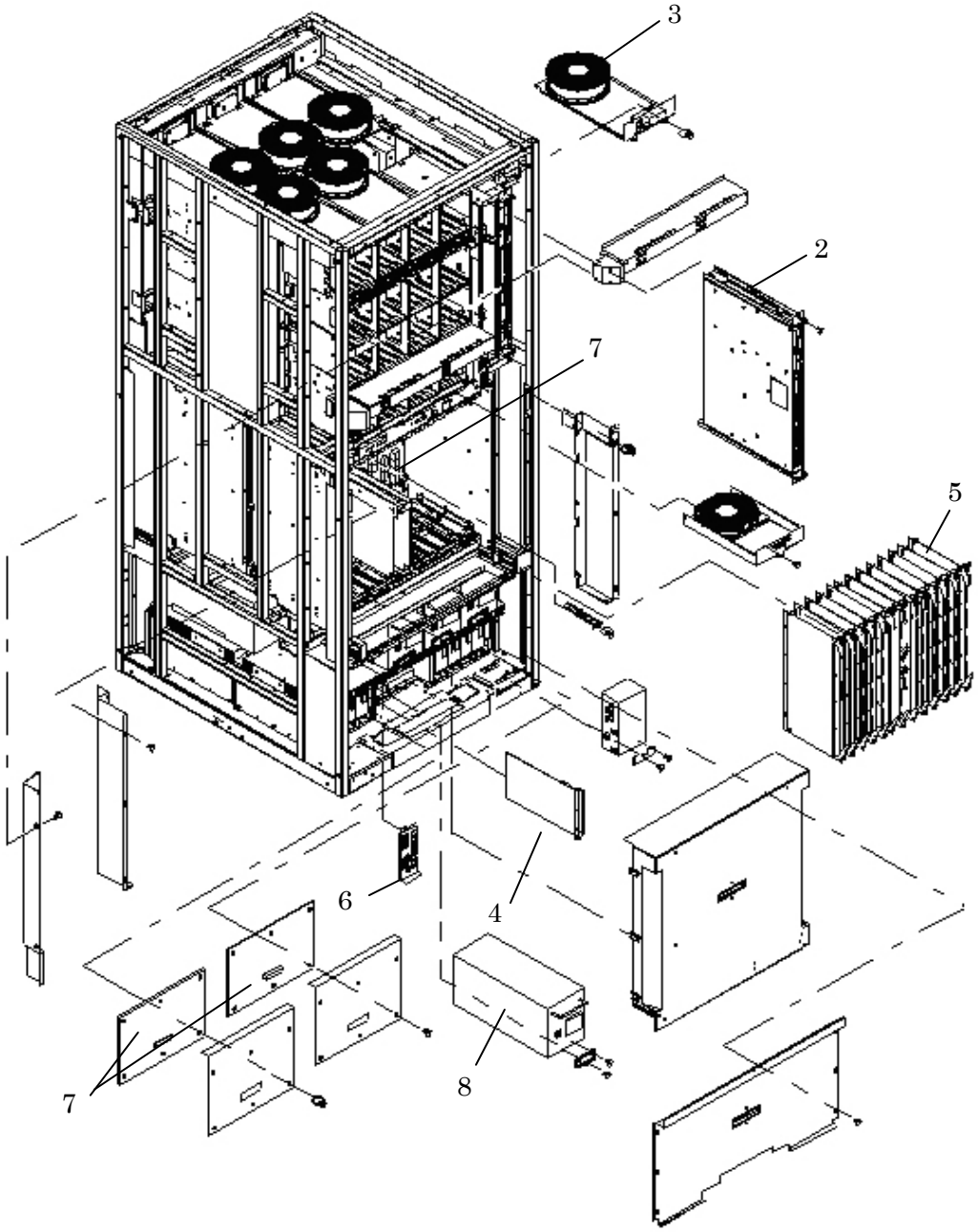


Figure 4. Rear of the AE002A DKC

Table 2 Components and Parts to Be Removed for the AE045A/AU DKU

No.	Component to be removed	Part to be removed[1]	Is disassembly work required?	More information
1	Fan	Printed circuit board	Yes	Removing the Fan
2	HDD	HDD	Yes	Removing the Hard Disk
3	SH-Printed circuit board[2]	Printed circuit board	No	--
4	B/B	Printed circuit board	No	--
5	Power supply	Printed circuit board	Yes	Removing and Disassembling the Power Supply HS0102 Removing the Power Supply HS0102
6	Battery	Battery	Yes	Removing the Lithium Battery
7	External cable	AC power cable, etc.	Yes[3]	--

[1] The parts to be removed are shown with the shaded enclosure characters in **Front and rear of the AE045A/AU DKU**.

[2] Some models of the SH- printed circuit board need disassembly work.

[3] Disassembly work is required if the external cable is connected.

1.2.2. Installed Location of the AE045A/AU DKU Parts

The following figures show the installed location of the components to be removed. The numbers in the figures correspond to those in Table 2.

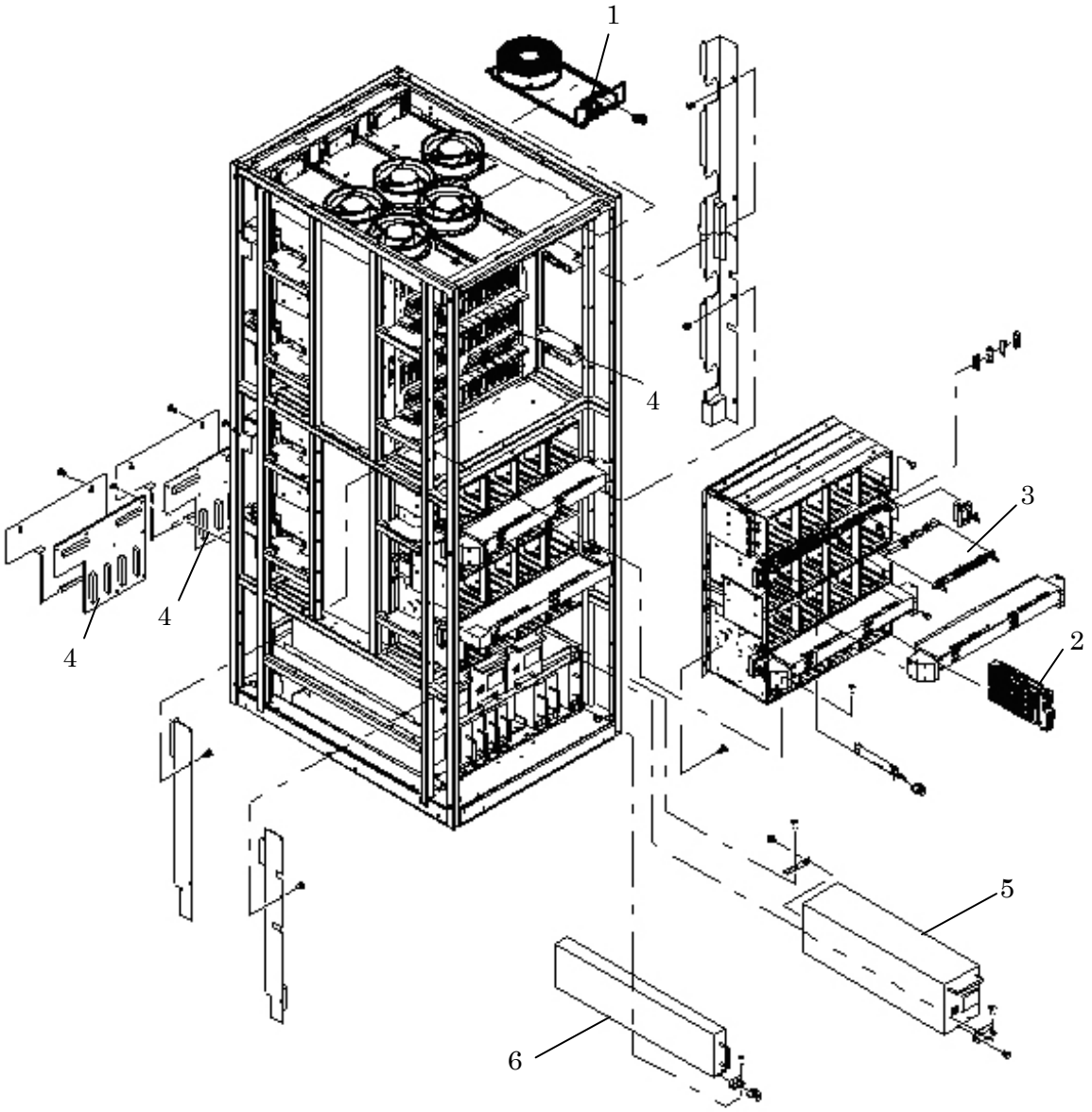


Figure 5. Front and rear of the AE045A/AU DKU

2. Disassembling the OP-PANEL

1. Remove the four screws that attach cover **B**, and then remove cover **B**.
2. Remove the five screws that attach the printed circuit board.
3. Remove the printed circuit board.

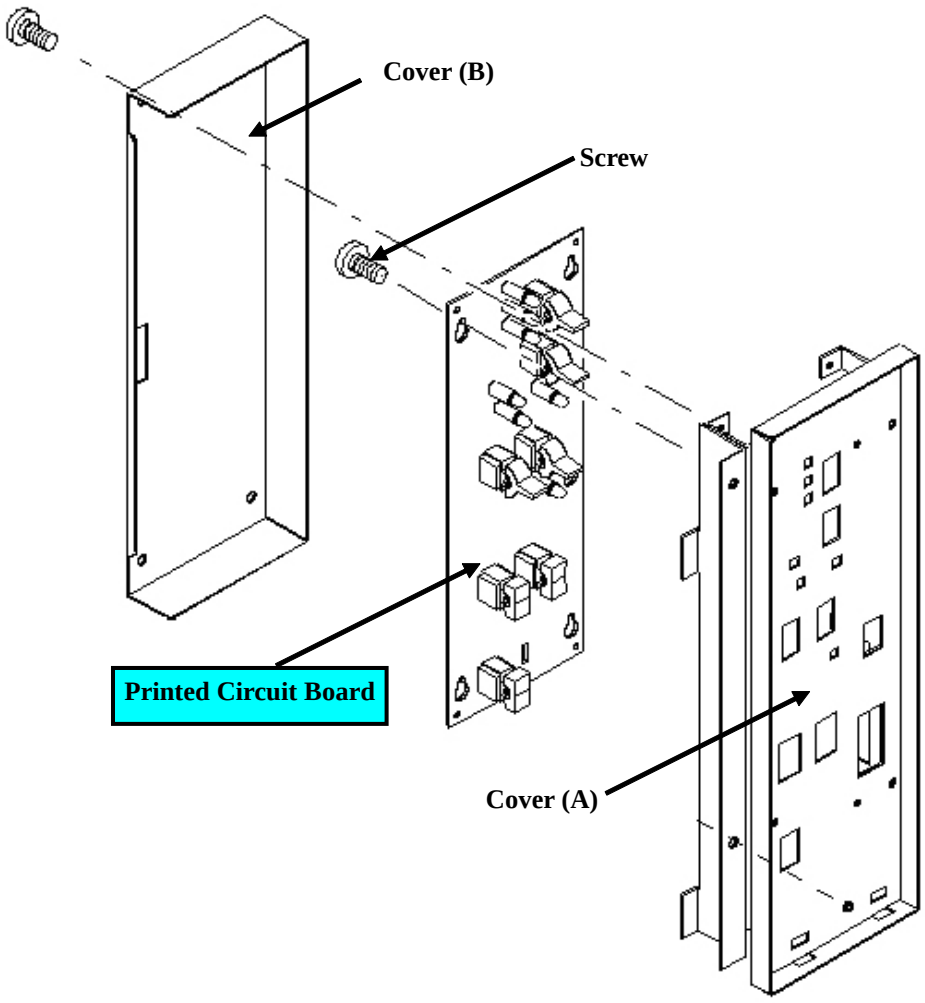


Figure 6. Disassembling the OP-PANEL

3. Disassembling the SVP

3.1. Removing the Cover

1. Remove the three screws from the rear panel.
2. Remove the four screws that attach the bracket.
3. Remove the cover by pulling it upward.

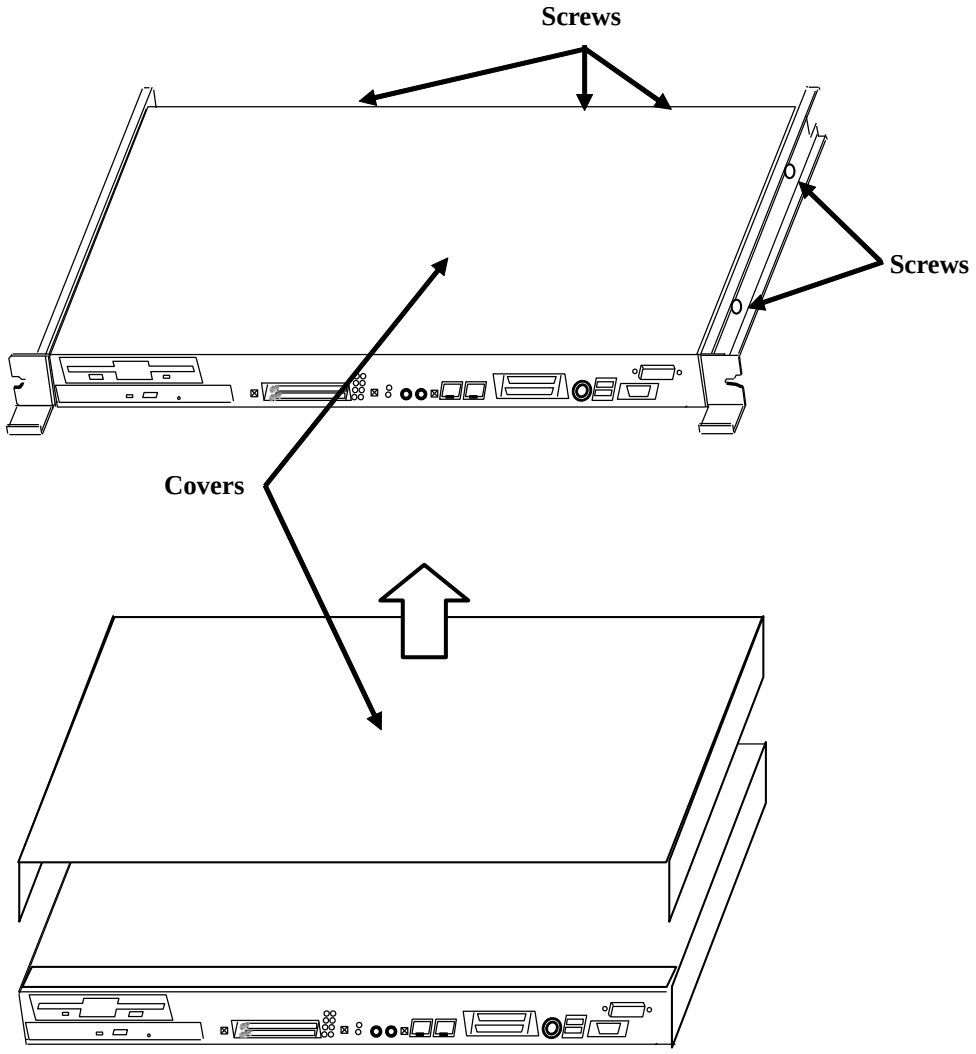


Figure 7. Removing the cover on the SVP

3.2. Removing the Hard Disk

1. Remove the two cables connecting the main board and the HDD.
2. Remove the four screws, and then remove the HDD by pulling it upward.
3. Disassemble the removed HDD unit, by removing the four screws on the back plate.
4. Remove the hard disk.

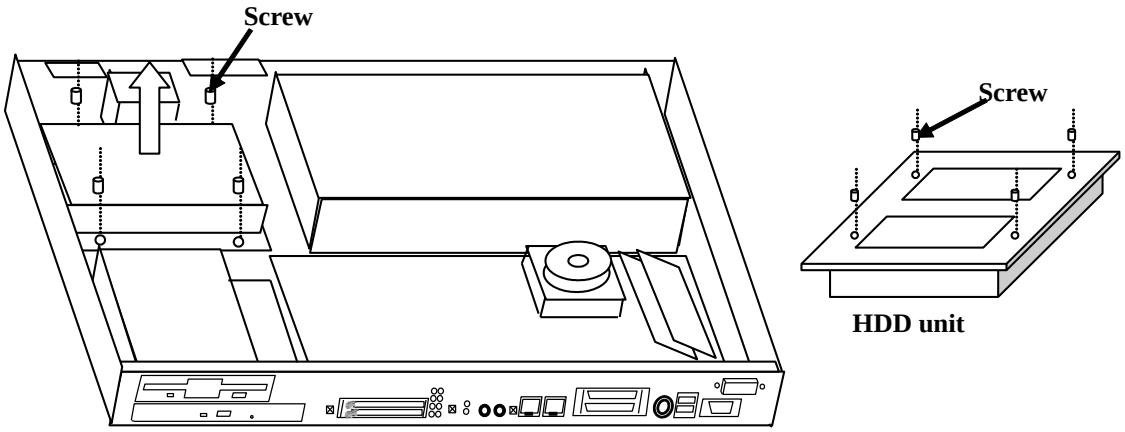


Figure 8. Removing the hard disk from the SVP

3.3. Removing the FDD/CD-ROM

1. Remove the cables connecting the main board and the FDD/CD-ROM.
2. Remove the four screws that attach the FDD/CD_ROM and then remove the FDD/CD-ROM by pulling it upward.
3. See the following sections for disassembling the removed FDD/CD-ROM.
   - See
   -
   -
   -
   -
   - Disassembling the FDD for the procedure for disassembling the FDD
   - See
   -
   -
   -
   -

- Disassembling the CD-ROM for the procedure for disassembling the CD-ROM

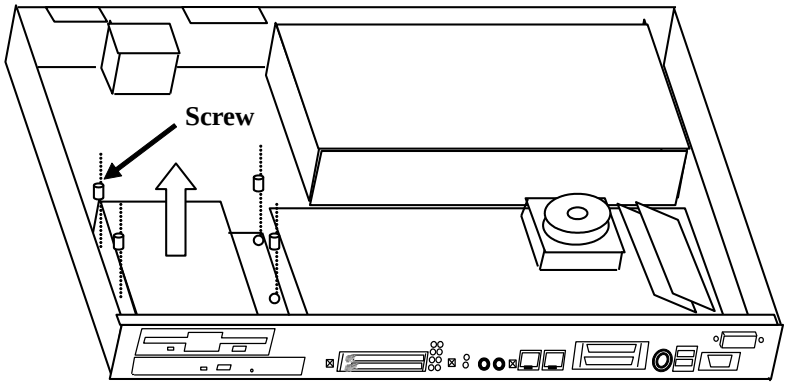


Figure 9. Removing the FDD/CD-ROM from the SVP

4.3.1. Disassembling the FDD

Removing the Shield Cover

1. Open the two tabs at the right and left, and release the shield cover lock.
2. Remove the shield cover by pulling it upward.

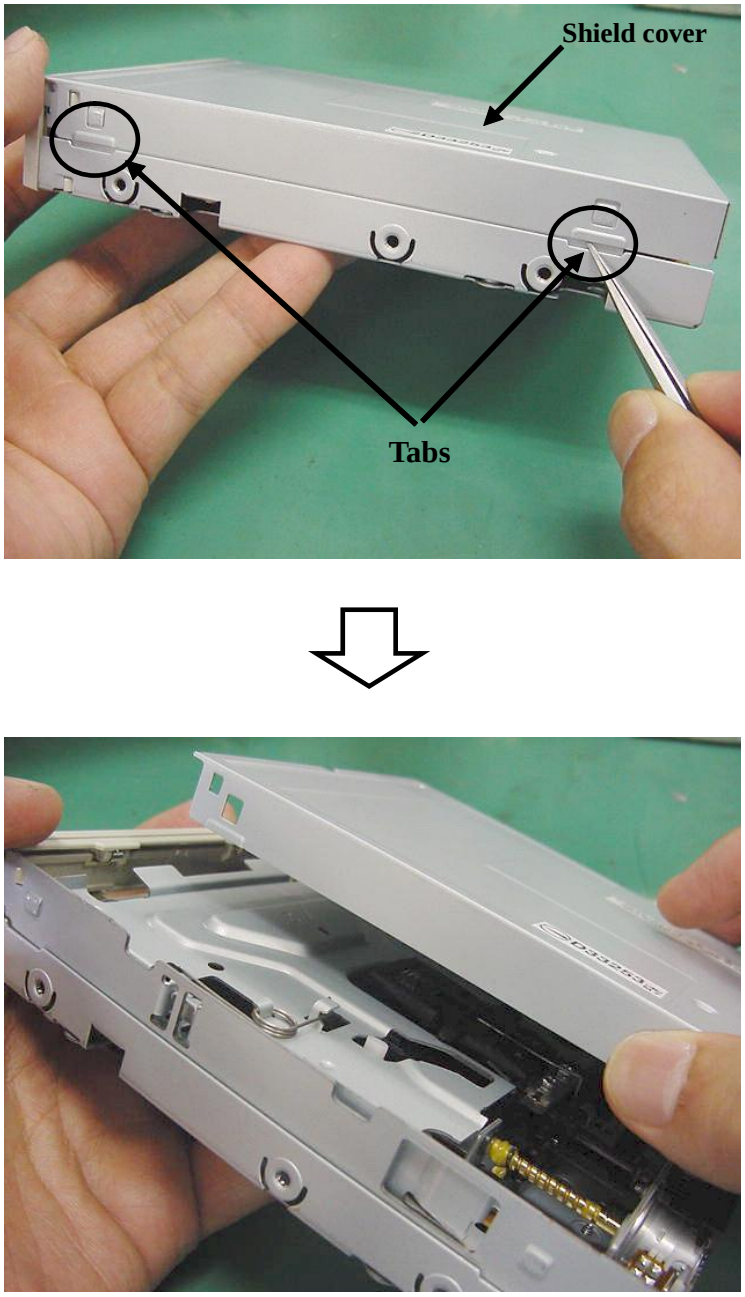


Figure 10. Removing the shield cover from the FDD

Removing the Front Panel and the Base Frame

1. Remove the three screws, and then remove the base frame.
2. Push the two tabs at the right and left, and remove the front panel.

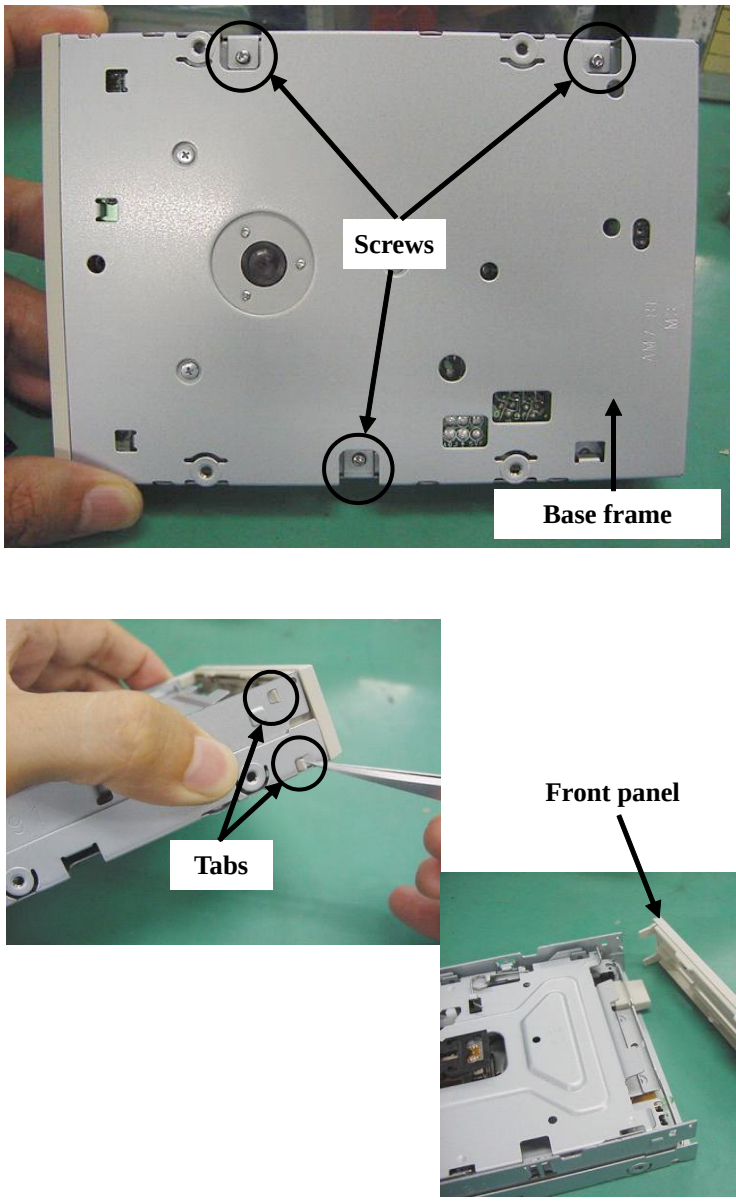


Figure 11. Removing the FDD front panel and base frame

Removing the Printed Circuit Board

1. Cut the motor FFC and stepper FFC that are connected to the printed circuit board.
2. Remove the one screw that attaches the printed circuit board.
3. Remove the printed circuit board.

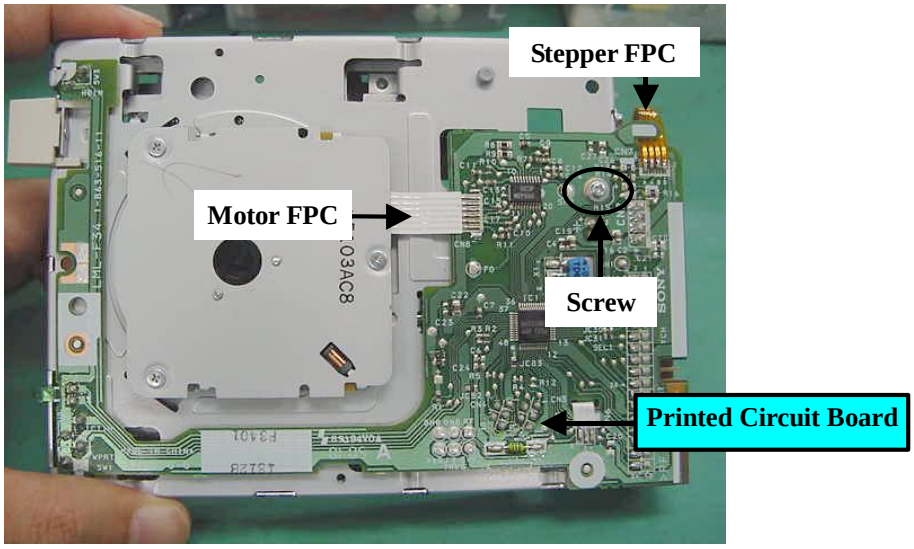


Figure 12. Removing the FDD PCB

4.3.2. Disassembling the CD-ROM

Removing the Cover

1. Remove the three screws that attach the cover.
2. Remove the tape cover by pulling it upward.

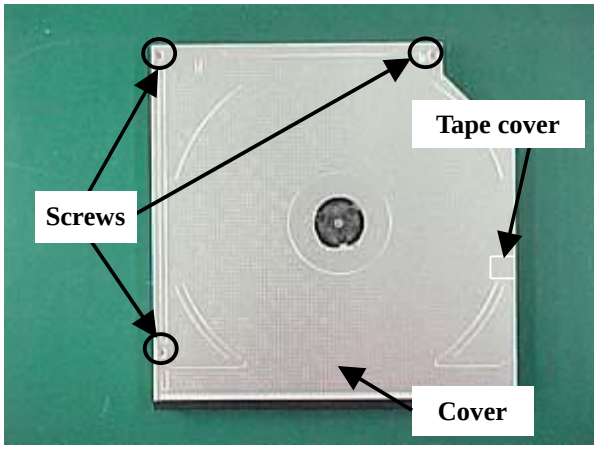


Figure 13. Removing the drive cover

Ejecting the CD-ROM Tray

1. Insert the eject tool into the emergency hole.
2. Pull the tray out toward you.

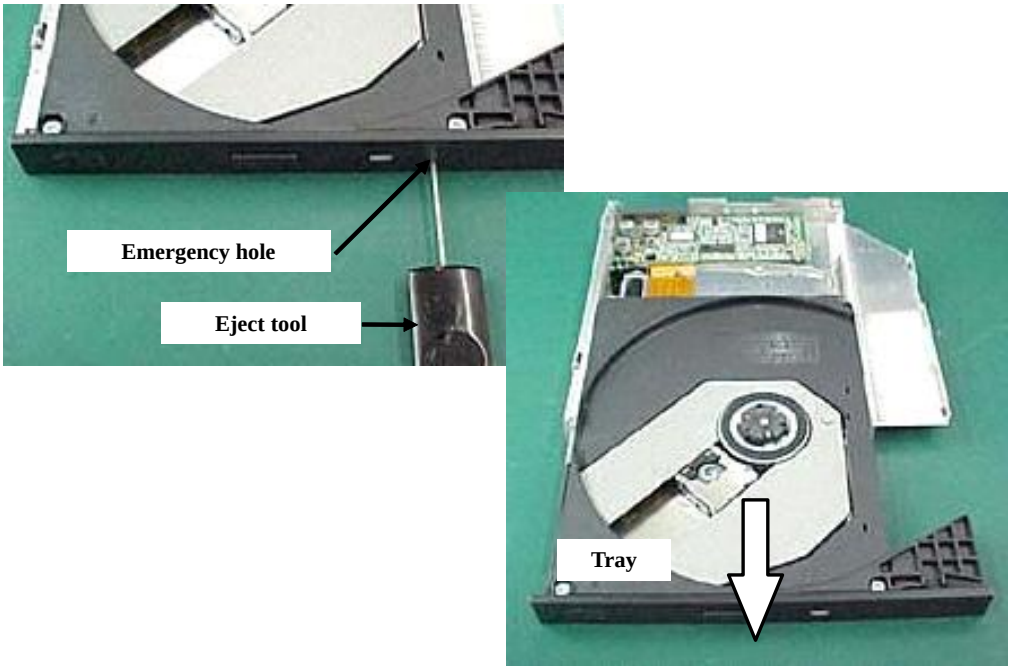


Figure 14. Ejecting the CD-ROM tray

4.3.3. Removing the Printed Circuit Board

1. Cut the FPC connected to the printed circuit board.
2. Remove the two screws that attach the printed circuit board.
3. Remove the printed circuit board.

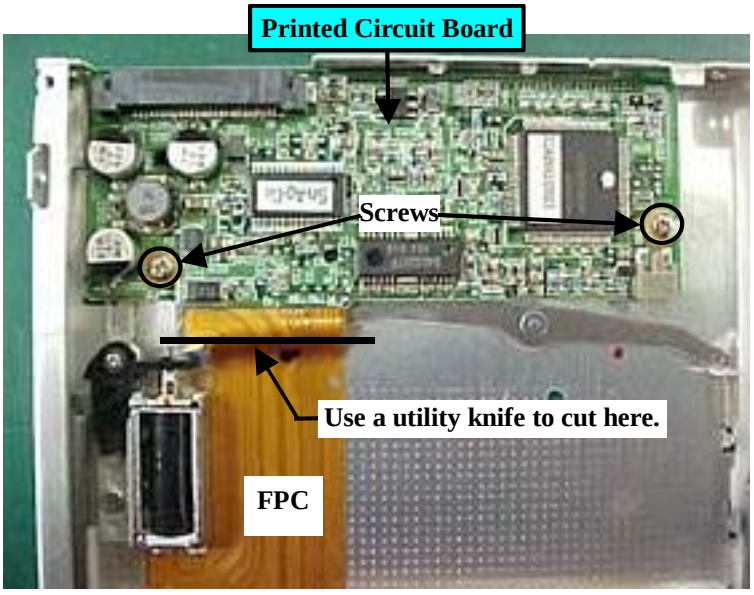


Figure 15. Removing the PCB from the CD-ROM

3.4. Removing and Disassembling the Power Supply HS0102

4.4.1. Removing the Power Supply HS0102

1. Remove the cables connecting the main board and the power supply.
2. Remove the four screws that attach the power supply.
3. Remove the power supply by pulling it upward.
   See section 4 for disassembling the power supply.

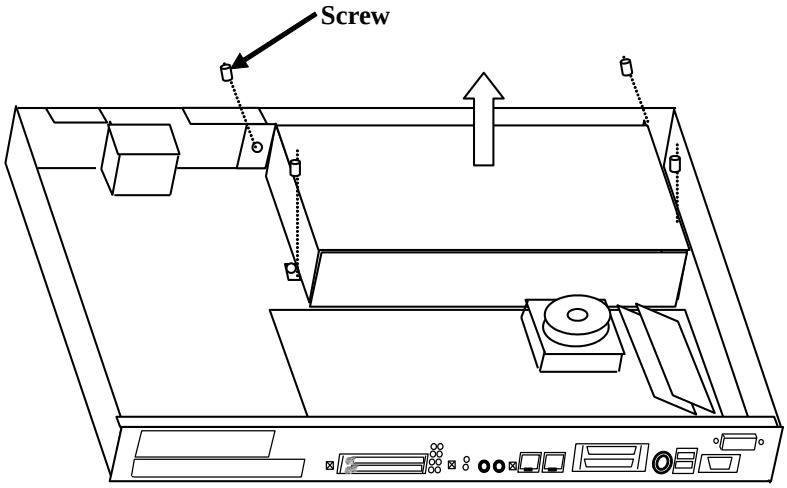


Figure 16. Removing the power supply HS0102

4.4.2. Disassembling the Power Supply HS0102

1. Remove the six screws that attach the cover, and then remove the cover by pulling it upward.

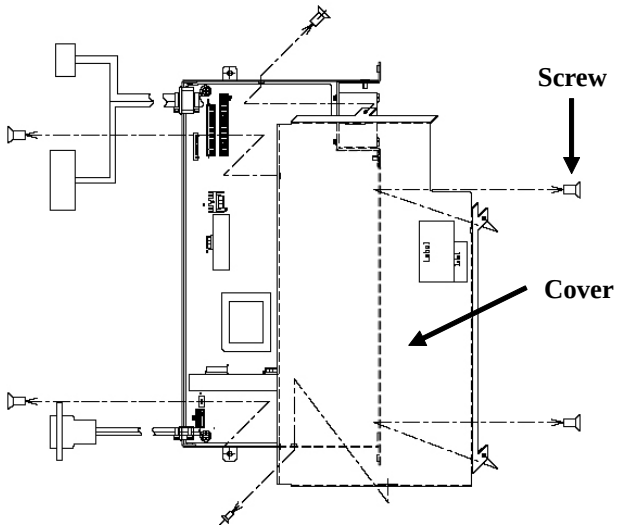


Figure 17. Removing the screw holding the power supply cover

2. Cut the four bands that attach the cable.
3. Remove the connector that is connected to the printed circuit board.
4. Remove the two screws, and then remove the fan.

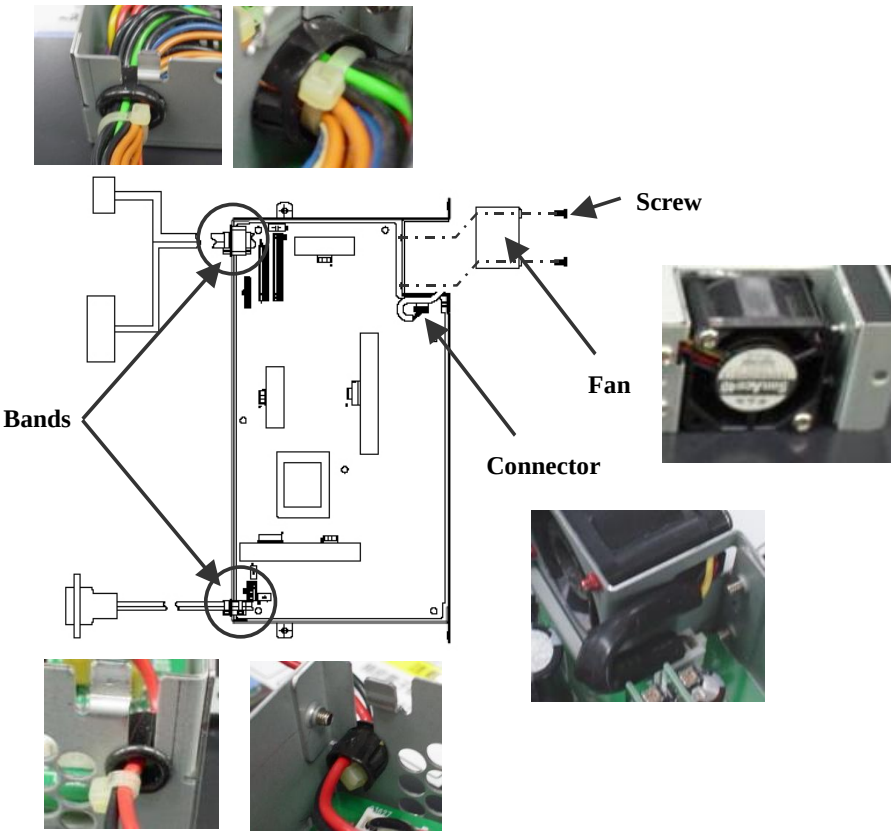


Figure 18. Removing and cutting cables and connector for HS0102

5. Remove the seven screws that attach the printed circuit board.
6. Remove the two protective covers.
7. Remove the printed circuit board.

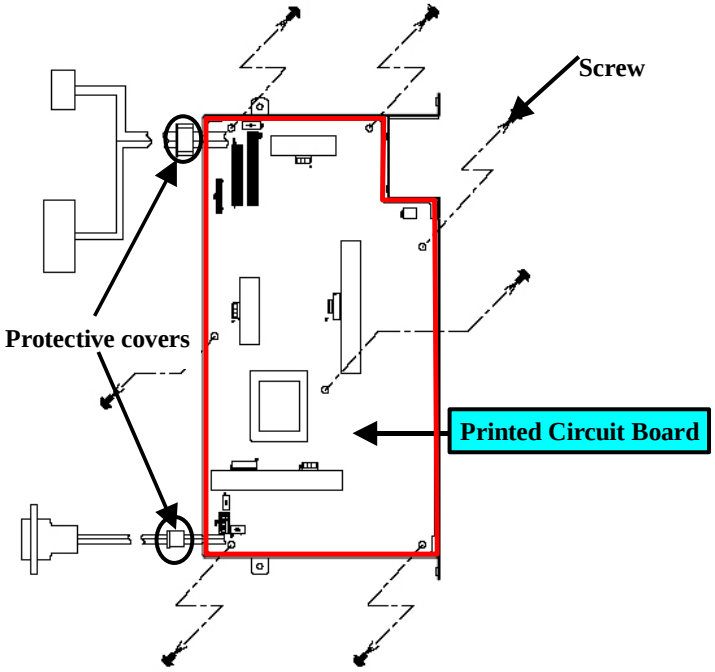


Figure 19. Removing cover and PCB from HS0102

3.5. Removing the Lithium Battery

1. Remove the lithium battery from the battery holder in the main board.
   To remove the battery, insert your finger or a stick between the side of the battery holder and the battery, pull the battery upward and then temporarily place the battery on the battery stopper.

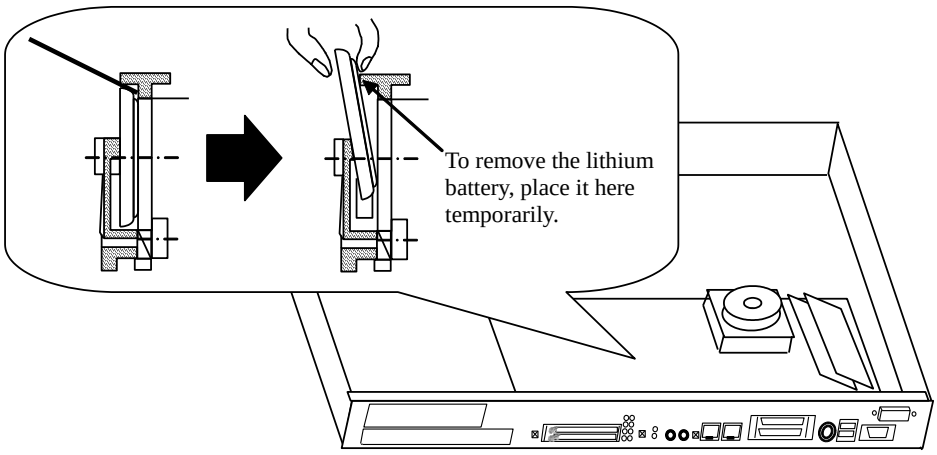


Figure 20. Removing lithium battery from holder

3.6. Removing the Fan

1. Remove the cables connecting the main board and the fan.
2. Remove the two screws that attach the fan, and then remove the fan.

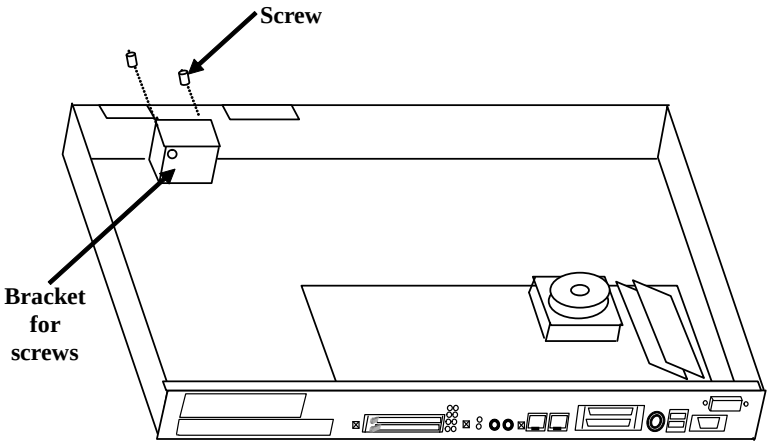


Figure 21. Removing the faj

3.7. Removing the Main Printed Circuit Board and Memory

1. Remove the ten screws that attach the main board, and then remove the main board.
   The main board includes the CPU and the DIMM (two DIMMs at the maximum).

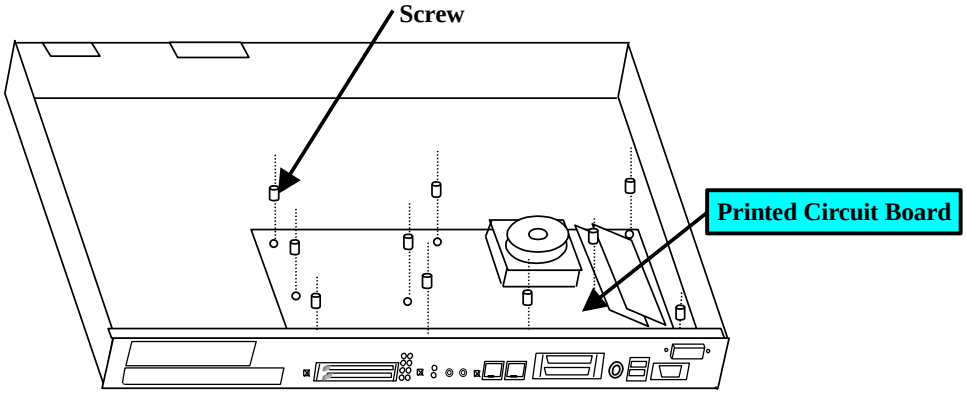


Figure 22. Removing the main PCB

2. Remove the memory by opening both sides of the slot outward.

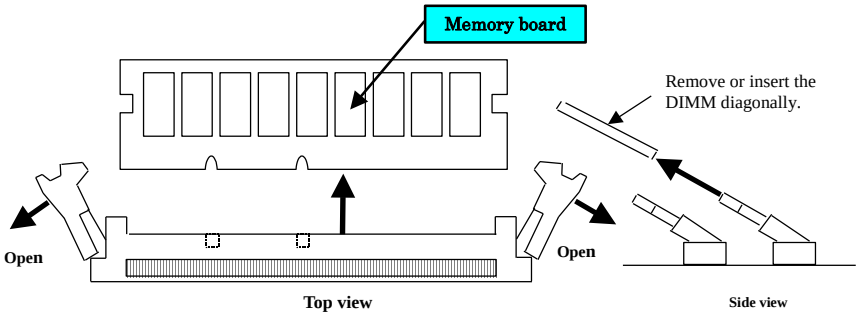


Figure 23. Removing the memory

4. Disassembling the Power Supply

The AE002A DKC or the AE045A/AU DKU uses two different power supplies. Follow the procedure for disassembling that corresponds to the appropriate power supply.

4.1. Disassembling the Power Supply PPD1950

5.1.1. Removing the Cover

1. Remove the 12 M3 screws, and then remove the cover.
   - Front panel: Ten screws (a)
   - Side panel: Two screws (b)

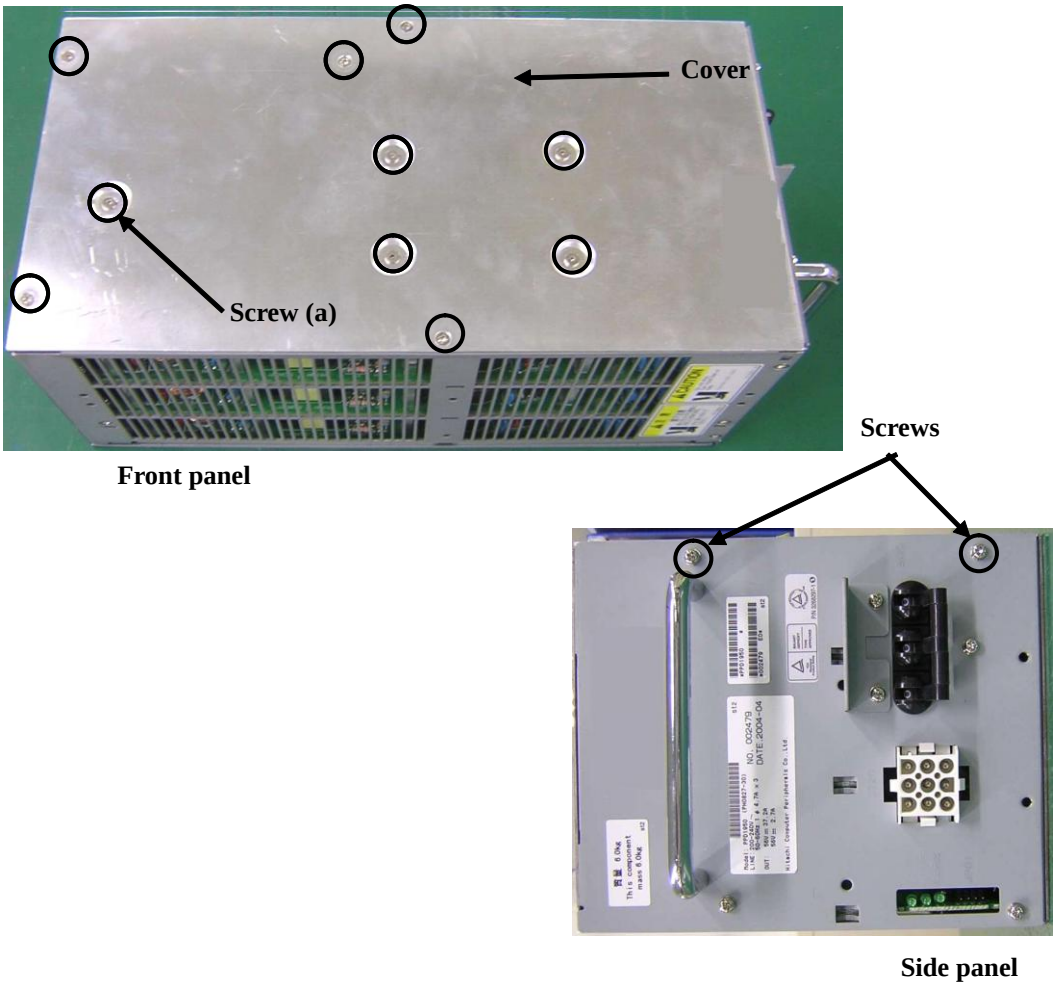
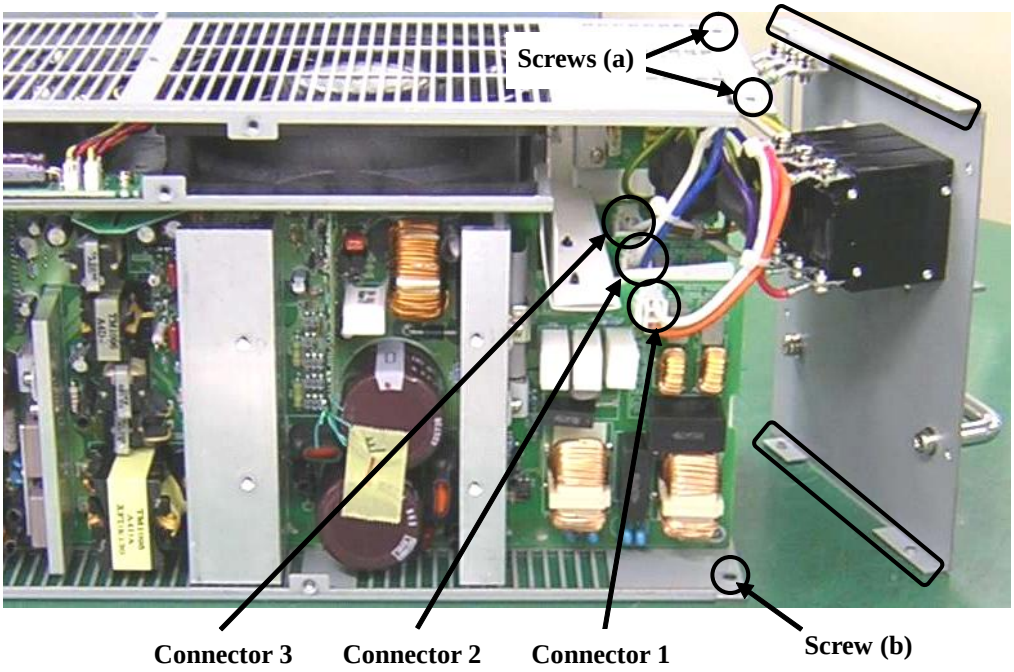


Figure 24. Removing the cover from PPD1950

5.1.2. Removing the Front Assembly

1. Remove connectors 1 to 3.
2. Remove the six M3 screws, and then remove the front assembly.
   - •Top panel: Two screws (a)
   - •Bottom panel: Two screws (b)
   - •Side panel: Two screws (c)



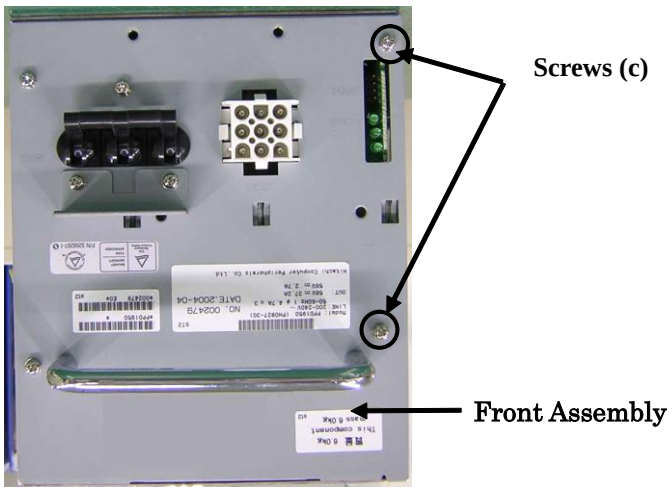


Figure 25. Removing the front assembly from PPD1950

5.1.3. Removing Printed Circuit Board 1

1. Remove connector 4, which is connected to printed circuit board 1.
2. Remove the three M3 screws that attach the printed circuit board 1.
3. Remove the partitioning chassis and the insulating paper.
4. Remove printed circuit board 1.

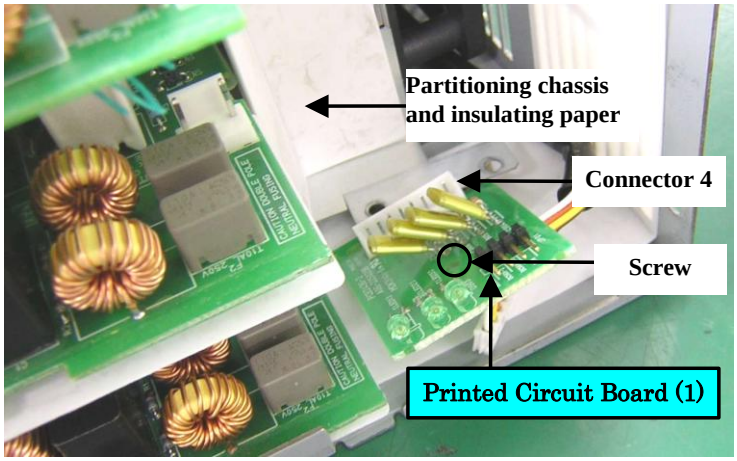


Figure 26. Removing PCB1 from PPD1950

5.1.4. Removing the Chassis

1. Remove the 13 M3 screws, and then remove the chassis by pulling it upward.
   - •Top panel: Two screws (a)
   - •Rear panel: Three screws (b)
   - •Side panel: Eight screws (c)

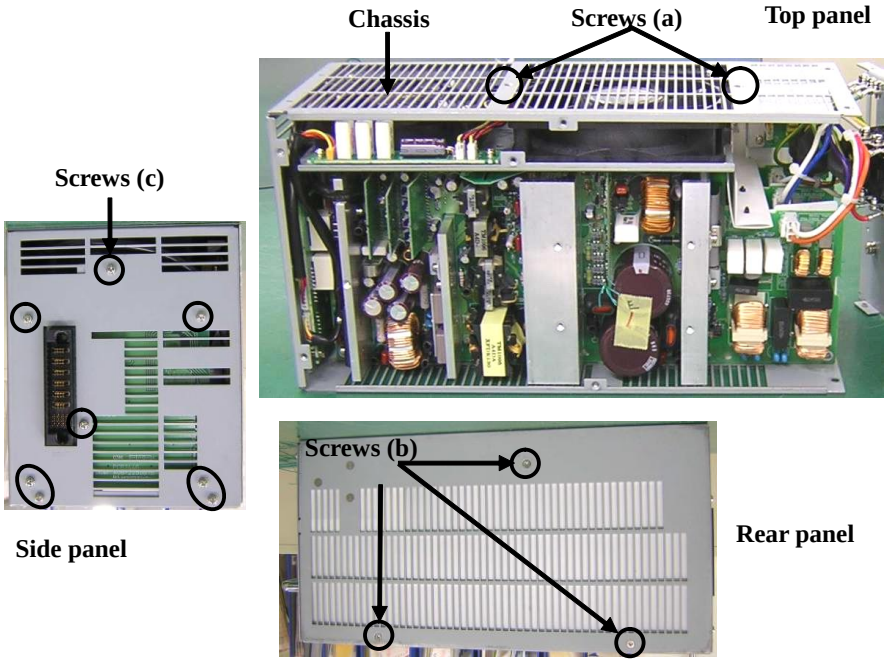


Figure 27. Removing the chassis from PPD1950

5.1.5. Removing Printed Circuit Board 2

1. Remove connectors 5 to 7.
2. Remove the two M3 screws that attach the printed circuit board (2).
3. Remove the printed circuit board (2).

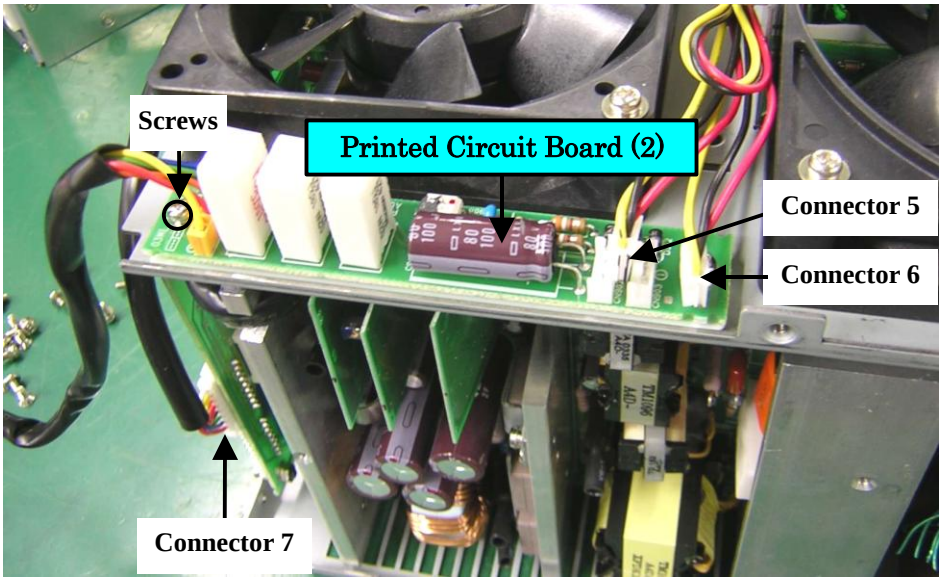


Figure 28. Removing PCB2 from PPD1950

5.1.6. Removing the Fan Assembly

1. Remove the six M3 screws that attach the fan assembly, and then remove the fan assembly.

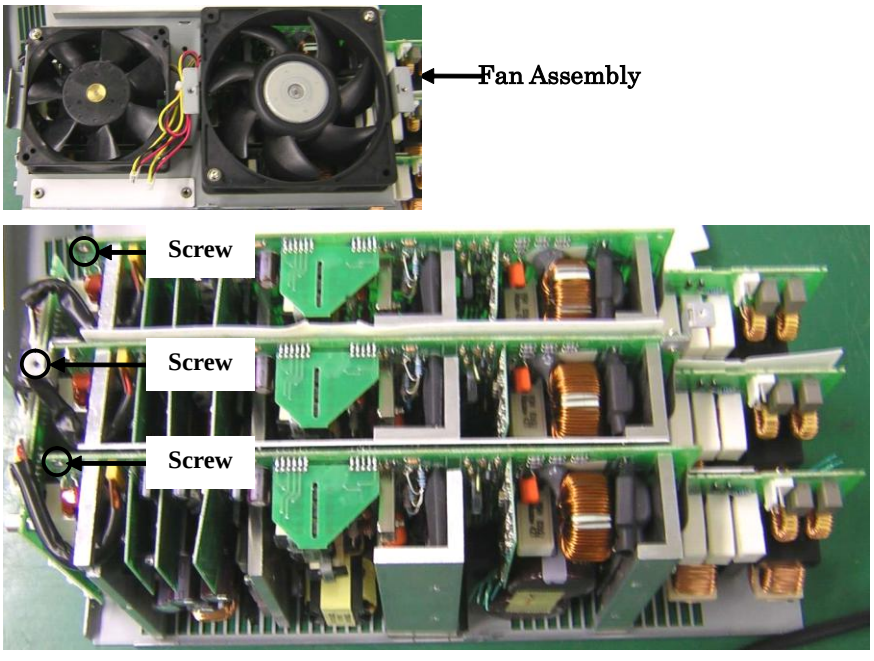


Figure 29. Removing the fan assembly from PPD1950

5.1.7. Removing Printed Circuit Boards 3 to 6

1. Remove connectors 8 to 11, and then remove printed circuit board 3.
2. Remove the two M3 screws (a), and then remove printed circuit board 4.
3. Remove the two M3 screws (b), and then remove printed circuit board 5.
4. Remove the two M3 screws (c), and then remove printed circuit board 6.

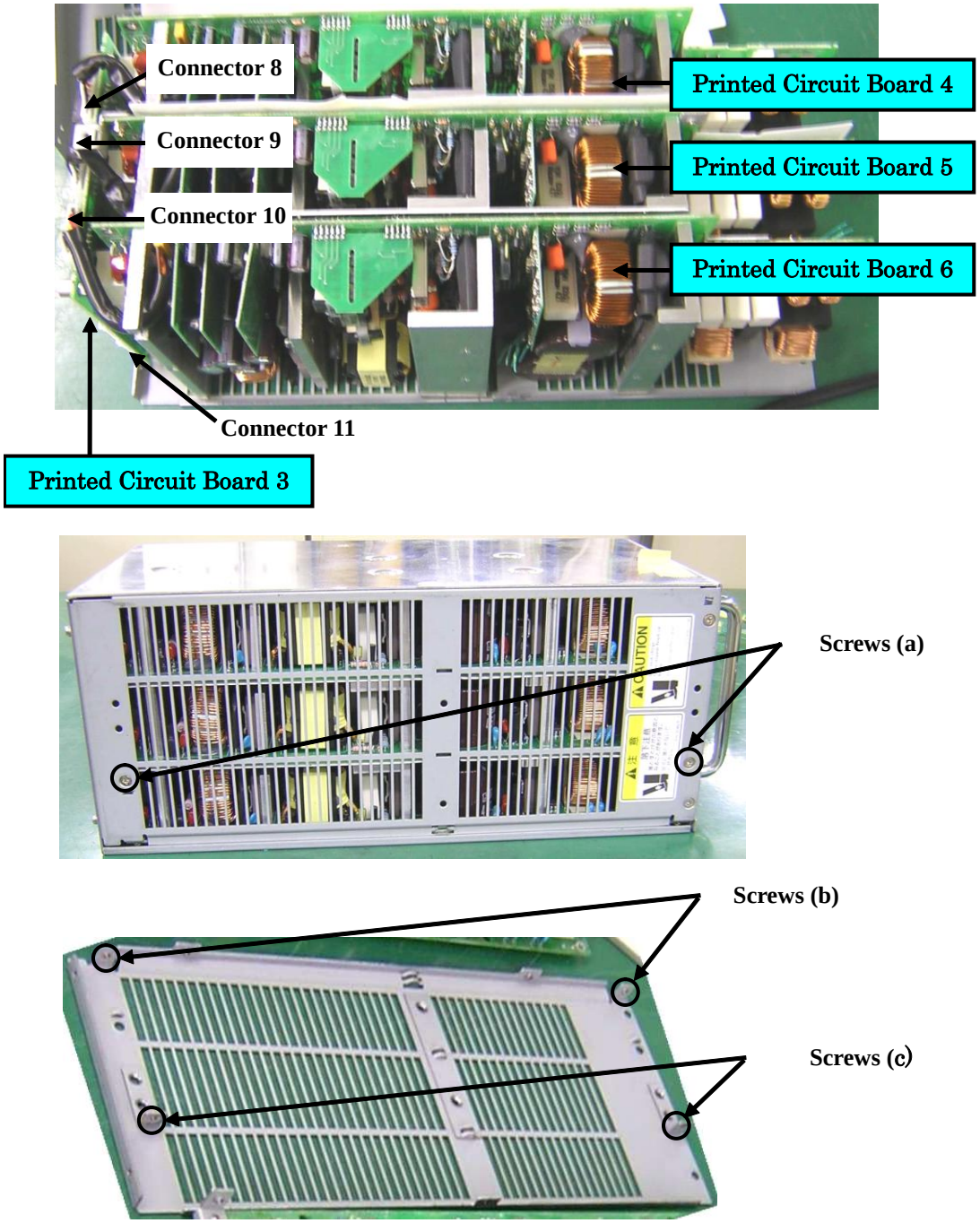
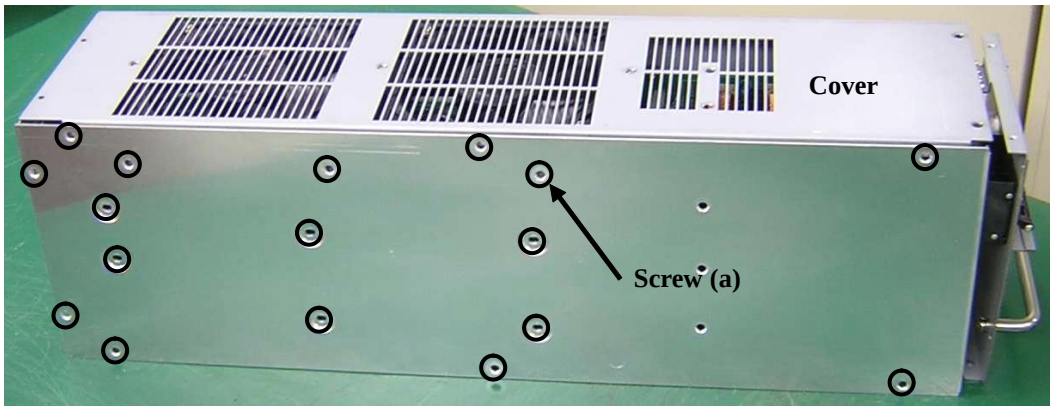


Figure 30. Removing PCB3 to 6 from PPD1950

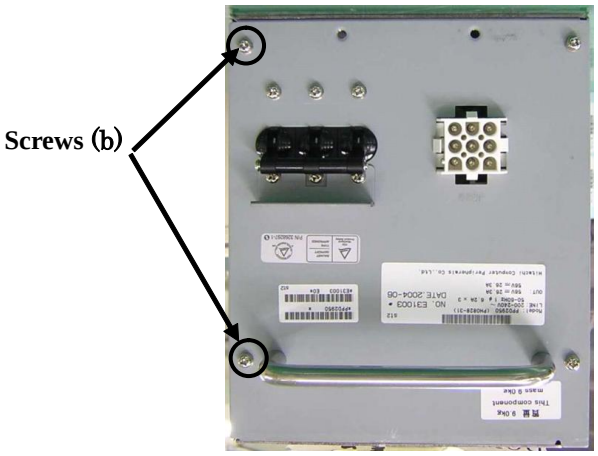
4.2. Disassembling the Power Supply PPD2950

5.2.1. Removing the Cover

1. Remove the 19 screws, and then remove the cover.
   - •Front panel: Seventeen screws (a)
   - •Side panel: Two screws (b)



Front Panel

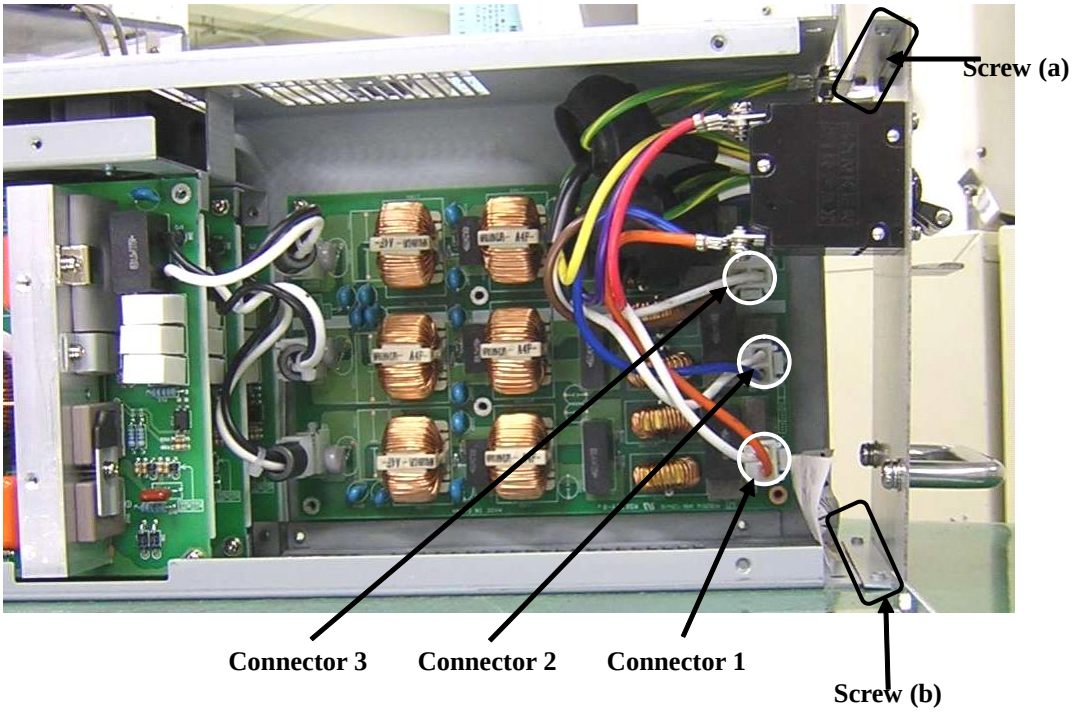


Side Panel

Figure 31. Removing the cover from PPD2950

5.2.2. Removing the Front Assembly

1. Remove connectors 1 to 3.
2. Remove the six M3 screws, and then remove the front assembly.
   - •Top panel: Two screws (a)
   - •Bottom panel: Two screws (b)
   - •Side panel: Two screws (c)



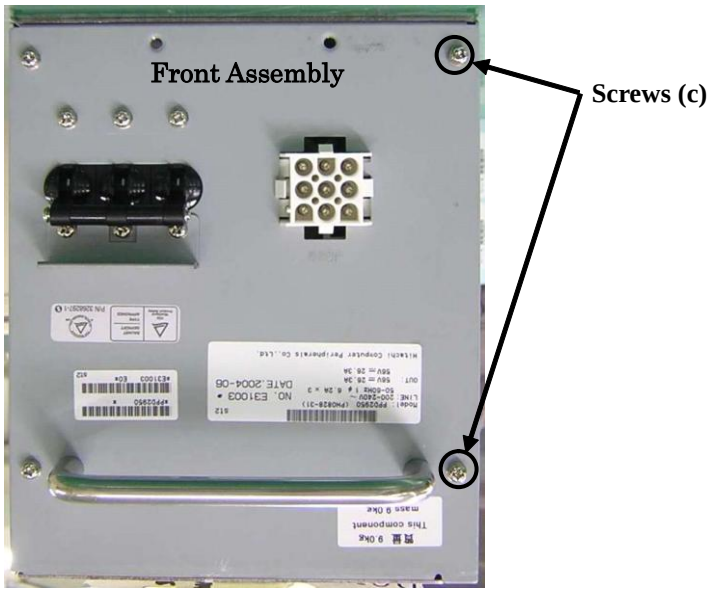


Figure 32. Removing the front assembly from PPD2950

5.2.3. Removing Printed Circuit Board 1

1. Remove connectors 4 to 6.
2. Remove the six M3 screws that attach printed circuit board 1.
3. Remove the printed circuit board 1.

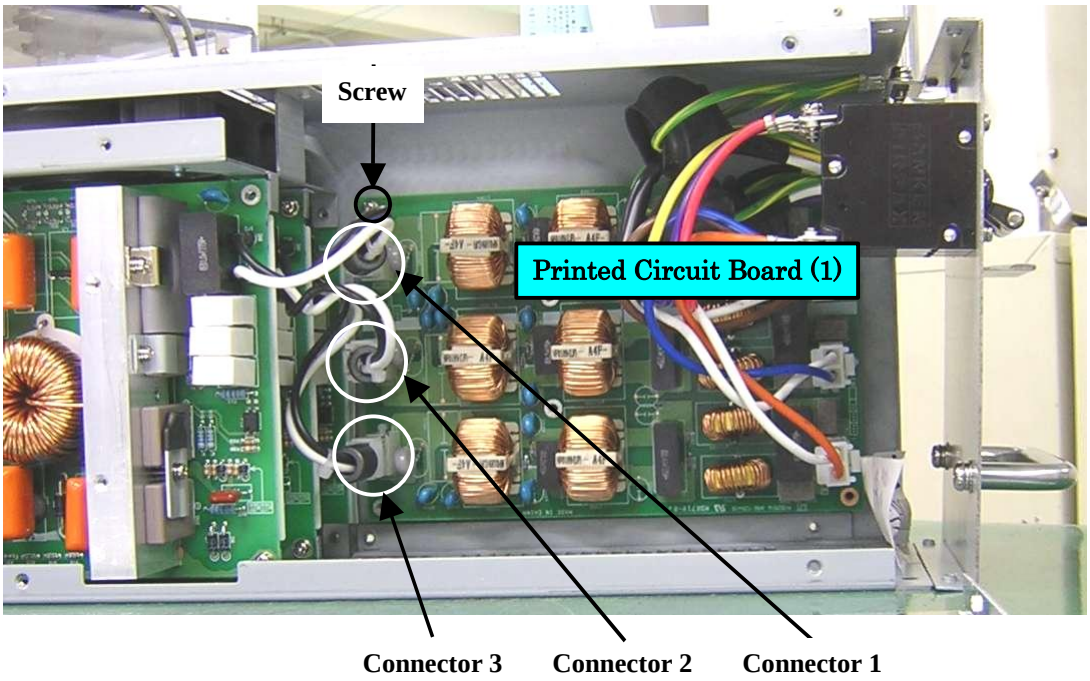


Figure 33. Removing PCB1 from PPD2950

5.2.4. Removing the Chassis

Remove the 20 M3 screws, and then remove the chassis by sliding it toward Side A.

•Side A: Eleven screws (a)
•Side B: Six screws (b)
•Side C: Three screws (c)

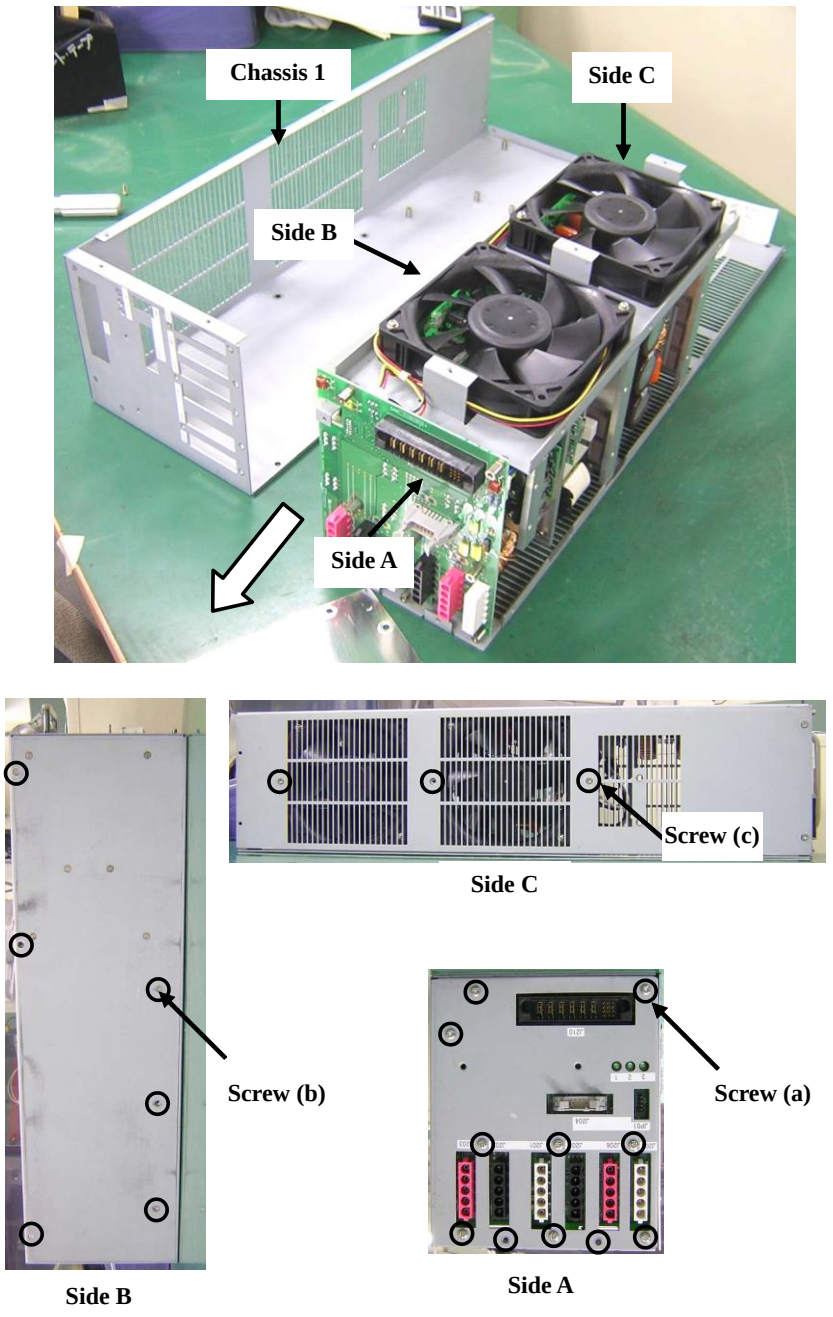


Figure 34. Removing the chassis from PPD2950

5.2.5. Removing the Fan Assembly

1. Remove connector 7, which is connected to printed circuit board 2.
2. Remove the six M3 screws, and then remove the fan assembly.
   •Two screws (a), two screws (b), two screws (c)

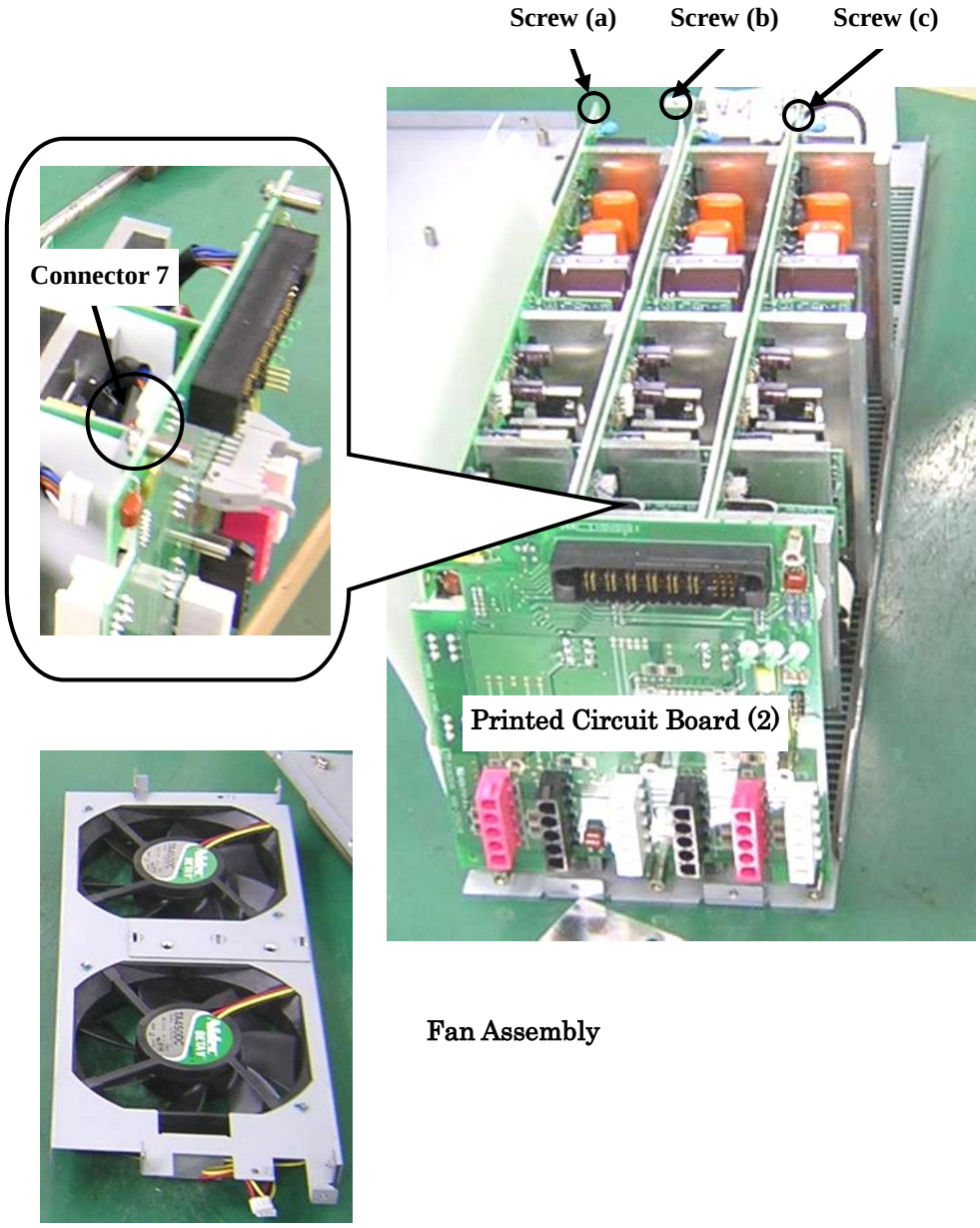


Figure 35. Removing the fan assembly from PPD2950

5.2.6. Removing Printed Circuit Boards 2 to 5

1. Remove connectors 8 to 10, and then remove printed circuit board 2.
2. Remove the two M3 screws (a), and then remove printed circuit board 3.
3. Remove the two M3 screws (a), and then remove printed circuit board 4.
4. Remove the two M3 screws (c), and then remove printed circuit board 5.

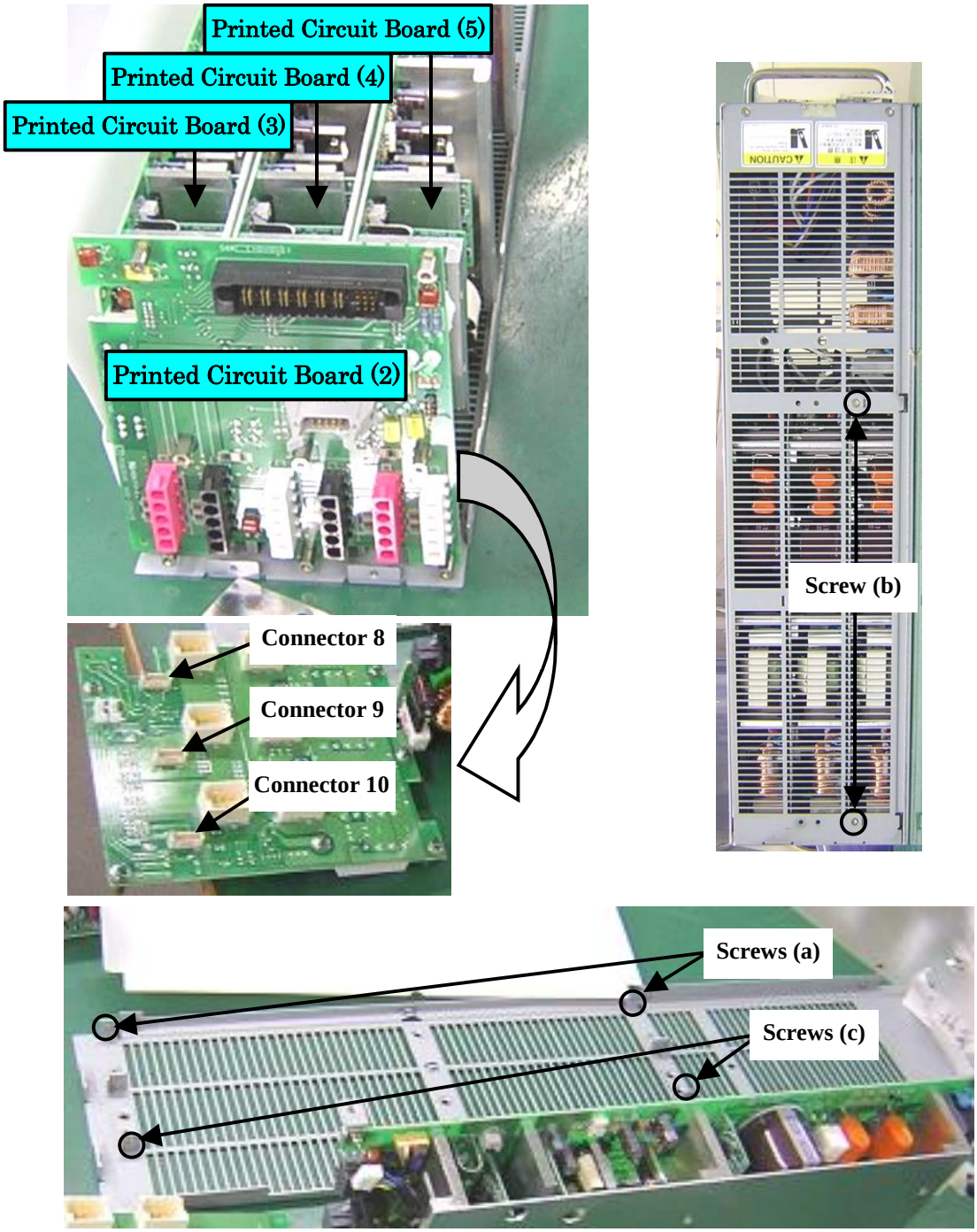


Figure 36. Removing PCB 2 to 5 from PPD2950

4.3. Disassembling the Power Supply HS1950

5.3.1. Removing the Cover

1. Remove the nine screws, and then remove the cover by pulling it upward.
   •Side panel: Four screws (a)
   •Top panel: Five screws (b)

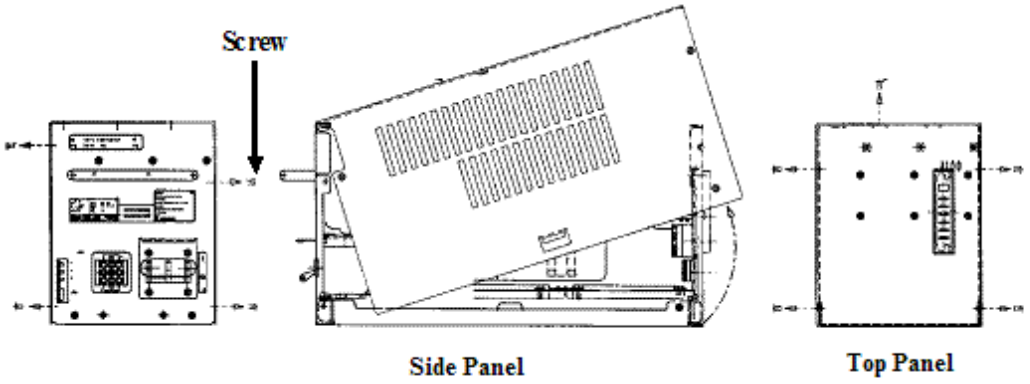


Figure 37. Removing the cover from HS1950

5.3.2. Removing the Front and Rear Panels

1. Remove the screws, and then remove the front and rear panels.
   •Front panel: Eight screws (a)
   •Rear panel: Eight screws (b)

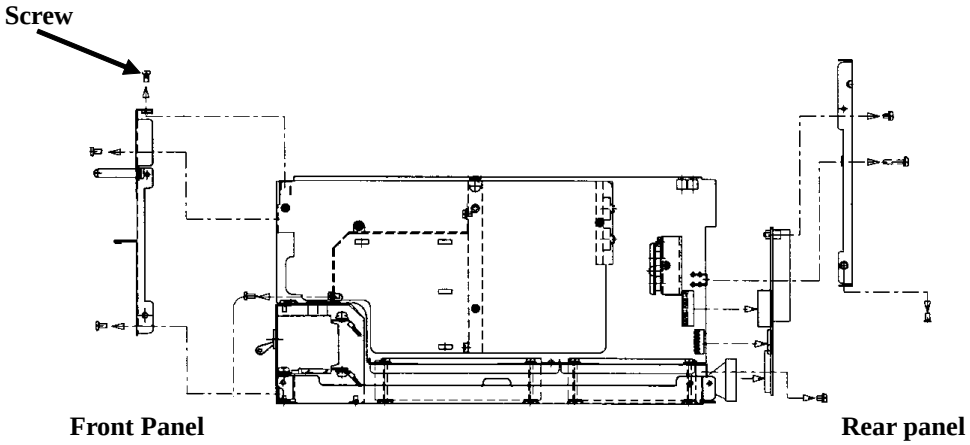


Figure 38. Removing the front and rear panels from HS1950

5.3.3. Removing Printed Circuit Board 1 (Front)

1. Remove the three heat-insulating boards.
2. Remove the three connectors that are connected to printed circuit board 1.
3. Remove the two screws that attach printed circuit board 1.
4. Remove the connector that is connected to printed circuit board 1.
5. Remove printed circuit board 1.

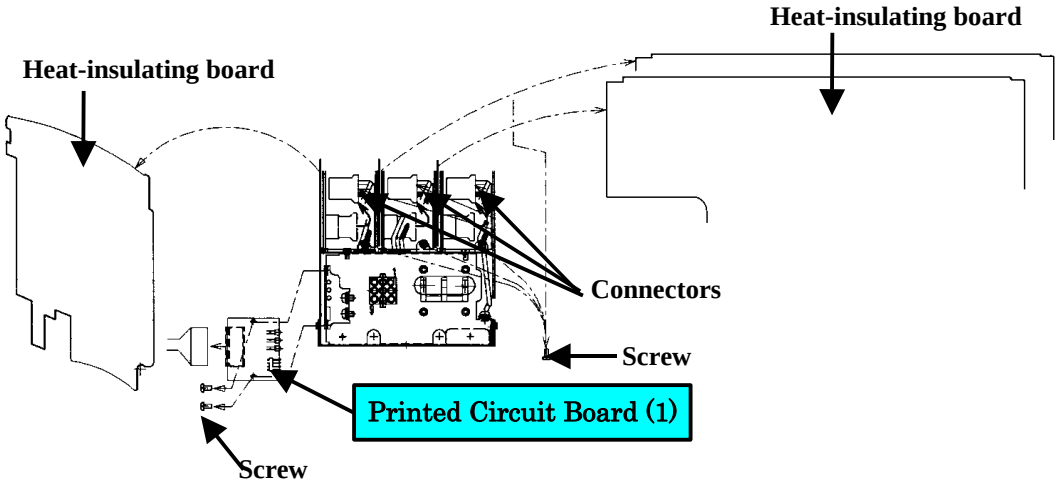


Figure 39. Removing PCB1 from HS1950

5.3.4. Removing Printed Circuit Board 2 (Rear)

1. Remove the two screws, and then remove printed circuit board 2.
2. Remove the six connectors 1 that are connected to printed circuit board 2.
3. Remove the three connectors 2 that are connected to printed circuit board 2.

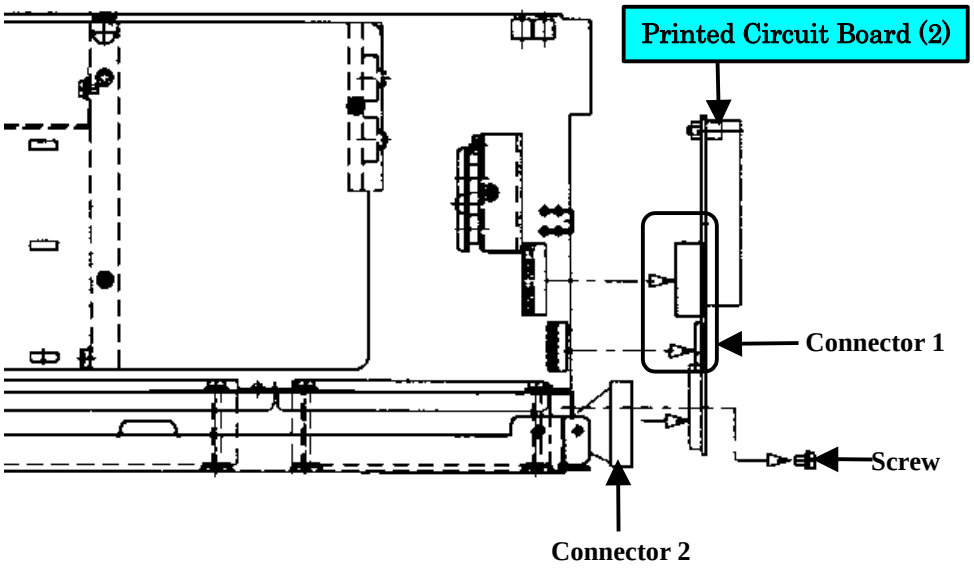


Figure 40. Removing PCB2 from HS1950

5.3.5. Removing Printed Circuit Boards 3 to 5

Remove the printed circuit boards 3, 4, and 5.

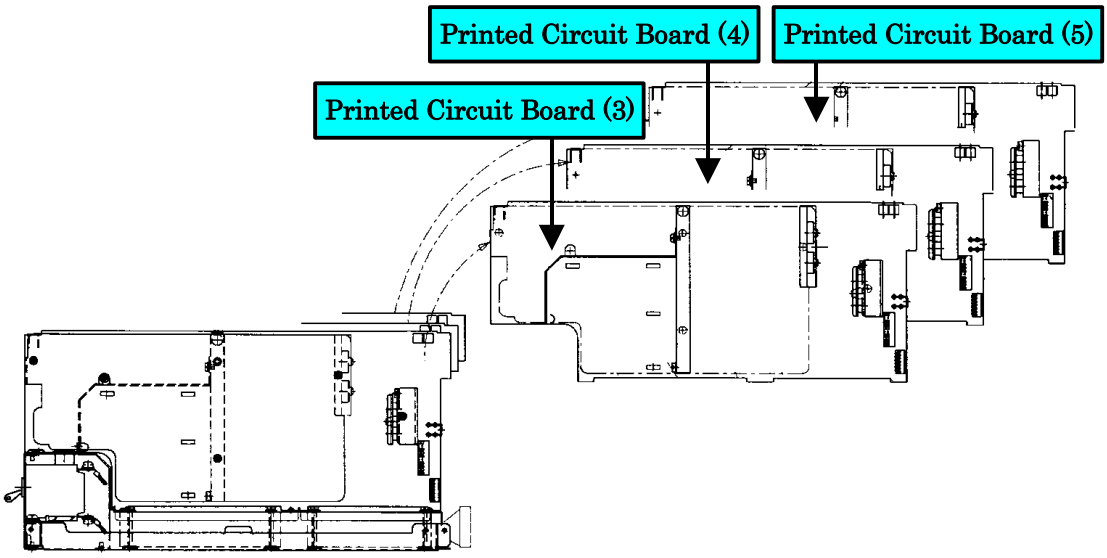


Figure 41. Removing PCB3 to 5 from HS1950

5.3.6. Removing the Fan Assembly

1. Remove the four screws, and then remove the fan assembly.
2. Remove the two screws that attach the circuit breaker.

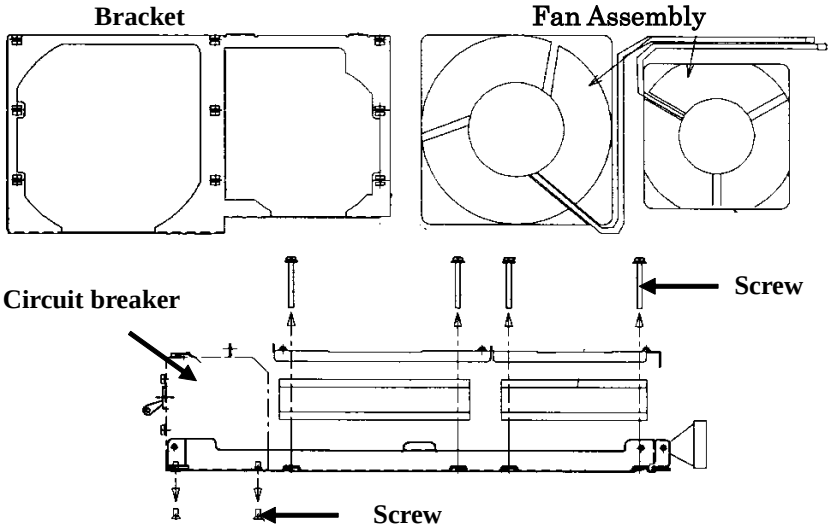


Figure 42. Removing the fan assembly from HS1950

4.4. Disassembling the Power Supply HS2950

5.4.1. Removing the Cover

1. Remove the 14 screws, and then remove the cover by pulling it upward.
   •Top panel: Five screws
   •Side panel: Nine screws

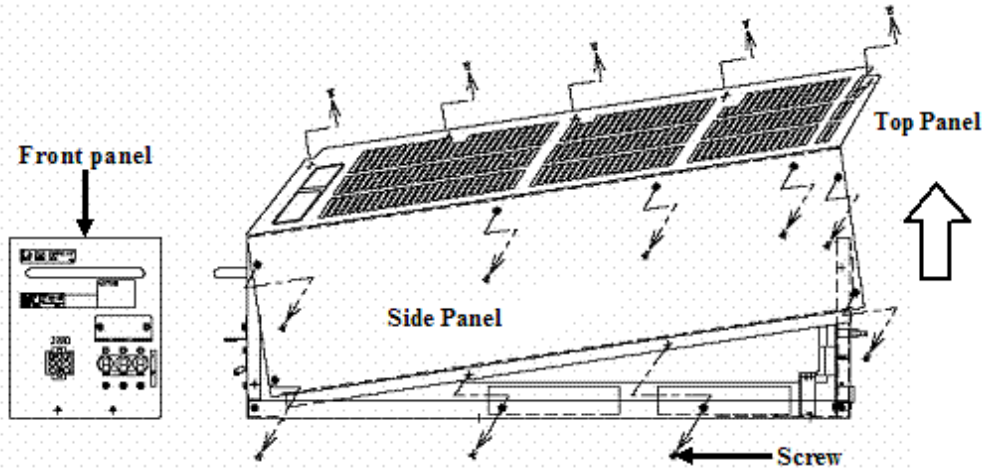


Figure 43. Removing the cover from HS2950

5.4.2. Removing the Front Panel

1. Remove the three screws, and then open the front panel.
   •Top panel: Two screws
   •Side panel: One screw
2. Cut the wire connected to the printed circuit board, and then remove the front panel.

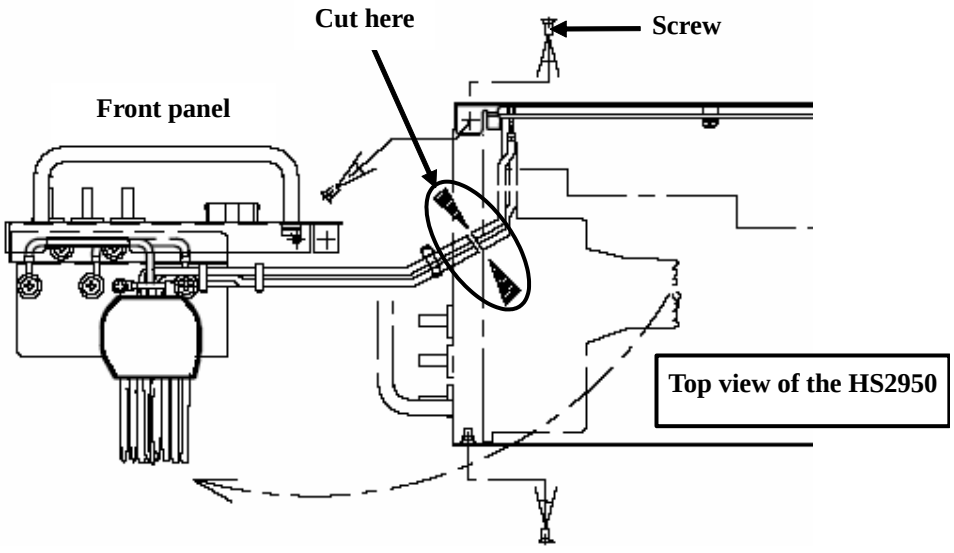


Figure 44. Removing the front panel from HS2950

5.4.3. Removing Printed Circuit Board 1(Front)

1. Remove the three connectors.
2. Remove the six screws, and then remove printed circuit board 1.

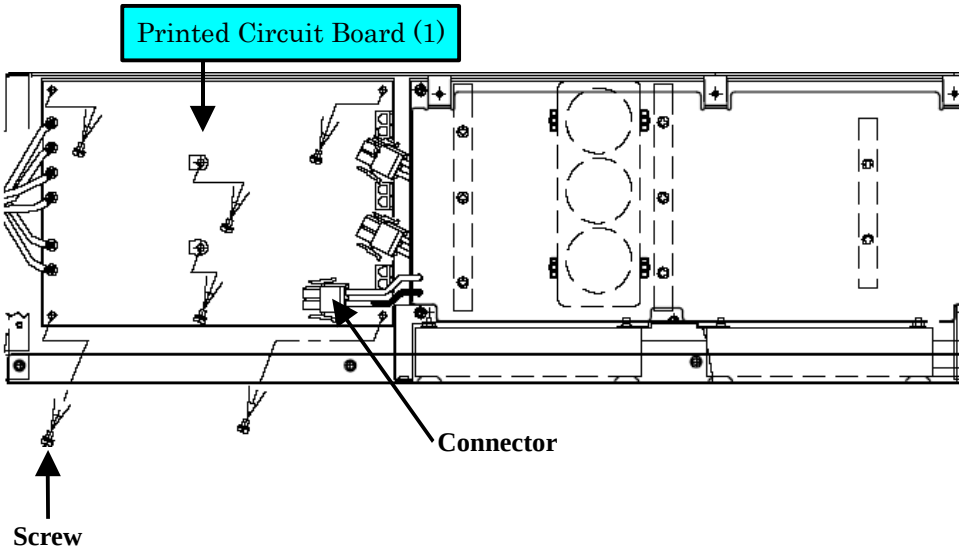


Figure 45. Removing PCB1 from HS2950

5.4.4. Removing the Rear Panel

Remove the three screws, and then remove the rear panel.
•Top panel: One screw
•Side panel: Two screws

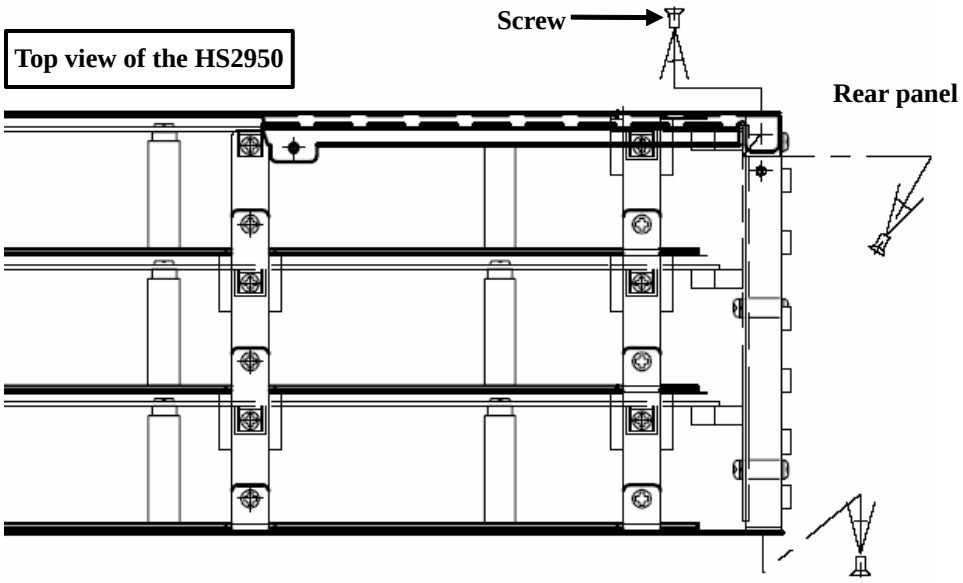


Figure 46. Removing the rear panel from HS2950

5.4.5. Removing Printed Circuit Board 2 (Rear)

1. Remove the five screws, and then remove the rear panel.
2. Pull printed circuit board 2 toward you and remove it.

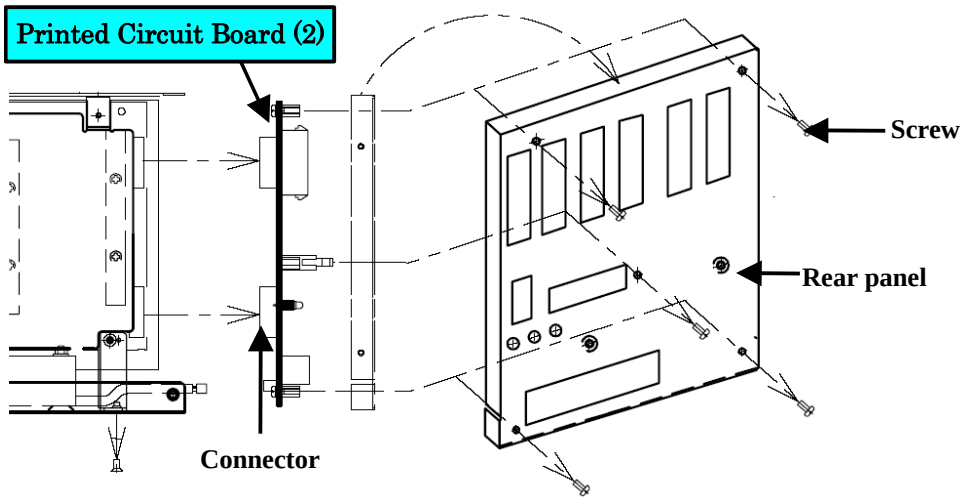


Figure 47. Removing PCB2 from HS2950

3.4.6. Removing Printed Circuit Board 3

1. Remove the four screws (a) from the chassis.
2. Remove the 18 screws (b) that attach printed circuit board 3.
3. Remove the bracket, and then remove the two units of printed circuit board 3.

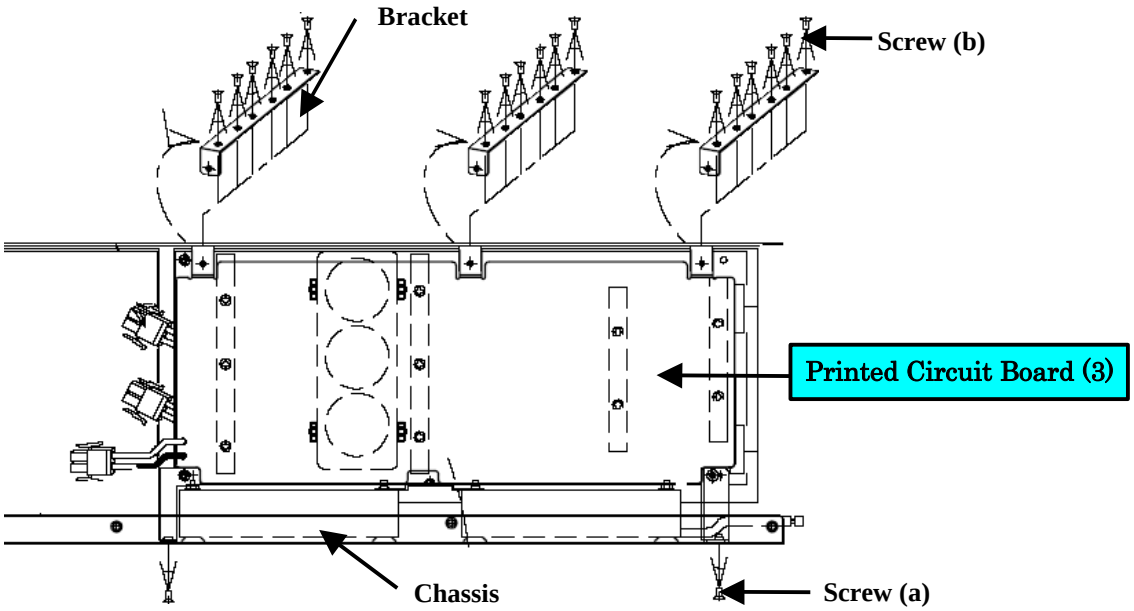


Figure 48. Removing PCB3 from HS2950

5.4.7. Removing Printed Circuit Board 4

Remove the four screws, and then remove printed circuit board 4.

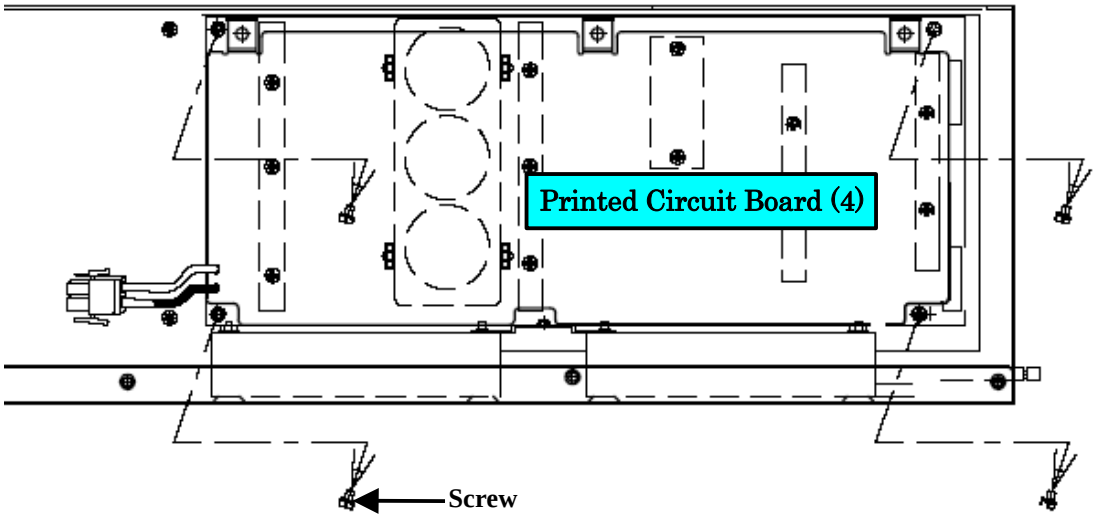


Figure 49. Removing PCB4 from HS2950

5.4.8. Removing the Fan Assembly

1. Remove the eight screws and four flange nuts, and then remove the fan assembly.

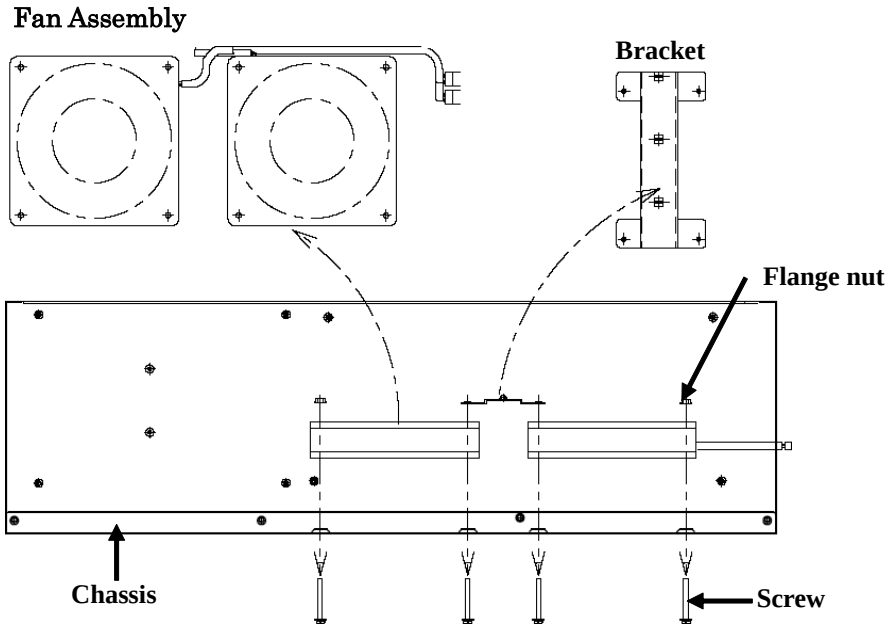


Figure 50. Removing the fan assembly from HS2950

5. Disassembling the Fan

Remove the four screws, and then remove the fan.

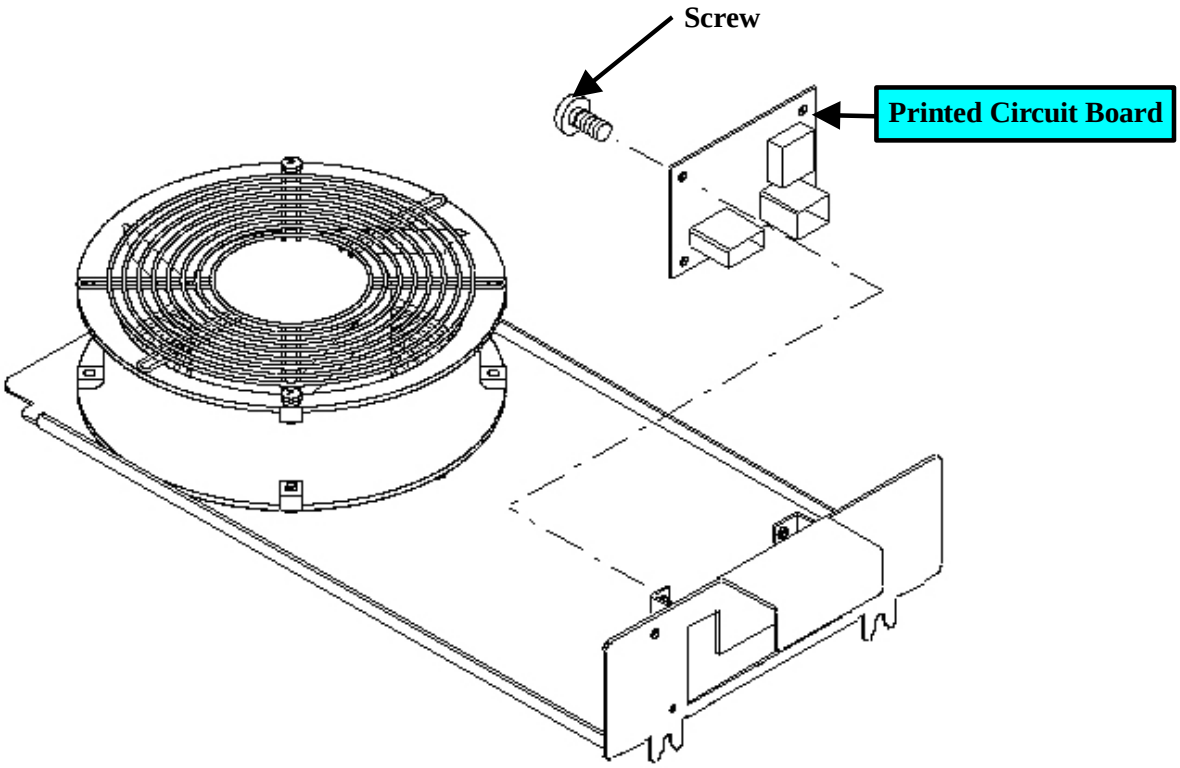


Figure 51. Disassembling the Fan

6. Disassembling the Hard Drive (HDD)

1. Remove the four screws, and then remove the HDD.
2. Remove the one screw, and then remove the drive.

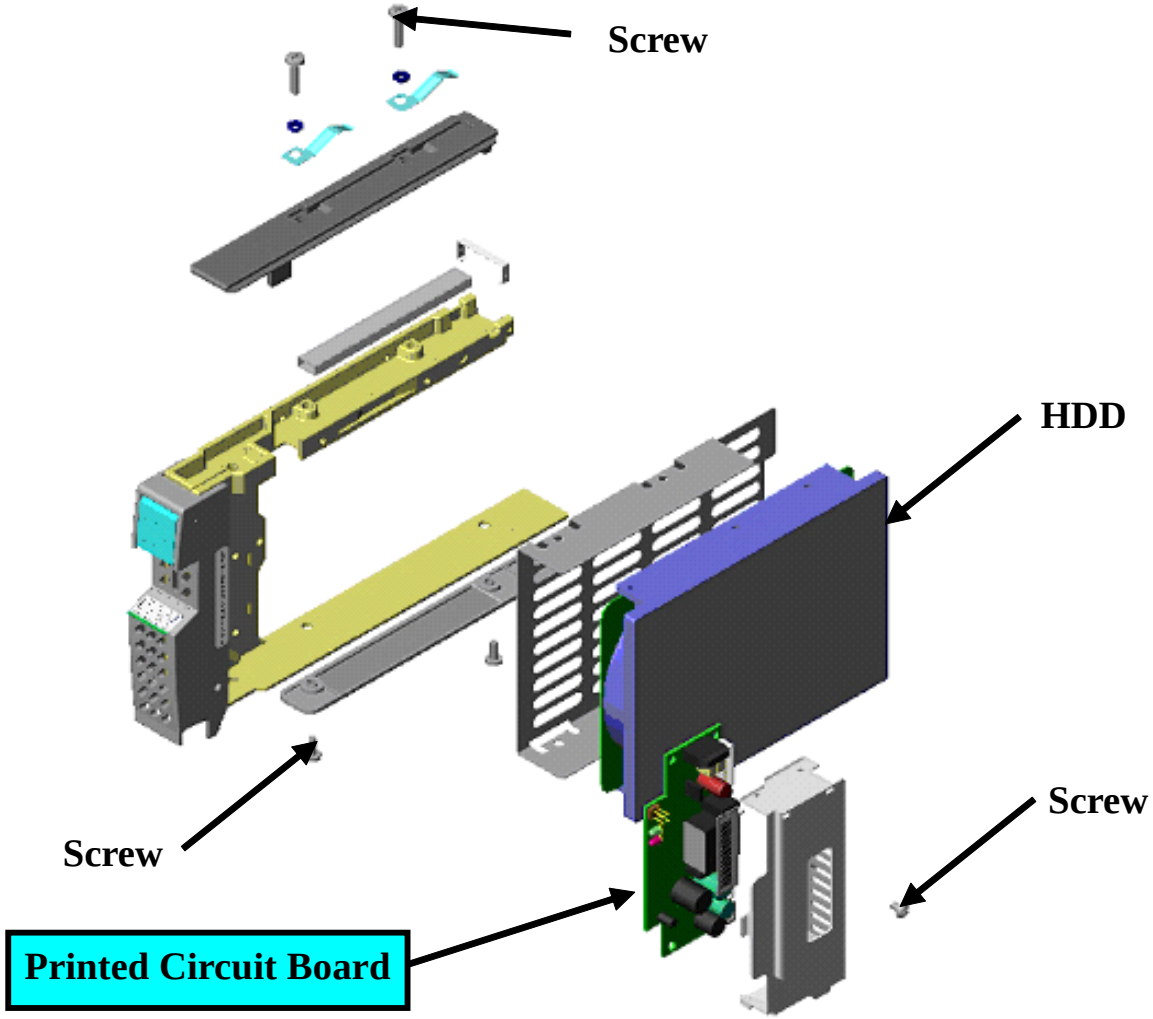


Figure 52. Disassembling the HDD

7. Disassembling the Battery Box

8.1. Removing the Cover

Remove the 17 M3 screws, and then remove covers 1 and 2 by pulling them upward.

- Top panel (Covers1 and 2): Eleven screws
- Side panel: Six screws

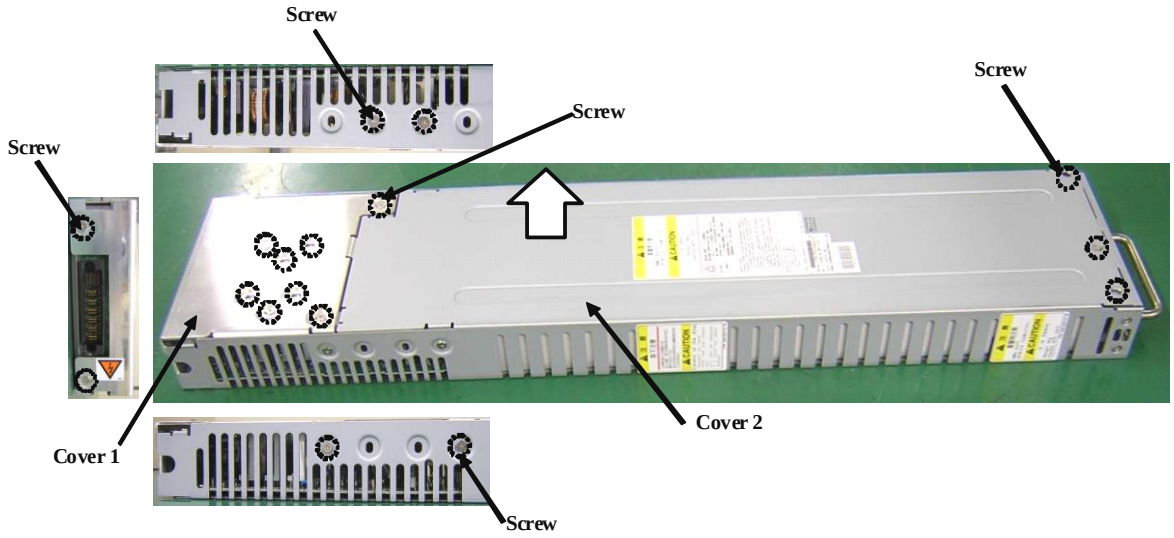


Figure 53. Removing the cover from the battery box

8.2. Removing the Battery Pack

1. Remove connectors 1 to 4.
2. Remove the two M3 screws, and then remove the bracket.
3. Remove the battery pack by pulling it upward.

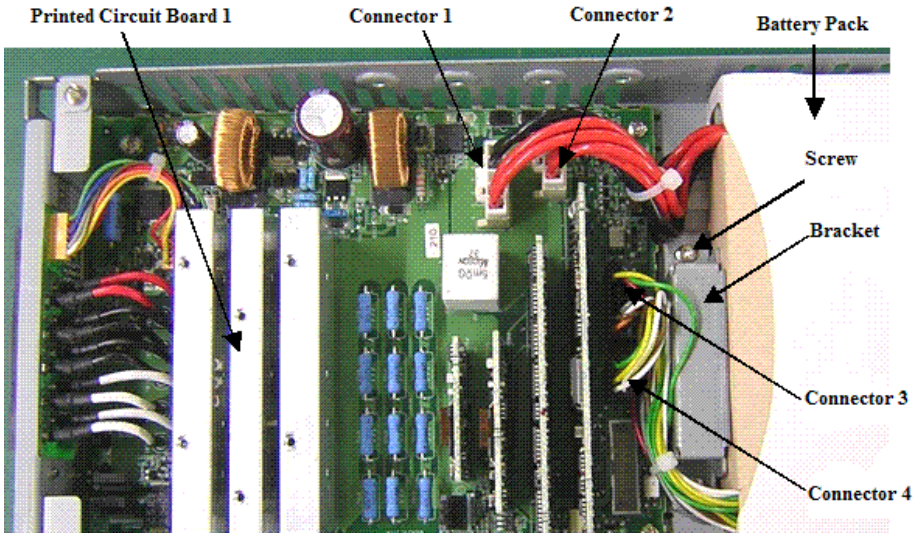


Figure 54. Removing the battery pack

8.3. Removing the Printed Circuit Board

1. Remove the flat cables connected to printed circuit boards 1 and 2.
2. Remove the four M3 screws that attach printed circuit board 1 and the two M3 screws and two washers at the side panel, and then remove printed circuit board 1 by pulling it upward.
3. Remove the two M3 screws that attach printed circuit board 2, and then remove printed circuit board 2 by pulling it upward.

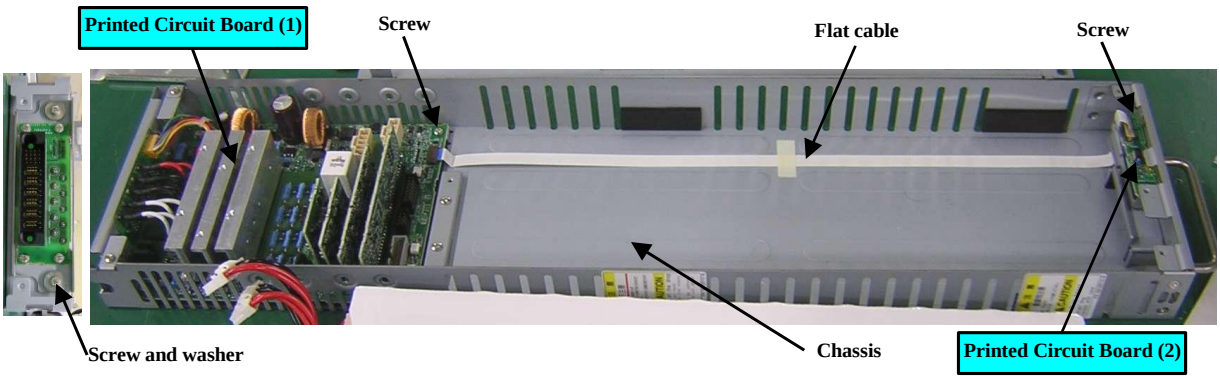


Figure 55. Removing PCB1 and 2 from the battery box

8. Removing and Disassembling the AC Power Cable

9.1. Removing and Disassembling the AE002A DKC AC Power Cable

1. Loosen the four screws, and then remove the terminal block cover.
2. Remove the screws, and then remove the AC power cable and the FG cable.

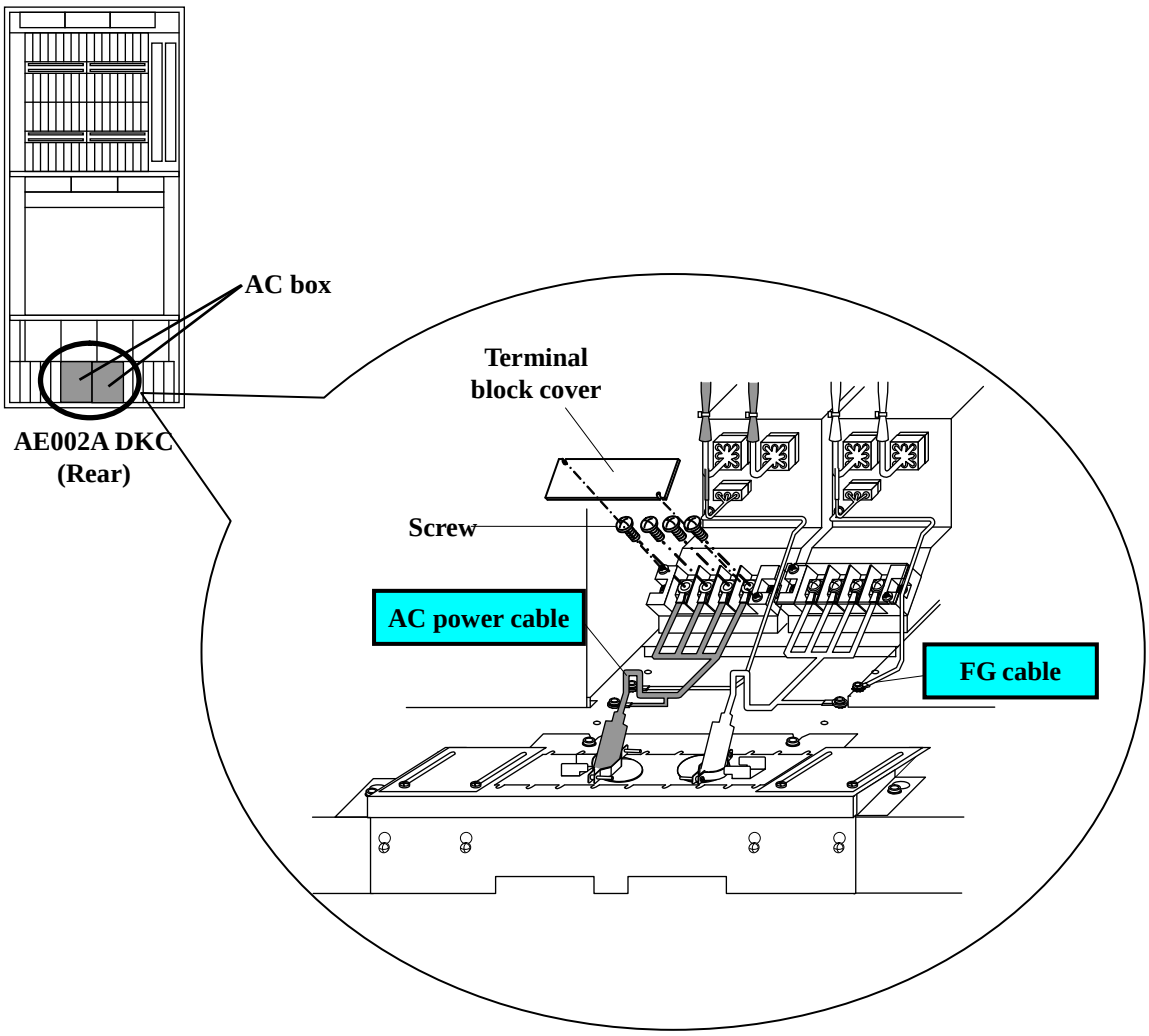


Figure 56. Removing the AE002A DKC AC Power Cable

9.2. Removing and Disassembling the AE045A/AU DKU AC Power Cable

1. Loosen the four screws, and then remove the terminal block cover.
2. Remove the screws, and then remove the AC power cable and the FG cable.

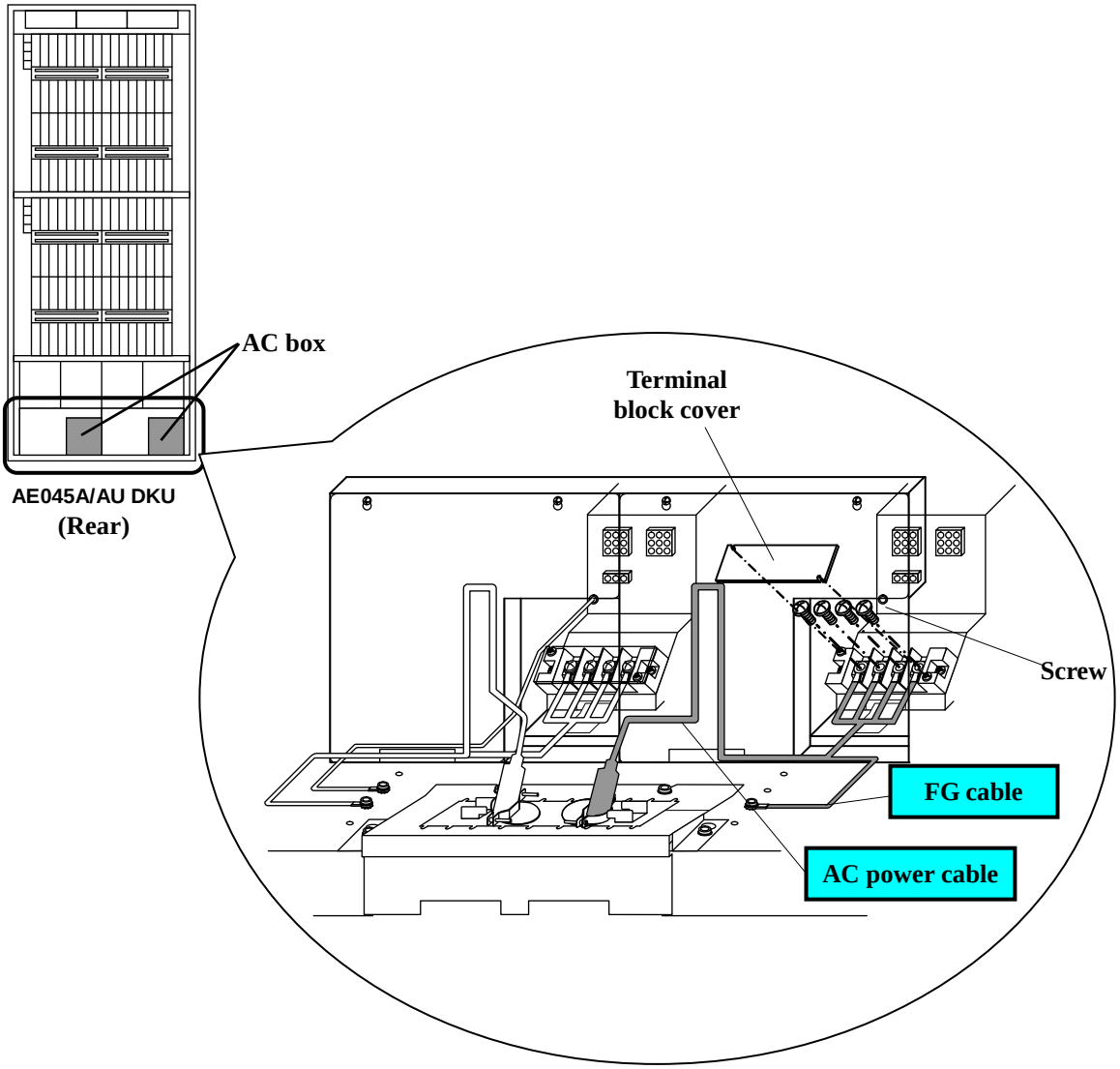


Figure 57. Removing the AE045A/AU DKC AC power cable