

GRiDCASE 1500
DISASSEMBLY/REASSEMBLY
Instructions

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

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INTRODUCTION

In this exercise, you are going to become intimately familiar with the disassembly, reassembly, and testing of the 1500 series system. In this case, the 1500 series system refers to both the 1520 (286) and the 1530 (386) machines. Therefore, the purpose of this exercise is to teach you the necessary techniques and skills to perform the disassembly and reassembly of the system without causing irreparable damage to either you or the system, and to give you the means to verify that the system works when you're done.

Similarities

The construction of the 1500 series system is much like the construction of the GRiDCASE/GRiDCASE Plus system. It disassembles much like the GRiDCASE/GRiDCASE Plus, and is divided into similar sub-assemblies. It has the same dimensions as the GRiDCASE/GRiDCASE Plus, and has the same color scheme. Much of the hardware has remained the same between the two product series: latch assemblies and latch receptacles, modems, external power supplies, some other accessories, and miscellaneous hardware such as screws, nuts, and bolts.

Differences

There are substantial differences between the 1500 series system and the GRiDCASE/GRiDCASE Plus. Here are some of the differences which are noticable and important to disassembly, assembly, and testing of the system:

1. Minimal cabling.
2. DC/DC converter: Plugs directly into the main logic board.
3. Floppy drive: 1.44 MB drives now.
4. Different serial connector (9 pin) needs a different serial loopback connector.
5. New 640 by 400 display: It has an adjustable brightness switch to adjust brightness.

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6. Four bi-color LEDs (located in the upper, right-hand corner of the keyboard bezel) are used to indicate system activity. Table 2 shows the system status indicated by each of the lights.

Tools Needed

You will need the following tools and materials for this exercise:

LED	RED	GREEN
DS4 (top)	Internal Floppy	Not Applicable
DS3	External Floppy	Hard Disk
DS2	Processor Speed Low	Not Applicable
DS1 (bottom)	Battery Low	Battery Charging

Table 3-1
Status LED's interpretation from top to bottom.

1. A #1 Phillips screwdriver (magnetic tip preferred)
2. A #2 flat-blade screwdriver
3. A Pick-Pry Tool (Moody Co., Providence, R.I.)
4. Diagnostics disk
5. A Serial and a Centronics loopback connector
6. A scratch disk
7. Pocket Floppy drive
8. This guide

DISASSEMBLY

Preparation:

1. Turn off and unplug system.
2. Prepare a clean workspace.
3. Have some padding available to protect the system's surfaces.
4. Have some anti-static packing material available in which to store static sensitive boards.
5. Have a cup or tray nearby for removed screws, nuts, and bolts.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 1: Remove the cover

1. Using the Pick-Pry tool, remove the knurled, rectangular screw caps from the rear panel to expose the cover retainer screws.
2. Remove the two cover retainer screws (#3) from the rear panel.



Figure 3-2. GRIDCASE 1500 Rear Panel.

3. Remove the cover in the following manner.
 - a. Pull the cover forward about 1/8".
 - b. Lift the cover off the system, starting on the right side.
4. Set the cover down where it won't be scratched.

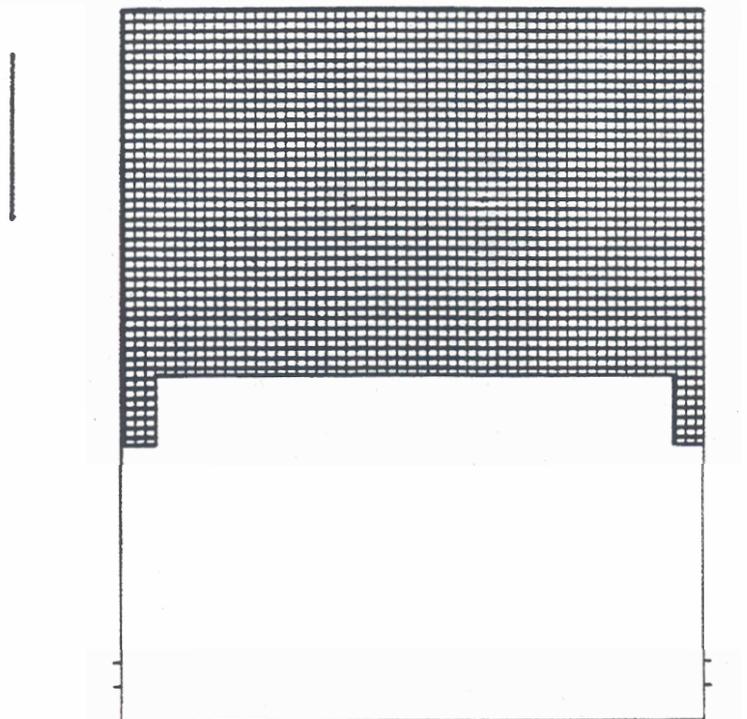


Figure 3-1. GRIDCASE 1500 Cover.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 2: Set aside the display

1. Place a rectangle of padding at least 12" wide and 9" long on the table next to the left side of the system.
2. Release the latches on the display so that it will open. **DO NOT OPEN IT YET!**
3. With your left hand, apply moderate downward pressure against the back of the display housing on the line indicated (This prevents damage to the hinge ears when raising the display). With your right hand, raise the display about halfway.
4. Close, but don't latch the display, lift it flat off the hinge ears, and lay it face up on the padding to the left of the system, leaving the display cable connected.

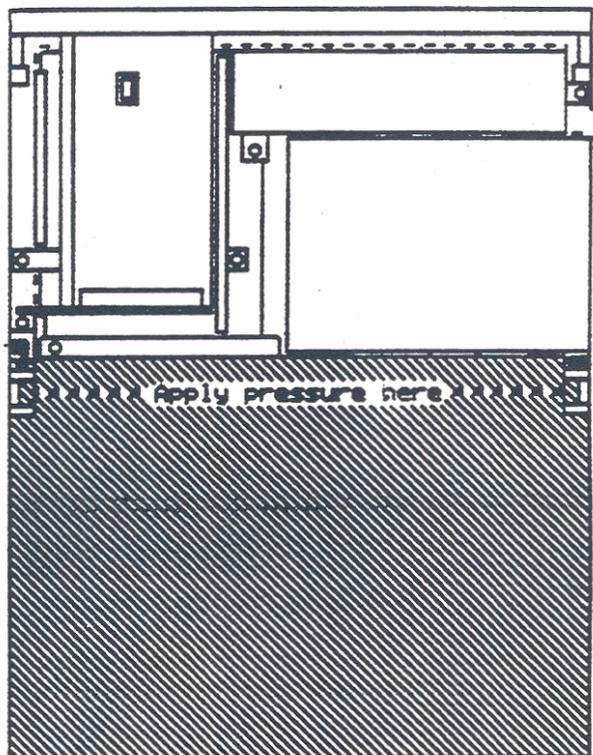


Figure 3-3. Removing the display.

Step 3: Remove the keyboard bezel

1. Carefully insert the edge of the flat-blade screwdriver between the bezel and the base of the system on the right side of the system.
2. Gently twist the screwdriver until the bezel parts from the base.
3. Perform the same operation on the left side of the base.
4. Grasp the bezel by the curved rear edge, and lift it clear of the base.
5. Set the bezel aside where it won't be damaged.

Step 4: Remove the keyboard

1. Remove the four Phillips screws (#5) holding down the latch receptacles.
2. Remove the latch receptacles.
3. Remove the two screws (#1) from the keyboard mounting tabs.
4. Lift the front edge of the keyboard until the keyboard is standing straight up on its rear edge.
5. Pry the two keyboard cables, located at the left front edge of the keyboard, from the main logic board with the flat-blade screwdriver.
6. Set the keyboard aside where it won't be damaged.

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Step 5: Remove the modem.

1. Grasp the modem card by the top edge and pull upwards while gently rocking the card back and forth. Doing this, the modem card will clear the system without bending any pins on its connector.

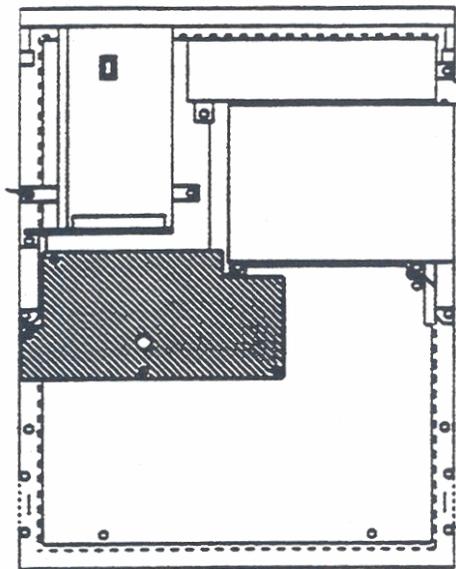


Figure 3-4. Removing the modem.

Step 6: Remove the Video/ROM board and the display

1. Remove the four screws from the Video/ROM board.
2. Remove the screw (#2) holding the display ground lug from the left-hand mounting ear of the battery box.
3. Remove the Video/ROM card from the system with the display cable attached.
4. Wrap the board in an anti-static bag, and set the display and the board aside where they won't be damaged.

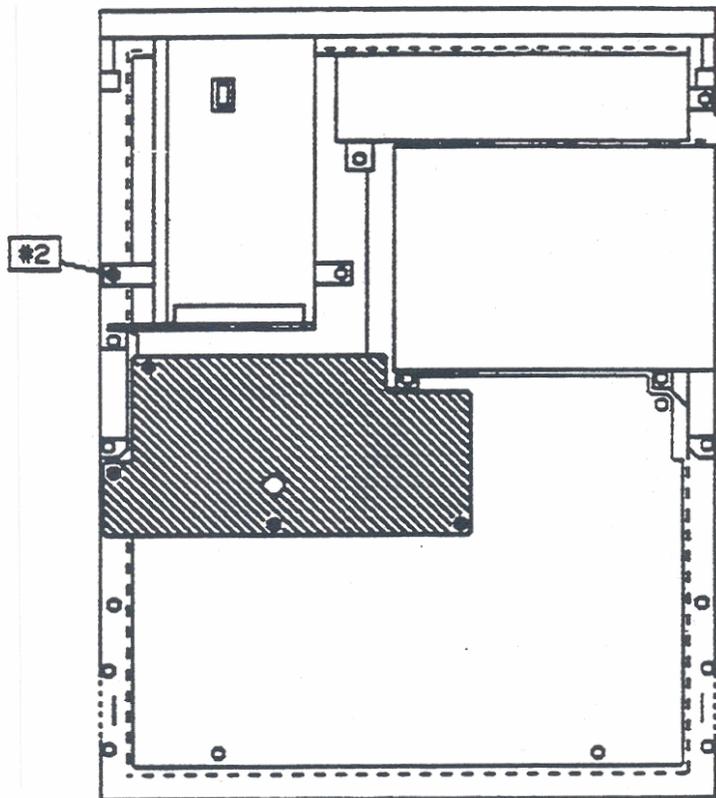


Figure 3-5. Removing the Video/ROM board and display.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 7: Remove the battery tray

1. Remove the remaining screw from the battery tray.
2. Firmly grasp the board on the front edge of the tray.
3. Pull the box up to disconnect the board from the main logic board and then forward to clear the battery box from rear panel.
4. Set the battery tray aside where it won't be damaged.
5. Collect the eject system's parts under battery tray (they consist of a spring and two plastic pieces) and put them in a safe place.

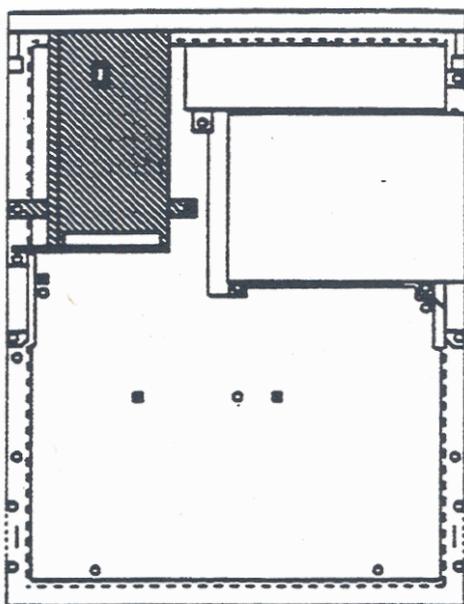


Figure 3-6. Removing the battery tray.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 8: Remove the DC/DC converter

1. Disconnect the three flat rear panel cables from the main logic board.
2. Remove the two screws from either side of the DC/DC converter.
3. Lift the DC/DC converter out of the system.
4. Set the DC/DC converter aside where it won't be damaged.

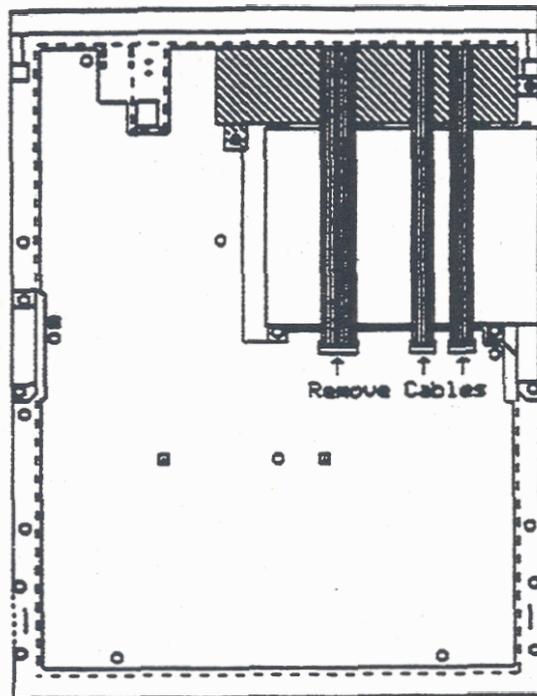


Figure 3-7. Removing the DC/DC converter.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 9: Remove the drive assembly

1. Remove the three screws (#1) and one 3/8" screw (#2) holding the drive assembly to the base.
2. Disconnect the backplane flex cables from the main logic board.
3. Keeping the backplane board with the drives, lift the drive assembly out of the system.

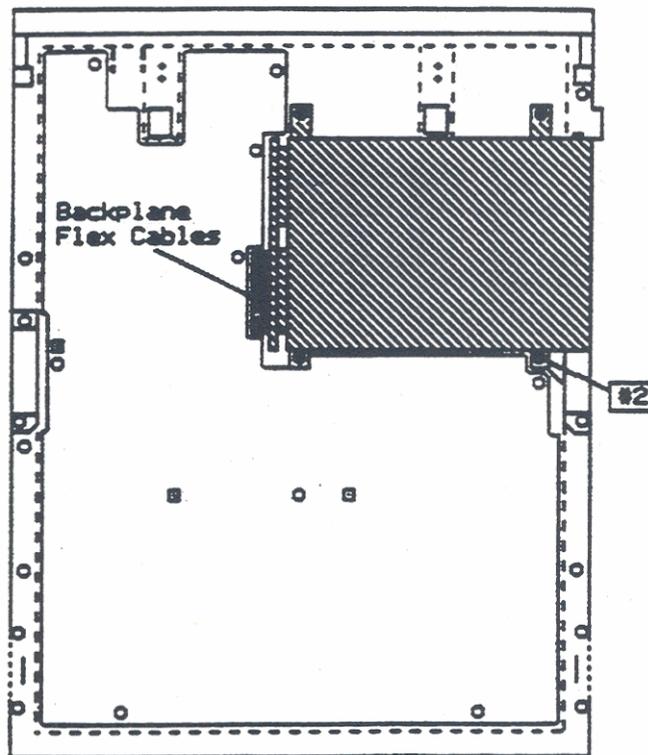


Figure 3-8. Removing the drive assembly.

Step 10: Disassemble and reassemble the drive assembly.

Disassembly

1. Mark the side brackets of the drive assembly so that they can be returned to their original positions later in the exercise.
2. Remove the four screws (#1) from the floppy drive and the hard drive holding each bracket to the drives.
3. Remove the hard drive from the backplane board by pulling gently on the drive while rocking the drive back and forth.
4. Remove the floppy drive from the backplane board in the same manner.

Reassembly

1. Reattach the hard drive onto the backplane board by aligning the pins on the drive with the lower receptacle on the backplane board, and pressing the drive into the backplane.
2. Reattach the floppy drive onto the backplane board by resting it on the hard drive, aligning the two sets of pins on the drive with the two upper receptacles of the backplane, and pressing the drive into the backplane.
3. Start the screws holding one of the brackets on to the side of the drive assembly.
4. Tighten down the screws, but leave a 1/32" gap between the floppy and the hard drive. (1/32" is about the thickness of four sheets of paper.)
5. Attach the other bracket onto the drive assembly.
6. Test the floppy drive by inserting and ejecting a floppy diskette.

NOTE: The diskette should completely seat into and eject from the drive. If this doesn't occur, remove the top cover of the drive, and realign the drive's logic board.

7. Set the drive assembly aside where it won't be damaged.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY

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Step 11: Remove the main logic board

1. Disconnect the connectors from the external power input jack and the on/off switch from the main logic board.
2. Remove the seven mounting screws and the associated seven board clamps from the main logic board. *Notice that the two rearmost mounting screws hold down the ground lugs for the external power input and the rear panel.*
3. Lift out the main logic board.

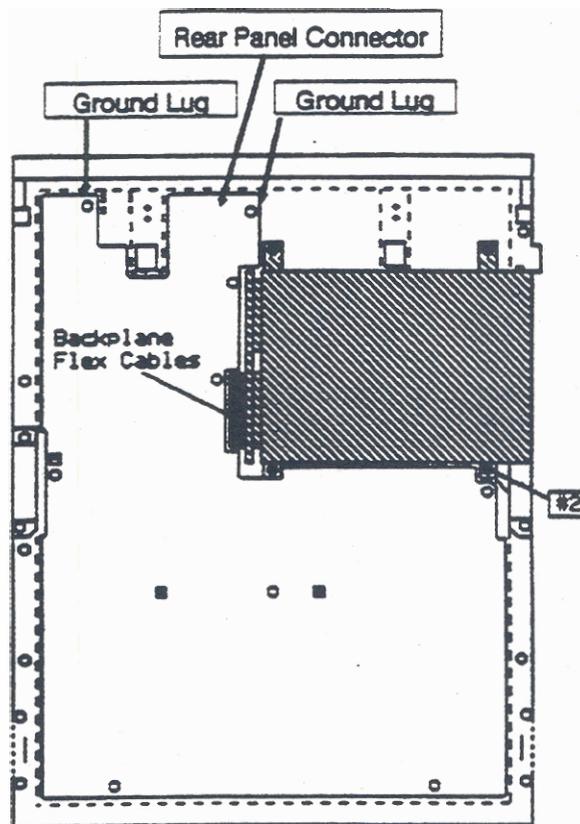


Figure 3-9. Removing the main logic board.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 12: Remove the rear panel and the remaining hardware on the base

1. Lower the system leg to the extended position, and remove the black, flat-head screw (#7) from beneath the right-hand leg support.
2. Remove the two rear panel screws (#4) attaching the rear panel to the base assembly.
3. Tip the top of the rear panel back until the panel separates from the base assembly.
4. Remove the three remaining Fillister screws (#5) from the display hinge ears and remove the ears from the base.
5. Set the rear panel and the hinge ears aside where they won't be damaged.

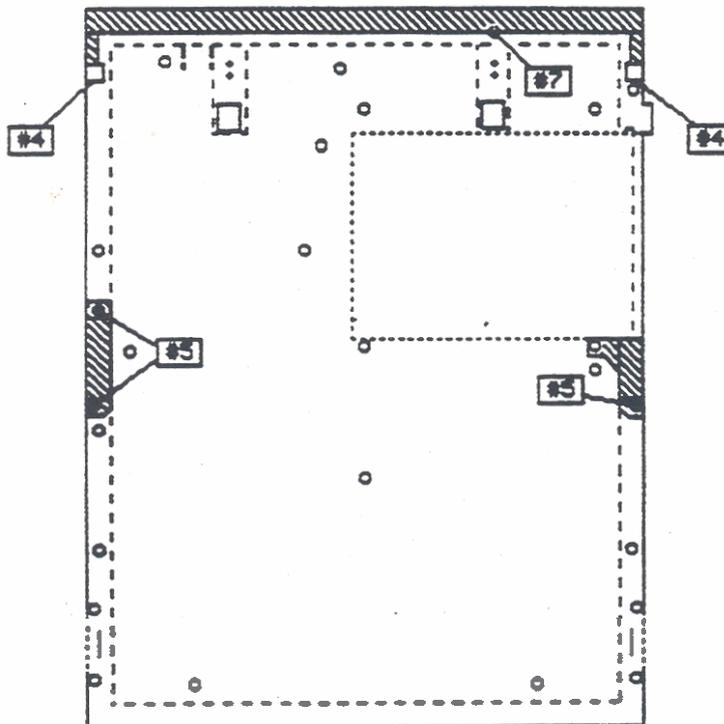


Figure 3-10. Removing rear panel and remaining hardware.

End of Disassembly

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY

- Instructions

REASSEMBLY

This section covers the reassembly of the 1500 series system.

Step 1: Attach the rear panel and the display hinge ears to the base assembly

1. Place the inside of the bottom edge of the rear panel against the back edge of the base assembly, then tilt it upwards to align the holes of the rear panel with the mounts of the base assembly.

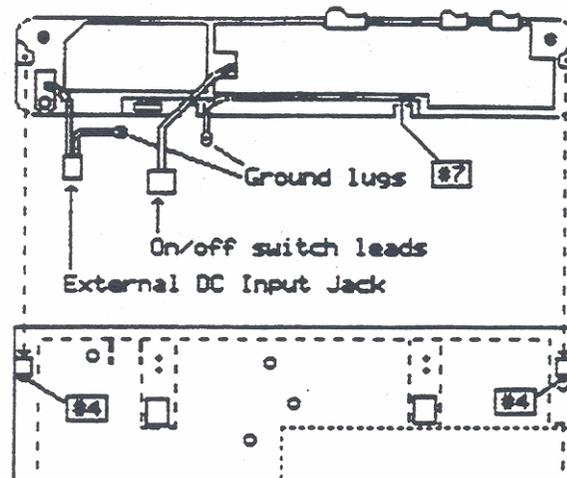


Figure 3-11. Attaching the rear panel.

2. Attach the rear panel onto the base assembly with the two self-tapping screws (#4), and the black, flat-head screw (#7).

CAUTION: *The self-tapping screws are more than capable of stripping the holes in the rear panel. BE CAREFUL!*

3. Reattach the display hinge ears to the base assembly with three Filister screws (#5). Press outward on the ears while tightening the screws to insure correct placement.

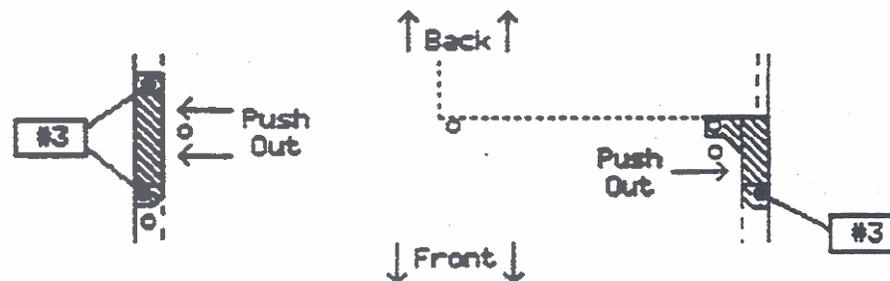


Figure 3-12. Reattaching display hinge ears.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 2: Install the main logic board

1. Set the main logic board into the base assembly.
2. Mount the main logic board to the base. All seven of the main logic board mounts consist of a 1/4" screw (#1) in conjunction with the board clamp (#6). The edge of the clamp is placed between the screw and the base assembly, and presses down against the main logic board. Make sure you place the ground lugs from the rear panel and the external power input jack under the right and left, rear-most mounting screws respectively.

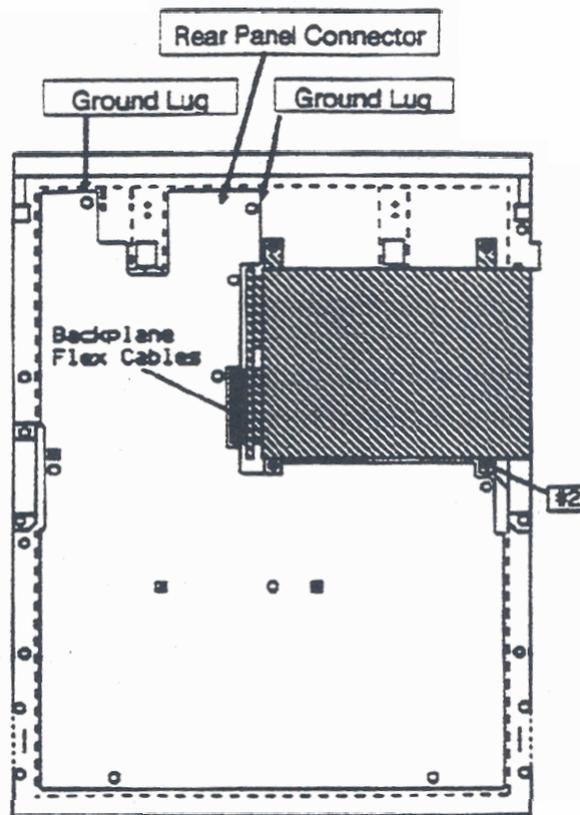


Figure 3-13. Installing the main logic board.

3. Connect the external power connector and rear panel switch connector to the main logic board.

Step 3: Install the drive assembly

1. Make sure the pins of the drive backplane board receptacle on the main logic board are straight.
2. Connect the backplane's flex cable into the main logic board.
3. Install the drive assembly into the base. Make sure the connector on the backplane board fits squarely into its socket.
4. Install the drive assembly with three screws (#1) and one longer screw (#2).

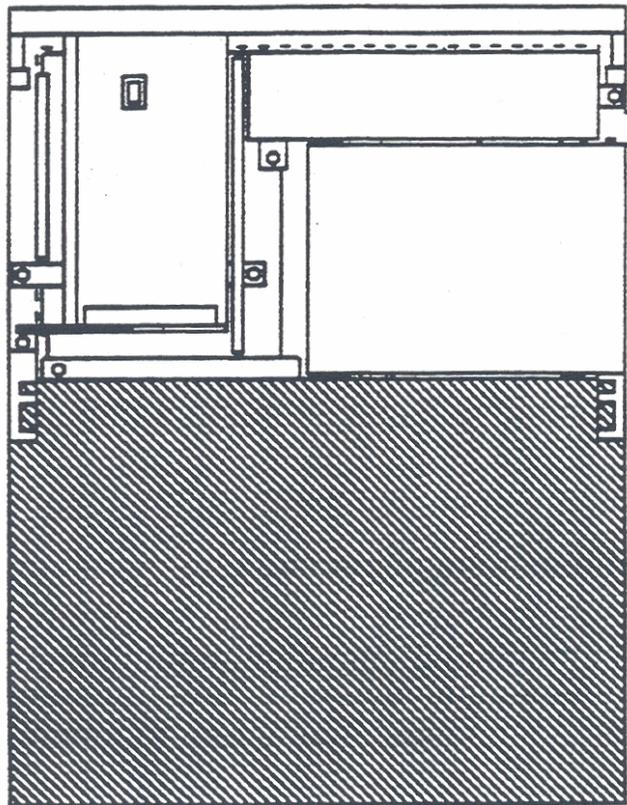


Figure 3-14. Installing the drive assembly.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 4: Install the DC/DC Converter

1. Make sure the DC/DC converter's connector mates with the receptacle on the main logic board before installing the two attachment screws.
2. Install the two screws to either end of the DC/DC converter.
3. Insure that the pins of the rear panel cable receptacles on the main logic board are straight, then install the rear panel cables into the main logic board.

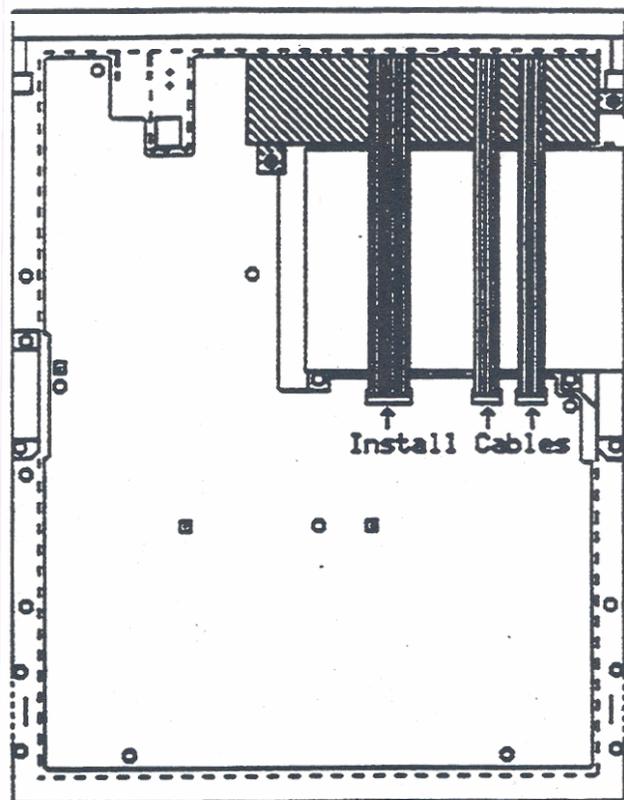


Figure 3-15. Installing the DC/DC Converter.

Step 5: Install the battery tray

1. Install the battery latch assembly first. Make sure the spring for the latch is positioned correctly under the latch, and the release lever is positioned correctly over the back of the latch.

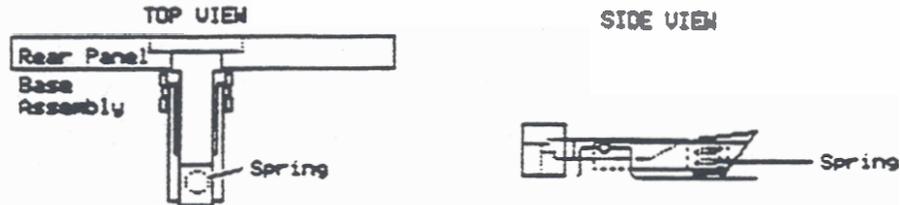


Figure 3-16. Installing the battery latch assembly.

2. Guide the back of the battery tray into the inside of the rear panel. Make sure it mates with the guide pin on the rear panel.

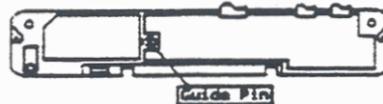


Figure 3-17. Guiding battery tray into the rear panel.

3. Use the Pick-Pry tool to pry the battery contacts on the main logic board forward, so they can clear the battery tray.
4. Install the screw on the right-hand mounting ear of the battery tray only.

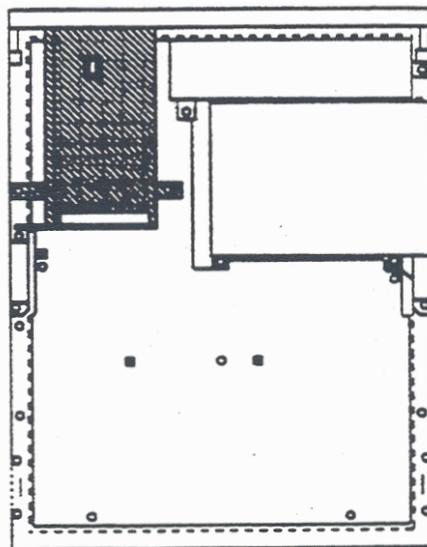


Figure 3-18. Installing the screw of the battery tray.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 6: Install the Video/ROM board

1. Make sure the display cable is snugly attached to the Video/ROM board.

NOTE: There are two right angle connectors on the Video/ROM board which are used by plasma and LCD displays. The smaller connector on the left edge of the board is used by the plasma display. The larger, more central connector is used by the LCD display. Pin one on both connectors is to the right when the Video/ROM board is installed.

2. Install the Video/ROM board onto the main logic board with 4 screws.
3. Attach the ground lug from the display cable to the left-hand mounting ear of the battery box with a #2 screw.

Step 7: Install the modem.

1. Check the modem card connector for bent pins.
2. Install the modem card by aligning the modem card connector with the receptacle on the main logic board, and gently pressing the card into place. Make sure the all of the pins of the card's connector fit into the receptacle.

Step 8: Install the keyboard

1. Connect the keyboard cables to the main logic board, and set the keyboard into place.
2. Install the latch receptacles over the front-most tabs of the keyboard. Notice that there is a difference between the right and left receptacles.
3. Push outward on the latch receptacles while attaching them to the base assembly with four Fillister (#5) screws to insure correct positioning.
4. Start the screws (#1) which connect the keyboard mounting tabs to the base, but don't tighten them yet.
5. Center the keyboard in the system by adjusting the keyboard's position until the gaps between the mounting tabs and the inside edges of the base on both right and left sides are of equal size.
6. Push back on the keyboard while tightening the mounting tab screws to insure correct positioning of the keyboard in the base.
7. Plug power into the system. Turn on the system and see if it boots. If it doesn't, let the instructor know.

Step 9: Install the keyboard bezel

1. Start by putting the front edge of the bezel into the base first. Then press down on the bezel's sides to "snap" the bezel into place.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 10: Install the display

1. Place the display down against the top of the keyboard, and guide the display hinge pins into the races of the display hinge ears in the base.
2. Open the display about halfway. Make sure you press down on the back of the display housing on the line indicated.
3. Close and latch the display.

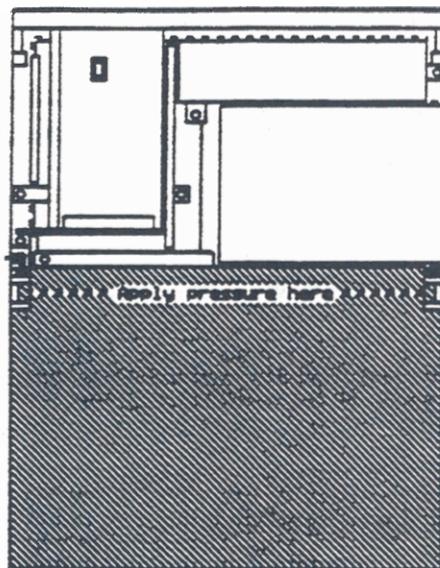


Figure 3-19. Closing/latching the display.

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY Instructions

Step 11: Install the cover

1. Start by putting the left edge of the cover down first. Bring the right side down, being careful not to scratch the drive face.
2. Start the retaining screws in both sides of the rear panel (push down on the cover to line up the threaded holes of the cover with the holes in the rear panel).
3. Push down on the cover in the locations indicated while tightening the retaining screws to insure that the cover is flush to the base.
4. Snap the screw caps back in place, over the retainer screws.

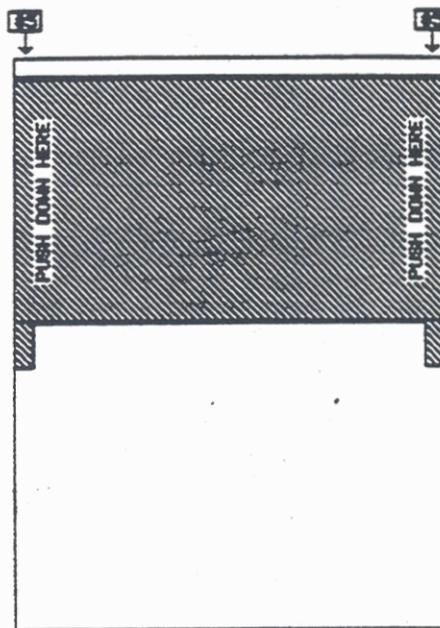


Figure 3-20. Installing the cover.

5. Perform all of the diagnostic testing on the system to insure that it works properly.

END OF REASSEMBLY

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY - Instructions

DIAGNOSTICS

Step 1: Install serial and Centronics loopbacks, pocket floppy drive, and + 16 volt external power.

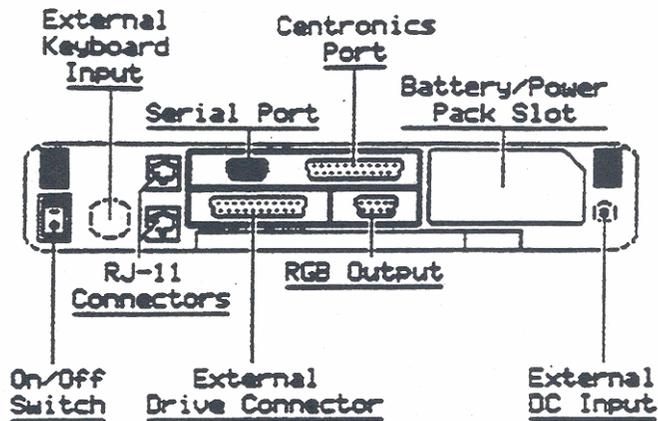


Figure 3-21. Rear panel.

Step 2: Insert Diagnostics disk into the top drive.

Step 3: Hold down the "F" key and turn on the system.

Step 4: Enter time and date at the prompts.

Step 5: Enter @BURNIN.BAT

NOTE: *The batch file will lead you through the diagnostics programs.*

APPENDIX A: 1520/1530 MEMORY CONFIGURATION

1520 Memory Configuration Using 256K and 1MB RAM Sticks (104014-00)

Location	1MB	2MB(302)	4MB(304)*	8MB(308)*
U66		256K RAM Stick		1MB RAM Stick
U65		256K RAM Stick		1MB RAM Stick
U64	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U63	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U62		256K RAM Stick		1MB RAM Stick
U61		256K RAM Stick		1MB RAM Stick
U60	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U59	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick

* 1MB RAM Controller (300831-00) is required.

1520 Memory Configuration Using 256K and 1MB RAM Sticks (105351-00)

Location	1MB	2MB (302)	4MB (304)	8MB (308)
U68				1MB RAM Stick
U67				1MB RAM Stick
U66	256K RAM Stick		1MB RAM Stick	1MB RAM Stick
U65	256K RAM Stick	1MB RAM Stick	1MB RAM Stick	1MB RAM Stick
U64				1MB RAM Stick
U63				1MB RAM Stick
U62	256K RAM Stick		1MB RAM Stick	1MB RAM Stick
U61	256K RAM Stick	1MB RAM Stick	1MB RAM Stick	1MB RAM Stick

GRIDCASE 1500 DISASSEMBLY/REASSEMBLY - Instructions

1530 Memory Configuration Using 256K and 1MB RAM Sticks (104078-00)

Location	1MB	2MB (302)	4MB (304)	8MB (308)
U76	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U75		256K RAM Stick		1MB RAM Stick
U74	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U73		256K RAM Stick		1MB RAM Stick
U72	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U71		256K RAM Stick		1MB RAM Stick
U70	256K RAM Stick	256K RAM Stick	1MB RAM Stick	1MB RAM Stick
U69		256K RAM Stick		1MB RAM Stick
J3	Jumper Installed		Jumper Installed	