

Customer Documentation

PN 005-040578-02 03/30/94

Installing the 3-1/2 Inch Disk Drives: Models 61000-S, 61000-D, 6802, and 6805

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Installing the 3-1/2 Inch Disk Drives: Models 61000-S, 61000-D, 6802, and 6805 014–002239–02

Revision History:

Original Release – July 1993 First Revision – October 1993 Second Revision – November 1993

A vertical bar in the margin of a page indicates substantive technical change from the previous revision.

NOTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

Changes or modifications to this unit not expressly approved by the party responsible for complicance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Testing was done with shielded cables. Therefore, in order to comply with the FCC regulations, you must use shielded cables with your installation.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe (B) prescrites dans la norme sur le matériel brouilleur : "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

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Dieses Gerät ist funkentstört nach VDE 0871 Grenzwertklasse B und entspricht den technischen Vorschriften der DBP-Verfügung 1046/1984.

Preface

This manual explains how to install the Model 61000-S, 61000-D, 6802, and 6805 drives and assumes that you have experience installing mass-storage drives in a computer or a PC.

Before you begin, find the setting up, expanding, or maintaining manual for the computer in which you will install the disk drive. If you are installing the disk drive in a mass-storage subsystem, you need the computer manual and also a copy of the mass-storage subsystem's installation and maintaining manual. During the installation procedure, you must refer to the drive jumpering rules and drive mounting instructions contained in one or both of these manuals.

Occasionally, you may need to refer to these installation instructions. We suggest that you place this disk drive manual in the back of the binder that contains the manual for your computer.

Telephone assistance

If you are unable to solve a problem using any manual you received with your system, free telephone assistance is available with your hardware warranty and with most Data General software service options. If you are within the United States or Canada, contact the Data General Customer Support Center (CSC) by calling 1–800–DG–HELPS. Lines are open from 8:00 a.m. to 5:00 p.m., your time, Monday through Friday. The center will put you in touch with a member of Data General's telephone assistance staff who can answer your questions.

For telephone assistance outside the United States or Canada, ask your Data General sales representative for the appropriate telephone number.

Avoiding electrostatic discharge (ESD) damage

The cover(s) and filler panel(s) installed on your equipment protect the electronic circuits inside the equipment from electrostatic discharge (ESD) damage. However, when you remove these covers and filler panels to replace or install subassemblies, you can inadvertently damage the sensitive electronic circuits in the equipment by simply touching them. Electrostatic charge that has

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accumulated on your body discharges through the circuits. If the air in the work area is very dry, running a humidifier in the work area will help decrease the risk of ESD damage. You must follow the procedures below to prevent damage to the equipment.

CAUTION: Read and understand the following instructions before you remove the cover(s) or panel(s) from the equipment.

- Provide enough room to work on the equipment. Clear the work site of any unnecessary materials or materials that naturally build up electrostatic charge, such as foam packaging, foam cups, cellophane wrappers, and similar materials.
- Do not remove replacement or upgrade subassemblies from their antistatic packaging until the exact moment that you are ready to install them.
- Gather the tools, manuals, an ESD kit, and all other materials you
 will need before you remove covers and panels from the equipment.
 Procedures for removing subassemblies usually list required
 materials at the beginning. After you remove a cover or panel, you
 should avoid moving away from the work site; otherwise, you may
 build up an electrostatic charge.
- Use an ESD kit when handling circuit boards or when touching the electronic circuits inside the equipment. If you don't have an ESD kit, you can order one from Data General. If an emergency arises and an ESD kit is not available, follow the procedures in the "Emergency Procedures (without an ESD kit)" section.
- Replace the cover(s) or panel(s) on the equipment as soon as possible so that the electronic circuits are protected.
- If the equipment has an opening for an optional device (such as a mass-storage drive), and the device is not installed, make sure a filler panel is installed in the opening before connecting the equipment to the ac power outlet.

Emergency procedures (without an ESD kit)

In an *emergency* when an ESD kit is not available, use the following procedures to reduce the possibility of an electrostatic discharge by ensuring that your body and the subassembly are at the same electrostatic potential.

CAUTION: These procedures are not a substitute for the use of an ESD kit. Follow them only in the event of an emergency.

 Before touching any electronic circuits or boards inside the equipment, firmly touch a bare (unpainted) metal surface of the equipment.

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- Before removing any replacement or upgrade subassembly from its antistatic bag, place one hand firmly on an unpainted surface of the chassis, and at the same time, pick up the replacement or upgrade subassembly while it is still sealed in the antistatic bag. Once you have done this, do not move around the room or contact other furnishings, personnel, or surfaces until you have installed and secured the subassembly in the equipment.
- Remove the subassembly from the antistatic bag, handling printed circuit boards by the edges. Avoid touching components and circuits on a printed circuit board.
- If you must move around the room or touch other surfaces before securing the subassembly in the equipment, first place the subassembly back in the antistatic bag. When you are ready again to install the subassembly repeat these procedures.
- Order an ESD kit from Data General for the next time you need to add or remove a cover or panel.

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Installing the drive

This document explains how to install a Model 61000-S, 61000-D, 6802, or 6805 3-1/2 inch disk drive in a Data General AViiON® or ECLIPSE® MV/Family computer or mass-storage subsystem. The Data General computer for the system in which you intend to install this drive must have a small computer system interface (SCSI-1 or SCSI-2).

The four drive models look very similar and mount in the computer or mass-storage subsystem in the same way. With a few exceptions, the installation procedures for these drives are the same. The following lists the major differences among the four disk drive models:

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61000-S (118-017677) is a 520-Mbyte single-ended drive.
61000-D (118-017772) is a 520-Mbyte differential drive.
6802 (118-016263) is a 1-Gbyte single-ended drive.
6805 (118-016903) is a 1-Gbyte differential drive.
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Table 1 highlights the specifications for the disk drives. Refer to this information as needed.

Table 1 Specifications for the Model 61000-S, 61000-D, 6802 and 6805 disk drive

Formatted Capacity	61000-S, 61000-D = 520 Mbyte 6802, 6805 = 1 Gbyte			
Interface Type	SCSI-1 or 2: 6802, 61000-S = single-ended 6805, 61000-D = differential			
Current +12 V dc	6802/ 61000-S 1.18 A (steady state) 2.0 A /1.5 s (surge)	6805/ 61000-D 1.07 A (steady state) 2.0 A /1.5 s (surge)		
+5 V dc	1.34 A	1.42 A		
Power Dissipation				
+12 V dc	14.16 W	12.83 W		
+5 V dc	5 W	7.08 W		
Weight	.46 kg (1 lb)			

The environmental specifications for the disk drive meet or exceed those of the Data General computer or mass-storage subsystem that houses it. For a list of the environmental specifications, refer to your Data General computer or mass-storage subsystem installing manual.

To install the drive, you will need to follow these procedures:

- 1. Verify that the computer system has the correct operating system software revision and SCSI host-bus adapter.
- 2. Unpack and inspect the disk drive for damage or missing parts.
- 3. Make sure the disk drive's SCSI ID and optional jumpers are set correctly.
- 4. Mount the drive in the enclosure; connect the disk drive's cables; rebuild and reboot the operating system.

Follow each of the next procedures in sequence to install a Model 6802, 61000-S, 6805, or 61000-D disk drive. (Note that if one model's installation procedure is different from another's, the model number for that disk drive appears beside the procedure.)

Verifying system requirements

1. Make sure your computer or mass-storage subsystem has the following operating system software:

For AViiON systems that use the Motorola 88100 processor, you will need the DG/UX[™] operating system 5.4R2.01 or a later release.

For AViiON systems that use the Motorola 88110 processor, you will need the DG/UX operating system 5.4R2.10 or a later release.

For ECLIPSE MV/Family systems, the AOS/VS operating system, revision 7.70 or higher, or AOS/VS II operating system revision 3.00 or higher.

2. Make sure your AViiON or ECLIPSE MV/Family computer has a SCSI 1 or SCSI-2 host-bus adapter.

A single-ended type for a Model 6802 or 61000-S disk drive. A differential type for a Model 6805 or 61000-D disk drive.

3. If you are installing a Model 6802 or 61000-S disk drive in a mass-storage subsystem that has a SCSI buffer installed, make sure the SCSI buffer is revision 3 or higher.

The revision number is printed on the outside of the SCSI buffer. Refer to the installing manual for your mass-storage subsystem if you are not familiar with the SCSI buffer or its location in the system.

4. For diagnostic support, make sure the AViiON or ECLIPSE MV/Family computer has the following diagnostic software revisions:

For AViiON systems, AViiON System Diagnostics (revision 10.20).

For MV/Family systems, MVADEX diagnostics (revision 19 or higher) and Series Proprietary Diagnostics & MVADEX (revision 11 or higher), which supports the ECLIPSE MV3200™, ECLIPSE MV3500™, ECLIPSE MV3600™, ECLIPSE MV5500™, and ECLIPSE MV5600™ systems.

Unpacking and inspecting the drive

- Read the "Avoiding Electrostatic Discharge (ESD) Damage" section in the Preface. When handling the drive, follow these instructions completely.
- 2. Remove and set aside the packing slip from the outside of the shipping carton.
- 3. Open the cartons one by one, and remove and inspect the equipment for any visible damage.

If the equipment is damaged, contact Data General as described in the Preface of this document.

CAUTION:

To avoid damage, handle your drive gently; do not drop or jar it.

Make sure you have a firm grip on it before you lift it, and lift it with both hands. Even a slight jar can severely damage your drive.

4. Make sure that the model and part numbers on the packing slip match those of your equipment.

If you think you received the wrong equipment, contact Data General as described in the Preface of this document.

5. Make sure that you have all necessary mounting brackets for the computer or mass-storage subsystem in which you intend to install this drive.

Refer to the installing or setting up manual for your computer or mass-storage subsystem. This manual describes any additional mounting brackets or slides that your computer or mass-storage subsystem may require. Keep this manual close by. It contains information that you will need to install the drive.

Setting the drive's jumpers

The disk drive is shipped with its SCSI IDs set to 6. This is the factory-default setting. Before you install the drive, you need to make sure the drive's SCSI ID and option jumpers are set correctly for your Data General computer system. If your drive is a Model 6802 or 61000-S follow the steps in the next section. If your drive is a Model 6805 or 61000-D, follow the steps in the "Setting SCSI ID and option jumpers (6805 or 61000-D)" section.

Setting SCSI ID and option jumpers (6802 or 61000-S)

To set the SCSI ID number and option jumpers of the Model 6802 or 61000-S disk drive, do the following:

 Refer to the installing or setting up manual for your AViiON or ECLIPSE MV/Family computer.

This manual lists the SCSI ID numbers for each category of drive that your computer supports (for example, disk, diskette, or tape). It also gives you the rules for choosing the correct SCSI ID number.

 Table 2
 SCSI ID jumper settings for the Model 6802 or 61000-S drive

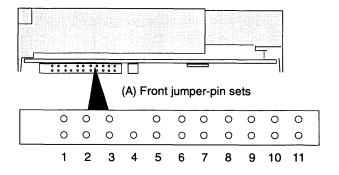
SCSI ID	Front Jumper-Pin Set Number			
Number	1	1 2		
0	OUT	OUT	OUT	
1	OUT	OUT	IN	
2	OUT	IN	OUT	
3	OUT	IN	IN	
4	IN	OUT	OUT	
5	IN	OUT	IN	
6*	IN	IN	OUT	
7*	iN	IN	IN	

IN means the jumper is installed. OUT means the jumper is not installed.

*The first SCSI-2 host bus adapter board in your computer system is normally set to SCSI ID 7. The second one in your system is set to SCSI ID 6. Make sure you set your drive to its own ID number — one that is not being used.

2. Once you have chosen the correct SCSI ID number, install the jumpers for that number according to Table 2. Refer to Figure 1 for the location of the front jumper-pin sets.

For example, if you choose SCSI ID 1, install a jumper across front jumper-pin set 3 as indicated in Table 2 by the word IN. Do not install jumpers across front jumper-pin sets 1 and 2 as indicated by the word OUT.



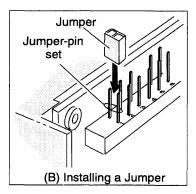


Figure 1 (A) Location of the jumper-pin sets at the front of the Model 6802 or 61000-S drive, (B) installing a jumper

3. Make sure jumpers are installed across front jumper-pin set 5 and jumper-pin set 10, as shown in Figure 2.

With these option jumpers installed, the drive delays spin-up for a period of time after power is applied.

The period of time = the drive's SCSI ID number \times 4 seconds

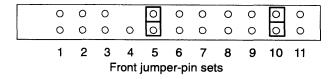


Figure 2 Required jumpers for Model 6802 or 61000-S drive (front jumper-pin sets)

- 4. When installing the Model 6802 or 61000 drive inside an ECLIPSE MV 3000 series computer, do one of the following:
 - a. If you are connecting the drive to the end (or last connector) of the computer's SCSI bus cable, install a jumper on front jumper-pin set 6, as shown in Figure 3. You must do this to terminate the computer's internal SCSI bus.
 - b. If you are *not* connecting the drive to the end (or last connector) of the computer's SCSI bus cable, *do not* install a jumper on front jumper-pin set 6.

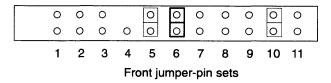


Figure 3 To have the drive terminate the SCSI bus, install a jumper across front jumper-pin set 6

5. Make sure a jumper is installed across bottom jumper-pin set 1, as shown in Figure 4.

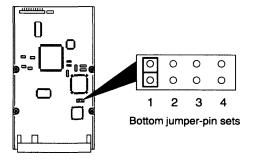


Figure 4 Required jumpers for Model 6802 or 61000-S drive (bottom jumper-pin sets)

6. Do not install jumpers on any of the remaining jumper-pin sets.

You do not use the remaining jumper-pin sets when you install the disk drive in an AViiON or ECLIPSE MV/Family computer or mass-storage subsystem.

After you have installed the disk drive's jumpers, skip to the procedure, "Mounting and Cabling the Drive" to complete the installation of the disk drive.

Setting SCSI ID and option jumpers (6805 or 61000-D)

To set the SCSI ID number and option jumpers of the Model 6805 or 61000-D disk drive, do the following:

1. Refer to the installing or setting up manual for your AViiON or ECLIPSE MV/Family computer.

This manual lists the SCSI ID numbers for each category of drive that your computer supports (for example, disk, diskette, or tape). It also gives you the rules for choosing the correct SCSI ID number.

2. Once you choose the SCSI ID number, install the jumpers for that ID number according to the Table 3. Also, refer to Figure 5 for the location of the front jumper-pin sets.

For example, if you choose SCSI ID 1, install a jumper across front jumper-pin set 4 as indicated in Table 3 by the word IN. Do not install jumpers across front jumper-pin sets 2 and 3 as indicated by the word OUT. Also, do not install a jumper across front jumper-pin set 1. This pin set is reserved for future use.

Table 3 SCSI ID jumper settings for the Model 6805 or 61000-D disk drive

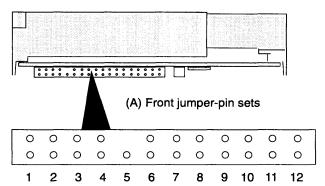
SCSI ID		Jumper-Pin Set Number				
Number	1	2	3	4		
0	RES	OUT	OUT	OUT		
1		OUT	OUT	IN		
2		OUT	IN	OUT		
3		OUT	IN	IN		
4		IN	OUT	OUT		
5		IN	OUT	IN		
6*		IN	IN	OUT		
7*	\ ₩	IN	IN	IN		
	1					

RES means the jumper-pin set is reserved for future use

IN means the jumper is installed. OUT means the jumper is not installed.

*The first SCSI-2 host bus adapter board in your computer system is normally set to SCSI ID 7. In some configurations, the second SCSI bus adapter board is set to SCSI ID 6. Make sure you set your drive to its own ID number — an ID number that another device on the same SCSI bus is not using.

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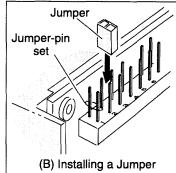


Figure 5 (A) Location of the jumper-pin sets at the front of the Model 6805 or 61000-D drive, (B) Installing a jumper

3. Make sure jumpers are installed across front jumper-pin set 6 and jumper-pin set 11, as shown in Figure 6.

With these option jumpers installed, the drive delays spin-up for a specific period of time after power is applied.

The period of time = the drive's SCSI ID number \times 4 seconds

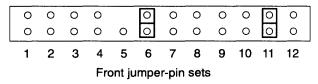


Figure 6 Required jumpers for Model 6805 or 61000-D drive (front jumper-pin set)

- 4. Make sure a jumper is installed across bottom jumper-pin set 1 and 4, as shown in Figure 7.
- 5. Do not install jumpers on the remaining jumper-pin sets.

You do not use the remaining jumper-pin sets when you install the disk drive in an AViiON or ECLIPSE MV/Family computer or mass-storage subsystem.

After you have installed the disk drive's jumpers, go to the next section to complete the installation of the disk drive.

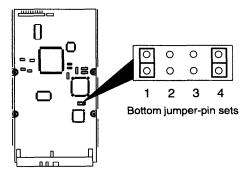


Figure 7 Required jumpers for Model 6805 or 61000-D drive (bottom jumper-pin sets)

Mounting and cabling the drive

Follow the steps in this section to mount the disk drive in the computer or mass-storage subsystem and to connect the SCSI bus cable and power cable to the disk drive.

CAUTION:

To avoid damage, handle your drive gently; do not drop or jar it. Make sure you have a firm grip on it before you lift it, and lift it with both hands. Even a slight jar can severely damage your drive.

1. What you do next depends on whether you are installing the drive in a 3-1/2 inch slot or a 5-1/4 inch slot.

If you are installing the drive in a 3-1/2 inch slot, skip to step 6.

If you are installing the drive in a 5-1/4 inch slot, go to the next step. You need to attach the 3-1/2 inch to 5-1/4 inch adapter kit (005-040530) that came with your drive.

2. From the adapter kit, take the two 3-1/2 inch to 5-1/4 inch adapter brackets 1 and 2 shown in Figure 8A, and attach each adapter bracket to the disk drive.

Use two $6-32 \times 1/4$ inch Phillips screws with captive washers to attach each bracket. Do not tighten the screws completely.

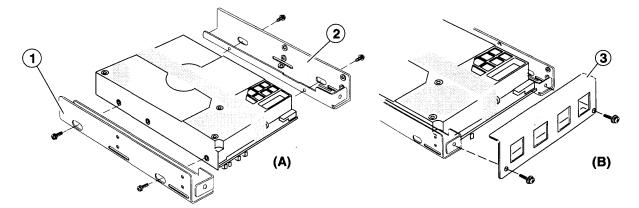


Figure 8 Attaching the 3-1/2 inch to 5-1/4 inch adapter kit (005–040530) to the disk drive

3. Attach the angle bracket (3), as shown in Figure 8B.

Use two $6-32 \times 1/4$ inch Phillips screws with captive washers and tighten each screw completely.

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4. Gently tighten each of the four remaining screws that hold brackets 1 and 2 until the screws are snug. Then tighten each screw an additional 1/8 of a turn as shown below.



CAUTION: Do not over tighten these four screws or you will damage the disk drive's special insulated screw-inserts.

Also, the drive's chassis has a thin sheet of clear plastic on each side that reduces electrical "noise" by insulating the drive from the computer system's electrical ground. Never remove the plastic or allow the adapter brackets to touch any metal part of the drive's chassis.

5. Refer to the manual for installing or setting up your computer or mass-storage subsystem.

You can mount the disk drive so that any of its surfaces faces down. Refer to the installing or setting up manual for your computer or mass-storage subsystem. This manual shows you where to install a disk drive and how to position and attach it. It also describes any special mounting brackets, slides, or hardware that your computer or mass-storage subsystem may require.

6. Mount the drive in your computer or mass-storage subsystem using the following screws:

To install the drive in a 5-1/4 inch slot—Mount the drive using four $6-32 \times 1/4$ inch Phillips screws or the special hardware that is required by your computer or mass-storage subsystem. See Figure 9A for the location of the mounting screw holes.

To install the drive in a 3-1/2 inch slot—Mount the drive using four $6-32\times3/16$ inch Phillips screws with captive washers or the special hardware that is required by your computer or mass-storage subsystem. See Figure 9B for the location of the mounting- screw holes. When you tighten the four screws, gently tighten each screw until it is snug. Then tighten each screw an additional 1/8 of a turn as shown below.



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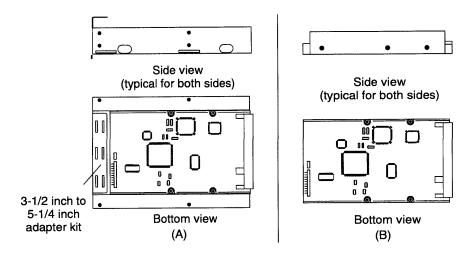


Figure 9 Mounting-screw holes (A) for installation in a 5-1/4 inch slot of a computer or a mass-storage subsystem and (B) for installation in a 3-1/2 inch slot

CAUTION: Do not over tighten these four screws or you will damage the disk drive's special insulated screw-inserts.

To avoid disk-drive damage, attach the drive using the mounting hardware that we provided. If you must use other hardware when installing the drive in a 3-1/2 inch slot, make sure the screws you use do not penetrate more than 3.8 mm (.149 in) into the drive's mounting holes.

Also, the drive's chassis has a thin sheet of clear plastic on each side that reduces "electrical noise" by insulating the drive from the computer system's electrical ground. Never remove the plastic or allow the PC's or mass-storage subsystem's enclosure to touch any metal part of the drive's chassis.

7. If you are installing the Model 6805 or 61000-D disk drive, skip to step 8. If you are installing a Model 6802 or 61000-S disk drive, plug the SCSI bus cable provided by the computer or mass-storage subsystem into the SCSI bus connector on the back of the disk drive. See Figure 10 for the location of the disk drive's SCSI bus connector.

Make sure the color tracer wire on the SCSI bus cable connects to pin 1 in the SCSI connector on the disk drive.

If you cannot connect the SCSI bus cable to the drive without twisting it, connect an optional adapter cable (005-035005) between the SCSI bus cable and the disk drive, as shown in Figure 10.

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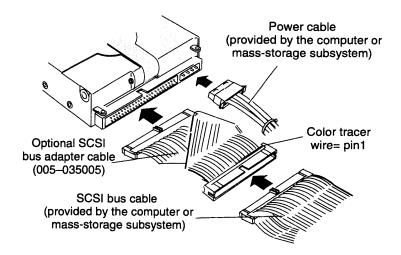


Figure 10 Connecting the SCSI bus cable and power cable to the back of the Model 6802 or 61000-S drive

If the computer's SCSI bus cable does not reach the back of the drive, make an extender cable by unfolding this optional adapter cable (005–035005) as shown in Figure 11. Then connect the unfolded adapter cable between the SCSI bus cable and the disk drive.

Once you have connected the SCSI bus cable, skip to step 9. to install the power cable.

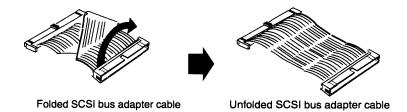


Figure 11 Unfolding the SCSI bus adapter cable (005-035005) to make a SCSI bus extender cable

8. If you are installing a Model 6805 or 61000-D disk drive, carefully plug the SCSI bus cable provided by the computer or mass-storage subsystem into the 50-pin to 68-pin (118-018192) adapter as shown in Figure 12. Then plug the adapter into the SCSI bus connector on the back of the disk drive.

Make sure the color tracer wire on the SCSI bus cable connects to pin 1 in the SCSI connector on the adapter. If you cannot connect the SCSI bus cable to the 50-pin to 68-pin adapter without twisting it, connect the optional adapter cable (005-035005) between the 50-pin to 68-pin adapter and the SCSI bus cable. Refer to Figure 12.

If the computer's SCSI bus cable does not reach the back of the drive, make an extender cable by unfolding an optional adapter cable (005–035005). Refer to Figure 11. Then connect the unfolded adapter cable between the SCSI bus cable and the 50-pin to 68-pin adapter as shown in Figure 12.

CAUTION: Failure to align the connector on the SCSI bus cable correctly with the disk drive's SCSI connector can bend the connector's pins causing severe cable-connector and drive-connector damage.

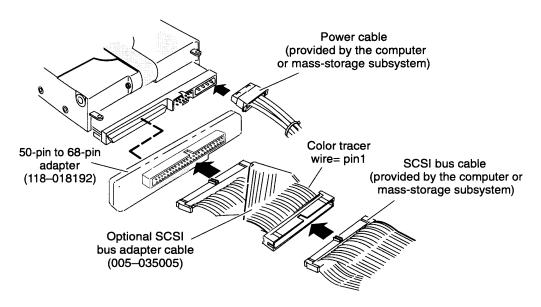


Figure 12 Connecting the SCSI bus cable, adapter, and power cable to the back of the Model 6805 or 61000-D drive

9. Plug the power cable provided by the computer or mass-storage subsystem into the power connector on the back of the disk drive. Refer to Figure 12.

Make sure you align the beveled edges of the power cable's connector with the beveled edges of the drive's power connector before you plug the power cable in.

10. Make sure you terminate the SCSI bus of the computer or mass-storage subsystem properly.

To terminate the SCSI bus for your system, you must install an external terminator plug in one of the SCSI bus connectors on the back of the computer or mass-storage subsystem. Note that the terminator plug for the single-ended drives and the one for the differential drives are not interchangeable. For more information, refer to the installing or setting up manual for your computer or mass-storage subsystem.

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11. Close the computer or mass-storage subsystem chassis.

For the correct procedure, refer to the installing or setting up manual for your computer or mass-storage subsystem.

12. Refer to the your operating-system manual.

You will need to rebuild and reboot your operating system software before you can begin using your newly installed disk drive. Your operating system manual explains what to do after you have installed a new mass-storage drive in your system.

reporting, contact Data General as described in the Preface of this

IMPORTANT: Because of the high-density storage technology used by the drives, it is not unusual for your system to report disk-drive soft errors.

This is normal and, by itself, does not indicate a disk-drive problem.

You should suspect disk-drive operational problems only when system-performance degradation accompanies disk-drive soft-error reporting. If you have any concern about disk-drive soft-error

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