

Apple 5.25 Drive / UniDisk

Technical Procedures

❑ TABLE OF CONTENTS

Section 1 – Basics	1.2	Product Description
	1.2	Model Comparison
	1.2	Connecting the Drives
Section 2 – Take-Apart	2.2	Introduction
	2.3	Case Top and Shield
	2.6	Cable
	2.8	Analog Board
	2.10	Mechanical Assembly
	2.13	Door, Spring, and Bezel
Section 3 – Adjustments	3.2	DSPEED
Section 4 – Troubleshooting	4.2	Using the Troubleshooting Flowchart
	4.3	Troubleshooting Flowchart
Section 5 – Preventive Maintenance	5.2	Introduction
	5.2	Read/Write Head
	5.3	Head Load Button
	5.4	Motor Drive Belt
Section 6 – Illustrated Parts List	6.3	Finished Goods Assembly (Figure 1)

©Apple Computer, Inc., 1986, 1987, 1988, 1989. No portion of this document may be reproduced in any form without the written permission of Apple Computer, Inc.

Apple IIgs and UniDisk are trademarks of Apple Computer, Inc.

DuoDisk, Apple, and the Apple logo are registered trademarks of Apple Computer, Inc.

Apple 5.25 Drive / UniDisk

Section 1 – Basics

❏ CONTENTS

- 1.2 Product Description
- 1.2 Model Comparison
- 1.2 Connecting the Drives

□ PRODUCT DESCRIPTION

Model Comparison

The Apple® 5.25 Drive and the UniDisk™ are floppy-disk drives that use removable single-sided disks to store and retrieve up to 143K of data per disk. The Apple 5.25 Drive and the UniDisk are compatible with any computer in the Apple II family.

The Apple 5.25 drive, in the new platinum case color, contains the same drive mechanism as the UniDisk, but has the added feature of a security lock connector. All technical procedures for the Apple 5.25 Drive and the UniDisk are the same.

Connecting the Drives

The 5.25 Drive and the UniDisk may be connected to a disk drive port (on an Apple IIGS™ or IIC) or to a 5.25 Drive controller card installed in a peripheral slot (in an Apple IIe or IIGS). (The 5.25 Drive controller card is identical to the UniDisk or DuoDisk® controller card.)

1. The controller card supports a maximum of two 5.25 drives. To add more drives, you must install a second 5.25 Drive controller card. You cannot plug a 3.5 drive into a 5.25 controller card, nor a 5.25 drive into a 3.5 controller card.
2. The disk drive port on the Apple IIGS will support a combination of up to four daisy chained 5.25 and 3.5 drives.

For installation instructions and daisy chain configurations, refer to the *Apple 5.25 Drive Owner's Guide*.

Apple 5.25 Drive / UniDisk

Section 2 – Take-Apart

❏ CONTENTS

- 2.2 Introduction
- 2.3 Case Top and Shield
- 2.6 Cable
- 2.8 Analog Board
- 2.10 Mechanical Assembly
- 2.13 Door, Spring, and Bezel

Note: If a step is underlined, detailed instructions for that step can be found elsewhere in this section.

□ INTRODUCTION

Interchangeable Parts

The mechanical assemblies for the Apple 5.25 Drive, UniDisk, and DuoDisk are all the same and are therefore interchangeable—except for their sub-bezels and doors. **If you exchange mechanical assemblies, be sure to make the following sub-bezel and door replacements.**

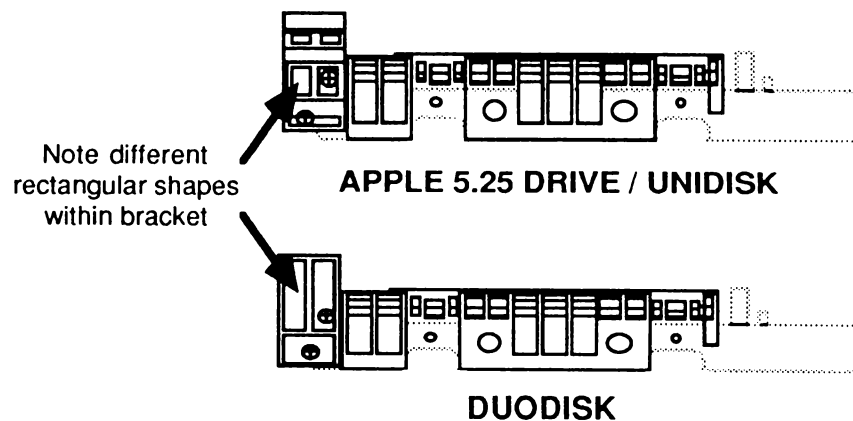
Apple 5.25 Drive/ and UniDisk

If you exchange the mechanical assemblies of an Apple 5.25 Drive and a UniDisk, **you must be sure to replace the sub-bezel and door so that the colors are appropriate.** The UniDisk has a beige door and beige sub-bezel. The Apple 5.25 Drive has a platinum door and beige sub-bezel.

DuoDisk

If you exchange a DuoDisk mechanical assembly with an Apple 5.25 Drive or a UniDisk, you must exchange the sub-bezels. The figure below shows the different sub-bezels.

The procedures for replacement are given in "Door, Spring, and Bezel" later in this Take-Apart section.



□ CASE TOP AND SHIELD

Materials Required

Medium Phillips screwdriver

Remove

To remove the case top and shield:

1. If the Apple 5.25 Drive or UniDisk is connected to a computer, power off the computer and disconnect the drive. (You will not be able to remove the cable until you remove the cover.)
2. Turn the drive upside down and remove the four Phillips screws (Figure 1, #1).

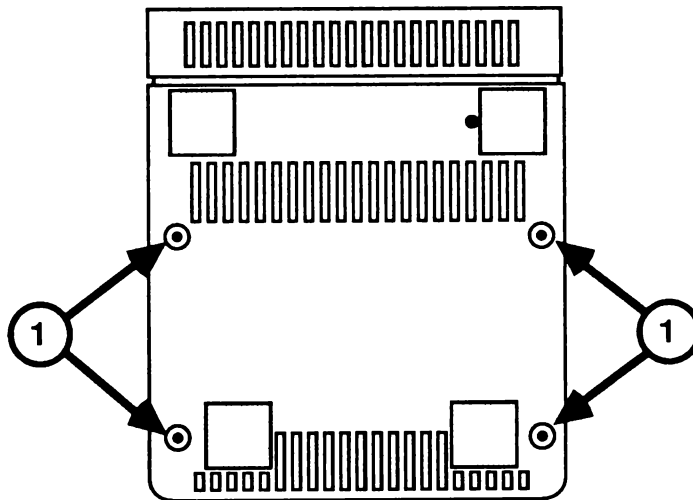


FIGURE 1

4. Orient the drive so that the back is facing you and remove the two Phillips screws (Figure 2, #1).

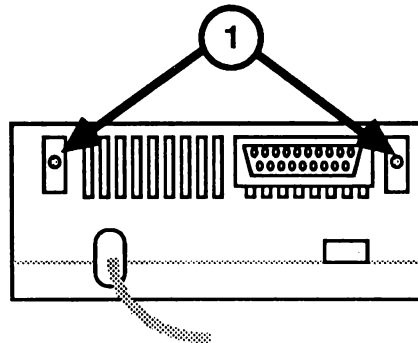


FIGURE 2

5. Pull up on the back of the case top until it clears the cable as shown in Figure 3. Slide the case top back and away from the drive.

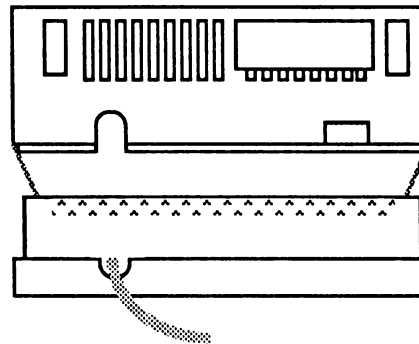


FIGURE 3

6. Remove the screw that secures the shield (top metal plate) to the chassis.
7. Pull up on the back edge of the shield and lift it off.

Replace

To replace the shield and case top:

1. Replace the shield by fitting the front prongs into place, then lowering the back until the shield is flush with the chassis.
2. Replace the Phillips screw to secure the shield to the chassis.
3. Fit the cable brace into the cutout at the back of the case bottom.
4. Slide the front edge of the case top against the front bezel as shown in Figure 4.

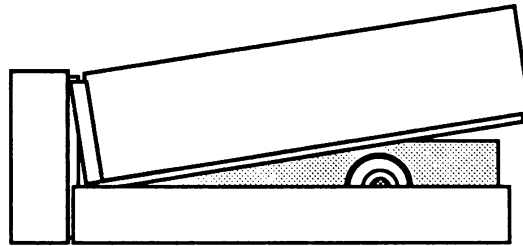


FIGURE 4

5. Push forward on the case top as you lower it over the cable, until the case top is flush against the case bottom.
6. Turn the drive upside down and replace the four Phillips screws.
7. Position the drive so that the back is facing you and replace the two Phillips screws.

□ CABLE

Materials Required

Medium Phillips screwdriver

Remove

To remove the cable:

1. Remove the case top and shield.

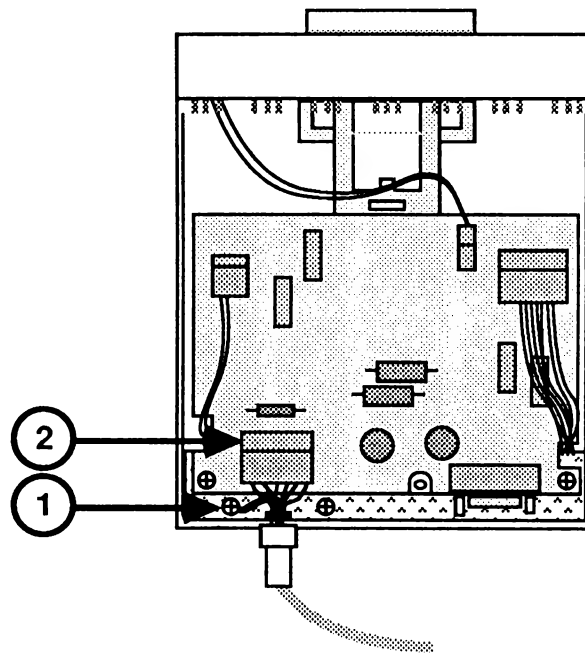


FIGURE 5

2. Remove the Phillips screw (Figure 5, #1) that secures the cable ground terminal and the case ground strap to the chassis.
3. Disconnect the bus connector from header J2 on the analog board (Figure 5, #2), and pull it back through the hole in the metal backplate.
4. Remove the cable.

Replace

To replace the cable:

1. Fit the cable brace (Figure 6, #1) into the slot at the back of the case bottom.

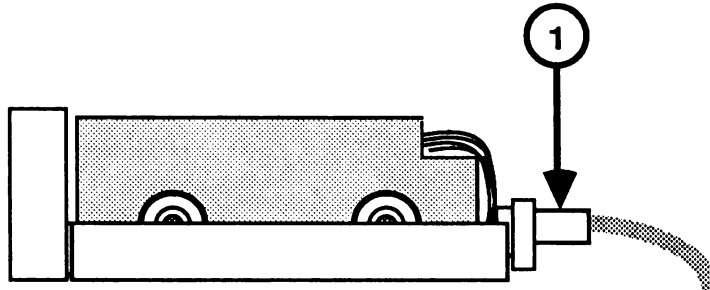


FIGURE 6

2. Replace the Phillips screw to secure the cable ground terminal and the ground strap to the chassis (Figure 5, #1).
3. Push the bus connector back through the hole in the metal backplate and reconnect it to header J2 on the analog board (Figure 5, #2).
4. Replace the shield and case top.

□ ANALOG BOARD

Remove

To remove the analog board:

1. Remove the case top and shield.

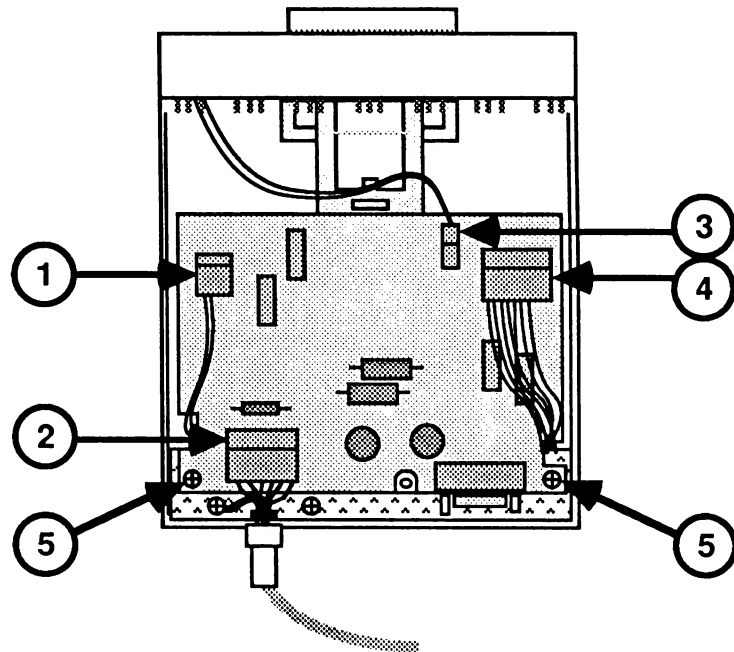


FIGURE 7

2. Disconnect the following connectors, pulling on the connector housing (not the wires):

- Head connector J4 (Figure 7, #1)
- Bus connector J2 (Figure 7, #2)

Note: Pull the bus connector back through the metal backplate on the analog board.

- LED connector J5 (Figure 7, #3)
- Stepper motor connector J1 (Figure 7, #4) - note position of wires in Figure 7.

3. Remove the two Phillips screws (Figure 7, #5) that secure the analog board to the chassis.
4. Carefully lift the analog board off of the chassis.

Replace

To replace the analog board:

1. Lift the connector wires away from the mechanical assembly.
2. Slide the front end (opposite the DB-19 connector) of the analog board between the supports at front of the chassis walls.

CAUTION: *Be careful not to pinch the connector wires while positioning the analog board.*

3. Route the connector wires through the cutouts at the sides of the analog board.
4. Connect the following connectors:
 - Head connector J4 (Figure 7, #1) - fits only one way
 - Bus connector J2 (Figure 7, #2)

Note: First route the bus connector through the metal backplate on the analog board.
 - LED connector J5 (Figure 7, #3)
 - Stepper motor connector J1 (Figure 7, #4) - note position of wires in Figure 7
5. Replace the two Phillips screws (Figure 7, #5) to secure the analog board to the chassis.
6. Replace the shield and case top.

□ MECHANICAL ASSEMBLY

Remove

To remove the mechanical assembly:

1. Remove the case top and shield, the cable, and the analog board.

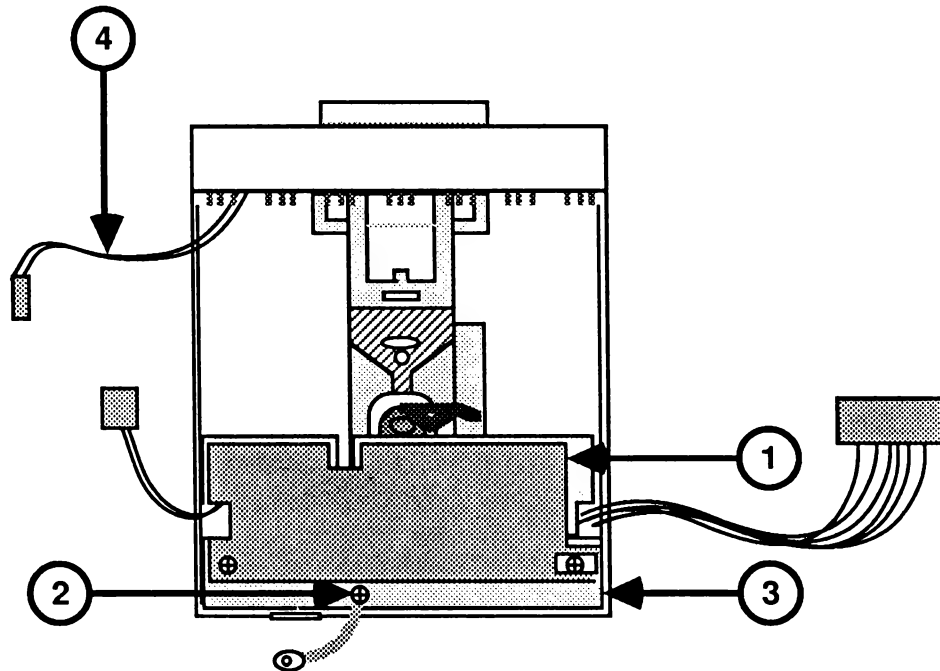


FIGURE 8

2. Remove the black insulation paper (Figure 8, #1).
3. Remove the Phillips screw (Figure 8, #2) that secures the ground strap to the chassis. Set the ground strap aside.
4. Lift off the metal shield (Figure 8, #3) and set aside.
5. Grasp the LED wires (Figure 8, #4) as close to the front bezel as possible and pull the LED lamp out of the front bezel.
6. Lift up on the back of the metal chassis and slide it completely out of the case bottom.

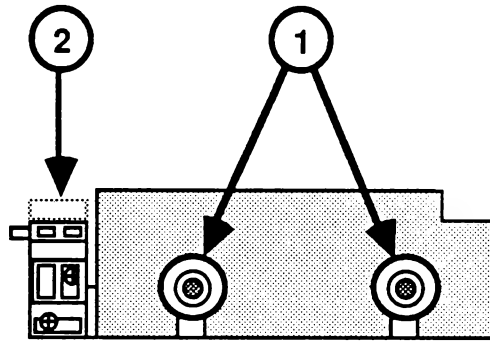


FIGURE 9

7. Orient the drive sideways, as shown in Figure 9, and remove the two Phillips screws (Figure 9, #1). Then turn the drive so that you face the other side, and remove those two screws.
8. Lift up on the sub-bezel (Figure 9, #2) and carefully slide the mechanical assembly out of its bottom shield.

Replace

To replace the mechanical assembly:

IMPORTANT: *Be sure to read the introduction to this section prior to exchanging the mechanical assembly.*

1. Place the mechanical assembly back inside its bottom shield.
2. Replace the Phillips screws (Figure 9, #1) on both sides of the drive to secure the mechanical assembly inside the bottom shield.
3. Replace the metal shield (Figure 8, #3), routing the cables through the cutouts at the sides of the shield. (See Figure 8.)
4. Place the black insulation paper (Figure 8, #1) on the metal shield as shown in Figure 8.
5. Replace the Phillips screw (Figure 8, #2) to secure one end of the ground strap to the chassis.
6. Locate the case bottom and insert the LED into the cutout provided at the front.

7. Close the door of the mechanical assembly.
8. Hold the LED cable out of the way while you carefully slide the mechanical assembly into the case bottom.
9. Replace the analog board, cable, shield, and case top.

□ DOOR, SPRING, AND BEZEL

Materials Required

Medium Phillips screwdriver

Remove

1. Remove the mechanical assembly.
2. Remove the two Phillips screws at each side of the sub-bezel, and remove the sub-bezel.
3. Slide the door off the mechanical assembly.

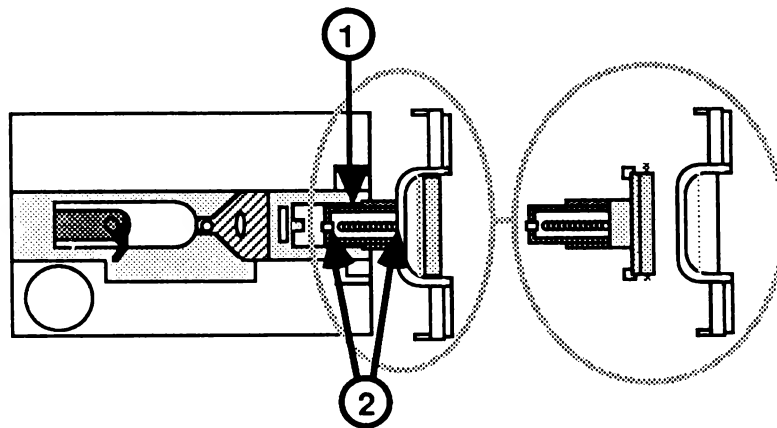


FIGURE 10

Replace

1. Install the new door, making sure the side edges of the door fit into the grooves on the metal carriage (Figure 10, #1) and the door springs fit over the supporting tabs (Figure 10, #2).
2. Reattach the sub-bezel.

Note: A defective mechanical assembly must be returned to Apple with a sub-bezel attached.
3. Replace the mechanical assembly.

Apple 5.25 Drive / UniDisk

Section 3 – Adjustments

□ CONTENTS

3.2 DSPEED

Note: If a step is underlined, detailed instructions for that step can be found in Section 1, Take-Apart.

□ DSPEED

This adjustment procedure was written to be used with the *5.25 Floppy Drive Test Assembly*—if the test indicates that you need to adjust the drive speed. All information on setting up and running the diagnostic is in the *Multi-Product Diagnostics Technical Procedures*, Section 2, 5.25-Inch Floppy Drive Test.

Materials Required

Multi-Product Diagnostics Technical Procedures manual
A small (jeweler's) flat-blade screwdriver
Apple II, II Plus, IIe, IIc, or IIGS
Known-good disk drive and controller (the controller is not necessary for the IIc and IIGS)
Apple 5.25 Drive or UniDisk to be adjusted

Making the Adjustment

To adjust the DSPEED (drive speed):

1. Remove the disk drive case.
2. Start the Drive Speed test (see the *Multi-Product Diagnostics Technical Procedures*, Section 2, 5.25-Inch Floppy Drive Test).
3. Locate the DSPEED adjustment hole under the drive being adjusted. It is a small hole next to the rubber foot on your right (when facing the drive) and nearest the front of the drive. The adjustment screw is located inside the hole.

Note: When you make the DSPEED adjustment, keep the Apple 5.25 Drive or UniDisk flat.
4. The adjustment is extremely sensitive, so turn the adjustment screw very slowly. The indicator on the screen will move back and forth to show changes in speed.
5. Adjust the speed so that the indicator stays within the "good" range—as close to 0 as possible. Let the test run for 30 seconds.

6. Press <Escape> to return to the main menu; then repeat the test.

Does the DSPEED now stay within the "good" range?

- Yes—Press <Escape> to return to the main menu.
- No—If the DSPEED cannot be properly adjusted, return the faulty drive mechanism to Apple.

Apple 5.25 Drive / UniDisk

Section 4 – Troubleshooting

❏ CONTENTS

- 4.2 Using the Troubleshooting Flowchart
- 4.3 Troubleshooting Flowchart

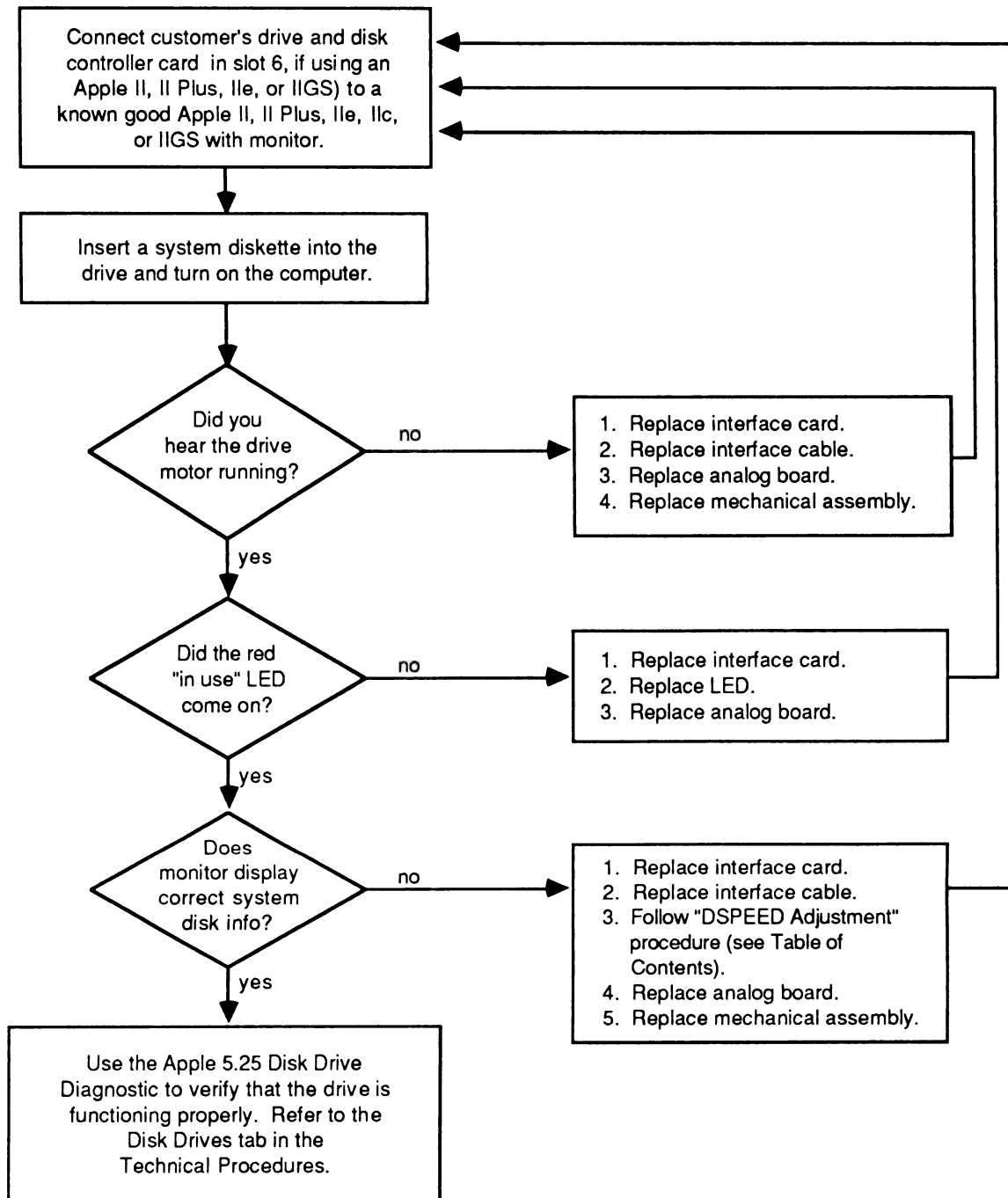
□ USING THE TROUBLESHOOTING FLOWCHART

Whenever a customer brings in a presumably bad Apple 5.25 Drive or UniDisk, use the flowchart on the following page as a troubleshooting guide. Begin with the box in the upper left corner of the page. When you get to one of the answer boxes, swap the modules, one at a time, in the order in which they are listed. Each time you swap out a module, go back to the beginning of the flowchart. Turn on the computer and see if you can boot a system diskette (preferably a ProDOS *System Utilities* diskette.)

Once you are able to boot the *System Utilities*, be sure to run the latest Apple drive diagnostic, performing any adjustments necessary. Reinstall the customer's modules, one at a time, running the drive diagnostic after each exchange to isolate the bad modules.

Note: If you do not know how to connect the Apple 5.25 Drive or UniDisk to an Apple computer, refer to the *Apple 5.25 Drive Owner's Guide* for instructions.

UNIDISK / APPLE 5.25 DRIVE TROUBLESHOOTING FLOWCHART



Apple 5.25 Drive / UniDisk

Section 5 – Preventive Maintenance

❏ CONTENTS

- 5.2 Introduction
- 5.2 Read/Write Head
- 5.3 Head Load Button
- 5.4 Motor Drive Belt

Note: If a step is underlined, detailed instructions for that step can be found in Section 2, Take-Apart.

□ INTRODUCTION

The read/write head should be cleaned any time the computer or disk drive is being serviced. The head load button should be replaced whenever it is worn or dirty. The motor drive belt should be inspected any time the disk drive is being serviced.

□ READ/WRITE HEAD

Materials Required

#2 Phillips screwdriver
Cotton swabs
Isopropyl Alcohol (80% alcohol/20% water)

Procedure

To service the read/write head:

1. Remove the top cover, drive shield, and analog board.
2. Clean the guide rails with the isopropyl alcohol. **Do not** use grease.
3. Inspect the head for worn or dull spots in the ceramic. If you find any, replace the mechanical assembly.
4. Clean the head with the isopropyl alcohol.
5. Move the read/write head assembly back and forth along the full length of its travel. Check for any blockage or friction. If there is any, replace the mechanical assembly.
6. Replace the analog board, drive shield, and top cover.

□ HEAD LOAD BUTTON

Materials Required

#2 Phillips screwdriver
Needlenose pliers
Head load button

Procedure

To service the head load button:

1. Remove the top cover, drive shield, and analog board.
2. Lift up the head load arm. If the head load button is worn or dirty, squeeze the top part of the load button with small needlenose pliers and let the button drop down.
3. Insert the new load button into the head load arm. Press the button until it snaps into place.
5. Replace the analog board, drive shield, and top cover.

□ MOTOR DRIVE BELT

Materials Required

#2 Phillips screwdriver
Motor drive belt

Procedure

To service the motor drive belt:

1. Remove the case, and the top and bottom shield.
2. Turn the drive upside down and locate the belt. Check the belt for cracks, slippage, and elasticity. If the belt is dry or cracked, or if it slips, continue with step 3.
3. Slip the belt off the pulley.
4. Place the new belt around the motor spindle and then slip it around the pulley.
5. Replace the top and bottom shield, and the case.

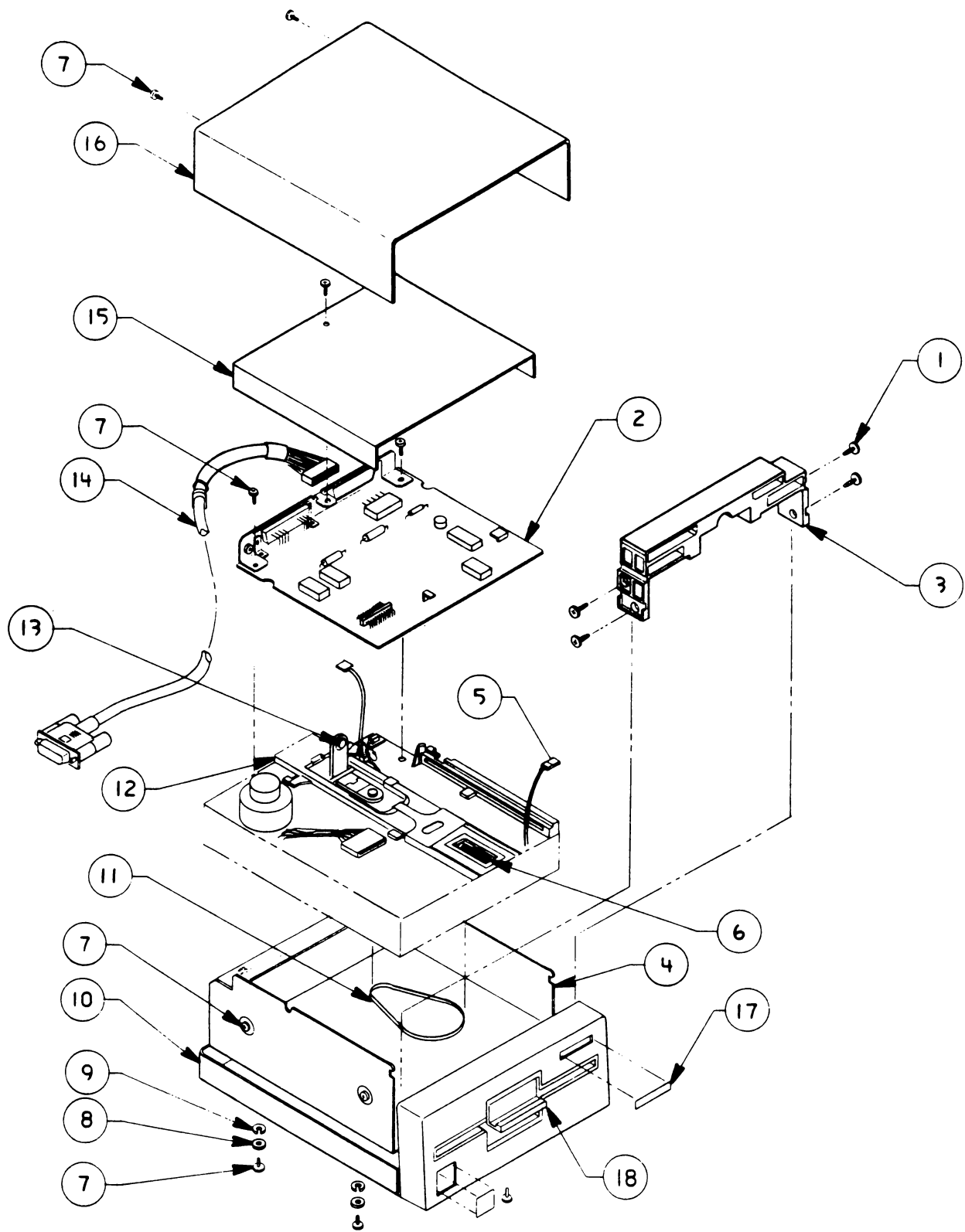
Apple 5.25 Drive / UniDisk

Section 6 – Illustrated Parts List

❑ CONTENTS

6.3 Finished Goods Assembly (Figure 1)

The figure and list in this section include all piece parts that can be purchased separately from Apple for the Apple 5.25 Drive and UniDisk, along with their part numbers. These are the only parts available from Apple. Refer to your *Apple Service Programs Manual* for prices.



□ 5.25 DRIVE/UNIDISK—FINISHED GOODS ASSEMBLY (Figure 1)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	400-3604	Screw, 6-32 x 1/4, Pozi-Dr. Flt.
2	661-0287	Analog Card, UniDisk
3	970-1258	Sub-Bezel, Universal Uni/Apple 5.25
4	805-0890	Bottom Shield
5	590-0140	LED Cable Assembly, D1
6	870-0023	Spring
7	400-1604	Screw, 6-32 x 1/4
8	860-0242	Washer, M3.5 x 4.0 I.D. x 7.0 O.D.
9	860-0053	Washer, Split Lock Metric, 3.5 mm
10	675-5101	Bottom Cover, Beige
	603-5111	Bottom Cover, Platinum
11	U880-0002	Disk Drive Belt
12	661-72128	Uni/DuoDisk Disk Mechanical Assembly
13	U815-0064	Load Button
14	590-0327	Cable, Drive-to-CPU, Beige
	590-0367	Cable, Drive-to-CPU, Smoke
15	805-0891	Top Shield
16	675-5103	Top Cover, Beige
	603-5112	Top Cover, Platinum
17	825-0548	Label, Drive #, Uni/DuoDisk
18	603-5113	Door, Smoke
	815-0637	Door, Beige