INSTALLATION INSTRUCTIONS
DOUBLE DENSITY UPGRADE KIT
MODEL 503

Manual Order Number: 121505-002 Rev. B

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PREFACE

This manual provides installation instructions for the Model 503 Double Density Upgrade Kit. Related publications are:

Intellec Series II Microcomputer Development Systems, Models 220, 221, 222 and Models 230, 231, 232, Service Information (Series II Service Manual)
Manual Order Number 9800878

Model 240/740 Intellec Series II Hard Disk Drive, Installation
Manual Order Number 121528

Hard Disk Subsystem Operating and Checkout Manual
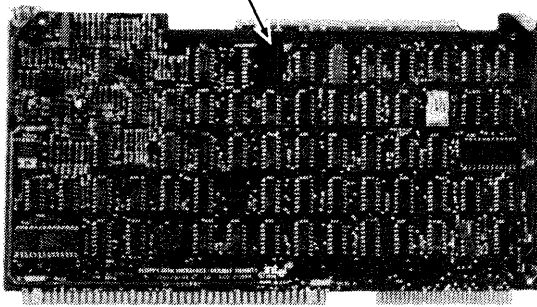Manual Order Number 9800943

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CHANNEL BOARD

INTERFACE BOARD

DUAL AUXILIARY CONNECTOR

J9

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DESCRIPTION AND PURPOSE OF THE MODEL 503 DOUBLE DENSITY UPGRADE KIT

The Model 503 Double Density Upgrade Kit converts the integral single-density drive of a Model 220 or Model 240 Intellec Series II Microcomputer Development System to double density, thereby doubling its storage capacity.

The Upgrade Kit consists of the following major parts:

Double Density Controller Boards:
  Channel Board
  Interface Board
Dual Auxiliary Connector
Double Density Integral Drive Controller Cable

INSTALLATION PLANNING

There is no significant planning to be completed prior to the installation of the Upgrade Kit in a Model 220 or Model 240 Development System. Note, however, that the installation of an Upgrade Kit in a Model 240 or in a Model 220 to which a Model 740 Hard Disk Subsystem has been added will use all of the card slots in the main chassis of the Development System. A Model 201 Expansion Chassis must then be added to the system to permit the use of an In-Circuit Emulator (ICE) or other Multibus-compatible printed wiring assemblies.

CONNECTING AN EXTERNAL DRIVE UNIT TO AN UPGRADED SYSTEM

An external Flexible Diskette Drive unit (Model 730, 731, or 732, or Model DDR) can be added to an upgraded Development System by connecting the external drive unit to J9 on the Development System's rear panel. This will provide three double density drives for the upgraded system.

DRIVE NUMBERING

Flexible diskette drives connected to controller cable (and system) connector J8 are numbered 0 and 1; flexible diskette drives connected to controller cable (and system) connector J9 are numbered 2 and 3. However, adding the upgrade kit to a system uses J8 (a) for the single integral drive, instead of (b) for two drives in an external drive unit. Thus there will be no "drive 1" in an upgraded system. Also, if a hard disk drive is part of the system, the system software automatically increases all drive numbers by 4. Specifically:

1. If the Development System being upgraded is a Model 220, 221, or 222, the integral drive will remain drive 0 after the upgrade. If an external drive is added to the system, its drives become drive 2 and 3. (The drive on the right will be drive 2; the drive on the left, drive 3.) There will be no drive 1.

2. If the system upgraded is a Model 240, or if a Model 740 Hard Disk Drive is added to an upgraded Model 220 System, the integral drive becomes drive 4. If an external drive unit is added to the upgraded system, its drives become drive 6 and 7. There will be no drive 5.

SUMMARY OF THE INSTALLATION

The installation, which is described in detail on the following pages, may be summarized as follows:

1. Verify system performance before starting the installation.

2. If desired, secure the dual auxiliary connector to the card cage backplane.

3. Install the cables.

4. Install the controller boards.

5. Verify system performance.

If a Model 740 Hard Disk Subsystem is being installed at the same time you are installing the Upgrade Kit, the two installations can be integrated into one as indicated in the detailed procedure.

Before you start, read the complete installation procedure and make certain you are sure of each stage in the procedure.

1. Check the contents of the Upgrade Kit. You should have the parts and materials listed on the checklist included in the kit. Make sure components are seated properly on the controller boards, with no bent pins. Inspect the cables for broken or bent pins in the connectors, broken or frayed wires, and bent or broken lugs. Verify that the address selection switches on the Channel Board are set to 78H and that the interrupt selection switch on the Interface Board is set to position 3 (interrupt level 2). (See figure 1.)

2. If you are upgrading an existing Model 220 or Model 240 Development System, verify its performance by performing the IOC (5-beep) diagnostic, the IPB (Z$) diagnostic, and the Con-fidence Test. Repair the system if any error messages are displayed or any test fails.

NOTE
Refer to the Intellec Series II service manual for diagnostic/test procedures and for removal and replacement procedures.

3. Turn the Development System off, disconnect it from its ac source and remove the top cover and front card cage cover.

4. Remove the ribbon cable connecting the integral drive to the IOC. (See figure 2.)

5. Remove the rear panel of the Development System.
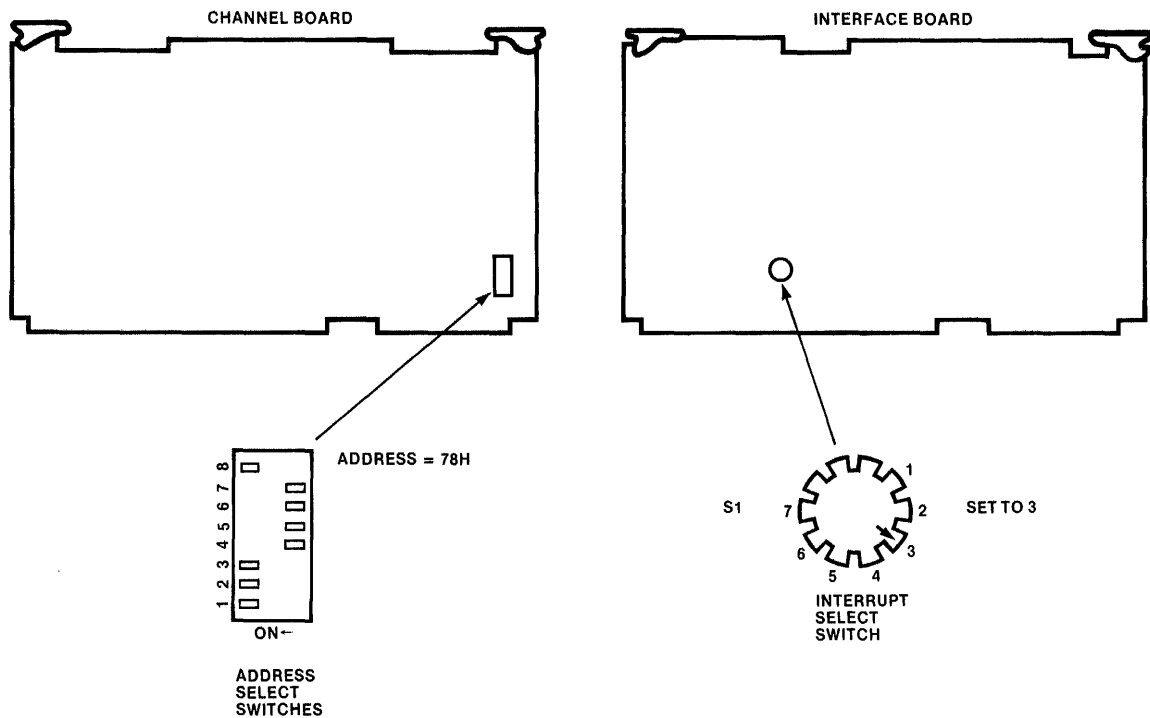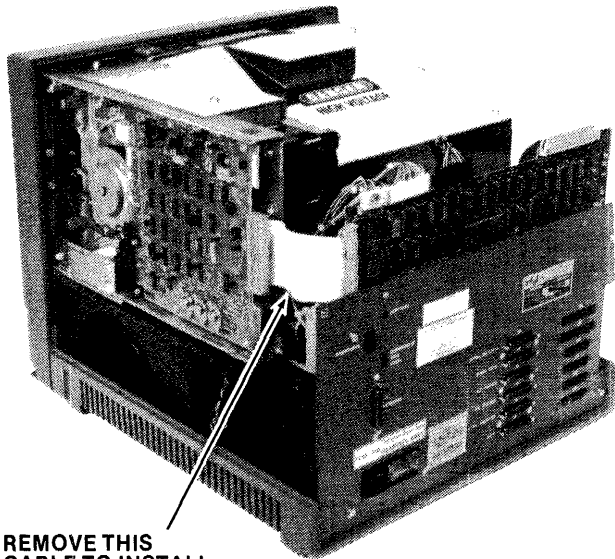
CHANNEL BOARD   INTERFACE BOARD

ADDRESS = 78H

ON←

ADDRESS
SELECT
SWITCHES

S1   7   2   SET TO 3

1
6   3
5   4

INTERRUPT
SELECT
SWITCH

Figure 1. Channel Board and Interface Board Switch Settings   1505-3-1

REMOVE THIS
CABLE TO INSTALL
MODEL 503 UPGRADE KIT   1505-3-2

**Figure 2. Interior of Development System,
Showing Integral Drive Ribbon Cable
to be Removed**

6. It is recommended that you now mount the dual auxiliary connector adjacent to the J3 and J4 connectors on the cardcage backplane. (See figure 3.) Before you tighten the connector to the backplane, insert the controller boards into the backplane connectors and the dual auxiliary connector to ensure the connectors are aligned properly. This is a lengthy process requiring removal of the Development System's power supply. If you want, you can omit this step and fit the dual auxiliary connector onto the controller boards as the boards are installed in the card cage. (If you are installing the Model 740 Hard Disk Subsystem concurrently with the Upgrade Kit, you may mount its dual auxiliary connector to the backplane at the same time.) It is more convenient to leave the dual auxiliary connector free of the backplane but, if you do, you must remove and insert the two controller boards together, as a set, and not separately.

7. If you are installing the Model 740 Hard Disk Subsystem concurrently with the Upgrade Kit, mount the hard disk controller cable's connectors to holes J10, J11 and J13 of the rear panel.
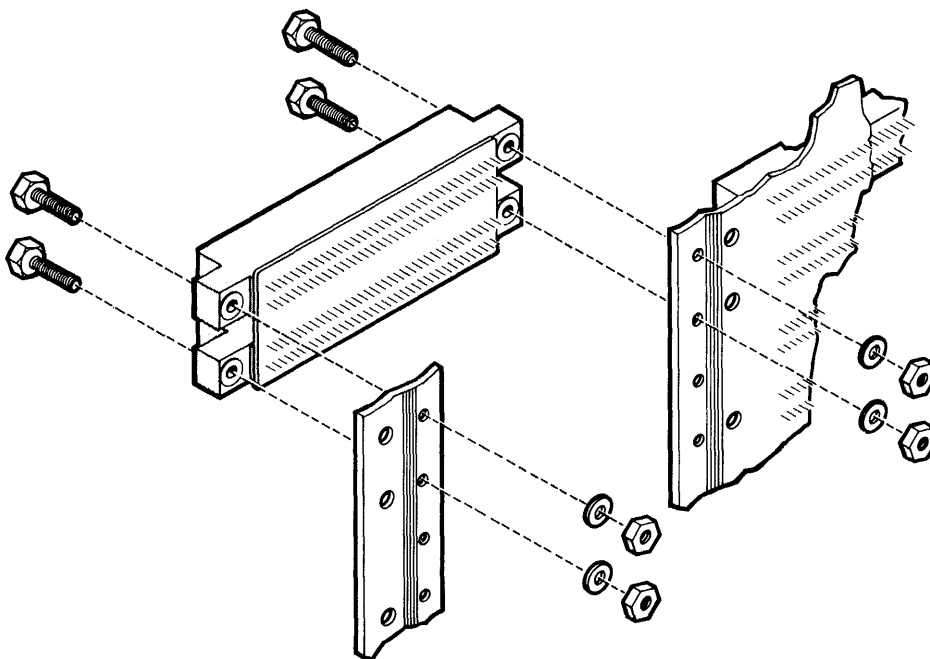
Figure 3. Dual Auxiliary Connector Mounting to Backplane   1505-0-1

3

8. Fasten J9 of the controller cable to the J9 hole in the rear panel. (See figure 4. If you are installing the Upgrade Kit in a system with a Hard Disk Drive, refer to figure 5 for the connector placement.) Secure the ground straps under the washer around the bolt holding J9 to the panel or, if a ground lug is available, to the ground lug.

9. If you are installing the Upgrade Kit in a system with a Hard Disk Drive, stick a tie-wrap pad on the inside of the end bracket of the power supply. (See Figure 5.)
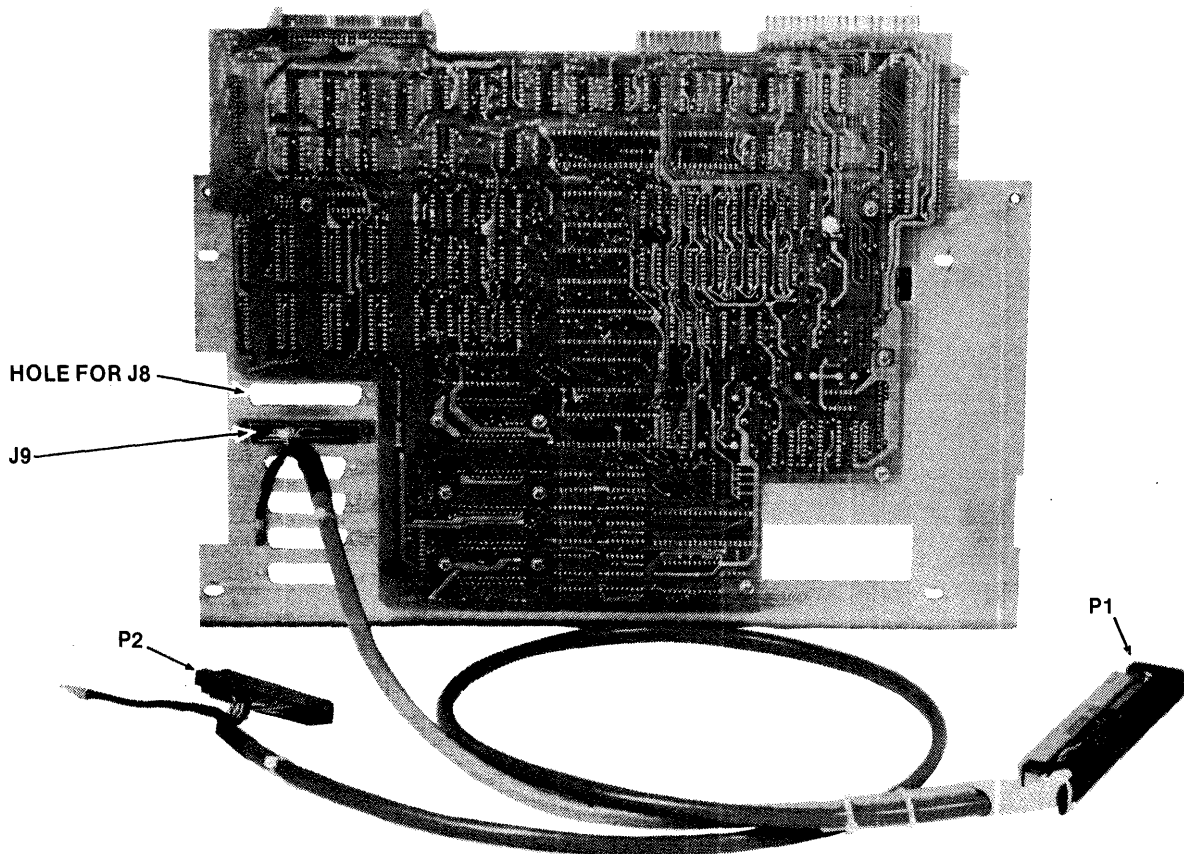
Figure 4. Controller Cable and Integral Drive Cable Connected to Rear Panel

80-007

INTEGRAL
DRIVE
CABLE

J9

GROUND
POINTS

J10,J11,J12

END BRACKET OF
POWER SUPPLY

HARD
DISK
CONTROLLER
CABLE

EXTERNAL
DRIVE
CABLE

TIE-WRAP PAD
FOR CONTROLLER
CABLES (ON INSIDE)

P1
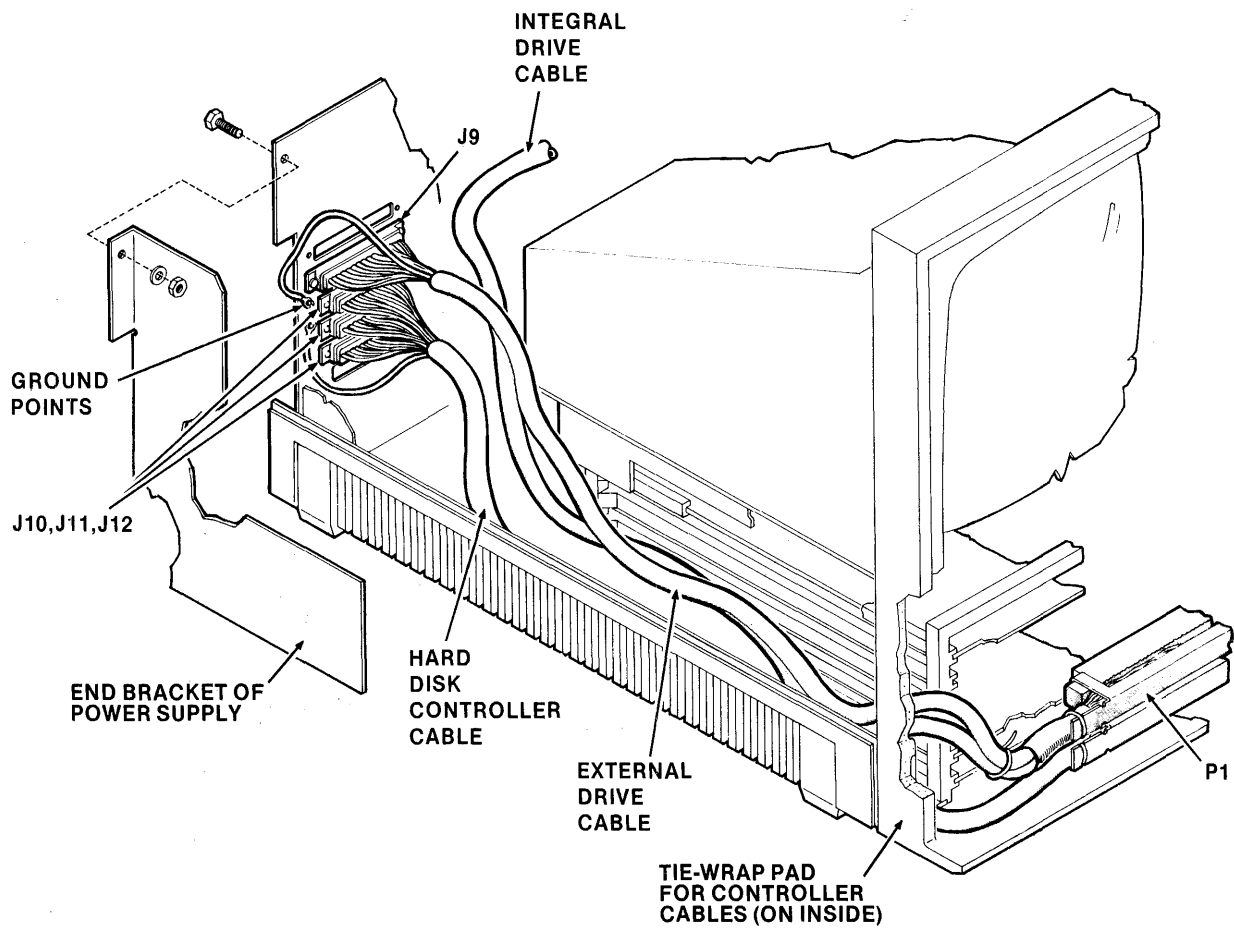
NOTE: Hard Disk Controller Cable may not be present.

Figure 5. Cable Routing

1505-0-3A

10. Re-mount the rear panel, feeding P1 of the double density controller cable (and the hard disk controller cable, if there) through the power supply and along the side of the card cage. Feed P2 of the double density controller cable through the power supply, pulling it up and across the rear of the CRT assembly, toward the integral drive. (See figures 6 and 7. Note there are two different types of power supplies used in the Development System. If you are installing the Upgrade Kit in a system with a Hard Disk Drive, see figure 5 for cable routing.)

11. Connect P2 of the double density controller cable to the drive's control/signal connector, with pin 1 of the connector down. Check figure 8 for the proper orientation of the connector. Secure the connector to the drive control board with tie wraps passed through the holes in the connector and holes in the board that are close to the connector.

12. If the system has a Xentek power supply, put a caterpillar grommet on the edge of the end bracket of the power supply to protect the integral drive cable.

13. Secure a stick-on tie wrap pad to the side of the power supply as shown in figure 6 or figure 7 depending upon which type of power supply is used in your system. Tie the cables to keep them away from the transformer in the power supply. Check Figure 5 and Figures 6 and 7, and use additional tie wraps as required. If you are installing the Upgrade Kit in a system with a Hard Disk Drive, secure both controller cables to the tie-wrap pad stuck to the inside of the power supply bracket in step 9. (See Figure 5.)

TIE WRAP

ORIENT CONNECTORS SO MOST OF THE WIRES ARE AT THE TOP PIN 1 GOES DOWN

GROUND STRAP CONNECTION
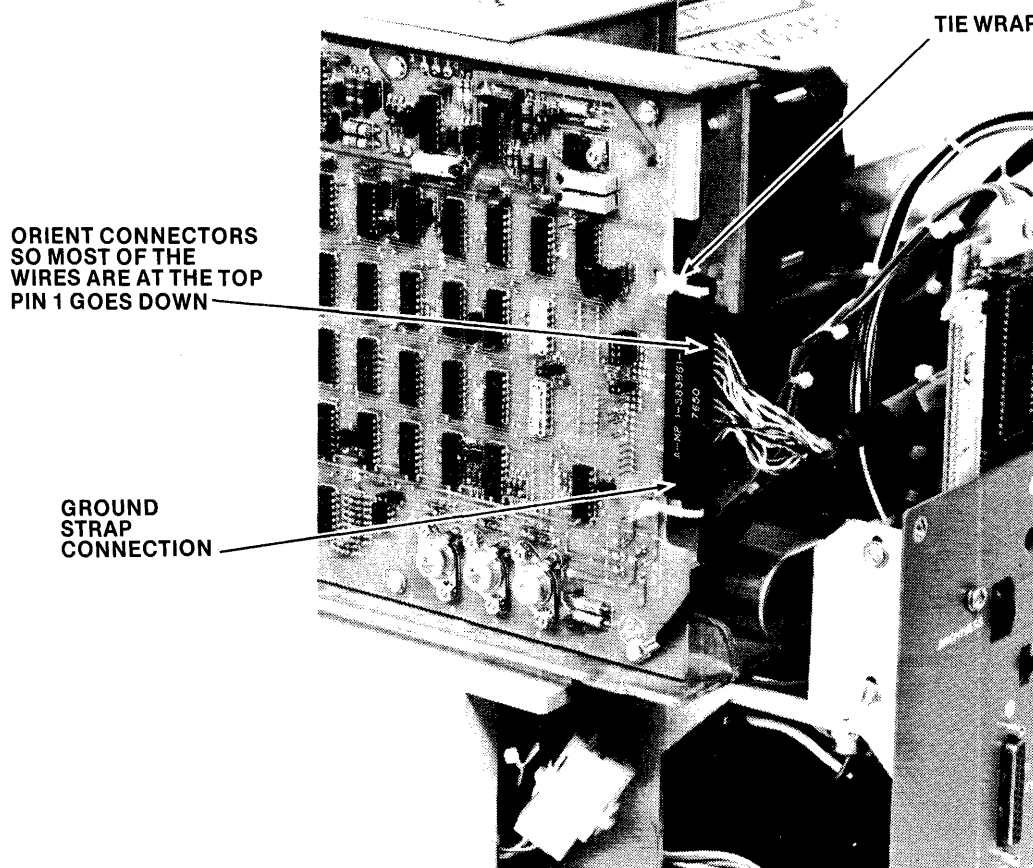
Figure 8. Integral Drive Cable Connector orientation

80-012

CABLE TO
INTEGRAL
DRIVE

TIE WRAP PAD

TIE WRAP
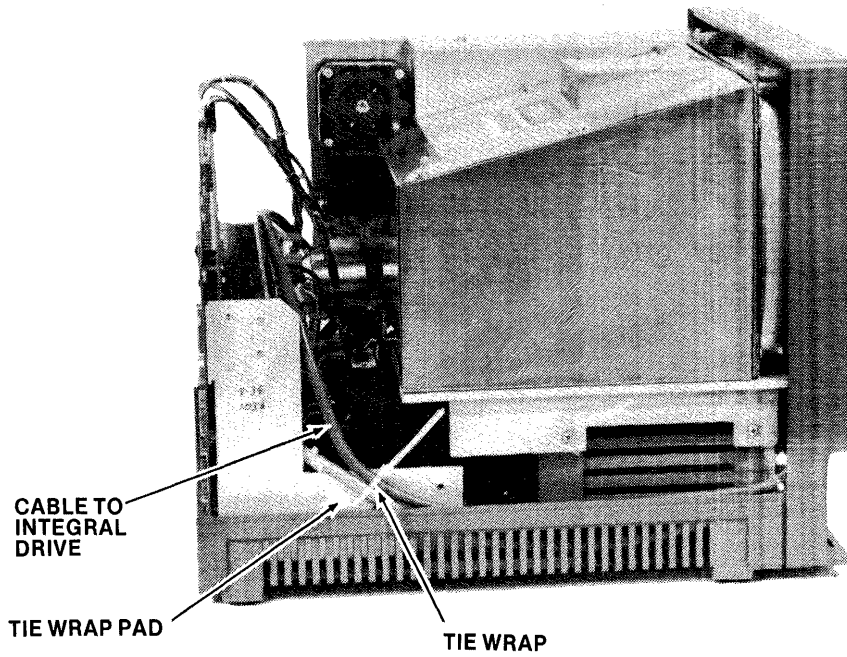
Figure 6. Path for Resulting Cable Through Power-1 Power Supply

80-001

CABLE TO
INTEGRAL
DRIVE

TIE WRAP PAD
AND TIE WRAP

TIE WRAP PAD AND
TIE WRAP MAY ALSO
BE USED IN THIS AREA.
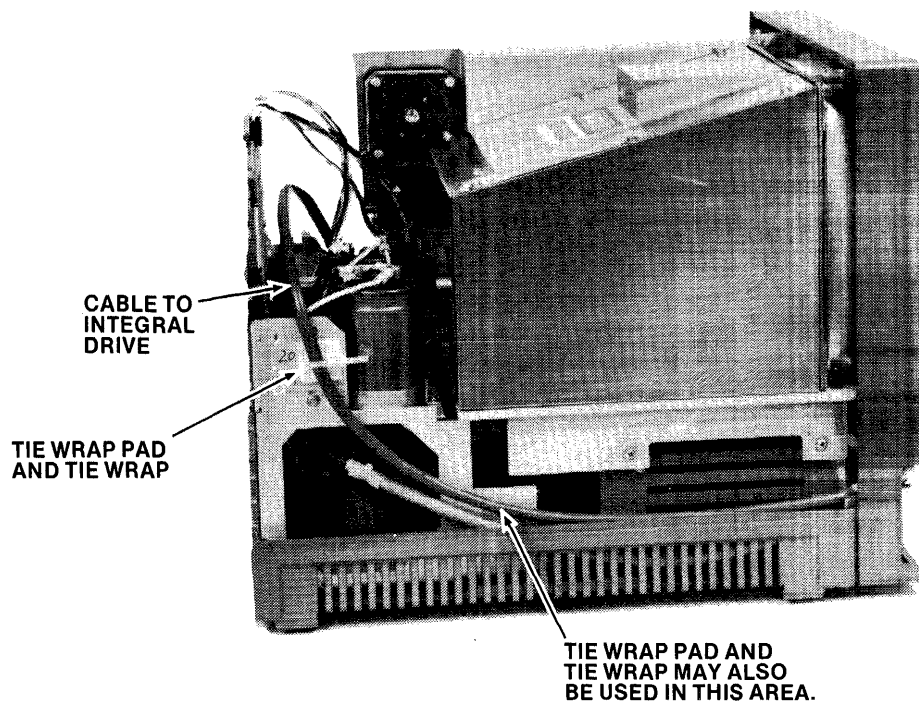
Figure 7. Path for Routing Cable Through Xentek Power Supply

80-002

7

14. Using the wraps, tie the double density controller cable to the cable from IOC J16 and to the cable from IOC J15. (See figure 9.)

15. Stick a tie-wrap pad on the front inside of the chassis, by the card cage, and use it to secure the floppy-disk controller cable and (if present) the hard disk controller cable so the controller board front edge connectors cannot work loose. (See Figure 5.)

16. Insert the controller channel board and the controller interface board into the card cage. (See figure 10.) If you did not secure the dual auxiliary connector to the backplane of the card cage, fit it onto the two controller boards and insert them together.

17. Place P1 of the double density controller cable on the front-edge connector of the interface board. (See figure 10.) If you are installing a Model 740 Hard Disk Subsystem concurrently with the Upgrade Kit, install the hard disk controller boards in J5 and J6 of the card cage.

18. Replace the top cover and the card cage cover.

19. Re-connect the development system to the ac source, and verify the upgrade by performing the IOC (5-beep) diagnostic, the IPB (Z$) diagnostic, and the Confidence Test. Since the integral drive is now a double-density drive, you must use the Double-Density Confidence Test diskette supplied with the kit.
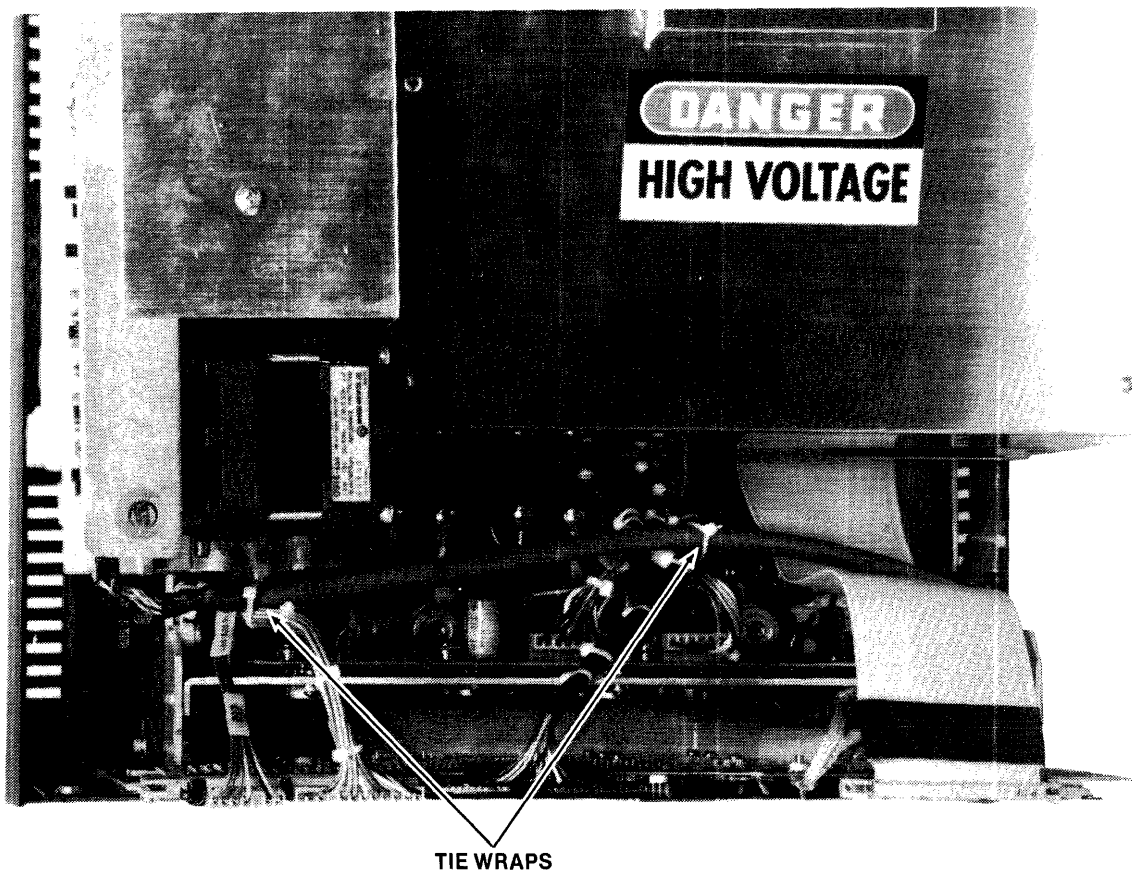

TIE WRAPS

Figure 9. Top View of Development System Showing Tie Wrap Locations

1505-3-8

J1: IPB
J2: ISBC-032 (IF USED)
J3:

J4:
J5: FLOPPY DISK CHANNEL BOARD
J6: FLOPPY DISK INTERFACE BOARD
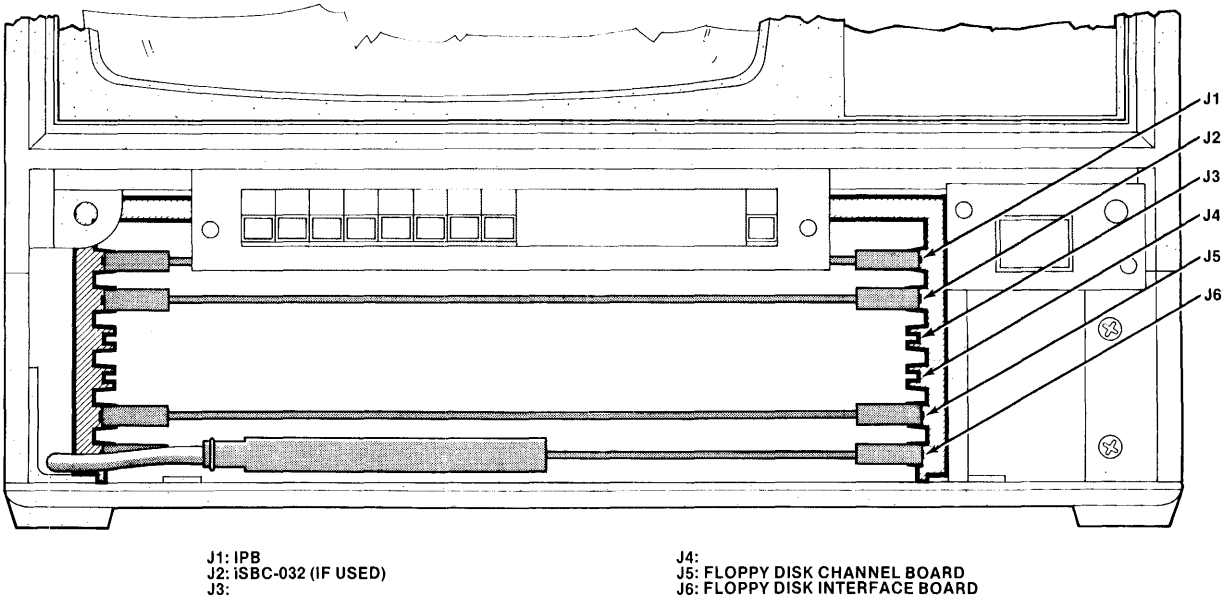
Figure 10A. Card Placement in Absence of Hard Disk Controller Boards

1505-3-9

Note: Controller boards are shown in preferred orientation, with interface board installed below channel board. System will operate with interface board installed above channel board.

J1: IPB
J2: ISBC-032
J3: FLOPPY DISK CHANNEL BOARD

J4: FLOPPY-DISK INTERFACE BOARD
J5: HARD DISK CHANNEL BOARD
J6: HARD DISK INTERFACE BOARD

Figure 10B. Card Placement With Hard Disk Controller Boards

1505-3-10

9

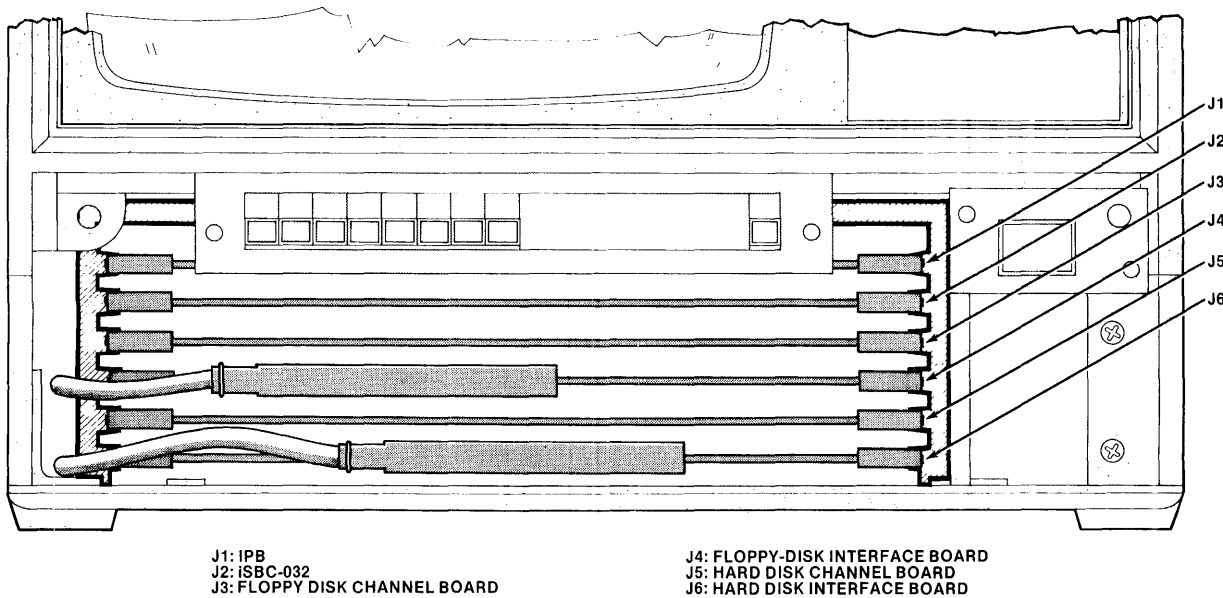The best service for your Intel product will be provided by an Intel Customer Engineer. These trained professionals will provide prompt, efficient on-site installation, preventive maintenance, or corrective maintenance services that will keep your equipment in the best possible operating condition.

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