* *
  *   CORVUS SYSTEMS (TM)
*   *
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OMNIDRIVE (TM)
DIAGNOSTIC GUIDE

Corvus Concept (TM)

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OMNIDRIVE (TM)
DIAGNOSTIC GUIDE

Corvus Concept (TM)

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CONTENTS |**

This guide covers the diagnostic program for the OmniDrive
mass storage system when used with the Corvus Concept personal
workstation. This program is used to detect and correct
certain types of hardware and software problems that may
develop.

Contact the Corvus Customer Service Department with problems
beyond the scope of this guide. Back up the drive on a
regular basis to avoid loss of valuable data. It is
recommended that a backup is done before using some options in
the diagnostic program.

The diagnostic program should be used only by the person
responsible for maintaining the drive, the system manager. A
password protection system is used to limit access to the
diagnostic program. The system manager should read this guide
completely before using the diagnostic program.

All regular users should avoid using the network when the
diagnostics program is in use. Additionally, it is suggested
that a single computer be connected directly to the OmniDrive
using a convenience connector.

HOW THIS GUIDE IS ORGANIZED

> Chapter 1 describes the diagnostic tools available,
> including indicator lights and diagnostic problems. The
> chapter also explains entering the diagnostic program
> from Constellation II or when using diskettes.
>
> Chapter 2 explains how to check and update the firmware.
>
> Chapter 3 describes how to exercise the heads and find
> media defects on the OmniDrive.

Chapter 4 explains how to change the parameters, including the interleave factor, spared tracks, and the read-after-write option.

Chapter 5 explains how to format the OmniDrive.

Appendix A contains two forms for recording diagnostic changes and updates.

USAGE

Throughout this guide, **type** means to enter two or more characters on the Corvus Concept keyboard. Type all words, symbols, spaces and punctuation to the right of the word **type** exactly as shown. Do not add or leave out punctuation marks at the end of a statement.

Example:

Type /CCUTIL/FUTIL

Do not type the spaces between **type** and the first character to its right, a slash in the above example. Enter characters in either upper or lower case.

Throughout this guide, **press** means to enter a single character or symbol on the Corvus Concept keyboard. When a keytop symbol is used, press the key to which it refers. Do not type out each letter of the word in the keytop symbol.

Examples:

Press Y

Press [RETURN]

When the command **press** or **type** appears in a sentence or paragraph, type in the information indicated.

Example:

Type the filename and **press** [RETURN].

At the top of the Corvus Concept keyboard are 10 function keys, numbered F1 through F10. The function key labels display across the bottom of the Corvus Concept screen; when a function is not associated with a key, a blank

space replaces the label. The function key labels appear
in instructions throughout this guide. Use the labels
like keytop symbols.

The labels change with each program. Within a program,
each function key represents up to four separate
functions. To call a function, press a specific
combination of keys; use the function, [SHIFT] and
[COMMAND] keys.

When the [COMMAND] key is pressed, up to 20 new functions
are displayed. The original function key labels on the
screen disappear and are replaced by new labels.

To call the first of the four possible functions
associated with a key, simply press the function key.
For example, if the guide states, "**Press** [SetVol]," from
the dispatcher level, press [F4].

To call the second function, hold down the [SHIFT] key
and press the proper function key. For example, if the
guide states, "**Press** [Exit]," from the file manager
program, press [SHIFT] and [F10] at the same time.

To call the third function, hold down the [COMMAND] key
and press the proper function key. For example, if the
guide states, "**Press** [MountMgr]," from the dispatcher
level, press [COMMAND] and [F9] at the same time.

To call the fourth function, hold down the [COMMAND] key
and the [SHIFT] key and press the proper function key.
For example, if the guide states, "**Press** [Reboot]," from
the dispatcher level, press [COMMAND], [SHIFT] and [F10]
at the same time.

For clarity, this guide always uses the function key
labels rather than the key number. The instruction
Press [ListVol], for example, clearly implies listing a
volume; the instruction **Press** [F5], however, may be
confused with the other functions called by pressing a
combination of [F5] and other keys.

The variables **x.xx** on the screen display stand for
software version numbers.

The convenience connector refers to the small plug used
to connect two tap cables together. The connector was
supplied with the OmniDrive.

SOFTWARE REQUIRED

The diagnostic program ODIAG and related files containing
the firmware and the diagnostic data block file are found
on one of the distribution diskettes. For 8-inch
diskettes, these files are on the FDIAG diskette. For
software on 5-1/4 inch diskettes, the files are on the
FBOOT diskette.

ODIAG	OmniDrive diagnostics program
FODRx.x.DATA	Firmware update file
OD.DIAG.DATA	Data file for diagnostics program

These files may also be found in the volume CCUTIL after
the drive has been updated.

This chapter briefly describes the diagnostic program, and is
a helpful starting point for identifying and correcting
problems. First the drive indicator lights are explained,
then there is a table of problems and possible solutions. The
chapter ends with the steps necessary to enter the diagnostic
program from either the OmniDrive or the FDIAG diskette in
case the drive is not accessable.

THE OMNIDRIVE INDICATOR LIGHTS

The OmniDrive has three indicator lights on the front
panel to show the status of the drive. The left light is
the fault indicator light; the center light is the busy
light, and the right light is the ready light. When the
drive is ready, only the right light should be on.
During normal operation, the center and right lights
flicker as data is transferred to and from the drive.

The illustration below shows these indicator lights:
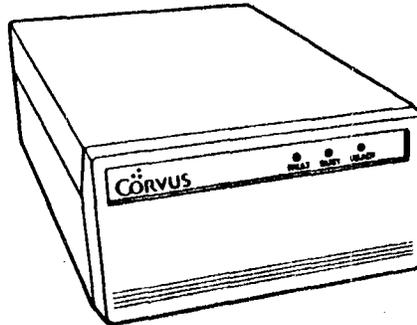
OmniDrive Indicator Lights

The OmniDrive takes approximately one minute to come
ready after it is turned on. If the drive does not come
ready, reset the drive by turning it off and after a
moment turning it on again.

The table below shows common problems and their
solutions.

Symptom	Possible Problem	Remedy
No indicator lights on disk	Power cord not properly connected	Properly connect power cord
Indicator lights function yet ready light doesn't stay on	Drive error	Reset drive
	Improper firmware	Replace firmware (See firmware section below)
Ready light on but computer cannot communicate with drive	Improper hardware setup	Check hardware setup and Omninet address
	Problems in interleave factor	Properly set interleave factor (see section below)
Ready light on and computer can communicate with the drive but intermittent problems	Media defects	Check for media defects (See section below)
	Problems in interleave factor	Properly set interleave factor (See section below)
	Improper firmware	Replace firmware (see firmware section below)
Other problems		Call Corvus Customer Service

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ENTERING THE DIAGNOSTIC PROGRAM

The system manager runs the diagnostic program using the computer connected to the OmniDrive. No other users should be using the network.

Before running the diagnostic program, the OmniDrive should be connected directly to one computer using the convenience connector to link the tap cables.

First, turn off all equipment. The computer can not be more than 30 feet from the OmniDrive, otherwise the tap cables for the two devices could not be connected.

Next, unplug the OmniDrive tap cable from its network tap box. The other end of the tap cable should remain connected to the OmniDrive. Insert the free end of the tap cable into one end of the convenience connector. For more information, refer to the <u>OmniDrive Setup Instructions</u>.

Unplug the tap cable from the network tap box of the computer that will run the diagnostic program. Insert the free end into the other end of the convenience connector. For more information, refer to the <u>Corvus Concept Personal Workstation Installation Guide</u>.

The drive must be backed up before certain diagnostic procedures are performed if you wish to save data on the drive. As a precaution, you should back up the drive before using the diagnostic program to perform any procedure.

The ODIAG program and the related data files must be in the current volume. If the program cannot find the data block file to access for information, an error message appears:

Unable to open Diag block file OD.DIAG.DATA

Pascal I/O error: 10
File not found.
Type <space> to continue...

Before running this program be sure to set the current
volume to CCUTIL if running ODIAG from a drive; FDIAG if
running ODIAG from 8 inch diskette; FBOOT if running
ODIAG from 5-1/4 inch diskette.

FROM DISKETTE

If the drive cannot be used, the diagnostic program must
be run from diskette. Normally, the diagnostic program
is run from the floppy diskette containing the diagnostic
utilities. For 8-inch software, this is the FDIAG
diskette. The 5-1/4-inch diskette is the FBOOT diskette.
The OmniDrive should be connected directly to the
computer using the convenience connector, as described
above.

To enter the program, boot the computer using the FBOOT
diskette.

From the 5-1/4 inch diskette, do this:

After the Corvus Concept dispatcher labels appear,

Type ODIAG

Press [RETURN]

From the 8 inch diskette, do this:

After the Corvus Concept dispatcher labels appear,

Type FDIAG

Press [SetVol]

Put the FDIAG diskette in the diskette drive.

Type ODIAG

Press [RETURN]

The ODIAG program begins. Skip to the section "Selecting
the Drive."

FROM CONSTELLATION II

The diagnostic program can also be run from the Omnidrive, or another drive. The OmniDrive should be connected directly to the computer using the convenience connector, as described above.

Log on as the system manager.

Press [Const II]

The Constellation II main menu appears. It is described in the Corvus Concept System Manager's Guide.

Select the maintenance utilities.

Press [Maint]

The maintenance utilities menu appears.

Press [OdrvDiag]

The ODIAG program begins. Continue with the next section "Selecting the Drive."

SELECTING THE DRIVE

After entering the program the screen display is similar to:


```
-------------------------------------------------------------

   DISK DIAGNOSTIC [x.xx]        Slot:  5

   Select Drive                ServCer:  0
-----------------------------------------------
    Slot 3: a Corvus 8" floppy interface
    Slot 5: an OMNINET interface


   Enter slot number    :  0

-------------------------------------------------------------
```

The slot and server address for the drive are shown, if the drive responds. All active devices connected to the Corvus Concept are then listed.

In some cases, no devices may be shown. Check all hardware connections. The ODIAG program allows you to specify a non-responding slot location. The OmniDrive will be in slot 5, the Omninet slot, since it is a network device.

Press 5

Press [RETURN]

The prompt for the server number (the Omninet address) appears next:

  Enter server number   : 0

Enter the server number of the OmniDrive and **press** [RETURN].

If the address is wrong or the OmniDrive does not respond, you are prompted to press [SPACE]. The prompts for slot and server numbers appear again. Enter the correct slot and server numbers.

If the drive has not been initialized, the main menu of the diagnostic program appears next. If the OmniDrive was initialized, the server name and drive name appear with the prompt below.

Selected drive is server SERVER0   ; drive DRIVE1
Continue (Y/N)?

Press Y

The system window displays:

```
-----------------------------------------------------------------

    DISK DIAGNOSTIC[x.xx]          Slot: 5

    Main Menu                      Server: 0
-------------------------------------------------------
    V - Version check

    M - Modify Parameters

    X - Exercise Heads

    C - Check for Bad Tracks

    U - Update Firmware on Drive

    F - Format Corvus Drive

    P - Park Heads for Shipment

    S - Select Drive

    E - Exit
-----------------------------------------------------

-----------------------------------------------------------------
```

The command window displays:

```
+-----------------------------------------------------------+
|                                                           |
|Please select an option:                                   |
+-----------------------------------------------------------+
```

The function key labels for ODIAG are:

ODIAG

```
   F1          F2          F3          F4          F5
+---------+---------+---------+---------+---------+
|         |         |         |         |         |
+---------+---------+---------+---------+---------+
|Vrsion   |Param    |Exrcis   |Update   |         |
+---------+---------+---------+---------+---------+


   F6          F7          F8          F9          F10
+---------+---------+---------+---------+---------+
|         |         |         |         |         |
+---------+---------+---------+---------+---------+
|         |CRCtst   |Format   |Park     |Exit     |
+---------+---------+---------+---------+---------+
```

ODIAG with [COMMAND] held down

```
   F1          F2          F3          F4          F5
+---------+---------+---------+---------+---------+
|         |         |         |         |         |
+---------+---------+---------+---------+---------+
|SelDrv   |         |         |         |         |
+---------+---------+---------+---------+---------+


   F6          F7          F8          F9          F10
+---------+---------+---------+---------+---------+
|         |         |         |         |         |
+---------+---------+---------+---------+---------+
|         |         |         |         |         |
+---------+---------+---------+---------+---------+
```

You can use the letter or the function key to select
an option from the main menu.

This page intentionally left blank.

This chapter presents the two diagnostic procedures for
OmniDrive mass storage system firmware. The firmware acts as
an interpreter for drive commands.

Corvus periodically issues new versions of drive controller
code referred to as firmware. Corvus firmware version number
FODR1.4 or later allows an OmniDrive to operate with a Corvus
Concept personal workstation.

There are two ODIAG options that apply to the firmware: the
version check, and firmware update. The Version option
displays various drive information including the firmware
version number, the version number of the firmware data block
file, the drive's size, capacity, ROM version, the number of
cylinders, tracks per cylinder, and sectors per track.

The Update option writes the firmware file onto the drive.
This option is used when the current firmware version becomes
damaged, or when updating the drive to contain a later
firmware version.

VERSION CHECK

> The version check should be performed before other
> diagnostic tests. Write down the results for future
> reference.
>
> **Press** [Vrsion]
>
> The screen below shows a typical version check:

```
-----------------------------------------------------------------

      DISK DIAGNOSTIC[x.xx]          Slot:  5

      Version Check                  Server:  0
-----------------------------------------------

      Drv P/V Capacity Size/Rev SPT TPC CPD
      --- --- -------- -------- --- --- ---
       1   P   32472    16MB/O   18  6 306

      ROM DB Firmware
      --- -- -------------------------------
       9  4 FODR1.4    -- CONST II - 01/84

      Press <space> to continue.

----------------------------------------------------------------
```

Drv	This is the drive number, which is always 1 for an OmniDrive.
P/V	This shows if the drive is considered a physical or a virtual drive. An OmniDrive should always show P for physical.
Capacity	The number shown for capacity is the number of 512-byte sectors available for data storage.
Size/Rev	This is the nominal drive size and type of drive. The size shown is the rated size of the drive. The rev shown should always be O, for OmniDrive.
SPT	This shows the number of sectors per track. The OmniDrive is divided into sections so that it can access information quickly. The drive is divided into cylinders, which are divided into tracks, which in turn are divided into sectors.
TPC	This shows the number of tracks per cylinder. See SPT above.
CPD	This shows the number of cylinders per drive. See SPT above.

ROM   This shows the level of the ROM chips contained
                 in the drive. These chips contain special code
                 and should be changed only by authorized
                 service centers.

DB   This shows the version of the ODIAG.DATA block
                 used by the drive firmware. This data file
                 contains information necessary for the drive
                 to operate.

Firmware   This is the version of firmware found on the
                 drive. The date shown is the release date for
                 the firmware. The firmware version and
                 release date should be written down for later
                 use.

Write down the information shown in the version check for
later use.

Press [SPACE]

The ODIAG main menu reappears.

UPDATING THE FIRMWARE

The Update option of the main menu of the diagnostic
program is used to update the firmware on the drive. The
firmware code is contained in the FODRx.x.DATA file,
where the x.x represents the version number. This file
is found on the same diskette as the diagnostic program.

To update the firmware,

Press [Update]

The system window displays:

```
-----------------------------------------------------------

  DISK DIAGNOSTIC[x.xx]        Slot:  5

  Update Firmware              Server:  0
-------------------------------------------------

  Change drive tables? N

-----------------------------------------------------------
```

Changing the tables clears the spare track table, sets
the interleaving factor to 9, and sets the
read-after-write to OFF. The spare track table should
never be cleared.

Press [RETURN]

The system window displays:

```
-----------------------------------------------------------

  Enter firmware file name: FODRx.x

-----------------------------------------------------------
```

Accept the suggested file name.

Press [RETURN]

The system window displays:

```
-----------------------------------------------------------

  Reading firmware from FODRx.x.DATA

...............................
  Firmware written.

  Press <space> to continue.

-----------------------------------------------------------
```

  Press [SPACE]

  The ODIAG main menu reappears.

The diagnostic program has two options to check the drive
hardware: exercising the heads, and checking the media
surfaces for defects causing CRC errors. A third option
allows parking the heads of the drive before shipment.

EXERCISING THE HEADS

Exercising the heads checks the movement of the
read-write heads across the platters in the disk drive
mechanism. The primary purpose of this test is to make
sure the heads move freely. This test also performs a
simple check for hard and soft data errors. A hard error
in this test indicates that the head could not find the
tracks on the platter surface. A soft error is a
read-write error that is detected and corrected by the
drive controller.

If hard errors are found, check for bad tracks and their
locations using the CRCtst option of the diagnostic
program. If a few, or no, soft errors appear then the
drive is in operating condition. A large number of soft
errors may indicate a problem with the firmware, or that
the sector interleave factor is set incorrectly.

To exercise the heads,

Press [Exrcis]

The system window displays:

```
-------------------------------------------------------------------

      DISK  DIAGNOSTIC[x.xx]        Slot:   5

      Exercise Heads               Server:   0
-------------------------------------------------

   Press <space> to stop test.

   ...................................
   ...................................
   ...................................
   .........

-------------------------------------------------------------------
```

The exercise starts immediately. Dots appear on the
screen as each pass is finished. After approximately a
minute,

Press [SPACE]

The system window displays:

```
-------------------------------------------------------------------

   Error Summary:

        Number of passes     : 128
        Number of soft errors:   0
        Number of hard errors:   0

   Press <space> to continue.

-------------------------------------------------------------------
```

Press [SPACE]

The ODIAG main menu reappears.

CHECKING FOR BAD TRACKS

   Select the CRCtst option to perform a cyclical redundancy
   check of the magnetic media on the drive platter surfaces
   to locate possible defects. Media defects can produce

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hard errors that cannot be corrected by the drive controller. These defects may cause bad tracks on the drive. This diagnostic is performed if hard errors appear in one of the other tests, if the drive has been subjected to sudden impact.

Check for bad tracks at least three consecutive times if any bad tracks are discovered in the first test. The program tries to correct the problem itself, and the track may not appear the second or third time. If a track appears to be bad again, then it probably is defective and should be corrected. Go to the section "Adding Spare Tracks" in Chapter 4 to correct bad tracks.

To check for bad tracks,

Press [CRCtst]

The system window displays:

```
----------------------------------------------------------

   DISK DIAGNOSTIC[x.xx]        Slot:  5

   Check For Bad Tracks      Server:  0
----------------------------------------------

   Check for bad tracks (Y/N)?

----------------------------------------------------------
```

Press Y

The screen displays:

```
----------------------------------------------------------

   This test takes from 1 to 6 minutes.

   Test in progress

----------------------------------------------------------
```

The test is performed automatically. If the test found no bad tracks, the system window displays:

```
----------------------------------------------------------------

    No blocks with CRC errors found

    Press <space> to continue.

----------------------------------------------------------------
```

If bad tracks are found, the screen display is similar to:

```
----------------------------------------------------------------

    3 block(s) with CRC errors

    Head      Cylinder      Sector       Track
    ----      --------      ------       -----
     1          229           6           916
     1          170          13           600
     1          280           7          1120

    Press <space> to continue.

----------------------------------------------------------------
```

Write down the information displayed for each bad track.

Press [SPACE]

The ODIAG main menu reappears. Run the CRC check again as necessary, and then add spare tracks as needed.

PARKING THE HEADS

Parking the heads positions the heads over an area on the disk that contains no data. A sudden impact to the drive will not cause the heads to bounce against the media surface and damage areas with data. The heads should be parked before the drive is shipped or transported for extended distances.

When the heads are parked, the drive heads are deactivated and the indicator lights change from ready to busy. The drive must be reset by turning it off, then

on, before it can be used again. The heads are
automatically activated when the drive is reset.

To park the heads,

Press [Park]

The system window displays:

```
------------------------------------------------------------

    DISK DIAGNOSTIC[x.xx]        Slot:  5

    Park Heads                   Server:  0
.-------------------------------------------------

    Park Heads (Y/N)?

------------------------------------------------------------
```

Press Y

The screen displays:

```
------------------------------------------------------------

    Heads parked.

    Press <space> to continue.

------------------------------------------------------------
```

Press [SPACE]

The ODIAG main menu. Exit the diagnostic program and
turn off the drive to prepare it for shipping or
transportation.

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CHANGING OMNIDRIVE |
PARAMETERS | 4

Three OmniDrive mass storage system parameters can be changed:
the interleave factor, the spared track table, and the
read-after-write option. These three parameters are stored in
the drive tables in the firmware. The default settings are:

    Interleave factor - 9
    Spared Track Table - No Spared Tracks
    Read After Write   - OFF

WARNING: All data on the drive should be backed up before the
          interleave factor or the spared track table is
          modified or changed.

From the ODIAG main menu,

Press [Param]

The modify parameters menu appears:

```
------------------------------------------------------------

    DISK DIAGNOSTIC[x.xx]        Slot:  5

    Modify Parameters            Server:  0
-------------------------------------------------------

    L - List Parameters

    I - Interleave Factor

    T - Spare Track Table

    R - Read After Write

    S - Save Changes

    E - Exit


------------------------------------------------------------

------------------------------------------------------------
```

The function keys display:

```
                 Modify Parameters
       F1        F2        F3        F4        F5
   +---------+---------+---------+---------+---------+
   |         |         |         |         |         |
   +---------+---------+---------+---------+---------+
   |List     |         |         |Sp Trk   |Interl   |
   +---------+---------+---------+---------+---------+

       F6        F7        F8        F9        F10
   +---------+---------+---------+---------+---------+
   |         |         |         |         |         |
   +---------+---------+---------+---------+---------+
   |Save     |RafterW  |         |         |Exit     |
   +---------+---------+---------+---------+---------+
```

LISTING THE PARAMETERS

First list the parameters to determine the current settings.

Press [List]

The system window displays:

```
-------------------------------------------------------------

   Modify Parameters              Slot:  5

   List Parameters              Server:  0
---------------------------------------------

   Spared Tracks  :  123   456   789

   3 tracks are currently spared.
   28 total tracks may be spared.


   Interleave Factor:  9

   Read After Write : OFF.

   Press <space> to continue.

-----------------------------------------------------------
```

Press [SPACE]

The modify parameters menu reappears.

CHANGING THE INTERLEAVE FACTOR

The interleave factor determines the frequency at which
the drive controller attempts to read data from or write
data to sectors on the drive platters. For example, an
interleave factor of 9 means that every ninth sector is
written, while an interleave factor of 6 means every
sixth sector is written.

The default interleave setting of 9 is the optimum
setting for the Corvus Concept. For other types of
computers, an interleave factor of 7 or 6 may yield
better performance. Do not change the interleave factor
without first consulting the Corvus Customer Service
Department.

The entire drive must be backed up before the interleave
factor is changed. The data is restored to the drive

after the new interleave factor is set. If the drive is
not backed up first, the diagnostic program should be run
from the floppy diskette to restore the original sector
interleaving.

To change the interleave factor,

Press [Interl]

The bell sounds and the system window displays:

```
---------------------------------------------------------------

   Modify Parameters            Slot:  5

   Interleave Factor            Server:  0
-------------------------------------------------------

   The option you have selected may
   destroy data on the drive. Please
   make sure that you are talking to
   the proper drive.

   Continue (Y/N)?

---------------------------------------------------------------
```

To change the interleaving factor,

Press Y

To exit, **press** N and [SPACE] to return to the modify
parameters menu.

After pressing Y, the screen displays the current factor:

```
---------------------------------------------------------------

   Enter interleaving: 9

---------------------------------------------------------------
```

Enter the value for the interleave factor designated by
the Corvus Customer Service Department. For this example
the interleave factor is set to 7.

```
------------------------------------------------------------

    Enter interleaving: 7

    The interleave factor is  7

    Press <space> to continue.

------------------------------------------------------------
```

Press [SPACE]

The modify parameters menu reappears.

ADDING SPARE TRACKS

The spare track table lists bad tracks that have been
removed from use. Tracks containing media defects can be
replaced with spare tracks. Each drive has a limited
number of tracks that can be replaced. A written record
of the spare track table should be kept for future use,
in case the table is cleared accidentally or the drive is
reformatted.

To select the spare track table option,

Press [Sp Trk]

The system window displays the spare track menu:

```
---------------------------------------------------------------

    Modify Parameters            Slot:   5

    Spare Track Table            Server:  0
---------------------------------------------

    A - Add A Track

    R - Remove A Track

    C - Clear Spare Track Table

    L - List Spare Track Table

    E - Exit

---------------------------------------------------


---------------------------------------------------------------
```

LISTING THE TABLE

First list the spare track table, and make a list of any tracks that have been spared. Keep this information for later use.

Press [List]

The screen display is similar to:

```
---------------------------------------------------------------

    Spare Track Table            Slot:   5

    List Spare Track Table    Server:   0
---------------------------------------------

  Spared Tracks    :  123   456   789

    3 tracks are currently spared.
    28 total tracks may be spared.

    Press <space> to continue.

---------------------------------------------------------------
```

Write down the information for future use.

Press [SPACE]

The spare track menu reappears.

ADDING TRACKS

Adding tracks to the spare track table replaces a bad
track with a good one. Tracks should be added to this
table only if they are known to be bad. Perform a CRC
test to verify the condition of tracks.

If bad tracks are found a method you may want to use is
to back up the entire drive to another media, format the
drive and perform a CRC test. After the CRC test is
finished, spare the bad tracks, update the software, and
then restore the drive data.

To spare a bad track,

Press [Add]

The system window displays:


```
-----------------------------------------------------------

   Spare Track Table          Slot:  5

   Add A Track                Server:  0
-------------------------------------------------

   Enter track number to be added:

-----------------------------------------------------------
```

Enter the track to be added to the spare track table.
For example,

Type 321

Press [RETURN]

The screen display is similar to:

```
-----------------------------------------------------------

    Spared Tracks   :  123   321   456   789

     4 tracks are currently spared.
    28 total tracks may be spared.

    Press A to add another track or
    Press <space> to continue.

-----------------------------------------------------------
```

Press [SPACE]

The spare track menu reappears.

REMOVING TRACKS

The Remove option is used to remove tracks from the
spared track table. Tracks removed from the table are
then available for data storage use. Do not remove a
track unless instructed to do so by the Corvus Customer
Service Department.

To remove a track,

Press [Remove]

The system window displays:

```
-----------------------------------------------------------

    Spare Track Table          Slot:   5

    Remove A Track             Server:  0
-----------------------------------------------

    Enter track number to be removed:

-----------------------------------------------------------
```

Enter the number of the track to be removed from
the spare track table. For example,

Type 321

Press [RETURN]

The screen display is similar to:

Spared Tracks   :   123   456   789

   3 tracks are currently spared.
28 total tracks may be spared.

Press R to remove another track or
Press <space> to continue.

Press [SPACE]

The spare track menu reappears.

CLEARING THE TABLE

The [Clear] option is used to clear all tracks from the
spare track table. All spare tracks should be recorded
before the spare track table is cleared. Do not clear
the table unless instructed to do so by the Corvus
Customer Service Department.

To clear the table,

Press [Clear]

The screen display is similar to:

```
----------------------------------------------------------

      Spare Track Table           Slot:   5

      Clear Spare Track Table  Server:   0
----------------------------------------------

   Spared Tracks    :  123   456   789

   3 tracks are currently spared.
   28 total tracks may be spared.

   This option will clear all tracks
   from the table.

   Continue? (Y/N)?

----------------------------------------------------------
```

To clear the spare track table,

Press Y

The system window displays:

```
----------------------------------------------------------

   No tracks are spared.
   Press <space> to continue.

----------------------------------------------------------
```

Press [SPACE]

The spare track menu reappears.

Press [Exit]

The modify parameters menu reappears.

READ-AFTER-WRITE

Read-after-write makes the drive read each sector after
writing to it, to verify that the data was written
correctly. This adds to data reliability, but slows down

the drive. The drive normally has the read-after-write option OFF.

To change the current setting,

Press [RafterW]

The system window displays:

```
-----------------------------------------------------------

    Modify Parameters             Slot:  5

    Read After Write            Server:  0
-----------------------------------------

    Read after WRITE (Y/N)?

-------------------------------------------------------------
```

Select the desired setting. For example, to turn the read-after-write ON:

Press Y

The system window displays:

```
-----------------------------------------------------------

Read After Write is ON.

Press <space> to continue.

-----------------------------------------------------------
```

Press [SPACE]

The modify parameters menu reappears.

SAVING CHANGES

Changes made to the interleaving, spare track table, or read-after-write option must be made permanent by saving them. If the diagnostic program is terminated without

saving the changes, the changes will not be made on the OmniDrive.

Press [Save]

The system window displays:

```
------------------------------------------------------------

   Modify Parameters            Slot:  5

   Save Changes                 Server:  0
---------------------------------------------------

   You are about to destroy data
   on the disk. Continue (Y/N)?

-------------------------------------------------------------
```

To save the changes,

Press Y

To save the original settings, **press** N.   The modify parameters menu reappears.

The system window displays:

```
------------------------------------------------------------

   Parameters Updated.

   Press <space> to continue.

------------------------------------------------------------
```

Press [SPACE]

The modify parameters menu reappears.

Press [Exit]

The ODIAG main menu reappears.

Formatting the drive clears all data from the drive, including
the volume and file structure. After the drive has been
formatted, the firmware must be updated. It is recommended
that a CRC test be performed after formatting and updating the
firmware, and the spare track table be updated, if necessary.
Then restore the data after all the diagnostic procedures are
completed.

WARNING: The Format option will completely destroy all data
on the drive. Back up the drive before starting the
Format procedure, and restore the drive data after
the procedure is completed. There is no way to
recover data destroyed during formatting.

If the drive does not come ready, but has the fault and busy
lights on, it may need to be formatted. Run the diagnostic
program from a floppy diskette. Then, select the Format
option to format the drive. If only the busy light is lit, or
if the lights flicker on and off, the drive is probably in
sound mechanical condition, but needs new software.

After formatting, update the firmware, run a check for bad
tracks, modify the parameters as needed, then exit the
diagnostic program. When the drive is reset, it should come
ready. If it does not, call the Corvus Customer Service
Department or an authorized service center for assistance.

From the ODIAG main menu,

Press [Format]

The bell sounds, and the system window displays:

```
-------------------------------------------------------------

   DISK DIAGNOSTIC[x.xx]        Slot:  5

   Format Drive                 Server:  0
-------------------------------------------------------------

   The option you have selected may
   destroy data on the drive.  Please
   make sure that you are talking to
   the proper drive.

   Continue (Y/N)?

-------------------------------------------------------------
```

To continue the procedure,

Press Y

The bell rings again and the system window displays:

```
-------------------------------------------------------------

   Enter the format password

-------------------------------------------------------------
```

The fault and ready indicator lights should both be on. The
password is ODFORMAT, used to prevent accidental formatting of
the drive. The password does not displayed as it is entered.

Type ODFORMAT

Press [RETURN]

The format procedure begins immediately, and the system window
displays:

```
-------------------------------------------------------------

   Format in progress.  Format takes
   from 1 to 6 minutes.

-------------------------------------------------------------
```

The busy light remains on during the format.   When the for-
matting procedure is finished, the computer bell rings
again, and the system window displays:

   Format complete.

   Enter firmware file name: FODRx.x

To enter the firmware filename,

Press [RETURN]

The firmware is written to the drive, and the system window
displays:

   Reading firmware from FODRx.x.DATA

   Firmware written.

   Press <space> to continue.

The Format procedure and firmware update is complete.

Press [SPACE]

The ODIAG main menu reappears, and the function keys return.

Now go to the section "Checking for Bad Tracks" in chapter 3
to find any bad tracks.   Spare any bad tracks then proceed to
the Corvus Concept OmniDrive System Generation Guide to
initialize the drive.   After the drive has been initialized
update the operating system and software and restore drive
data.

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```
                                              |
                                   DIAGNOSTIC |
                                     RECORDS  | A
                                              |
                                              |
```

SYSTEM MANAGER'S DIAGNOSTIC RECORD

```
   +------------+------------------------------------------------+
   | Date       | Diagnostic Performed                           |
   +------------+------------------------------------------------+
 1 |            |                                                |
   +------------+------------------------------------------------+
 2 |            |                                                |
   +------------+------------------------------------------------+
 3 |            |                                                |
   +------------+------------------------------------------------+
 4 |            |                                                |
   +------------+------------------------------------------------+
 5 |            |                                                |
   +------------+------------------------------------------------+
 6 |            |                                                |
   +------------+------------------------------------------------+
 7 |            |                                                |
   +------------+------------------------------------------------+
 8 |            |                                                |
   +------------+------------------------------------------------+
 9 |            |                                                |
   +------------+------------------------------------------------+
10 |            |                                                |
   +------------+------------------------------------------------+
11 |            |                                                |
   +------------+------------------------------------------------+
12 |            |                                                |
   +------------+------------------------------------------------+
```

SPARE TRACK TABLE

TRACK	DATE SPARED		TRACK	DATE SPARED
1			11	
2			12	
3			13	
4			14	
5			15	
6			16	
7			17	
8			18	
9			19	
10			20	