

CP/M  
USER GUIDE

H DRIVE

## **DISCLAIMER OF ALL WARRANTIES & LIABILITIES**

Corvus Systems, Inc. makes no warranties, either expressed or implied, with respect to this manual or with respect to the software described in this manual, its quality, performance, merchantability, or fitness for any particular purpose. Corvus Systems, Inc. software is sold or licensed "as is." The entire risk as to its quality or performance is with the buyer and not Corvus Systems, Inc., its distributor, or its retailer. The buyer assumes the entire cost of all necessary servicing, repair, or correction and any incidental or consequential damages. In no event will Corvus Systems, Inc. be liable for direct, indirect, incidental or consequential damages, even if Corvus Systems, Inc. has been advised of the possibility of such damages. Some states do not allow the exclusion or limitation of implied warranties or liabilities for incidental or consequential damages, so the above limitation may not apply to you.

Every effort has been made to insure that this manual accurately documents the operation and servicing of Corvus products. However, due to the ongoing modification and update of the software along with future products, Corvus Systems, Inc. cannot guarantee the accuracy of printed material after the date of publication, nor can Corvus Systems, Inc. accept responsibility for errors or omissions.

## **NOTICE**

Corvus Systems, Inc. reserves the right to make changes in the product described in this manual at any time without notice. Revised manuals and update sheets will be published as needed and may be purchased by writing to:

Corvus Systems, Inc.  
2029 O'Toole Avenue  
San Jose, CA 95131

Telephone: (408) 946-7700  
TWX 910-338-0226

This manual is copywrited and contains proprietary information. All rights reserved. This document may not, in whole or in part be copied, photocopied, reproduced, translated or reduced to any electronic medium or machine readable form without prior consent, in writing, from Corvus Systems, Inc.

Copyright© 1982 by Corvus Systems, Inc. All rights reserved.

Mirror® patent pending, The Corvus Concept,™ Transporter,™ Corvus OMNINET,™ Corvus Logicalc,™ Time Travel Editing,™ EdWord,™ Constellation,™ Corvus,™ Corvus Systems,™ Personal Workstation,™ Tap Box,™ Passive Tap Box,™ Active Junction Box,™ Omnet Unit™ are trademarks of Corvus Systems, Inc.

## **FCC WARNING**

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

# USER GUIDE

## CP/M

**PART NO.:** 7100-03160 H REV. A

**DOCUMENT NO.:** CPM/10-22/1.2

**PUBLICATION DATE:** February, 1983

CP/M® is a registered trademark of Digital Research, Inc.



# Table of Contents

Chapter 1. Introduction .....	1
Chapter 2. Reviewing Some Basic Points About Your System .	3
Start-Up of Your Computer System .....	3
How to List a Directory .....	4
How to Run a Program .....	4
How to Save a File .....	5
How to Copy a File .....	5
Chapter 3. Backing Up Your Drive with the Mirror® .....	7
Description of the Corvus Mirror .....	7
General Tips .....	7
Hardware Installation of the Corvus Mirror .....	7
The Mirror Menu .....	8
The RETRY Function .....	9
Exiting the Mirror Program .....	9
Using the Mirror to Back Up Your Entire Corvus Disk .....	10
How to Back Up Single Virtual Drives on the Corvus Disk .....	13
How to Use the Verify Option on the Mirror .....	16
How to Use the Identify Option on the Mirror .....	17
How to Use the Restore Option on the Mirror .....	19
Chapter 4. Printing Multiple Files .....	21
How to Create a Pipes Area .....	21
How to Send a File to a Pipe .....	23
Sending a File from a Pipe to a Printer .....	25
How to Clear the Pipes Area .....	27
How to Clear a Single Pipe .....	28
What Is in the Pipes? .....	29
Chapter 5. Troubleshooting Your Corvus Drive .....	31
Chapter 6. Diagnostic Utilities for Your Corvus Drive .....	37
How to Load the CDIAGNOS Program .....	37
A Brief Description of the CDIAGNOS MENU .....	38

APPENDIX A. List of Common CP/M Extensions .....	45
APPENDIX B. Corvus Disk Error Codes .....	47
APPENDIX C. Description of CDIAGNOS Program .....	49
APPENDIX D. Description of Corvus Utilities Programs .....	53
APPENDIX E. Supplemental VCR Information .....	57

# Chapter 1

## Introduction

The CORVUS SYSTEMS CP/M USER GUIDE provides you with a general introduction to the Corvus hard disk system, the Mirror option for backup of data, the pipes and spooling features for moving files between computers and peripherals, trouble-shooting procedures, and diagnostic programs. Your Corvus hard disk system should already be installed and configured for a single user. Please retain your installation guide for future reference.

The CORVUS SYSTEMS CP/M USER GUIDE is used with the following computers:

- TRS-80™ Model II (under CP/M)
- XEROX 820™
- Zenith Z-89 or Z-90
- Intertec SuperBrain™
- NEC PC-8001, PC-8001A or PC-8800™
- S-100 Bus Systems, for example:
  - Cromemco™ (under CP/M)
  - CCS (California Computer Systems)
  - Dynabyte™
  - North Star™
  - Vector Graphic™

as well as other systems. Consult with your dealer if you wish information about a specific computer system or a particular model.

This guide and other Corvus manuals do not take the place of the operating system and language manuals provided by the manufacturer of your computer. It is presumed that you have a working knowledge of your computer system hardware and software.

For more detailed information on Corvus software, refer to Appendix F. For information on multi-user configurations, refer to the CORVUS SYSTEMS MULTIPLEXER INSTALLATION GUIDE for your computer.

---

CP/M is a registered trademark of Digital Research, Inc.  
Corvus Mirror® is a registered trademark of Corvus Systems, Inc.  
TRS-80 is a trademark of Tandy Corporation.  
XEROX and 820 are registered trademarks of XEROX Corporation.  
Cromemco is a trademark of Cromemco, Inc.  
North Star is a trademark of North Star Computers, Inc.  
Dynabyte™ is a trademark of Dynabyte Business Computers.  
Superbrain™ is a trademark of Intertec Data Systems.  
Vector Graphic is a trademark of Vector Graphic, Inc.  
NEC PC-8001 is a trademark of Nippon Electric Corporation.





## Chapter 2

# Reviewing Some Basic Points About Your System

Your Corvus hard disk system should be installed and configured at this point, following the directions provided in the installation guide for your computer. The standard configuration makes the Corvus Model 6 and 11 drives appear as two extra-large floppy drives to your computer system (Drives C and D) and a Corvus Model 20 drive appear as a three extra-large floppies (C, D and E). These pseudo floppies are called virtual drives. The entire Corvus disk is called a physical drive. If your system only has a single floppy diskette drive, you should have this single physical drive appear as two virtual drives (for example, the TRS-80 Model II has a program called ONEDRIVE to do this).

### Start-Up of Your Computer System

Insert the CP/M boot diskette into Drive A:. The screen displays the initial boot instructions and information on the CP/M version (you should have version 2.2 or later), and then a prompt, similar to:

```
CP/M VER. 2.2  COPYRIGHT DIGITAL RESEARCH  
CORP.
```

```
A
```

Insert a CORVUS UTILITIES VOL. 1 diskette into Drive B:.

Type **B:** and press < RETURN >. The screen displays:

```
B
```

Type the appropriate CLINK program, for example: **CLINK2TN** and press < **RETURN** >. The screen displays:

```
--- CORVUS LINK INSTALLED ---  
B
```

Remember, you must run the correct CLINK program before you can use your Corvus drive.

### How to List a Directory

To list a directory for the one of the virtual drives on the Corvus, follow the same procedure you use for a floppy drive. For example, type D:DIR and press <RETURN>. The screen displays the directory in a manner similar to:

```
D : INDEX      DOC : CERROR  DOC : PUTGET  COM : CLINK2FV COM  
D : CLINK2TN  COM : CLINK2TW  COM : CLINK7FV COM : CLINK7TN COM  
D : CLINK7TW  COM : CDIAGNOS COM : CDIAGNOS DOC : CORVB173 CLR  
D : MIRROR   COM : SEMA4    COM :  
B
```

### How to Run a Program

Files that have a "DOC" extension are text files, rather than programs. To examine the contents of a DOC file named INDEX.DOC on Drive C: of the Corvus disk, type **D:TYPE INDEX.DOC** and press <**RETURN**>. The contents of the file will scroll up the screen. To stop at any point, hold the control key down and press S (<**CNTL**>**S**). To restart, hold the control key down and press Q (<**CNTL**>**Q**). If you wish to return to the main CP/M program, hold down the control key and press C (<**CNTL**>**C**).

CP/M finds files by filename. Each file also has a three-letter extension. For example, "COM" indicates that the file is a command program (also known as a "system program") that you can run. See Appendix A of this guide for a list of the different types of extensions. It is not necessary to type the extension for COM files.

Your Corvus drive should already be configured and linked. To run the program TANGENT (as an example) on Drive D of the Corvus disk drive, type **D:TANGENT** and press <RETURN>. The computer goes to Drive D:, finds TANGENT, and runs the program.

### How to Save a File

Once a Corvus drive has been linked to your computer system with one of the CLINK programs, it works just like a giant floppy disk drive, and CP/M programs work in the usual manner. Save files on a Corvus drive just as you would on a floppy, specifying the drive and file name, plus the extension (optional).

### How to Copy a File

Files are copied from one drive (either physical or virtual) to another drive, using the PIP program in CP/M. Since one physical Corvus drive is made to look like either two or three floppy drives (virtual drives), you can have duplicate files on the Corvus, or transfer material from the floppy drives to the Corvus and vice-versa. To move the TEXT.TXT file (as an example) from Drive C: on the Corvus disk to Drive B: on the floppy drive, first make sure the CP/M boot diskette is in Drive A:. Type **A:PIP** and press <RETURN>. This loads the PIP program. The screen displays:

```
*

```

Type **B:=C:TEST.TXT** and press <RETURN>. The screen displays:

```
*

```

Type <CNTRL>**C** to exit the PIP program and return to the main CP/M program. You have now copied the TEST.TXT file from the Corvus hard disk to a floppy diskette.



# Chapter 3

## Backing Up Your Drive with the Mirror

This chapter is for those users who have a Corvus Mirror (either built-in or add-on) with their Corvus Disk System.

### **Description of the Corvus Mirror**

Corvus Systems has developed a unique system for providing effective, low-cost backup for its hard disk drive, known as the Corvus Mirror, using a video cassette recorder (VCR) and video cassettes. The Mirror creates an "image", or copy, of either virtual drives or the entire physical drive on the video cassette. The Corvus drive is configured to appear as several (either two or three, depending on size) virtual drives to your computer.

The Mirror hardware can be ordered built into Corvus Disk Systems, or it can be purchased as an add-on option. Mirror software is included on the CORVUS UTILITIES diskettes which accompany the Corvus disk drive.

### **General Tips**

Use the same VCR whenever possible for backing up your Corvus drive. The VCR should be set at the standard play speed, and the highest quality tape should be used to prevent errors. It is recommended that VCRs without the color enhancement feature be used, or that this feature be disabled when using the VCR with a Mirror.

See Appendix E for the capacity of different-sized cassettes and the time required to backup Model 6, 11 and 20 drives. You should be familiar with the operation of your VCR before using it with the Mirror.

### **Hardware Installation of the Corvus Mirror**

Your drive must already be configured for the number of virtual drives before using the Mirror. Turn off all power before making any connections.

If you have a drive with a Mirror already installed, the serial number and the drive size should both end with an "M". Insert one end of the phono connector cable into the VIDEO out jack on the VCR, and the

other end into the VIDEO IN jack on the back panel of the Corvus drive. Connect one end of the other phono connector cable into the VIDEO IN jack on the VCR and the other end into the VIDEO OUT jack of the Corvus drive.

If you have an add-on Mirror, see the CORVUS SYSTEMS MIRROR INSTALLATION GUIDE supplied with the add-on Mirror for instructions on hardware set-up.

### The Mirror Menu

```
L : LIST THIS MENU
H : LIST HELP DATA
B : BACKUP
V : VERIFY
I : IDENTIFY
R : RESTORE

TASK (L TO LIST) : _
```

This is the Mirror menu, which allows you to pick which sub-program of the Mirror program you wish. Simply press the letter for the option you wish.

**L:** LIST THIS MENU—Pressing **L** for this option allows you to see a display of the Mirror menu, as shown above.

**H:** LIST HELP DATA—If you press **H** for this option, HELP DATA will display a brief description of the BACKUP, IDENTIFY and RESTORE options, in addition to a brief overall description of the Mirror utility program running under CP/M.

**B: BACKUP**—Pressing **B** for the BACKUP option starts the Mirror option for recording an image (a copy of all or part of the Corvus hard disk) on the VCR. See below in this chapter.

**V: VERIFY**—Pressing **V** for the VERIFY option makes the Mirror read a video tape image to check if the image has been properly recorded. A search is made for hard and soft recording errors and a status report is displayed on the screen. If a different VCR machine will be used for the RESTORE option than for the original BACKUP recording, you can perform a verify pass to check the head alignment on the VCR.

**I: IDENTIFY**—Pressing **I** for the IDENTIFY option tells the Mirror to read the initial header block which is created at the beginning of each image. This header block has the date, time, a name, a comment, and format information, which helps you locate images on the video tape if you have several images on the same tape. The Mirror program displays an error message on your CRT if the initial header block cannot be found in about 1 minute on the video cassette.

**R: RESTORE**—Pressing **R** for the RESTORE option copies a video cassette image back onto the Corvus disk. This image may be stored in a different disk location than the original data copied by the Mirror.

### **The RETRY Function**

The RETRY function is part of the VERIFY and RESTORE options of the Mirror. If you need to use this function after performing either a VERIFY or a RESTORE, a screen message is displayed that alerts you to the number of blocks that need to be retried. With the RETRY function, the Mirror program attempts to reconstruct data from blocks with errors to create a block without errors.

### **Exiting the Mirror Program**

You can exit from the Mirror program back to the CP/M prompt by pressing **<CNTL>C**, except in the middle of actual Mirror operations.

## Using the Mirror to Backup Your Entire Corvus Disk

1. First, make sure the Corvus Mirror and the VCR are properly connected. Boot your computer system with the CP/M boot diskette. Run the correct CLINK program.
2. Load the Mirror program from the CORVUS UTILITIES VOL. 1 diskette in Drive B: by typing **MIRROR** and pressing **<RETURN>**. The screen displays the Mirror menu:

```
L : LIST THIS MENU
H : LIST HELP DATA
B : BACKUP
V : VERIFY
I : IDENTIFY
R : RESTORE

TASK (L TO LIST) : _
```

3. Press **B** for Backup. The screen displays:

```
BACKUP ENTIRE CORVUS DISK (Y/N) ? _
```

4. Press **Y** for Yes. The screen displays:

```
CORVUS DRIVE # (1-4) ? _
```

5. Press **1** (unless you have added on another Corvus physical drive). The screen displays:

```
--- ENTER TAPE FILE HEADER INFORMATION ---
DATE _
```



6. It is strongly recommended that you complete the tape header information. The tape header is information that is written at the beginning of the backup image to help you identify the image. Here is a sample tape file header. Type **MAY 9, 1982** and press **<RETURN>**. The screen displays:

TIME \_\_

7. Type **12:00 A.M.** and press **<RETURN>**. The screen displays:

NAME \_\_

8. Enter the name you wish to use on your tape header. Type **TEST ONE** and press **<RETURN>**. The screen displays:

COMMENT \_\_

9. Type **COMMENT COMPLETED** and press **<RETURN>**. The comment is optional. If you do not want a comment, just press **<RETURN>**. The screen displays:

NORMAL OR FAST FORMAT , N/F; ?

10. Press **N** for Normal. The screen then displays:

START UP RECORDER AND PRESS RETURN

11. Make sure the VCR is on, and the video cassette is loaded properly. Write down the VCR counter number on a piece of paper and save it. Start the VCR recording (on most recorders you will have to press both the play and record buttons). Press **<RETURN>**. The screen displays:

**WAITING FOR RECORDER TO SPEED UP ...**

After about half a minute, the screen displays:

**BACKUP HAS STARTED <<**

12. When the backup is finished (about 11 minutes for the 6 MB drive, 17 minutes for the 10 MB drive and 35 minutes for the 20 MB drive), the screen displays:

**BACKUP DONE --- NO DISK ERRORS  
TASK (L TO LIST) ? \_**

13. Stop the VCR. It is strongly recommended that you copy down the VCR counter number, so you will know the approximate starting and ending locations of the image on the video cassette.

It is a good idea to record just one entire drive on each cassette, and to use a double back-up system—keeping the current backup and one copy of the next previous backup on another cassette.

### How to Backup Single Virtual Drives on the Corvus Disk

1. Boot your computer system with the CP/M diskette, and then run the correct CLINK program.
2. Load the Mirror program on the **CORVUS UTILITIES VOL. 1** diskette in Drive B: by typing **MIRROR** and pressing **<RETURN>**. The screen displays the Mirror menu:

```
L : LIST THIS MENU
H : LIST HELP DATA
B : BACKUP
V : VERIFY
I : IDENTIFY
R : RESTORE

TASK (L TO LIST) : _
```

3. Press **B** for Backup. The screen displays:

```
BACKUP ENTIRE CORVUS DISK (Y/N) ? _
```

4. Press **N** for No. The screen now displays:

```
STARTING DISK BLOCK # ? _
```

5. This starting disk block number is for an internal address of the Corvus drive, which is calculated in terms of 512-byte sectors (four 128-byte sectors). See Table 1 below for the correct starting disk block number. For example, on a Model 20 drive, the starting disk block number for Drive D is 12345.

**TABLE 1—REFERENCE TABLE FOR BLOCK NUMBER/  
LENGTH**

**Model 6 Drive with CLINK2 Program**

Drive	Starting Disk Block #	Number of Blocks in Drive
<b>C:</b>	<b>580</b>	<b>5472</b>
<b>D:</b>	<b>6068</b>	<b>5472</b>

**Model 11 Drive with CLINK2 Program**

Drive	Starting Disk Block #	number of Blocks in Drive
<b>C:</b>	<b>580</b>	<b>11552</b>
<b>D:</b>	<b>12148</b>	<b>11552</b>

**Model 20 Drive with CLINK2 Program**

Drive	Starting Disk Block #	Number of Blocks in Drive
<b>C:</b>	<b>580</b>	<b>11749</b>
<b>D:</b>	<b>12345</b>	<b>11749</b>
<b>E:</b>	<b>24110</b>	<b>11749</b>

Type **12345** and press **<RETURN>**. The screen displays:

**NUMBER OF BLOCKS ?**

6. Table 1 shows that for a Model 20 drive (CLINK2) the number of blocks in a virtual drive is 11749.  
Type **11749** and press **<RETURN>**.

7. The Mirror now requests the information for the header block.  
The screen displays:

--- ENTER TAPE FILE HEADER INFORMATION ---  
DATE:

8. Type **4/18/82** and press **<RETURN>**. The screen displays:

TIME:

9. Type **2:30 p.m.** and press **<RETURN>**. The screen displays:

NAME:

10. The name cannot be more than 16 characters long. Type **TEST FILE** and press **<RETURN>**. The screen displays:

COMMENT:

11. Type **COMMENT FINISHED** and press **<RETURN>**, or just press **<RETURN>** if you have no comment. The screen displays:

NORMAL OR FAST FORMAT (N/F) ?

12. Press **N** for Normal. The screen displays:

START UP RECORDER AND PRESS RETURN

13. Make sure the VCR is on, and the video cassette is loaded properly. Write down the VCR counter number on a piece of paper and save it. Start the VCR recording (on most recorders you will have to press both the play and record buttons). Press **<RETURN>**. The screen displays:

**WAITING FOR RECORDER TO SPEED UP...**

After about a half a minute, the screen displays:

**BACKUP HAS STARTED**

14. When Backup is finished, the screen displays:

**BACKUP DONE—NO DISK ERRORS  
TASK (L TO LIST) :**

15. Now stop the VCR and copy down the VCR counter number. If you do record more than one image on a cassette, it is recommended that a gap be left between different virtual drives, so that the initial header blocks can be located easier.

### **How to Use the Verify Option on the Mirror**

1. Rewind the video cassette to the start of the tape, or to the location on the cassette you copied down earlier.
2. Your computer should be operating under CP/M. The Corvus drive should be on and the Corvus link established. The Mirror and VCR hardware should be connected.

3. Load the Mirror program from the CORVUS UTILITIES VOL. 1 diskette in Drive B by typing **MIRROR** and pressing **<RETURN>**. The screen displays:

```
L : LIST THIS MENU
H : LIST HELP DATA
B : BACKUP
V : VERIFY
I : IDENTIFY
R : RESTORE

TASK (L TO LIST) :
```

4. Press **V** for Verify option. The screen displays:

```
START RECORDER AT BEGINNING IF IMAGE
VERIFY IN PROGRESS
```

5. Start the VCR playing (not recording). When the Verify procedure is finished, the screen displays (for example):

```
--- ERROR STATISTICS ---
# SOFT ERRORS : 3
# DISK ERRORS : 0
# OF BLOCKS NEEDING RETRYS : 0

ALL DATA RECEIVED
```

Sometimes soft errors will appear. However, this is no problem since all data is recorded four times.

### **How to Use the Identify Option on the Mirror**

1. Rewind the video cassette to the start of the tape, or to the location on the cassette you copied down earlier. Since the Identify option searches for the very first characters of the header block, it is important to rewind the video cassette completely to avoid missing the header.

2. Your computer should be operating under CP/M. The Corvus drive should be on the Corvus link established. The Mirror and VCR hardware should be connected.
3. Load the Mirror program from the CORVUS UTILITIES VOL. 1 diskette in Drive B: by typing **MIRROR** and pressing **<RETURN>**. The screen displays:

```
L : LIST THIS MENU
H : LIST HELP DATA
B : BACKUP
V : VERIFY
I : IDENTIFY
R : RESTORE
TASK (L TO LIST) : _
```

4. Press **I** for the Identify option. The screen displays:

```
POSITION TAPE AND START PLAYBACK
SEARCHING FOR IMAGE HEADER
```

5. Start the VCR playing (not recording). When the image is found, the screen displays (for example):

```
--- IMAGE RECORDED FROM CORVUS DRIVE ---
IMAGE ID :
IMAGE LENGTH : 11220 BLOCKS
SYSTEM : CP/M
DATE : 4/12/82
TIME : 2:18 p.m.
NAME : TEST ONE
COMMENT : COMMENT FINISHED
TASK (L TO LIST) : _
```

You can use the Identify option to locate different images on the same cassette, or to examine the header blocks of different cassettes, if you are searching for a particular backup.



## How to Use the Restore Option on the Mirror

1. Connect the Corvus Mirror and VCR hardware. Boot your computer system with the CP/M diskette, and then run the correct CLINK program.
2. Load in the Mirror program from the CORVUS UTILITIES VOL. 1 diskette in Drive B: by typing **MIRROR** and pressing **<RETURN>**. The screen displays:

```
L : LIST THIS MENU
H : LIST HELP DATA
B : BACKUP
V : VERIFY
I : IDENTIFY
R : RESTORE

TASK (L TO LIST) : _
```

3. Press **R** for Restore. The screen displays:

```
RESTORE ENTIRE DISC (Y/N) ? _
```

4. If you have backed up the entire disk, press **Y** for Yes. If you have backed up only part of the entire physical drive, press **N** for No.
5. If you press **N**, the screen displays:

```
STARTING DISK BLOCK # ? _
```

6. Enter the same starting disk block number that you used in Backup (from Table 1). The screen displays:

```
NUMBER OF BLOCKS ? _
```

7. Enter the same number of blocks that you used for Backup (from Table 1). The screen displays:

```
CORVUS DRIVE # (1-4) ?
```

8. Press 1. The screen now displays:

```
POSITION TAPE AND START PLAYBACK  
RESTORE IN PROGRESS...
```

9. Find the beginning of the image on the video cassette. You may have to use the Identify feature if you have several images on the same cassette. If you use the VCR counter to find the starting position, make sure you get the complete image. When you are finished the Restore procedure, the screen displays (for example):

```
--- ERROR STATISTICS ---  
# SOFT ERRORS: 0  
# DISC ERRORS: 0  
# OF BLOCKS NEEDING RETRYS: 0  
ALL DATA RECEIVED  
TASK (L TO LIST) :
```

You have now backed up and then restored a Corvus drive. We recommend that you back up data on your Corvus hard disc at least weekly, or more often, depending on computer use. Although hard disk drives offer superior reliability compared to floppy diskette drives, you should take proper care to protect valuable data from unforeseen accidents.

# Chapter 4

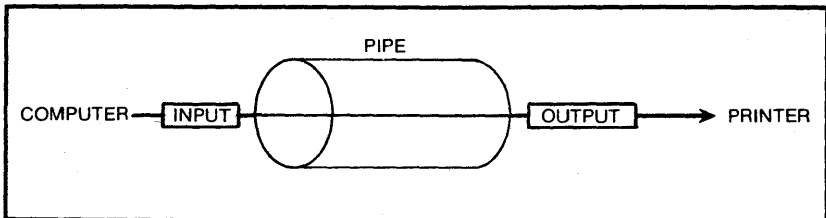
## Printing Multiple Files

It is desirable, in some applications, to print more than one file at a time.

Corvus has implemented this by providing a special area on the disk that you can write files to (spooling) and retrieve files from (despooling). This temporary file area is called the "pipes" area. The reason for this name is that like a pipe, the first thing put into it is the first thing out.

In this section you will find instructions for creating a pipes area, putting files into the pipes area (spooling) and sending files to the printer (despooling).

Although there are many more uses for these techniques, they are reserved for multi-user systems. For a complete explanation, see the Corvus Systems CP/M Multiplexer User Guide.



### How to Create a Pipes Area

Although the CLINK program automatically reserves an area of 250K bytes for pipes, it is possible to reserve a larger or smaller area.

**NOTE:** Do not attempt to recreate a pipes area if you already have data on your Corvus disk. To do so will destroy some of the data.

If the default of 500 blocks is changed, it will be necessary to have CLINK altered by a programmer.

1. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B. Type **PMGR** and press **<RETURN>**. The screen displays:

```
Pmgr [1.1] L)ist P)urge C)lear I)nit Q)uit _
```

2. Press **I** to initialize the pipes area. The screen displays:

```
DEFAULT PARAMETERS
STARTING BLOCK: 64
BLOCK LENGTH: 500
USE DEFAULT PARAMETERS ? (Y/N) _
```

3. Press **N** for NO. The screen displays:

```
STARTING BLOCK:
```

4. Type **64** and press **<RETURN>**. The screen displays:

```
BLOCK LENGTH:
```

5. Type **500** and press **<RETURN>**. The screen displays:

```
INITIALIZE ? (Y/N)
```

6. Press **Y** for YES. The screen displays:

```
INITIALIZING PIPES AREA
Pipes Area Initialized
Pmgr [1.1] L)ist P)urge C)lear I)nit Q)uit
```

7. You have now set up the pipes area. Press **Q** to quit the PMGR program. The screen displays:

```
B
```

## How to Send a File to a Pipe

To send a file to a pipe, the file must already exist on your Corvus disk drive, or on the floppy diskettes.

1. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B. Type **SPOOL** and press <RETURN>. The screen displays:

```
SPOOLER [2.0]: S(pool D(espool L(ist Q(uit
```

2. Press **S** for S(pool. The screen displays:

```
SPOOL PARAMETERS
P(ipe name: PRINTER
F(ile name:
M(essage:
T(ype of File: F(ormatted Text
L(inefeeds: TRUE
N(ew pages: FALSE
I(nclude Files: FALSE
  S( P( F( M( T( L( N( I( Q( : _
```

3. Press **F** for F(ile name. The screen displays:

```
F(ile name:
```

4. Type **B:INDEX.DOC** and press <RETURN>. The screen displays:

```
SPOOL PARAMETERS
P(ipe name: PRINTER
F(ile name: B:INDEX.DOC
M(essage:
T(ype of File: F(ormatted Text
L(inefeeds: TRUE
N(ew pages: FALSE
I(nclude Files: FALSE
  S( P( F( M( T( L( N( I( Q( : _
```

INDEX.DOC is the name of the file you want to send. B: is the drive it resides on.

5. Press **M** for message. The screen displays:

```
M(essage:
```

6. Type **This is a test file.** and press **<RETURN>**. The screen displays:

#### SPOOL PARAMETERS

```
P(ipe name: PRINTER
F(ile name: B:INDEX.Doc
M(essage:This is a test file.
T(ype of File: F(ormatted Text
L(inefeeds: TRUE
N(ew pages: FALSE
I(nclude Files: FALSE
S( P( F( M( T( L( N( I( Q( : _
```

The message option allows you to make comments about a file without having them included in it. When printed, this message will appear on a separate page from the text.

7. Press **S** to send the file. The screen displays:

```
Spooling file to pipe. PRINTER [1] .....
10 blocks written to pipe PRINTER [1]
```

The number in brackets is the pipe's number. There can be up to 62 pipes named PRINTER.

8. Press **Q** to quit. The screen displays:

```
SPOOL PARAMETERS
P(ipe name: PRINTER
F(ile name: B:INDEX.DOC
M(essage: This is a test file.
T(ype of File: F(ormatted Text
L(inefeeds: TRUE
N(ew pages: FALSE
I(nclude Files: FALSE
S P( F( M( T( L( N( I( Q( : _
```

The other SPOOL options are:

- P(ipe name— Allows you to assign another name to the pipe. For single user applications, leave it set as PRINTER.
- T(ype of File— may be changed to U for unformatted text or N for non-text. Non-text may result in an end of file error.
- L(inefeed— will allow linefeeds when TRUE and will strip them out if FALSE. If your printed copy seems to double-space, select F for FALSE.
- N(ew Pages— if your printed copy does not leave blank lines between the bottom of one page and the top of the next, you should select T for TRUE.
- I(nclude Files— is used with word processing packages that allow file linking. If you wish to use this feature, select T for TRUE.

### **Sending a File From a Pipe to a Printer**

If you have not sent a file to the pipes area, go to the previous instructions labelled "How to Send a File to a Pipe."

1. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B:.

Type **SPOOL** and press **<RETURN>**. The screen displays:

```
Spooler [2.0]: S(pool D(espool L(ist Q(uit :
```

2. Press **D** for **D(espool**. The screen displays:

```
DESPOOL PARAMETERS  
P)ipe name: PRINTER  
W)here: PRINTER  
M)ax lines/Page: 0  
E)xpand Tabs: 8  
L)inefeeds: TRUE  
  
D) P) W) M) E) L) Q) :
```

3. Say we wish to despool the file INDEX.DOC which was loaded in pipe **PRINTER [1]**.

Press **P** for **P)ipe name:**. The screen displays:

```
P)ipe name:
```

4. Type **PRINTER** and press **<RETURN>**. The screen displays:

```
DESPOOL PARAMETERS  
P)ipe name: PRINTER  
W)here: PRINTER  
M)ax Lines/Page: 8  
E)xpand Tabs: 8  
L)inefeeds: TRUE  
  
D) P) W) M) E) L) Q) _
```

5. If you wish to change other defaults, follow a similar procedure. When you are finished, press **D** for despool. The file is despoiled to the printer, and the computer waits to despool the



next pipe. The screen displays:

```
Pipe Contained 10 Blocks
```

```
Waiting to Despool Pipe "PRINTER"
```

```
Depress any key to escape...
```

This procedure will print all pipes named PRINTER.

6. When you press any key, the computer returns to the start of the Spool program and the screen displays:

```
Spooler [2.0]: S(pool D(espool L(ist Q(uit :
```

7. Continue despooling files until you are finished. Press **Q** for Q(uit. The screen displays:

```
B _
```

### How to Clear the Pipes Area

1. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B. Type **PMGR** and press **[RETURN]**. The screen displays:

```
Pmgr [1.1] L(ist P(urge C(lear l(nit Q(uit : _
```

2. Press **C** for Clear. The screen displays:

```
Clearing Pipes area:  
Starting Block: 0  
Block Length: 500  
Continue? (Y/N) _
```

3. Press **Y**. The screen displays:

```
Pipes Area Cleared
```

You have just cleared the entire pipes area of files.

### How to Clear a Single Pipe

1. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B. Type **PMGR** and press **[RETURN]**. The screen displays:

```
Pmgr [1.1] L(ist P(urge C(lear I(nit Q(uit : _
```

2. Press **P** for purge. The screen displays:

```
Purge which pipe (enter pipe number)?
```

3. Type **1** and press **[RETURN]**. The screen displays:

```
PIPE ERROR -12  
Pipe does not exist.
```

Pipe number 1 did not have any data in it because the pipes area was already cleared.

## What Is In the Pipes?

It is possible to find out what pipes you have spooled to in the following way:

1. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B.

Type **PMGR** and press **[RETURN]**. The screen displays:

```
Pmgr [1.1] L(ist P(urge C(lear I(nit Q(uit :
```

2. Press **L** for list. The screen displays something like:

```
Active Pipes are:  
1.  PENPLOT      Closed      ----  Contains Data  
2.  PRINTER     Closed      ----  Contains Data
```

**A pipe is open only while spooling or despooling. If a pipe does not contain data, it will not be listed.**

3. To quit, press **Q**. The screen displays:

```
B
```



# Chapter 5

## Troubleshooting Your Corvus Drive

The Corvus disk system is designed to provide years of problem-free use. At times, however, it may experience a hardware or software problem. If your drive is not performing properly, consult the following table for recommended actions.

Corvus Systems suggests that you take two simple steps when you first set up your system:

- Make copies of the Corvus Utilities Program diskettes.
- Copy down on paper the spared track and virtual drive offset tables. See page 49 of this manual.

PROBLEM	OPERATION TO FIX PROBLEM
A. NO FRONT PANEL INDICATOR LIGHTS ON.	<ol style="list-style-type: none"><li>1. Make sure power switch is on.</li><li>2. Check power cord connections to drive and wall socket.</li><li>3. Inspect fuse—replace with proper fuse if blown (see the Installation Guide for your computer).</li><li>4. Check the Voltage Circuit Board for correct voltage and installation (see the Installation Guide for your computer).</li><li>5. Listen to the drive and hear if fan is spinning. If fan is not operating, repeat Steps 1-4, then call your Corvus Service Center for further instructions. If fan operating, go Step 7.</li><li>6. Toggle Reset Switch (right-most switch on front panel). If front panel lights remain off (and fan is operating), call your Corvus Service Center for further instructions.</li></ol>

**B. FAULT AND BUSY LIGHTS COME ON AFTER POWER UP SEQUENCE. BUSY LIGHT FLASHES FOR A WHILE, THEN BOTH LIGHTS STAY ON.**

7. Toggle Reset Switch on front panel.
8. Check all front panel switches for proper position.
9. Check flat interface cable connections.
10. Unplug processor flat cable and video connections (if you are using the Mirror). Toggle Reset Switch. If drive becomes ready, reconnect interface cable (and video connections if using Mirror), and repeat the installation sequence, making sure correct software programs are used. (See the Installation Guide for your computer for instructions).

11. If drive does not become ready after Step 10, turn format switch on and reset drive. If the drive becomes ready, refer to Section 6 of this User Guide. Go to Step 12.

If your drive still does not become ready, call your Corvus Service Center.

12. You will now update the controller code on the drive (refer to Section 6 of this User Guide). Power drive down. Turn format switch to the right before proceeding. Power drive up. Run the CDIAGNOS program from the floppy drive. Select option #6. Update with controller

code program from directory (see Step 13 above). After updating controller code, turn format switch off (to the left). See Section 6 of this manual for examples of this operation.

**Toggle Reset Switch.** If drive does not become ready after 1 to 2 minutes, the final step is to reformat the drive (Step #15).

13. First, read the section on reformatting the Corvus drive (refer to Section 6 of this User Guide).

#### **WARNING**

**REFORMATTING THE DRIVE WILL DESTROY ALL DATA ON DRIVE. BACK UP DATA IF AT ALL POSSIBLE. COPY DOWN SPARE TRACK TABLE AND VIRTUAL DRIVE OFFSET TABLE AS WELL.**

Power the Corvus drive down. Flip the Format Switch (second switch from right) to the right. Power drive up.

Run **CDIAGNOS** program from floppy drive. Select option #6. Type the controller code (**CORVXX. XXX**) with an **.FMT** extension, example:

**CORVB173.FMT**

Answer the questions as they appear on the screen. The busy light will flicker rapidly for about one minute and

then the screen displays a long message indicating formatting is finished, and the new controller code has been written out. You should then restore the old values to the Virtual Drive Offset Table (VDO Table) and spare track table. Turn format switch off and toggle Reset Switch.

Repeat Step 13 to check controller code. If the system does not become ready after toggling reset, call the Service Center for further information.

C. BACKUP OR RESTORE FUNCTION SHOWS DISK ERROR.

14. This is usually caused by bad sectors on the drive. Run CDIAGNOS program and do the Format Check (Option 2). You should back drive up (ignoring disk errors), spare out bad tracks, and then restore data.

D. VERIFY FUNCTION INDICATES BLOCK(S) NEEDING RETRY.

15. Possible causes are bad tape, faulty connections, VCR tracking out of adjustment, VCR play speed out of adjustment. If none of the above, you may have hardware problems in the VCR or Mirror.

E. RESTORE FUNCTION INDICATES BLOCK(S) NEEDING RETRY.

16. Probable causes same as #15 above. Do a retry pass. If problem persists, check hardware.

F. WHEN TRYING A RESTORE, ERROR MESSAGE "IMAGE SIZE MISMATCH" OR "MIRROR ERROR 4" DISPLAYS.

17. Probable cause is wrong block size or starting address was used. Use IDENTIFY option of Mirror program to determine correct image size and repeat RESTORE.



G. WHEN TRYING A RESTORE, VERIFY OR IDENTIFY OPTION ON THE MIRROR PROGRAM, THE ERROR MESSAGE "IMAGE NOT FOUND" OR "MIRROR ERROR 7" DISPLAYS.

H. CORVUS I/O DRIVER OR CORVUS UTILITY PROGRAM ISSUES ERROR MESSAGE IN THE FORM:

\*\*DISC R/W ERROR #XXH\*

18. Video cassette not rewound to beginning or VCR connections faulty. First, check video connections and VCR line input/output switches (these switches should be set to either line or VCR, depending on your machine—not TV).

Rewind video cassette to correct starting position and repeat function.

If problem persists, call your Corvus Service Center.

22. Look up error code in Appendix B of this guide for an indication of the error type. If it is a bad sector (indicated by error codes AAH, ABH, EBH, or ECH), try to fix it by using Option 2 of the CDIAG-NOS Program.



# Chapter 6

## Diagnostic Utilities for Your Corvus Drive

Corvus Systems has produced a special diagnostics program—CDIAGNOS—to allow you to perform certain hardware and software system checks, and to replace the firmware if necessary. You should read this entire section before using CDIAGNOS, and follow the instructions very carefully.

CDIAGNOS is usually on VOL. 1 of the CORVUS UTILITIES diskettes. It must be run from your floppy drive, rather than the Corvus disk drive.

### How to Load the CDIAGNOS Program

1. You should have your hardware (the computer system and the Corvus drive) already connected. The Corvus hard disk should be configured for your system.
2. Boot your computer system with the CP/M boot diskette.
3. Insert the CORVUS UTILITIES VOL. 1 diskette into floppy drive B:.

Type **CDIAGNOS** and press **<RETURN>**. The screen displays something like this:

```
--- CORVUS DISC DIAGNOSTIC ---  
      (VERSION 2.55/TT)  
--- TEST MENU ---  
  
0. LIST THIS MENU  
2. LIST INSTRUCTIONS  
1. LIST INSTRUCTIONS  
2. DISC FORMAT CHECK  
3. READ CONTROLLER CODE VERSION #  
4. HEAD SERVO CHECK TEST  
5. MANUAL CONTROLLER DIAGNOSTIC  
6. UPDATE CONTROLLER CODE  
7. LIST/MODIFY DRIVE PARAMETERS  
8. LIST/MODIFY CONSTLLATION PARAMETERS  
9. EXIT BACK TO CP/M (CTL-C ALSO WORKS)  
P—"PARK" REV. H DRIVE HEADS  
  
TASK (0 TO LIST) : _
```

4. To use CDIAGNOS, press the number for the task and follow the directions. If you wish to exit CDIAGNOS and return to CP/M, press Q when prompted for a task, or hold the control key and press **C** (<CNTRL> C).

## A Brief Description of the CDIAGNOS Menu

### 0. LIST THIS MENU

Press **0** and the menu displays.

### 1. LIST INSTRUCTIONS

Press **1** and the screen displays:

```
TO CONSERVE SPACE, THE INSTRUCTIONS HAVE  
BEEN REMOVED AND PLACED IN A SEPARATE  
FILE: CDIAGNOS.DOC. TO READ THEM JUST TYPE  
THE FILE.
```

To see this file, press **9** to exit, and then type **TYPE CDIAGNOS.DOC** and press <RETURN>. A summarization of these instructions is also found in Appendix C of this guide.

### 2. DISK FORMAT CHECK

Press **2** and the screen displays:

```
CORVUS DRIVE # (1-4) ? _
```

Press **1** (unless you have multiple Corvus physical drives). The screen displays:

```
DISK FORMAT CHECK IN PROGRESS...
```

A check of the Corvus disk is performed. After several minutes, the screen displays:

```
NO BAD SECTORS FOUND!!
TASK (0 TO LIST) : _
```

If the Disk Format Check test found any bad sectors, it would display them in this fashion:

```
-- BAD SECTORS RE-WRITTEN --
SURFACE  CYLINDER  SECTOR  TRACK
  #         #         #         #
  ---      ---      ---      ---
  XX       XX       XX       XX
LIST DATA AGAIN (Y/N) ? _
```

Copy this table down on a piece of paper. The fourth column, TRACK #, contains the information you will need to spare tracks, out, which we will discuss later in this section.

### 3. READ CONTROLLER CODE VERSION NUMBER

Press 3. The screen displays:

```
CORVUS DRIVE # (1-4) ? _
```

Press 1 (or the number of the Corvus drive if you have added on more physical Corvus drives). The screen displays:

```
V18.3--CONST II 10/82 REVISION #37
CONTROLLER ROM VERSION #63
TASK (0 TO LIST) : _
```

**NOTE:** You may have different numbers, but the controller code version should be 18.3 or later.

#### 4. HEAD SERVO CHECK TEST

Press **4** and the screen displays:

**CORVUS DRIVE # (1-4) ?**

Press **1** (or the drive number, in case of add-on physical Corvus drives). The read/write heads of the Corvus disk will rapidly move from the outer edge to the center of the disk, producing a whirring sound. This test verifies that the disk reads data and that the disk heads move properly.

**NOTE:** This test continues indefinitely until stopped by holding down the control key and pressing **C (<CNTRL>C)**. Approximately one minute of this test should be enough to check the disk.

#### 5. MANUAL CONTROLLER DIAGNOSTIC

Press **5** and the screen displays:

**WARNING**  
**THIS TEST CAN CAUSE LOSS OF USER DATA**  
**(IF USED IMPROPERLY)**

**THE COMMAND FORMAT IS:**  
**R - READ A BYTE FROM THE CONTROLLER**  
**WXX - WRITE HEX BYTE TO CONTROLLER**  
**S - READ CONTROLLER STATUS**  
**E - EXIT TEST**

**NOTE:** This test should be performed **ONLY** under the direction of qualified Corvus Systems Customer Service representatives.

#### 6. UPDATE CONTROLLER CODE

Press **6** and the screen displays:

**CONTROLLER CODE FILE NAME (COVBXX.CLR) :**

Type the controller code file name listed in the Directory of the CORVUS UTILITIES diskettes; for example, type **CORVB183.CLR** and press **<RETURN>**. This starts the procedure for updating the controller code on the Corvus drive, which is contained in protected tracks of the hard disk. Normally, this code cannot be written to or read by the user (even accidentally). However, it can be made accessible, for writing, by turning on the format switch. To use this option, follow this procedure:

1. Power the drive up. Turn on the format switch (the second switch from the right under the front bezel of the drive), and depress the reset switch (the first switch from the right).
2. Run the proper CLINK program to establish the Corvus link.
3. Run the CDIAGNOS program from the floppy diskette drive. Select the update option, number 6.
4. Type the controller code file name. For example, type **CORVB183.CLR** and press **<RETURN>**.
5. Turn off the format switch and reset the drive by either using the reset switch (the rightmost switch under the front bezel of the drive), or by powering the drive down and back up again, and re-running the CLINK program.

## 7. LIST/MODIFY DRIVE PARAMETERS

Press **7** and the screen displays:

```
CORVUS DRIVE # (1-4) ? _
```

Press **1**. The screen displays (as an example):

```
--- SPARED TRACK TABLE ---  
      TRACK 16  
      TRACK 38  
PRESS RETURN TO CONTINUE
```

Press <RETURN>. The screen displays:

```
SECTOR INTERLEAVING SPEC. = 9
PRESS RETURN TO CONTINUE
```

**NOTE:** The Sector Interleaving Specification is 9 for all drives. **CORVUS SYSTEMS STRONGLY RECOMMENDS THAT YOU DO NOT CHANGE IT.**

Press <RETURN>. The screen displays:

```
--- VIRTUAL DRIVE TRACK ---
      OFFSET TABLE
DRIVE      TRACK
   1             0
          WARNING
CHANGING ANY OF THE FOLLOWING PARAMETERS
CAN MAKE ANY USER DATA STORED ON THE DISC
UNUSABLE
DO YOU WISH TO CONTINUE (Y/N) ?
```

**NOTE:** Changing these specifications can make your data totally inaccessible, because the directory pointers are changed from the actual disk locations. Before altering drive parameters, you should back up the entire Corvus disk.

Press **Y** for Yes (if you wish to continue). The screen displays:

```
DRIVE PARAM MENU
S : CHANGE SPARED TRACK TABLE
I : CHANGE SECTOR INTERLEAVING
V : CHANGE VIRTUAL DRIVE OFFSETS
E : EXIT BACK TO MAIN MENU
TASK ?
```



Press **S** if you wish to change the spared track table. Spared tracks are tracks automatically skipped by the drive—any data on them is lost if not backed up first; and other data may be disturbed. Add or delete tracks by typing the track numbers, and then press **<RETURN>**.

It is not recommended that you change the sector interleaving spec or the virtual drive offsets.

## 8. LIST/MODIFY CONSTELLATION PARAMETERS

This option allows one to examine and/or modify the:

### A. Master Multiplexer Connection Table

This table is usually set to assume all the slots have a mux on them.

### B. Constellation Polling Constants

These numbers determine certain aspects of the Constellation polling environment.

The main menu displays:

**---CONSTELLATION PARAM. MENU---**

**M : LIST/EDIT MUX TABLE**

**P : LIST/EDIT POLLING PARAMETERS**

**E : EXIT**

**TASK? M**

**---MASTER MUX CONFIGURATION---**

<b>M</b>					<b>M</b>
<b>M</b>					<b>M</b>
<b>M</b>					<b>M</b>
<b>M</b>					<b>M</b>
		<b>=</b>		<b>=</b>	
		<b>=</b>		<b>=</b>	

**DO YOU WANT TO CHANGE THIS (Y/N)?**

**Press Y**

<b>5</b>					<b>4</b>
<b>6</b>					<b>3</b>
<b>7</b>					<b>2</b>
<b>8</b>					<b>1</b>
		<b>=</b>		<b>=</b>	
		<b>=</b>		<b>=</b>	

**IN THE FOLLOWING, SPECIFY WHAT IS CONNECTED TO EACH SLOT IN THE MASTER MUX. THE SLOTS ARE NUMBERED IN THE PICTURE ABOVE. LEGAL RESPONSES ARE:**

**<RET> — NO CHANGE**  
**M — MUX**  
**L — LSI-11**

**--NOTHING**  
**C — COMPUTER**

**SLOT 1(-,M,C,L):**  
**SLOT 2(-,M,C,L):**  
**SLOT 3(-,M,C,L):**  
**SLOT 4(-,M,C,L):**  
**SLOT 5(-,M,C,L):**  
**SLOT 6(-,M,C,L):**  
**SLOT 7(-,M,C,L):**  
**SLOT 8(-,M,C,L):**

**Goes Back to Main Menu**

For CP/M systems all slots must specify a Master Multiplexer regardless of the device connected to each slot.

Press P

**--POLLING PARAMETERS--**

**180**  
**26**  
**32**  
**0**

**DO YOU WISH TO CHANGE THE POLLING PARAMETERS (NOT RECOMMENDED) (Y/N) ?**

Press N

**Return to menu**

Press E

**WRITE CHANGES BACK TO DISC (Y/N)?**

Press N

**Returns to Test Menu**

**9. EXIT BACK TO CP/M (CTL-C ALSO WORKS)**

If you wish to return to the main menu, press option 9.

**P—"PARK" REV. H DRIVE HEADS**

The PARK option will move the disk read/write heads to a safe area on the disk. The heads should be placed in PARK for shipment or long term storage. Powering on the drive will automatically remove the heads from PARK.

## Appendix A. List of Common CP/M Extensions

Extension	Explanation
.ASM	<b>A</b> ssembly language source file
.BAK	<b>B</b> ackup file
.BAS	<b>B</b> ASIC program source file
.DAT	<b>D</b> ata file
.DOC	Text ( <b>D</b> ocument) file
.FOR	Microsoft <b>F</b> ORTRAN source file
.HEX	Intel <b>H</b> EX format object code file
.LIB	Extension for a <b>L</b> ibrary file
MAC	Source code for some Microsoft <b>M</b> ACRO assemblers.
.OBJ	Machine code ( <b>O</b> bject code)
.PAS	<b>P</b> ascal source file
.PCO	Sorcin Pascal run-tim module
.REL	<b>R</b> elocatable machine code program
.SRC	<b>S</b> ource file for CP/M User's Group
.SUB	Command file for a <b>s</b> ubmit run
.TXT	<b>T</b> ext file
\$\$\$	Temporary file or an improperly saved, unusable file



## **Appendix B. Corvus Disk Error Codes (text of CERROR.DOC file from CORVUS UTILITIES DISKETTE VOL. 1)**

### **Corvus Disk Error Codes**

The Corvus controller has a number of error codes that may be issued if either an illegal command is given, or the controller is out of synchronization, or there is a hardware malfunction. A number of the utilities and disk interface programs can list these error codes (in hex) if such an error occurs. For example, PUTGET.COM may list the code as:

**\*\* DISK R/W ERROR # XXH \*\***

where XX is the error code. You can demonstrate this by trying to read a sector (with PUTGET) from drive 4 (unless you have four drives). This will give error code A7H. The upper 3 bits of the error code have the following significance:

BIT 5 Set if there was a recoverable error (as in a re-try or read or write).

BIT 6 Set if an error occurred on a re-read (verification) following a disk write.

BIT 7 Set if any fatal error has occurred.

NOTE: Most of the programs will not list the error unless bit 7 is set.

The lower 5 bits have the following significance:

<b>BITS 0-4</b>	<b>MEANING</b>
0	Disk Header Fault
1	Seek Timeout
2	Seek Fault
3	Seek Error
4	Header CRC Error
5	Re-zero (Head) Fault
6	Re-zero Timeout
7	Drive Not On Line
8	Write Fault

- 9 -----
- A Read Data Fault
- B Data CRC Error
- C Sector Locate Error
- D Write Protected
- E Illegal Sector Address
- F Illegal Command
- 10 Drive Not Acknowledged
- 11 Acknowledge Stuck Active
- 12 Timeout
- 13 Fault
- 14 CRC
- 15 Seek
- 16 Verification
- 17 Drive Speed Error
- 18 Drive Illegal Address Error
- 19 Drive R/W Fault Error
- 1A Drive Servo Error
- 1B Drive Guard Band
- 1C Drive PLO (Phase Lockout) Error
- 1D Drive R/W Unsafe

# **Appendix C**

## **Description of CDIAGNOS Program**

### **CDIAGNOS.DOC**

The CP/M version of the Corvus Disk Diagnostic (CDIAGNOS.COM) provides some relatively "safe" disk tests along with the ability to list and/or change some parameters within the controller code.

For the latest documentation, see the text in the CP/M Utilities diskette with the file name CDIAGNOS.DOC.





# Appendix D

## Description of Corvus Utilities Programs

1. INDEX.DOC This is the disk index document file.
2. CERROR.DOC This is a short document file listing the controller error codes.
3. PUTGET.COM This is a disk utility that can be used under CP/M to read and write from memory to the Corvus drive as well as fill various sections of the disk with data. The routine has its own disk drivers and is mainly useful as a SYSGEN routine to write a configured CP/M 2.X system out to the drive, and to initialize a drive directory.
4. CLINK2FV.COM  
CLINK2TN.COM  
CLINK2TW.COM  
CLINK7FV.COM  
CLINK7TN.COM  
CLINK7TW.COM These are several versions of the Corvus link program. You should choose the one that best meets your needs, and ignore the others. Consult the CORVUS SYSTEMS CP/M USERS GUIDE for descriptions of each program. This program contains the Corvus disk drivers that are linked into CP/M. These programs will only work with CP/M version 2.0 or later.
5. CDIAGNOS.COM  
CDIAGNOS.DOC A disk diagnostic that can be used to verify correct drive operation as well as to update the controller code and change other drive parameters.
6. CORVB183.CLR This is a controller code file for use with CDIAGNOS.COM. This is a copy of version 18.3 of the controller code for the REV H controller.
7. MIRROR.COM This program is the control program for the Corvus Mirror disk backup system.
8. SEMA4.COM This is an example program designed to illustrate how to access the semaphores supported on the Corvus drive.

9. PMGR.COM This is a program that allows the user to manage the pipes area of the drive. It allows the user to initialize the pipes and clear the pipes area, purge as pipe, and list the current pipes and their status.
10. SPOOL.COM This is a program that use the pipes facilities on the Corvus drive. It transfers files to and from an area of the drive that is accessible by any user and/or system through pipe commands. Examples of its usage are: (1) Send text files to a shared printer; and (2) Transfer files between different systems (CPM <--> APPLE).
11. DRIVEL.COM This is a program that helps you configure your Corvus drive, if you choose not to use one of the default CLINK.COM's provided. Based on your input, it creates a file containing the equates that need to be changed in the CLINK2.ASM program to set up your drive. Also in this file is the start and directory addresses for the pseudo drives being set up. These addresses are used with the PUTGET and MIRROR programs.
12. LINKASM.COM  
LINKASM.DOC This is an assembler that uses the standard Intel mnemonics and is upward compatible with the assembler supplied by Digital Research (but unfortunately not also provided by XEROX with their version of CP/M). This program was written by Ward Christensen and was extracted from CP/M Users Group disk #36. If necessary, you can use this assembler to assemble any of the .ASM files on these disks. NOTE: This assembler is only supplied for the XEROX 820 or Vector Graphics computers.

The following source programs are provided for those of you who wish to modify the Corvus interface or utility programs:

13. CLINK2.ASM Source for the Corvus link program which may be modified if the default versions do

not meet your needs. Consult Appendix F for instructions on how to modify CLINK2.ASM.

- 14. SEMA4.ASM  
SPOOLGEN.SUB  
SPOOL.SRC  
SPOOL.DEF  
SPOOL.PAS  
SPOOLM.PAS  
PIPEGEN.SUB  
PIPES.SRC  
PIPED.PAS  
PIPEC.PAS  
PIPES.PAS  
CPMIO.MAC

Sources for the SEMA4 and SPOOL programs. These sources are provided as examples of how to use the Semaphore and pipe features of the Corvus drive.

NOTE: The spool program is written in Pascal, and requires you to have PASCAL/MT and the M80 Assembler in order to modify it.

- 15. CLOADR.ASM

This is a short boot loader program to be used with CP/M 2.X. It can be used under a floppy-based CP/M to boot in CP/M from the hard-disk once it is put there, or it can be used to make a ROM-based loader.

- 16. CBOOT.ASM

This is a cold boot loader for CP/M 2.X. It is brought in by CLOADER. CBOOT then brings in the CP/M system.

- 17. BIOSC.ASM  
BIOSCT.ASM

One of these two files should be on your set of diskettes. Both of these files contain the source for the Corvus Basic I/O System (BIOS) to configure the Corvus drive into one to seven pseudo drives, as well as allow for the control of two floppy drives. The BIOSC.ASM file contains dummy floppy and console I/O drivers. These dummy drivers should be replaced with the floppy and console should be replaced with the floppy and console I/O drivers for your computer. The BIOSCT.ASM file contains floppy and console I/O drivers for a typical S-100 system using a single density floppy diskette drive controller.

NOTE 1: Source for the programs PUTGET, CDIAGNOS, and MIRROR is available by special order.

NOTE 2: All of the disk utilities contain their own Corvus disk drivers. They can be run from floppy-based CP/M systems that are not yet linked to the Corvus drive.

NOTE 3: Support for pre-2.0 versions of CP/M has been discontinued. The last release of pre-2.0 software, dated 7-May-81, is available by special order.

## Appendix E

# Supplemental VCR Information

Corvus Systems recommends that you purchase a VHS-type video cassette recorder (VCR). The following VCR models have been used with the Corvus Mirror:

Grundig VCR 4000 (PAL Format)

Hitachi VT 5000 (PAL Format)

National NV 7000

Panasonic VHS 1000

Panasonic VHS 1500

Panasonic NV 3810

Panasonic NV 8200

Panasonic NV 1200

RCA VDP 150

RCA VET 180

RCA VCT 201

RCA VET 250

RCA VDT 350

RCA VDT 501

Sony Betamax SL 5600 (Beta Format)

Technicolor 212 (limited to 30 minute cassette)

Zenith VL 9700 (Beta Format)

When used in the normal quad recording format of the Corvus Mirror, video cassettes have the storage capacities listed below:

30 minute cassette—18 MB maximum storage capacity

60 minute cassette—36 MB maximum storage capacity

90 minute cassette—55 MB maximum storage capacity

120 minute cassette—73 MB maximum storage capacity

