

# RX02 Floppy Disk System Technical Manual

Copyright © 1978 by Digital Equipment Corporation

The material in this manual is for informational purposes and is subject to change without notice.

Digital Equipment Corporation assumes no responsibility for any errors which may appear in this manual.

Printed in U.S.A.

**This document was set on DIGITAL's DECset-8000 computerized typesetting system.**

The following are trademarks of Digital Equipment Corporation, Maynard, Massachusetts:

DIGITAL	DECsystem-10	MASSBUS
DEC	DECSYSTEM-20	OMNIBUS
PDP	DIBOL	OS/8
DECUS	EDUSYSTEM	RSTS
UNIBUS	VAX	RSX
	VMS	IAS

# CONTENTS

	<b>Page</b>
<b>PREFACE</b>	
<b>CHAPTER 1 GENERAL INFORMATION</b>	
1.1 INTRODUCTION.....	1-1
1.2 GENERAL DESCRIPTION.....	1-2
1.2.1 Interface Modules .....	1-2
1.2.2 Microprogrammed Controller.....	1-2
1.2.3 Read/Write Electronics.....	1-2
1.2.4 Electromechanical Drive .....	1-2
1.2.5 Power Supply .....	1-4
1.3 OPTION DESCRIPTION .....	1-4
1.3.1 Operation For Single Density Recording Only (RX8E, RX11, RXV11).....	1-6
1.3.1.1 PDP-8 Operation.....	1-6
1.3.1.2 PDP-11 Operation.....	1-6
1.3.1.3 LSI-11 Operation .....	1-7
1.3.2 Operation For Single or Double Density Recording RX28, RX211, RXV211).....	1-7
1.3.2.1 PDP-8 Operation.....	1-7
1.3.2.2 PDP-11 Operation.....	1-7
1.3.2.3 LSI-11 Operation .....	1-7
1.4 SPECIFICATIONS.....	1-8
1.5 SYSTEMS COMPATIBILITY.....	1-9
1.5.1 Media.....	1-9
1.5.2 Recording Scheme .....	1-10
1.5.2.1 Double Frequency (FM).....	1-10
1.5.2.2 Miller Code (MFM) .....	1-10
1.5.3 Logical Format.....	1-12
1.5.3.1 Header Field Description.....	1-13
1.5.3.2 Data Field Description .....	1-13
1.5.3.3 Track Usage .....	1-14
1.5.3.4 CRC Capability.....	1-14
<b>CHAPTER 2 INSTALLATION</b>	
2.1 SITE PREPARATION.....	2-1
2.1.1 Space.....	2-1
2.1.2 Cabling .....	2-2
2.1.3 AC Power.....	2-3
2.1.3.1 Power Requirements .....	2-3
2.1.3.2 Input Power Modification Requirements.....	2-3

# CONTENTS (Cont)

	<b>Page</b>
2.1.4	Fire and Safety Precautions ..... 2-4
2.2	CONFIGURATION GUIDELINES ..... 2-4
2.3	ENVIRONMENTAL CONSIDERATIONS..... 2-4
2.3.1	General ..... 2-4
2.3.2	Temperature, Relative Humidity ..... 2-4
2.3.3	Heat Dissipation ..... 2-4
2.3.4	Radiated Emissions ..... 2-4
2.3.5	Cleanliness ..... 2-6
2.4	UNPACKING AND INSPECTION..... 2-6
2.4.1	General ..... 2-6
2.4.2	Tools..... 2-6
2.4.3	Unpacking ..... 2-6
2.4.3.1	Cabinet-Mounted..... 2-6
2.4.3.2	Separate Container..... 2-7
2.4.3.3	Inspection ..... 2-7
2.5	INSTALLATION..... 2-7
2.6	TESTING ..... 2-11
 <b>CHAPTER 3 USER INFORMATION</b>	
3.1	CUSTOMER RESPONSIBILITY..... 3-1
3.2	CARE OF MEDIA..... 3-1
3.2.1	Handling Practices and Precautions..... 3-1
3.2.2	Diskette Storage ..... 3-2
3.2.2.1	Short Term (Available for Immediate Use) ..... 3-2
3.2.2.2	Long Term ..... 3-2
3.2.3	Shipping Diskettes..... 3-2
3.3	OPERATING INSTRUCTIONS..... 3-3
3.4	OPERATOR TROUBLESHOOTING ..... 3-3
 <b>CHAPTER 4 PROGRAMMING</b>	
4.1	RX8E and RX28 PROGRAMMING INFORMATION ..... 4-1
4.1.1	Device Codes..... 4-1
4.1.2	Instruction Set..... 4-2
4.1.2.1	RX8E Load Command (LCD) – 67x1 ..... 4-2
4.1.2.2	RX28 Load Command – (First byte 67x1, Second byte 67x2) ..... 4-3
4.1.2.3	Transfer Data Register (XDR) – 67x2 ..... 4-3
4.1.2.4	STR – 67x3 ..... 4-4
4.1.2.5	SER – 67x4 ..... 4-4
4.1.2.6	SDN – 67x5 ..... 4-4
4.1.2.7	INTR – 67x6 ..... 4-4
4.1.2.8	INIT – 67x7..... 4-4
4.1.3	Register Description..... 4-4

## CONTENTS (Cont)

	<b>Page</b>
4.1.3.1	Command Register.....4-4
4.1.3.2	Error Code Register .....4-5
4.1.3.3	RX2TA – RX Track Address.....4-6
4.1.3.4	RX2SA – RX Sector Address .....4-6
4.1.3.5	RX2DB – RX Data Buffer.....4-7
4.1.3.6	RX8E – RX Error and Status .....4-7
4.1.3.7	RX28 – RX Error and Status .....4-8
4.1.4	Function Code Description .....4-9
4.1.4.1	Fill Buffer (000) .....4-10
4.1.4.2	Empty Buffer (001) .....4-10
4.1.4.3	Write Sector (010).....4-11
4.1.4.4	Read Sector (011) .....4-11
4.1.4.5	Set Media Density (100) for RX28 Only .....4-11
4.1.4.6	Maintenance Read Status (101) for RX28 Only .....4-12
4.1.4.7	Read Status (101) for RX8E Only .....4-12
4.1.4.8	Write Deleted Data Sector (110) .....4-12
4.1.4.9	Read Error Code Function (111).....4-12
4.1.4.10	Power Fail .....4-12
4.1.5	Error Recovery .....4-13
4.1.5.1	RX8E .....4-13
4.1.5.2	RX28.....4-13
4.1.6	RX8E Programming Examples .....4-14
4.1.6.1	Write/Write Deleted Data/Read Functions.....4-14
4.1.6.2	Empty Buffer Function .....4-16
4.1.6.3	Fill Buffer Function.....4-17
4.1.7	RX28 Programming Examples.....4-17
4.1.8	Restrictions and Programming Pitfalls.....4-23
4.2	RX11 and RXV11 PROGRAMMING INFORMATION .....4-24
4.2.1	Register and Vector Addresses.....4-24
4.2.2	Register Description .....4-24
4.2.2.1	RXCS – Command and Status (177170).....4-24
4.2.2.2	RXDB – Data Buffer Register (177172) .....4-26
4.2.2.3	RXTA – RX Track Address .....4-26
4.2.2.4	RXSA – RX Sector Address .....4-26
4.2.2.5	RXDB – RX Data Buffer.....4-27
4.2.2.6	RXES – RX Error and Status .....4-27
4.2.3	Function Codes .....4-28
4.2.3.1	Fill Buffer (000) .....4-29
4.2.3.2	Empty Buffer (001) .....4-29
4.2.3.3	Write Sector (010).....4-29
4.2.3.4	Read Sector (011) .....4-30
4.2.3.5	Read Status (101).....4-30
4.2.3.6	Write Sector with Deleted Data (110).....4-31
4.2.3.7	Read Error Code Function (111).....4-31