

VT52 DECscope Maintenance Manual

1st Edition, September 1976
2nd Printing (Rev), July 1978

Copyright © 1976, 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:

DEC	DECtape	PDP
DECCOMM	DECUS	RSTS
DECsystem-10	DIGITAL	TYPESET-8
DECSYSTEM-20	MASSBUS	TYPESET-11
		UNIBUS

CONTENTS

	Page
CHAPTER 1 INTRODUCTION	
1.1 GENERAL DESCRIPTION.....	1-1
1.2 FEATURES	1-2
1.2.1 19-Key Auxiliary Keypad	1-2
1.2.2 Hold-Screen Mode	1-2
1.2.3 Direct Cursor Addressing	1-2
1.2.4 Identification Feature.....	1-2
1.2.5 Terminal Interface.....	1-2
1.2.6 Copier Option	1-2
1.2.7 Printer Interface Option	1-2
1.3 VT52 SPECIFICATIONS.....	1-3
1.4 DOCUMENTATION ORDERING INFORMATION	1-5
CHAPTER 2 INSTALLATION	
2.1 SITE PLANNING.....	2-1
2.2 UNPACKING AND INSPECTION.....	2-1
2.3 INSTALLATION AND SETUP	2-1
2.3.1 Off-Line Tests	2-4
2.3.2 On-Line Tests.....	2-4
2.4 ACCEPTANCE TEST PROCEDURES.....	2-4
2.4.1 Flashing Cursor Check	2-4
2.4.2 Escape and Control Command Check	2-5
2.4.3 Terminal Identification Check	2-6
2.4.4 Alternate Keypad Mode.....	2-6
2.4.5 Hold Screen Mode.....	2-6
2.4.6 Direct Cursor Addressing.....	2-7
2.4.7 On-Line Acceptance Test.....	2-7
CHAPTER 3 OPERATION	
3.1 CONTROLS.....	3-1
3.1.1 Operator Controls	3-1
3.1.2 Keyboard.....	3-1
3.1.2.1 Alphabetic Keys	3-2
3.1.2.2 Numeric/Symbol Keys.....	3-3
3.1.2.3 Function Keys.....	3-3
3.1.2.4 The CONTROL Key.....	3-3
3.1.2.5 The BREAK Key	3-3

CONTENTS (Cont)

	Page
3.1.2.6	Auxiliary Keypad.....3-5
3.1.2.7	The REPEAT Key.....3-6
3.1.2.8	The SCROLL Key.....3-7
3.1.2.9	The COPY Key3-7
3.2	OPERATING PROCEDURE.....3-7
3.2.1	OFF-LINE.....3-7
3.2.2	ON-LINE3-9
3.3	USER MAINTENANCE.....3-9
 CHAPTER 4 TECHNICAL DESCRIPTION	
4.1	GENERAL.....4-1
4.2	FUNCTIONAL DESCRIPTION.....4-1
4.2.1	VT52 Video Terminal.....4-1
4.2.2	VT52 Input Terminal.....4-4
4.2.3	VT52 Output Terminal.....4-6
4.3	MODULE DESCRIPTION4-8
4.3.1	Data Paths, Memory, and Decoders Module (DP).....4-8
4.3.1.1	RAM and Memory Buffer4-8
4.3.1.2	Video Shift Register (VSR).....4-11
4.3.1.3	Decoders4-11
4.3.1.4	Character Generator.....4-15
4.3.2	ROM, UART, Timing Module (RUT)4-15
4.3.2.1	ROM and PC4-15
4.3.2.2	Timing.....4-17
4.3.2.3	Interface Module.....4-17
4.3.2.4	UART.....4-20
4.3.3	The Monitor and Power Supply Module.....4-20
4.3.3.1	The CRT4-20
4.3.3.2	Beam Deflection4-20
4.3.3.3	Power Supply4-25
4.4	KEYBOARD.....4-27
4.5	MICROPROGRAM4-27
4.5.1	Servicing the Keyboard.....4-28
4.5.2	Scrolling4-28
4.5.3	Hold-Screen Mode4-32
4.5.4	Terminal Identification.....4-33
4.5.5	Flashing the Cursor4-33
 CHAPTER 5 SERVICING	
5.1	SERVICE PHILOSOPHY.....5-1
5.2	SUBASSEMBLY LEVEL TROUBLESHOOTING5-1
5.2.1	Identifying the Faulty Subassembly5-1
5.2.2	Analyzing the Symptoms.....5-2

CONTENTS (Cont)

		Page
5.3	SUBASSEMBLY REPLACEMENT	5-12
5.3.1	Removing the Base Assembly	5-12
5.3.2	Replacing the ROM, UART and Timing (RUT) or Data Path, Memory and Decoder (DP) Module	5-14
5.3.3	Replacing the Monitor/Power Supply Module	5-15
5.3.4	Replacing the Keyboard	5-19
5.3.5	Replacing the CRT Assembly	5-19
5.3.6	Replacing the Transformer Assembly	5-22
5.4	DISPLAY ALIGNMENTS AND ADJUSTMENTS	5-22
5.4.1	CRT Yoke Alignment.....	5-22
5.4.2	Display Adjustments	5-22
5.4.2.1	Height	5-23
5.4.2.2	Width	5-23
5.4.2.3	Vertical Linearity.....	5-23
5.4.2.4	Focus	5-23
5.5	VOLTAGE CHECKS	5-24
5.5.1	Testing the NO VOLTAGE Condition	5-24
5.5.2	Testing the +15 V Supply	5-24
5.5.3	Testing the +5 V Supply	5-25
5.5.4	Testing the -12 V Supply.....	5-26
5.6	TIMING WAVEFORMS	5-27
5.7	MONITOR WAVEFORMS	5-29
CHAPTER 6	VT50-SERIES COPIER OPTION	
6.1	VT50-SERIES COPIER INTRODUCTION	6-1
6.2	COPIER BLOCK DIAGRAM	6-1
6.3	COPIER TIMING.....	6-3
6.4	OPERATING THE COPIER	6-4
6.5	PROGRAMMING THE COPIER.....	6-4
6.6	COPIER REMOVAL AND REPLACEMENT PROCEDURE.....	6-6
6.7	COPIER MAINTENANCE.....	6-6
6.8	COPIER TROUBLESHOOTING.....	6-7
6.9	COPIER SPECIFICATIONS.....	6-9
6.10	RELATED DOCUMENTATION	6-10
CHAPTER 7	VT52 PRINTER INTERFACE OPTION	
7.1	VTXX-KA INTRODUCTION	7-1
7.2	PRINTER INTERFACE BLOCK DIAGRAM	7-1
7.2.1	Parallel Operation	7-1
7.2.2	Serial Operation	7-1
7.3	VTXX-KA INSTALLATION	7-3
7.3.1	Installation of the VTXX-KA Module.....	7-4
7.3.2	VTXX-KA Cable Installation.....	7-8