

# The Contents.

## 1 The Firmware.

- 1.1 The Hardware.
- 1.2 The Division of the Firmware.
- 1.3 Controlling the Firmware.
- 1.4 The Jumpblocks.
- 1.5 Conventions.
- 1.6 Routine Documentation.
- 1.7 Example of Patching a Jumpblock.

## 2 ROMs, RAM and the Restart Instructions.

- 2.1 Memory Map.
- 2.2 ROM Selection.
- 2.3 The Restart Instructions.
- 2.4 RAM and the Firmware.
- 2.5 Bank Switching.
- 2.6 The Keyboard.

## 3 Keyboard Scanning.

- 3.1 Key Translation.
- 3.2 Characters from the Keyboard.
- 3.3 Shift and Caps Lock.
- 3.4 Repeating Keys.
- 3.5 Breaks.
- 3.6 Function Keys and Expansion Tokens.
- 3.7 Joysticks.

## 4 The Text VDU.

- 4.1 Text VDU Coordinate Systems.
- 4.2 Streams.
- 4.3 Text Pen and Paper Inks.
- 4.4 Text Windows.
- 4.5 The Current Position and the Cursor.
- 4.6 Characters and Matrices.
- 4.7 Character Output and Control Codes.

## **5 The Graphics VDU.**

- 5.1 Graphics VDU Coordinate Systems.
- 5.2 The Current Graphics Position.
- 5.3 Graphics Pen and Paper Inks.
- 5.4 Graphics Write Mode.
- 5.5 Graphics Window.
- 5.6 Writing Characters.
- 5.7 Drawing Lines.
- 5.8 Filling Areas.

## **6 The Screen**

- 6.1 Screen Modes.
- 6.2 Inks and Colours.
- 6.3 Screen Addresses.
- 6.4 Screen Memory Map.

## **7 The Sound Manager.**

- 7.1 The Sound Chip.
- 7.2 Tone Periods and Amplitudes.
- 7.3 Enveloping.
- 7.4 Sound Commands.
- 7.5 Sound Queues.
- 7.6 Synchronization.
- 7.7 Holding Sounds.

## **8 The Cassette Manager.**

- 8.1 File Format.
- 8.2 Record Format.
- 8.3 Bit Format.
- 8.4 The Header Record.
- 8.5 Read and Write Speeds.
- 8.6 Cataloguing.
- 8.7 Reading Files.
- 8.8 Writing Files.
- 8.9 Reading and Writing Files Simultaneously.
- 8.10 Filenames.
- 8.11 Cassette Manager Messages.
- 8.12 Escape Key.
- 8.13 Low Level Cassette Driving.

## **9 AMSDOS**

- 9.1 Features
- 9.2 Filenames
- 9.3 File Headers
- 9.4 Disc Organisation
- 9.5 Boot Sector
- 9.6 AMSDOS Messages
- 9.7 BIOS Facilities Available to AMSDOS
- 9.8 Store requirements
- 9.9 Extended Disc Parameter Blocks

## **10 Expansion ROMs, Resident System Extensions and RAM Programs**

- 10.1 ROM Addressing.
- 10.2 The Format of an Expansion ROM.
- 10.3 Foreground ROMs and RAM Programs.
- 10.4 Background ROMs.
- 10.5 Resident System Extensions.
- 10.6 External Commands.
- 10.7 Examples.

## **11 Interrupts.**

- 11.1 The Time Interrupt.
- 11.2 External Interrupts.
- 11.3 Nonmaskable Interrupts.
- 11.4 Interrupts and Events.
- 11.5 Interrupt Queues.

## **12 Events**

- 12.1 Event Class.
- 12.2 Event Count.
- 12.3 Event Routine.
- 12.4 Disarming and Reinitializing Events

## **13 The Machine Pack.**

- 13.1 Hardware Interfaces.
- 13.2 The Printer.
- 13.3 Loading and Running Programs.

## **14 Firmware Jumpblocks.**

- 14.1 The Main Jumpblock.
  - 14.1.1 Entries to the Key Manager.
  - 14.1.2 Entries to the Text VDU.
  - 14.1.3 Entries to the Graphics VDU.
  - 14.1.4 Entries to the Screen Pack.
  - 14.1.5 Entries to the Cassette Manager.
  - 14.1.6 Entries to the Sound Manager.
  - 14.1.7 Entries to the Kernel.
  - 14.1.8 Entries to the Machine Pack.
  - 14.1.9 Entries to the Jumper.
  - 14.1.10 Further Entries.
- 14.2 Firmware Indirections.
  - 14.2.1 Text VDU Indirections.
  - 14.2.2 Graphics VDU Indirections.
  - 14.2.3 Screen Pack Indirections.
  - 14.2.4 Keyboard Manager Indirections.
  - 14.2.5 Machine Pack Indirections.
  - 14.2.6 Further Indirections.
- 14.3 The High Kernel Jumpblock.
- 14.4 The Lower Kernel Jumpblock.

## **15 The Main Firmware Jumpblock.**

## **16 The Firmware Indirections.**

## **17 Kernel High Entries.**

## **18 Low Entries to the Kernel.**

## **19 AMSDOS 'BIOS' Facilities**

## **20 AMSDOS External Commands**

## **Appendices**

- I Key Numbering.**
- II Key Translation Tables.**
- III Repeating Keys.**
- IV Function Keys and Expansion Strings.**
- V Inks and Colours.**
- VI Displayed Character Set.**
- VII Text VDU Control Codes.**
- VIII Notes and Tone Periods.**
- IX The Programmable Sound Generator.**
- X Kernel Block Layouts.**
- XI The Alternate Register Set.**
- XII Hardware and Hardware Variants**
- XIII Hints, Tips and Workarounds.**
- XIV Printer Translation Table.**

