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Information Technology - Address Offset Reserved Area Boot Method

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for Information Systems —

Address Offset Reserved Area Boot Method

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Abstract

This technical report describes a method of booting an operating system from a reserved area on ATA/ATAPI devices, using an Address Offset Set Features Function.

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Foreword

This technical report describes the Set Features Address Offset feature and the method of booting an operating system from the reserved area using the Address Offset feature.

This technical report was developed by T13 during 1999/2000. The approval process started in 2000.

This document is not an American National Standard and the material contained herein is not normative in nature. Comments on the content of this document should be sent to the NCITS Secretariat, Information Technology Industry Council, 1250 Eye Street, NW (Suite 200), Washington, DC 20005.

This technical report was processed and approved for submittal to ANSI by Accredited Standards Committee on Information Processing Systems, NCITS. Committee approval of the technical report does not necessarily imply that all committee members voted for approval. At the time it approved this technical report, the NCITS Committee had the following members:

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Introduction

This technical report encompasses the following:

Clause 1 describes the scope.

Clause 2 provides definitions, abbreviations, and conventions used within this technical report.

Clause 3 describes the operation of the Set Features Address Offset feature.

Clause 4 describes booting from the reserved area using the Address Offset feature.

National Committee for Information Technology Standards (NCITS)
Technical Report —

Address Offset Reserved Area Boot Method

1. Scope

This technical report assumes that the reader is familiar with the conventional Int 13h interface, and the basic operation of ATA devices. This technical report describes the Address Offset feature and the method of booting an operating system from a reserved area using the Address Offset feature.

2. Definitions, abbreviations, and conventions

2.1 Definitions and abbreviations

2.1.1 user area: The range of device addresses accessible by read and write commands.

2.1.2 reserved area: The range of device addresses not accessible by read and write commands after a SET MAX command has been used to reduce the size of the user area.

2.1.3 set max pointer: The set max pointer is the lowest addressable sector of the reserved area.

2.2 Conventions

Lowercase is used for words having the normal English meaning. Certain words and terms used in this standard have a specific meaning beyond the normal English meaning. these words and terms are defined either in clause 2 or in the text where they first appear.

The names of abbreviations, commands, fields, and acronyms used as signal names are in all uppercase (e.g., IDENTIFY DEVICE).

2.2.1 Precedence

If there is a conflict between text, figures, and tables, the precedence shall be tables, figures, then text.

2.2.2 Lists

Ordered lists, those lists describing a sequence, are of the form:

- a)
- b)
- c)

Unordered lists are of the form:

- 1)
- 2)
- 3)

3. Address Offset Mode operation

3.1 Enable/Disable Address Offset Mode

In devices that support the Address Offset feature, the SET FEATURES subcommand 09h Enable Address Offset Mode, offsets address Cylinder 0, Head 0, Sector 1, LBA 0, to the start of the non-volatile protected area established using the SET MAX ADDRESS Command.

The Address Offset condition is cleared by the SET FEATURES subcommand 89h Disable Address Offset Mode, a hardware reset or a power-on reset.

If Reverting to Power on Defaults has been enabled by a SET FEATURES command, it is cleared by software reset as well.

Upon entering the Address Offset mode the capacity of the drive returned in the Identify device data is the size of the former protected area. A subsequent SET MAX ADDRESS command using the address returned by the READ NATIVE MAX ADDRESS command allows access to the entire drive. Addresses wrap so the entire drive remains addressable (see figure 1).

If a non-volatile reserved area has not been established before the device receives a SET FEATURES Enable Address Offset Mode command, the command fails with Abort error status.

The Disable Address Offset Mode removes the address offset and sets the size of the drive reported by the IDENTIFY DEVICE command back to the size specified in the last non-volatile SET MAX ADDRESS command.

3.2 IDENTIFY DEVICE

IDENTIFY DEVICE word 83 bit 07, if set to one, indicates the device supports the Address Offset Mode.
IDENTIFY DEVICE word 86 bit 07, if set to one, indicates the device is in Address Offset Mode.

3.3 SET MAX ADDRESS

Issuing the SET MAX ADDRESS command with bit 0 in the Sector Count register set to one is not valid when the device is in Address Offset Mode.

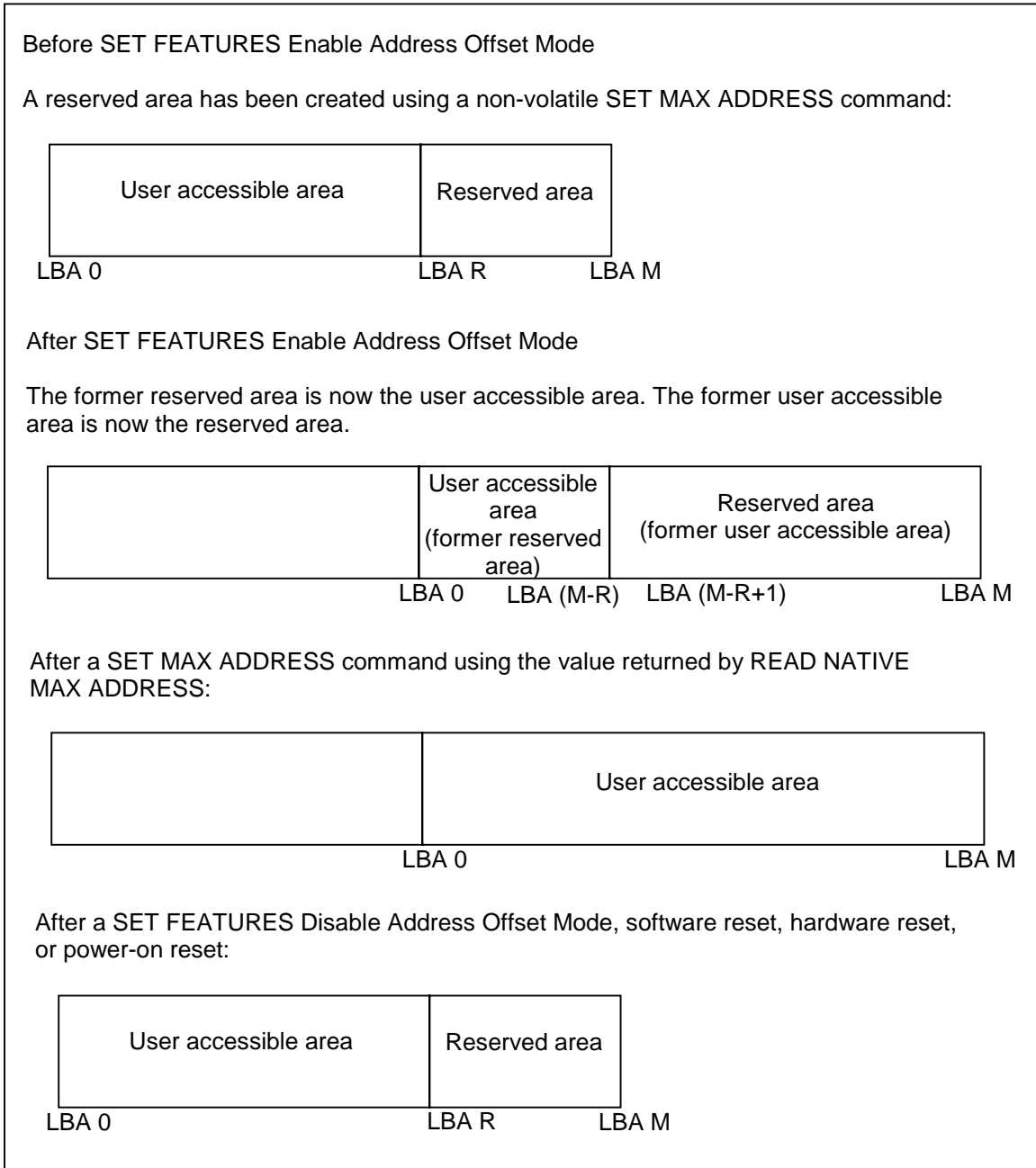


Figure 1 - The effect of address offset on addressing

4. Booting from the reserved area using Address Offset

Computer systems perform initial code loading (booting) by reading from a predefined address on a disk drive. The Address Offset feature allows a second operating system to be booted from the reserved area on a drive by changing the location of LBA 0 instead of modifying the BIOS to begin the boot process from an alternate starting address.

To boot an alternate operating system the BIOS:

- a) Issues a SET FEATURES Address Offset command to the disk drive
- b) Checks to see that the SET FEATURES Address Offset command was completed successfully.
- c) Executes the normal boot process.

Annex A
(informative)
Bibliography

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