INTERNATIONAL STANDARD

ISO/IEC 8441-2

First edition
1991-08-01

Information technology — High density digital recording (HDDR) —

Part 2:
Guide for interchange practice

Technologies de l'information — Enregistrement numérique à haute densité (HDDR) —

Partie 2: Guide pour l'échange d'information

Reference number
ISO/IEC 8441-2:1991(E)

Contents

		Page
1	Scope	1
2	Normative references	1
3	Definitions	1
4	Recording and reproducing characteristics	4
4.1	General	4
4.2	Tape speeds	4
4.3	Track configurations	5
4.4	Recorder/reproducer characteristics	5
4.5	Other characteristics	6
5	Methods for high density digital recording	15
5.1	Introduction	15
5.2	Record transfer function	15
5.3	Flux transition densities and rates for high density recording	15
5.4	Data input/output	16
5.5	Data sense	16
5.6	Reproduce equalization	16
5.7	Other system parameters	17

5.8 Auxiliary data recording **17**

Annexes

A Operating modes, performance categories, and cross-play criteria for high density PCM recording systems **18**

A.1 Performance categories **18**

A.1.1 General **18**

A.1.2 Record head gap length for category A and category B performance **18**

A.1.3 Record head gap length for category C performance **18**

A.1.4 Operating modes **19**

A.2 Single track serial high density recording **19**

A.2.1 Serial high density recording with wideband analogue recorder/reproducer (category A) **19**

A.2.2 Parallel high density digital recording **21**

B Recording techniques **22**

B.1 Recording code names and their abbreviations **22**

B.2 Enhanced NRZ format for parallel HDDR **22**

B.2.1 ENRZ coding **22**

B.2.2 ENRZ — parallel HDDR format **22**

B.2.3 Summary of enhanced NRZ format **22**

B.3 Miller squared format (M^2) for parallel HDDR **23**

B.3.1 Miller squared coding **23**

B.3.2 M^2 format for parallel HDDR **23**

B.3.3 Summary of M^2 format **24**

B.3.4 M^2 format bandwidth utilization/packing density **24**

B.4 Randomized NRZ-L format parallel HDDR **24**

B.4.1 RNRZ-L coding **24**

B.4.2 RNRZ-L parallel HDDR format **24**

B.4.3 Summary of randomized NRZ-L format **25**

B.4.4 Randomized NRZ-L format bandwidth utilization/packing density **25**

B.5 PROP format for parallel HDDR (Pseudo random odd parity) **26**

B.5.1 General **26**

B.5.2 Summary of PROP format **27**

B.5.3 PROP format bandwidth utilization **27**

B.6 3PM formats for parallel HDDR **27**

B.6.1 General **27**

B.6.2 3PM format versions **28**

B.6.3 Error detection and correction (formats A and B) **29**

B.6.4 Summary of 3PM formats A and B **29**

B.6.5 3PM format bandwidth utilization **30**

B.7 MODAS airborne recording format **30**

B.7.1 General **30**

B.7.2 Description **30**

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 8441-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 8441 consists of the following parts, under the general title *Information technology — High density digital recording (HDDR)*:

— *Part 1: Unrecorded magnetic tape for (HDDR) applications*

— *Part 2: Guide for interchange practice*

Annexes A and B of this part of ISO/IEC 8441 are for information only.

This page intentionally left blank

Information technology — High density digital recording (HDDR) —

Part 2:
Guide for interchange practice

1 Scope

This part of ISO/IEC 8441 specifies the minimum performance levels necessary for the effective interchange of information using High Density Digital Recording (HDDR). It also describes methods of testing for determining these levels. It gives guidance on recorders/reproducer characteristics, modes of recording, and modulation patterns.

The imperial dimensions given in this part of ISO/IEC 8441 are the reference dimensions. The metric and imperial dimensions are, however, given to a sufficient degree of accuracy as to be totally interchangeable.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 8441. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 8441 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 3788:1990, *Information processing — 9-track, 12,7 mm (0,5 in) wide magnetic tape for information interchange using phase encoding at 126 ftpmm (3 200 ftpi), 63 cpmm (1 600 cpi).*

ISO 6068:1985, *Information processing — Recording characteristics of instrumentation magnetic tape (including telemetry systems) — Interchange requirements.*

ISO/IEC TR 6371:1989, *Information processing — Interchange practices and test methods for unrecorded instrumentation magnetic tape.*

3 Definitions

For the purposes of this part of ISO/IEC 8441, the following definitions apply.

3.1 aliasing: The false lower frequency components resulting from an insufficient sampling rate (i.e. less than required by the sampling theorem) when reconstructing an analogue signal from its sampled data representation.

3.2 baseline restorer: A device to restore the d.c. component removed by the record/reproduce process.

3.3 bit error: The incorrect interpretation of a binary bit by a message processing unit.

3.4 bit error rate (BER): The rate at which bit errors occur in a message processing unit, expressed in terms of the number of bit errors divided by the total number of bits processed in a given period of time, or from a given length of tape.

3.5 bit packing density: The number of bits recorded per unit track length, usually expressed in terms of bits per millimetre (bit/mm) or kilobits per inch (kbit/in).

3.6 bit slip: The condition in a message processing unit where the bit rate clock has gained (or lost) more than 180° phasing with respect to synchronism with the binary message bits.