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Interchangeable magnetic six-disk pack — Physical and magnetic characteristics

Chargeur interchangeable à six disques magnétiques — Caractéristiques mécaniques et magnétiques

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2864 was drawn up by technical Committee ISO/TC 97, *Computers and information processing*, and circulated to the Member Bodies in December 1972.

It has been approved by the Member Bodies of the following countries :

Belgium	Hungary	South Africa, Rep. of
Brazil	Italy	Sweden
Bulgaria	Japan	Switzerland
Canada	Netherlands	Thailand
Czechoslovakia	New Zealand	United Kingdom
France	Poland	U.S.A.
Germany	Romania	U.S.S.R.

No Member Body expressed disapproval of the document.

Interchangeable magnetic six-disk pack — Physical and magnetic characteristics

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the physical and magnetic characteristics for the interchange of magnetic six-disk packs in order to facilitate the interchange of data between electronic data processing systems.

It does not apply to a specific design. It defines only the parameters relevant for interchange.

2 DEFINITIONS

The terms for elements of six-disk packs are defined by figures 1 and 2.

The drawings show a typical disk pack assembly for illustration purposes only.

3 GENERAL REQUIREMENTS

3.1 Operating, storage and test environments

3.1.1 Operating environment

The operating temperature shall lie within the range 15 to 50 °C (60 to 120 °F) at a relative humidity of 8 to 80 %. The wet bulb reading shall not exceed 26 °C (78 °F). Before a disk pack is placed into operation, it shall be conditioned within its covers for a minimum of 2 h in the same environment as that in which the disk drive is operating. The above specified range does not necessarily apply to the disk drive.

3.1.2 Storage environment

3.1.2.1 UNRECORDED DISKS

The storage temperature shall lie within the range – 40 °C to + 65 °C (– 40 °F to + 150 °F), the wet bulb reading not exceeding 30 °C (85 °F). For wet bulb temperatures between 0,5 °C (33 °F) and 30 °C (85 °F), the disk pack shall be able to withstand a relative humidity of 8 to 80 %.

3.1.2.2 RECORDED DISKS

The storage temperature shall lie within the range – 40 °C to + 65 °C (– 40 °F to + 150 °F), the wet bulb reading not exceeding 30 °C (85 °F). For wet bulb temperatures between 0,5 °C (33 °F) and 30 °C (85 °F), the disk pack shall be able to withstand a relative humidity of 8 to 80 %. The stray magnetic field intensity shall not exceed 4 000 A/m.

A suggested accelerated storage life test is included in annex A.

3.1.3 Test environment

Unless otherwise stated, measurements shall be carried out at 23 ± 3 °C (73 ± 5 °F), 40 to 60 % relative humidity, after 24 h of acclimatization. Tests shall be carried out with the disk pack in the upright position, unless otherwise stated.

3.2 Resistance to shock and vibration

The disk pack shall withstand exposure to shock and/or vibration and still meet all dimensional and functional specifications of this International Standard.

A recommended test procedure is described in annex B. Any damage to the cover shall not be a failure criterion.

3.3 Materials

Unless otherwise stated, the disk pack may be constructed from any suitable materials so long as the dimensional, inertial and other functional requirements of this International Standard are maintained. The material and surface finish of the sector disk shall permit reading of the notches by eddy current and optical transducers.

The materials and design of the disk pack shall be based on an intended lifetime of minimum 5 years.

4 PHYSICAL REQUIREMENTS

4.1 Dimensions

Some dimensions shown in figures 1, 3 and 6 are given with respect to a reference line; the reference line is the line on which rests a reference ball having a diameter of 38,894 mm (1.531 25 in).

4.1.1 Overall height (see figure 1)

The overall height of the disk pack with top and bottom covers is

$$h_1 \leq 115 \text{ mm (4.5 in).}$$

4.1.2 Top cover (see figure 1)

4.1.2.1 OUTSIDE DIAMETER

The outside diameter of the top cover is

$$d_1 \leq 370 \text{ mm (14.55 in)}$$

4.1.2.2 CONCENTRICITY

The top cover shall be concentric with the cover centreline within 1,0 mm (0.04 in) total indicated runout.

4.1.2.3 VERTICAL CLEARANCE

The vertical clearance between the lower edge of the top cover and the reference line is

$$h_2 \geq 10 \text{ mm (0.39 in).}$$

4.1.3 Hub (see figure 3)

4.1.3.1 HEIGHT OF THE HUB

The height of the hub is

$$h_3 = 35,3 \pm 0,4 \text{ mm (1.390} \pm 0.015 \text{ in).}$$

4.1.3.2 BORE RELIEF

In a zone having a height

$$h_4 = 20,6 \pm 1,5 \text{ mm (0.81} \pm 0.06 \text{ in)}$$

extending above height

$$h_5 = 6,3 \pm 0,8 \text{ mm (0.25} \pm 0.03 \text{ in)}$$

the bore can be relieved.

4.1.3.3 HEIGHT OF THE HUB OVER THE REFERENCE LINE

The height of the hub over the reference line is

$$h_6 = 21 \pm 0,5 \text{ mm (0.822} \pm 0.012 \text{ in).}$$

4.1.3.4 TAPER

The taper of the hub bore is

$$(1 \pm 0,000 2) : 2.$$

4.1.3.5 FINISH OF THE BORE

The finish shall be of class N7 to N6 [1,6 to 0,8 μm (63 to 32 μin) arithmetical mean deviation; see ISO/R 1302].

4.1.4 Spindle lock (see figures 3 and 4)

4.1.4.1 THREAD OF THE SPINDLE LOCK

The thread of the spindle lock is a two-start thread of type 8NS-2A or 16 UNC-2A. The nominal diameter is

$$d_2 = 9,52 \text{ mm (3/8 in).}$$

4.1.4.2 FULL THREAD LENGTH

The full thread length is

$$h_7 \geq 7,4 \text{ mm (0.29 in).}$$

4.1.4.3 CHAMFER

The lower end of the spindle lock presents a chamfer having an inner diameter of

$$d_3 = 7,4 \pm 0,2 \text{ mm (0.293} \pm 0.008 \text{ in)}$$

and an angle

$$\gamma = 30 \pm 2^\circ.$$

4.1.4.4 LOCATION OF THE FLANGE OF THE SPINDLE LOCK

The flange of the spindle lock is located with regard to the reference line at a distance of

$$h_8 = 59,048 \begin{smallmatrix} + 0,175 \\ - 0,255 \end{smallmatrix} \text{ mm (2.325} \begin{smallmatrix} + 0,007 \\ - 0,010 \end{smallmatrix} \text{ in).}$$

4.1.4.5 LENGTH OF THE LOWER PART OF THE SPINDLE LOCK

The length of the lower part of the spindle lock is

$$h_9 = 19,65 \pm 0,15 \text{ mm (0.774} \pm 0.006 \text{ in).}$$

4.1.4.6 DIAMETER OF THE LOWER PART OF THE SPINDLE LOCK

The diameter of the lower part of the spindle lock with the safety balls expanded is

$$d_4 \leq 10,97 \text{ mm (0.432 in).}$$

The safety balls must not extend before the lockshaft pin is at a distance

$$h_{22} \leq 18,5 \text{ mm (0.728 in)}$$

from the flange of the spindle lock. The safety balls must cease to expand when the lockshaft is at a distance

$$h_{23} \geq 14,3 \text{ mm (0.563 in)}$$

from the flange of the spindle lock.

The diameter with relaxed balls is

$$d_5 \leq 9,65 \text{ mm (0.38 in).}$$

4.1.4.7 LOCATION OF THE SAFETY BALLS

The centres of the safety balls are located with regard to the spindle lock flange at a distance

$$h_{10} = 8,66 \pm 0,24 \text{ mm } (0.341 \pm 0.009 \text{ in}).$$

4.1.4.8 HOLE FOR THE PENETRATION OF THE LOCKSHAFT PIN

The diameter of the hole for the penetration of the drive spindle lockshaft pin into the spindle lock is

$$d_6 \geq 3,0 \text{ mm } (0.12 \text{ in}).$$

4.1.4.9 DEPTH OF PENETRATION OF THE LOCKSHAFT PIN

The clearance for the penetration of the drive spindle lockshaft pin into the spindle lock must stretch to a distance from the flange of

$$h_{11} \geq 12,5 \text{ mm } (0.492 \text{ in}).$$

4.1.4.10 REMOVAL OF THE TOP COVER

It must be possible to remove the top cover when the lockshaft has penetrated into the spindle lock to a distance from the flange of

$$h_{12} = 13,8 \pm 0,5 \text{ mm } (0.543 \pm 0.020 \text{ in}).$$

4.1.5 Sector disk (see figure 5)**4.1.5.1 DIAMETER**

The diameter of the sector disk is

$$d_7 = 362,74 \pm 0,25 \text{ mm } (14.281 \pm 0.010 \text{ in}).$$

4.1.5.2 THICKNESS

The thickness of the sector disk is

$$e_1 = 1,3 \pm 0,08 \text{ mm } (0.051 \pm 0.003 \text{ in}).$$

4.1.5.3 NOTCHES

4.1.5.3.1 The sector disk has at its circumference 21 rectangular notches.

4.1.5.3.2 The angle between the leading edges of two adjacent notches in the range 1 to 20 (see figure 5) is

$$\alpha = 18^\circ \pm 4'.$$

This tolerance is not cumulative.

An additional notch, x (see figure 5), is provided between notches 1 and 2 for Index identification.

The angle between the leading edges of notches 1 and x is

$$\beta = 2^\circ 23' \pm 4'.$$

4.1.5.3.3 The radial depth of the notches is limited by the radius

$$r_1 \leq 178,0 \text{ mm } (7.008 \text{ in}).$$

4.1.5.3.4 The width of the notches is

$$e_2 = 1,9 \pm 0,2 \text{ mm } (0.075 \pm 0.008 \text{ in}).$$

4.1.5.3.5 The distance from the bottom surface of the sector disk to the reference line (see figure 6) is

$$h_{13} = 17,95 \pm 0,55 \text{ mm } (0.707 \pm 0.022 \text{ in}).$$

4.1.5.3.6 All edges and corners can have a radius

$$r_2 \leq 0,4 \text{ mm } (0.015 \text{ in}).$$

4.1.6 Disk support (see figure 6)

The radius is

$$r_3 \leq 95,3 \text{ mm } (3.75 \text{ in}).$$

4.1.7 Recording disks (see figures 6 and 7)**4.1.7.1 DIAMETER**

The diameter of all disks is

$$d_8 = 356,4 \begin{smallmatrix} 0 \\ -0,25 \end{smallmatrix} \text{ mm } (14.03 \begin{smallmatrix} 0 \\ -0,01 \end{smallmatrix} \text{ in}).$$

4.1.7.2 THICKNESS

The thickness of the disks is

$$e_3 = 1,27 \pm 0,05 \text{ mm } (0.050 \pm 0.002 \text{ in}).$$

4.1.7.3 DISK EDGE RELIEF

For a distance

$$e_4 \leq 1,3 \text{ mm } (0.05 \text{ in})$$

from the outside edge of the recording disk, the disk contour may be relieved within the extended boundaries of the disk surfaces.

4.1.8 Location of the disks (see figure 6)

The disks are located with regard to the reference line as follows :

1st disk :

distance from the upper surface to the reference line :

$$h_{14} = 20,83 \pm 0,52 \text{ mm } (0.820 \text{ 0} \pm 0.020 \text{ 5 in}).$$

2nd disk to 6th disk :

distance from the lower surface to the reference line :

$$h_{15} = 29,72 \pm 0,51 \text{ mm } (1.170 \text{ 0} \pm 0.020 \text{ 0 in})$$

$$h_{16} = 39,88 \pm 0,45 \text{ mm } (1.570 \text{ 0} \pm 0.017 \text{ 5 in})$$

$$h_{17} = 50,04 \pm 0,37 \text{ mm } (1.970 \text{ 0} \pm 0.014 \text{ 5 in})$$

$$h_{18} = 60,20 \pm 0,43 \text{ mm } (2.370 \text{ 0} \pm 0.017 \text{ 0 in})$$

$$h_{19} = 70,36 \pm 0,50 \text{ mm } (2.770 \text{ 0} \pm 0.019 \text{ 5 in}).$$

4.1.9 Clearance of lowest element (see figure 6)

The clearance of the lowest element of the disk pack is

$$h_{20} \geq 12 \text{ mm (0.474 in)}$$

in the area between a radius r_4 and a radius r_5 :

$$r_4 \geq 74 \text{ mm (2.913 in)},$$

$$r_5 \leq 90 \text{ mm (3.543 in)}.$$

Inside r_4 the clearance shall be not less than the minimum value of h_6 (see 4.1.3.3).

4.1.10 Overall height without top cover (see figure 6)

The overall height of the disk pack without cover above the reference line is

$$h_{21} \leq 95,3 \text{ mm (3.75 in)}.$$

4.1.11 Hub/disks relationship

4.1.11.1 AXIAL RUNOUT OF DISKS

The axial runout of the recording disks and of the sector disk at any diameter is included in the dimensions of 4.1.8.

The actual axial runout (i.e. the total indicator reading), at any speed up to the maximum specified in 4.4, shall not exceed

0,3 mm (0.012 in) for the recording disks,

0,5 mm (0.02 in) for the sector disk.

4.1.11.2 ACCELERATION OF AXIAL RUNOUT

The acceleration of the disk surface in the axial direction shall not exceed 280 m/s^2 ($11\,000 \text{ in/s}^2$) at any speed within the range 2 352 to 2 448 rev/min.

4.1.11.3 HORIZONTAL RUNOUT OF DISKS

The total indicated horizontal runout is

a) for the sector disk and the bottom two recording disks : 0,25 mm (0.01 in) maximum,

b) for the other disks : 0,5 mm (0.02 in) maximum.

4.1.11.4 ANGULAR SHIFT BETWEEN DISKS AND HUB

After the disk pack has experienced a positive or negative acceleration up to $3\,000 \text{ rad/s}^2$, the angular shift between disks and hub must remain equal to zero when measured with a device capable of detecting a shift of 3'' of arc.

4.1.12 Location of magnetic surface

The area of the magnetic coating extends from an inside diameter of 208,3 mm (8.20 in) maximum to an outside diameter of 353,0 mm (13.90 in) minimum.

4.2 Moment of inertia

The moment of inertia of the disk pack without covers shall not exceed $57 \text{ g}\cdot\text{m}^2$ ($195 \text{ lb}\cdot\text{in}^2$).

4.3 Balance

The disk pack shall be balanced within 200 g·mm (0.28 oz·in) in a single plane parallel to the disk surfaces. This plane is located $68 \pm 3 \text{ mm}$ ($2.71 \pm 0.12 \text{ in}$) above the reference line.

4.4 Maximum speed

The disk pack shall be capable of withstanding the effect of stress at a speed of 2 500 rev/min counter-clockwise as seen from the top.

4.5 Locking pull

The disk pack shall be held to the disk drive spindle by a force of $925 \pm 145 \text{ N}$ ($206 \pm 32 \text{ lbf}$), exerted by the downward pull of the disk drive lockshaft on the disk pack spindle lock.

4.6 Air feed openings

At least 12 openings having a minimum total area of 710 mm^2 (1.1 in^2) are equally distributed around the disk support between each pair of recording disks.

4.7 Air filter

4.7.1 Filter media

The filter media shall be a screen-type construction having a maximum spacing between strands of $44 \mu\text{m}$ (0.001 73 in). The material shall not contain tendrils or loose particles which can separate from the filter and enter the filtered system.

4.7.2 Air flow and pressure drop

The pressure drop across a clean air filter shall not exceed 11 mm (0.43 in) of water while passing $0,95 \pm 0,1 \text{ m}^3$ ($33 \pm 2 \text{ ft}^3$) of air per minute.

4.8 Air flow

Figure 8 shows the test configuration for air flow measurements. With the disk pack rotating at $2\,400 \pm 48 \text{ rev/min}$, the static pressure drop measured at the static pressure tap shall not exceed 13,5 mm (0.53 in) of water with an air flow through the disk pack of $0,95 \pm 0,1 \text{ m}^3$ ($33 \pm 2 \text{ ft}^3$) per minute of air measured at the air intake.

4.9 Thermal time constant

Within the conditions specified in 4.8, the disk pack thermal time constant shall not exceed 1 min. The thermal time constant is defined as the time required to reduce an initial temperature difference between the pack and the drive by 2/3.

4.10 Operational earthing

The disk pack shall provide a discharge path from the disks to the drive spindle through the hub mechanism.

4.11 Physical characteristics of magnetic surfaces

4.11.1 Surface roughness

The finished magnetic surface shall have a surface roughness less than $0,09 \mu\text{m}$ ($3.5 \mu\text{in}$), arithmetic average, with a maximum deviation in height of $0,76 \mu\text{m}$ ($30 \mu\text{in}$) from the average, when measured with a $0,0025 \text{ mm}$ (0.0001 in) stylus and a $0,75 \text{ mm}$ (0.03) cut-off range.

4.11.2 Durability of magnetic surface

4.11.2.1 RESISTANCE TO CHEMICAL CLEANING FLUID

The magnetic surface of recording disks shall not be adversely affected when cleaned with a mixture consisting of 91 parts by volume of reagent grade isopropyl alcohol and 9 parts by volume of distilled or deionized water.

4.11.2.2 COATING ADHESION

The nature of the coating shall be such as to ensure wear resistance under operating conditions and maintenance of adhesion and abrasive wear resistance. Suggested tests for checking the durability of the coating are given in annex C.

4.11.2.3 ABRASIVE WEAR RESISTANCE

The coating shall be able to withstand operational wear. A possible test method is described in annex C.

5 MAGNETIC REQUIREMENTS

5.1 Track and recording information

5.1.1 Surface geometry

The recording transducers are disposed as in figure 9. Head and surface details are as below (surfaces taken consecutively from top).

Number (head or surface)	Type	Head orientation
0	B	up
1	A	down
2	A	up
3	B	down
4	B	up
5	A	down
6	A	up
7	B	down
8	B	up
9	A	down

5.1.2 Track geometry

5.1.2.1 NUMBER OF TRACKS

There are 203 discrete concentric tracks per disk surface.

5.1.2.2 WIDTH OF TRACK

The recorded track width on the disk surface shall be $0,140 \pm 0,013 \text{ mm}$ ($0.0055 \pm 0.0005 \text{ in}$). The area between the tracks shall be erased.

A suggested method of measuring effective track width is given in annex D.

5.1.2.3 TRACK LOCATIONS

5.1.2.3.1 Nominal locations

The geometry of the head disk system is defined in figure 9. The basic dimensions are :

- incremental head movement

$$S = 0,2567 \text{ mm (0.010106 in)}$$

- lesser gap distance

$$F_A = 10,861 \text{ mm (0.4276 in)}$$

- greater gap distance

$$F_B = 11,999 \text{ mm (0.4724 in)}$$

- centreline radius of track 73

$$R_{73} = 146,507 \text{ mm (5.7680 in)}$$

- head offset angle

$$\theta = 4^\circ 54'$$

The nominal track centreline radii derived from these basic dimensions are given in table 1.

5.1.2.3.2 Track location tolerance

The centreline of the recorded tracks, measured at $23 \pm 1^\circ\text{C}$ ($73 \pm 2^\circ\text{F}$), shall be within $\pm 0,025 \text{ mm}$ ($\pm 0.001 \text{ in}$) of the nominal positions.

NOTE — At other temperatures (within those specified in 3.1) the nominal track centreline can be calculated using an appropriate coefficient of linear expansion; for example, aluminium alloys : $24 \times 10^{-6}/^\circ\text{C}$ ($13.3 \times 10^{-6}/^\circ\text{F}$).

5.1.2.3.3 Recording offset angle

At the instant of writing or reading a magnetic transition, it shall make an angle of $4^\circ 54' \pm 30'$ with the appropriate line of access as defined in figure 9.

5.1.2.4 IDENTIFICATION

For the purpose of testing, the following identifying system is used.

5.1.2.4.1 Track identification

Track identification shall be by a three-digit decimal number (000 to 202) which counts tracks consecutively starting at the outermost track.

5.1.2.4.2 Surface identification

Surfaces shall be numbered 00 to 09 corresponding with the surface numbers of 5.1.1.

5.1.2.4.3 Cylinder address

A cylinder is defined as all tracks on the disk pack with a common track identification number.

5.1.2.4.4 Track address

A five-digit number is used for track address, with the three most significant digits defining the cylinder address and the remaining two digits defining the surface address.

5.1.2.5 INDEX

The index point of each track is the starting and ending point of the track. Its location is established as the angular difference between the access centreline and the leading edge of notch x , when corrected for the head gap displacement F_A and F_B as defined in figure 10 where the angle is $\epsilon = 69^\circ 0' 54''$.

5.1.2.6 TEST AREAS

5.1.2.6.1 Header area

For the purpose of testing, the header area is defined as that area starting not later than $100\mu s$ after index and ending not sooner than $700\mu s$ after index with the disk pack rotating at 2 400 rev/min.

5.1.2.6.2 Data area

For the purpose of testing, the data area is defined as that area starting not later than $700\mu s$ after index and continuing to the next index with the disk pack rotating at 2 400 rev/min.

5.2 Test conditions

5.2.1 General conditions

5.2.1.1 ROTATIONAL SPEED

The rotational speed shall be $2\,400 \pm 24$ rev/min.

5.2.1.2 TEMPERATURE

The temperature of the air entering the disk pack shall be $27 \pm 1^\circ C$ ($80 \pm 2^\circ F$).

5.2.1.3 RELATIVE HUMIDITY

The relative humidity of the air entering the disk pack shall be between 40 and 60 %.

5.2.2 Reference standards

5.2.2.1 STANDARD REFERENCE SURFACES

The standard reference surfaces are surfaces held by the National Bureau of Standards (Gaithersburg, U.S.A.) or other approved agencies as the reference by which all secondary standard reference surfaces will be calibrated. The standard reference surfaces shall be correlated between the NBS and the other agencies.

5.2.2.2 STANDARD REFERENCE SURFACE CHARACTERISTICS

The standard reference surfaces shall be characterized in areas designated by a scratch and defined as beginning $50\mu s$ after the edge of the scratch and ending $275\mu s$ from the same point. The mean voltage outputs when used with a test head (see 5.2.3) shall be as follows (see 5.2.4.2 for definitions of $1f$ and $2f$) :

Track 200	1f	7,5 mV
Track 200	2f	3,75 mV
Track 000	1f	11,9 mV

Those values are measured peak-to-peak with tunnel erase used.

5.2.2.3 SECONDARY STANDARD REFERENCE SURFACES

These surfaces are calibrated from the standard reference surfaces using a test transducer (see 5.2.3.1). An output calibration factor C_D is derived from

$$C_D = \frac{\text{Standard reference surface output}}{\text{Secondary standard reference surface output}}$$

where $0,90 \leq C_D \leq 1,10$.

5.2.3 Test heads

5.2.3.1 DESCRIPTION

Disk measurements will be taken with a suitable test transducer.¹⁾ The head calibration factor C_H is defined as

$$C_H = \frac{\text{Standard reference surface output}}{(\text{Actual head voltage measured}) \times C_D}$$

when measured on the tracks 000 and 200 of the secondary reference surface at $1f$ frequency. (For definition of C_D and $1f$ see 5.2.2.3 and 5.2.4.2 respectively.) To qualify as a test head, the factor C_H must be $0,90 \leq C_H \leq 1,10$ on both tracks.

1) For example, IBM 2316 (2311 type) amplitude test head is a suitable test transducer.

5.2.3.2 WRITE CURRENT

The write current at the $1f$ frequency shall be 35 mA. The write current waveform must conform to figure 11, where :

$$I_W = \frac{I_{W1} + I_{W2}}{2} = 35 \pm 1 \text{ mA}$$

Overshoot = 6 to 10 % I_W

$T_R \leq 200 \text{ ns}$

$T_F \leq 200 \text{ ns}$

NOTE — With any disk this current must be above the saturation point defined as that current above which no measurable increase occurs in the read-back signal amplitude.

5.2.4 Test parameters

5.2.4.1 DC ERASE

The DC current supplied to the read/write element when DC erase is specified shall be $35 \pm 1 \text{ mA}$.

5.2.4.2 TEST SIGNALS

The frequency specified as $1f$ shall be $(125 \pm 0,125) \times 10^4$ transitions per second.

The frequency specified as $2f$ shall be $(250 \pm 0,250) \times 10^4$ transitions per second.

5.2.4.3 TUNNEL ERASE

Tunnel erase shall be used for all tests unless otherwise indicated.

5.2.4.4 MAGNETIC RECORDING

Unless otherwise specified, all write operations shall be preceded by one DC erase operation.

5.2.4.5 LOCATIONS

The track quality test requirements (see 5.3.2) shall be met anywhere within 0,025 mm (0.001 in) of the nominal track positions in table 1.

5.3 Functional testing

5.3.1 Surface tests

5.3.1.1 OVERWRITE

5.3.1.1.1 Procedure

Write at $1f$ at track 000. Without DC erase overwrite at $2f$. Measure the average amplitude of $2f$ signal and of $1f$ signal by a frequency selective millivoltmeter.

5.3.1.1.2 Result

The overwrite residual amplitude is defined as

$$\frac{\text{Average amplitude of selectively measured } 1f \text{ signal after overwrite with } 2f}{\text{Average amplitude of selectively measured } 2f \text{ signal}} \times 100 \%$$

The overwrite residual amplitude shall not be higher than 5,5 %.

5.3.1.2 AMPLITUDE TEST

5.3.1.2.1 Procedure

Write on any part of the recording surface at $1f$.

5.3.1.2.2 Result

The read-back amplitude averaged over any 500 μs interval shall be as follows :

Minimum voltage output $\geq 75 \%$ of the $1f$ reference voltage at track 200.

Maximum voltage output $\leq 150 \%$ of the $1f$ reference voltage at track 000.

5.3.1.3 RESOLUTION TEST

5.3.1.3.1 Procedure

On any part of the recording surface write at $1f$ and read back. After DC erasing, write at the same position at $2f$ and read back.

5.3.1.3.2 Result

In all cases the ratio

$$\frac{\text{Amplitude (peak to peak) at } 2f}{\text{Amplitude (peak to peak) at } 1f}$$

averaged over a 500 μs interval shall be 0,4 to 0,75.

5.3.2 Track quality tests

Two methods, A and B, are described below for the track quality tests. It is recognized that neither of them gives absolute correlation between computer and test equipment, but both give acceptable correlation.

Method A is based on a fixed voltage reference.

Method B is based on track relative voltage references.

Agreement on the use of one of them shall be made between the interchange parties.

5.3.2.1 MISSING PULSE TEST

5.3.2.1.1 Method A

Write at any track position at $1f$ and read back.