Description

This invention relates generally to magnetic disc memory apparatus and particularly to temperature compensation in the transducer positioning system in a disc drive.

Disc drive machines record and reproduce information stored on concentric circular tracks recorded on magnetic discs. The tracks are written and read by a magnetic transducer that cooperates with the surface of the disc. Many disc drives today employ pulley band mechanisms driven by stepper motors to position the read/ write heads. For example, a detailed disclosure of a disc drive and especially the linear actuator for positioning the heads in alignment with a selected track on a disc is found in our U.S. Patent 4,323,939: a disclosure of a rotary actuator positioned by a stepper motor is found in our EP-A-016261.

Such drives convert rotary motion of the stepper motor shaft to linear or rotary motion of a carriage which moves the transducers carried on an end of the carriage across the disc to read and record data on concentric circular disc tracks. The drive band is wrapped around the motor shaft pulley attached to the shaft, and has its ends attached to the carriage. Rotation of the shafts wraps one end of the band on the pulley and unwraps the other, causing the carriage to move the head from track to track.

Industry requirements for greater storage capacities in ever decreasing physical package sizes demand that the tracks be spaced as closely adjacent to one another as possible.

However, this creates the problem that the heads must be very accurately positioned relative to each track, so that the heads do not land on an incorrect track or too far from the center line of a desired track. A particularly difficult situation occurs in relatively low cost rigid disc drives; in order to achieve a significant reduction in cost and complexity as demanded by the competitive nature of the business, the head actuator which positions the transducer relative to the track does not incorporate any closed loop positioning control.

Therefore, it is an objective of this invention to provide a disc drive positioning mechanism which minimizes positioning error without any closed loop feedback control system.

Because of the wide range of operating environments in which a disc drive may be utilized, it has been found that one of the critical sources of mistracking error in positioning of the head relative to the desired track is thermal expansion and contraction of the various components with changes in the ambient temperature. This is due to the fact that it is very difficult to properly match thermal expansion coefficients of the different materials which must be used in the construction of the disc drive, particularly its baseplate, spindle motor and the transducer positioning actuator. As has been already noted, the thermal off-track problem is particularly severe in an open loop drive which is common to the lower cost rigid disc industry: there is no track following servo to insure that the head is centered on the desired track, or to indicate that this tracking has occurred. The mistracking problem which may be created by variations in ambient temperature does not become evident until data has been incorrectly read or written, and even then, no inherent self-correction means exist.

Therefore, it is an objective of this invention to provide a disc drive with means to limit thermally induced off-track errors.

Thermal off-track error may be corrected, for example, by introducing additional components with varying thermal expansion rates in the positioning mechanism; however, this typically results in increased device costs.

Previously, open loop thermal mistracking has been addressed by methods such as that disclosed in US-A-3,412,386 wherein the transducer head is stationarily positioned over a zero track and from that position, the transducer head can detect non-zero signals emanating from tracks laid closely to the zero track. The presence of these non-zero signals indicates mistracking. However, in that disclosure, there is no compensation method.

In EP-A-0162614, a compensation method is disclosed utilizing the same detection method as disclosed in U.S. Patent No. 3,412,386. EP-A-O162614 also requires that the transducer head be positioned over a zero track such that while the disc rotates, the transducer head remains stationary, and compensation is effectuated.

It is an objective of this invention to provide an improved thermal off-track compensation system.

To minimize the cost of added components, an objective of this invention is to use the positioning electronics already provided in the disc drive system to provide a method for compensating for thermal mistracking error with changes in ambient temperature.

This invention provides a method for correction of thermal mistracking in a disc drive comprising a rotating disc having a plurality of spaced circular tracks for storing recorded data and actuator means for accessing the data including a carriage, means for mounting a transducer at one end of the carriage and means adjacent the periphery of the rotating disc for driving and positioning the carriage along a predetermined path to position the transducer relative to the disc and the tracks, the method comprising the steps of: defining a selected test track and a reference track on at least one side of said test track on said disc, both tracks being at

locations not accessible to the user, positioning said transducer to said test track and determining a correction for tracking in accordance with a reference signal received from said reference track: wherein, after positioning of said transducer to said test track, said transducer is moved from said test track towards said reference track in predetermined incremental microsteps which are substantially smaller than the nominal track to track distance, said reference signal is detected, the number of microsteps necessary to move said transducer from the test track to when said reference signal has been detected is used to determine the thermal shift of said transducer relative to said tracks on said disc, and the data of said determined thermal shift is applied to subsequent seeks to user accessible data tracks.

More specifically a thermal test track is defined outside the user-accessible area on the disc and a track of a known frequency is then written on either side of this thermal test track, preferably half the usual track separation distance away. To develop the thermal compensation constant, the transducer is moved to the thermal test track with no compensation applied. This way, any thermally induced off-track error, which would affect seeks to user-accessible data tracks, will be reflected in the off-track from the nominal position of the thermal test track. The transducer is now moved in a series of defined increments smaller than normal track-to-track steps, or "micro-steps," away from the uncompensated position of the thermal track toward one of the tracks written with the known frequency. When the data on the written track to the side of the thermal test track is detected, a note is made of the number of micro-steps the transducer has been moved. The transducer is then micro-stepped incrementally in the opposite direction until the data written on the other side of the thermal test track is detected. A simple comparison of these two micro-step counts will yield the existing thermal shift, which can be converted into a thermal compensation constant for the transducer positioning mechanism by means of a simple look-up table.

Of course, some time is needed to carry out this thermal correction function. Therefore, in a preferred embodiment of the invention, to minimize the time lost in performing this function during a seek operation, the function is only carried out when a thermistor which is incorporated in the disc drive registers a change in ambient temperature of, for example, 5-10.

The invention can be better understood together with its advantages and features by reference to the accompanying drawings wherein:

FIG 1 is a plan view of a stepper motor driven actuator and data recording disc in which this invention may be incorporated;

FIG 2 is a layout of an example of the thermal test track and adjacent data tracks used in the thermal compensation system of this invention;

FIG 3 is a simple block diagram of the electrical elements in the disc drive controller system used to carry out the operating sequence of this invention; and

FIG 4 is a flow diagram of the sequence of steps which is utilized to carry out the thermal compensation and correction features of this invention.

Referring particularly to FIG 1, it shows a transducer 10 which is mounted on a flexure 20 attached to an actuator arm 21 to be positioned by a movement of a drive arm 32 on any data track of a disc 12. The disc 12 is driven in constant rotation by a spindle motor 25. The positioning of the actuator is carried out by the stepper motor 30 which drives a pulley 36 connected through a flexible band 38 to the head portions 19a, 19b of the actuator arm 32. With rotation of the motor pulley 36, the portion of flexible band 38 wind and unwind on the pulley 36, moving the transducer 10 from track to track. This is accomplished under control of the microprocessor 40 shown schematically in the corner of the disc drive; this provides the control signals to the stepper motor 30 in response to externally received seek commands. Such seek commands are received whenever the transducer is to be moved from its current position to a newly addressed track.

Referring to FIG 2, a thermal test track is defined at an area of the disc surface not accessible to the user of the disc, in this example, outside of track 0 (i.e., toward the outer diameter of disc 12). As shown in detail in FIG 2, the thermal test track in this example is track -3. A constant frequency level, selected in this case to be 1.8 MHz is written 50% track distance away from the center of the thermal test track on each side of the track.

As noted above, it would be impractical to determine the thermal compensation factor for every seek operation. This would greatly slow user accesses to the disc drive. Instead, there is a set of temperature sensing logic incorporated herein and shown generally as thermistor circuits 72 on FIG 3. Included in the thermistor circuits 72 is a thermistor or other temperature sensing device and associated circuitry for determining when a temperature change has occurred which exceeds a preselected significant range. This range, in the example, has been set at 5 intervals. When the temperature monitoring circuitry determines that the operating temperature has increased or decreased beyond this 5 range, a logic flag is set in the thermistor circuits 72 and remains set until acknowledged and

cleared by the microprocessor 40. This acknowledgment will not occur until the host computer in the system employing the disc drive commands the disc drive to seek to a new track.

This sequence of events is perhaps best understood in conjunction with the flow diagram of FIG 4. Upon receipt of the seek command 70, the microprocessor will poll the logic flag in the thermistor circuits 72 to determine if the operating temperature of the disc drive has changed significantly (more than 5) since the last prior seek command (step 71). As the flow diagram of FIG 3 shows, if no significant temperature change has occurred (i.e., the flag is not set), the disc drive seeks to the addressed track (step 90) applying the thermal correction last obtained (step 92). If, however, the flag is set, the microprocessor then clears the flag (step 72) and enters the sequence to determine a new thermal compensation factor by initiating a special seek to the thermal test track 60 (step 73).

When the head is moved to the thermal test track 60 without any compensation made for thermal expansion or contraction, it will still be positioned between the two test data tracks (62, 64 of FIG 2) prerecorded with the known frequency.

Once the head is landed at track 60, the first micro-step toward one of the special data track 62, 64 is taken as shown at block 74. The frequency discriminator 50 is read, as shown at step 76. If an up level is detected, the head has already reached the test data track 62 or 64 and the count used to reach that position is stored. As shown in the decision block 78, if no data has yet been read, a further step is taken and the sequence returns to block 74. Only four steps are taken in the search for the recorded data level because a series of four micro-steps, each equivalent to 3% of the track-to-track distance, will represent 12% of the distance between tracks (or 24% of the distance between the thermal test track 60 and the test data tracks 62, 64), and the mechanical design of the disc drive is such that greater errors cannot be thermally induced.

Closer examination of FIG 2 will yield a greater appreciation of this. In disc drives designed using current technology, a guard band is included between adjacent tracks which is approximately 20% of the track-to-track distance. If the test data tracks 62, 64 are thought of as normal data tracks, then the thermal test track 60 will be located at the center of the guard band between the two recorded known frequencies, with a maximum of 10% of this guard band on either side of the nominal position of the thermal test track.

After locating the first of the test data tracks, the microstepper proceeds to return to the thermal track 60 and step in the opposite direction looking for a written data track. This is shown at blocks 81 82. Again, with each micro-step in the direction of the opposite test data track, the frequency discriminator is read as shown at step 84 looking for an up level as shown at step 86. When the test data track is found, the count of micro-steps is stored. Based on the data stored from these sequences of transducer steps and readings generated by the frequency discriminator 50, a thermal correction can be calculated at 88.

The transducer 10 is now moved to the commanded track as shown in block 90. When the track is reached the developed thermal correction is applied as shown at step 92 to accurately position the transducer 10 over the track.

The seek sequence is now complete, and the thermal correction is stored so that until another significant shift in ambient temperature occurs, the same thermal correction can be applied in each instance.

A person of skill in the disc drive art who studies this invention disclosure may realize that modification can be made to the preferred embodiment which has been described above. For example, a track of test data may be written on only one side of the thermal test track 60, or the development of a thermal compensation constant may be carried out at regular intervals, rather than with significant changes in ambient temperature. Therefore, the scope of the present invention is to be limited only by the following claims.

Claims

1. A method for correction of thermal mistracking in a disc drive comprising a rotating disc (12) having a plurality of spaced circular tracks for storing recorded data and actuator means for accessing the data including a carriage, means for mounting a transducer (10) at one end of the carriage and means adjacent the periphery of the rotating disc for driving and positioning the carriage along a predetermined path to position the transducer relative to the disc and the tracks, the method comprising the steps of: defining a selected test track and a reference track on at least one side of said test track on said disc (12), both tracks being at locations not accessible to the user, positioning said transducer (10) to said test track and determining a correction for tracking in accordance with a reference signal received from said reference track; characterised in that, after positioning of said transducer to said test track said transducer is moved from said test track towards said reference track in predetermined incremental microsteps which are substantially smaller than the nominal track to track dis-

cleared by the microprocessor 40. This acknowledgment will not occur until the host computer in the system employing the disc drive commands the disc drive to seek to a new track.

This sequence of events is perhaps best understood in conjunction with the flow diagram of FIG 4. Upon receipt of the seek command 70, the microprocessor will poll the logic flag in the thermistor circuits 72 to determine if the operating temperature of the disc drive has changed significantly (more than 5) since the last prior seek command (step 71). As the flow diagram of FIG 3 shows, if no significant temperature change has occurred (i.e., the flag is not set), the disc drive seeks to the addressed track (step 90) applying the thermal correction last obtained (step 92). If, however, the flag is set, the microprocessor then clears the flag (step 72) and enters the sequence to determine a new thermal compensation factor by initiating a special seek to the thermal test track 60 (step 73).

When the head is moved to the thermal test track 60 without any compensation made for thermal expansion or contraction, it will still be positioned between the two test data tracks (62, 64 of FIG 2) prerecorded with the known frequency.

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After locating the first of the test data tracks, the microstepper proceeds to return to the thermal track 60 and step in the opposite direction looking for a written data track. This is shown at blocks 81, 82. Again, with each micro-step in the direction of the opposite test data track, the frequency discriminator is read as shown at step 84 looking for an up level as shown at step 86. When the test data track is found, the count of micro-steps is stored. Based on the data stored from these sequences of transducer steps and readings generated by the frequency discriminator 50, a thermal correction can be calculated at 88.

The transducer 10 is now moved to the commanded track as shown in block 90. When the track is reached the developed thermal correction is applied as shown at step 92 to accurately position the transducer 10 over the track.

The seek sequence is now complete, and the thermal correction is stored so that until another significant shift in ambient temperature occurs, the same thermal correction can be applied in each instance.

A person of skill in the disc drive art who studies this invention disclosure may realize that modification can be made to the preferred embodiment which has been described above. For example, a track of test data may be written on only one side of the thermal test track 60, or the development of a thermal compensation constant may be carried out at regular intervals, rather than with significant changes in ambient temperature. Therefore, the scope of the present invention is to be limited only by the following claims.

Claims

1. A method for correction of thermal mistracking in a disc drive comprising a rotating disc (12) having a plurality of spaced circular tracks for storing recorded data and actuator means for accessing the data including a carriage, means for mounting a transducer (10) at one end of the carriage and means adjacent the periphery of the rotating disc for driving and positioning the carriage along a predetermined path to position the transducer relative to the disc and the tracks, the method comprising the steps of: defining a selected test track and a reference track on at least one side of said test track on said disc (12), both tracks being at locations not accessible to the user, positioning said transducer (10) to said test track and determining a correction for tracking in accordance with a reference signal received from said reference track; characterised in that, after positioning of said transducer to said test track said transducer is moved from said test track towards said reference track in predetermined incremental microsteps which are substantially smaller than the nominal track to track dis-

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tance, said reference signal is detected, the number of microsteps necessary to move said transducer from the test track to when said reference signal has been detected is used to determine the thermal shift of said transducer relative to said tracks on said disc (12), and the data of said determined thermal shift is applied to subsequent seeks to user accessible data tracks.

2. A method as claimed in Claim 1, characterised in that a reference signal is recorded on either side of the test track, and in that the transducer is moved towards each of said reference signal positions to detect the recorded signal on each side of the test track, the thermal shift of said transducer relative to said disc tracks then being calculated.

3. A method as claimed in Claim 2, characterised in that no signal is recorded on said test track, said transducer reading only noise when centered on said test track.

4. A method as claimed in any of Claims 1 to 3, characterised in that said reference signal is recorded along a line about 50% of the distance between the thermal test track and the next adjacent track on the disc.

5. A method as claimed in any of Claims 1 to 4, characterised in that the disc drive includes a temperature sensing means for monitoring the operating temperature of the drive, said method including the steps of periodically sensing the ambient temperature of the disc drive, and moving the transducer to the test track in response to sensing a defined change in ambient temperature.

6. A method as claimed in Claim 5, characterised in that said defined change in ambient temperature is at least 5°C.

7. A method as claimed in Claim 1, further comprising:

during seek cycles of the transducer (10) periodically moving said transducer to said test track,

developing a compensation constant to accurately position said transducer (10) from said test track toward each of said recorded reference signals to detect the reference signal recorded thereon,

determing the distance moved toward each of said tracks from said test tracks, and

developing the compensation constant from said distance.

8. A method as in Claim 7, characterised in that no signal is recorded on said test track, said transducer reading only noise when centered on said test track.

9. A method as in Claim 7 or Claim 8, characterised in that said reference signal is recorded along a line about 50% of the distance between the thermal test track and the next adjacent track on the disc.

10. A method as in Claim 9, characterised in that the disc drive includes a temperature sensing means for monitoring the operating temperature of the drive, said method including the steps of periodically sensing the ambient temperature of the disc drive, and moving the transducer to the test track in response to sensing a defined change in ambient temperature.

Patentansprüche

1. Verfahren zur Korrektur thermisch bedingter Spurfehler in einem Plattenlaufwerk mit einer sich drehenden Platte (12) mit mehreren voneinander beabstandeten kreisförmigen Spuren zur Speicherung eingegebener Daten und Stellantriebsmitteln für den Zugriff auf die Daten, einschließlich eines Schlittens, Mitteln zur Montage eines Meßwandlers (10) auf einem Ende des Schlittens und neben dem Umfang der sich drehenden Platte gelegenen Mitteln zum Antreiben und Positionieren des Schlittens entlang eines vorbestimmten Pfades, um den Meßwandler in bezug auf die Platte und die Spuren zu positionieren, wobei dieses Verfahren folgende Schritte aufweist:
Definierung einer ausgewählten Prüfspur und einer Referenzspur auf mindestens einer Seite der Prüfspur auf dieser Platte (12), wobei beide Spuren so angeordnet sind, daß vom Benutzer nicht auf sie zugegriffen werden kann,
Positionierung des Meßwandlers (10) auf die Prüfspur und Bestimmung einer Korrektur der Spursteuerung in Übereinstimmung mit einem von der Referenzspur empfangenen Referenzsignal, dadurch gekennzeichnet, daß nach der Positionierung des Meßwandlers auf der Prüfspur der Meßwandler in festgelegten Inkremental-Mikroschritten von der Prüfspur in Richtung auf die Referenzspur bewegt wird, wobei die Mikroschritte wesentlich kleiner sind als der Nennabstand zwischen den beiden Spuren, daß das Referenzsignal erfaßt wird, daß die Anzahl der Mikroschritte, die erforderlich sind, um den Meßwandler von der Prüfspur bis zur Erfassung des Referenzsignals zur Referenz-

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spur zu bewegen, dazu verwendet wird, die thermisch bedingte Abweichung des Meßwandlers in bezug auf die Spuren auf der Platte (12) zu bestimmen, und daß die Daten der bestimmten thermisch bedingten Abweichung auf nachfolgende Überprüfungen derjenigen Datenspuren angewendet werden, auf die der Benutzer zugreifen kann.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß ein Referenzsignal zu beiden Seiten der Prüfspur aufgezeichnet wird, und daß der Meßwandler in Richtung auf jede der Referenzsignalpositionen bewegt wird, um das aufgezeichnete Signal zu beiden Seiten der Prüfspur zu erfassen, und daß daraufhin die thermische Abweichung des Meßwandlers in bezug auf die Plattenspuren berechnet wird.

3. Verfahren nach Anspruch 2, dadurch gekennzeichnet, daß kein Signal auf der Prüfspur aufgezeichnet ist und der Meßwandler nur ein Rauschen liest, wenn er auf dieser Prüfspur zentriert wird.

4. Verfahren nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß das Referenzsignal entlang einer Linie aufgezeichnet ist, die sich etwa in der Mitte des Abstands zwischen der thermischen Prüfspur und der nächsten, danebenliegenden Spur auf der Platte befindet.

5. Verfahren nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß das Plattenlaufwerk mit Mitteln zur Temperaturerfassung für die Überwachung der Betriebstemperatur des Laufwerks ausgestattet ist, wobei dieses Verfahren die Schritte zur periodischen Erfassung der Umgebungstemperatur des Plattenlaufwerks und zur Weiterführung des Meßwandlers auf die Prüfspur als Reaktion auf die Erfassung einer bestimmten Veränderung der Umgebungstemperatur umfaßt.

6. Verfahren nach Anspruch 5, dadurch gekennzeichnet, daß diese bestimmte Veränderung der Umgebungstemperatur mindestens 5 °C beträgt.

7. Verfahren nach Anspruch 1, das des weiteren umfaßt: periodische Weiterführung des Meßwandlers zur Prüfspur während der Überprüfungszyklen des Meßwandlers (10),

Entwicklung einer Ausgleichskonstanten zur genauen Positionierung des Meßwandlers (10) von der Prüfspur auf jedes der aufgezeichneten Referenzsignale, um das aufgezeichnete Referenzsignal zu erfassen,

Bestimmung des zurückgelegten Abstands zwischen den einzelnen Spuren von der Prüfspur aus, und

Entwicklung der Ausgleichskonstanten auf der Basis dieses Abstands.

8. Verfahren nach Anspruch 7, dadurch gekennzeichnet, daß auf der Prüfspur kein Signal aufgezeichnet ist und der Meßwandler nur Rauschen liest, wenn er auf der Prüfspur zentriert wird.

9. Verfahren nach Anspruch 7 oder Anspruch 8, dadurch gekennzeichnet, daß das Referenzsignal entlang einer Linie aufgezeichnet ist, die sich etwa in der Mitte des Abstands zwischen der thermischen Prüfspur und der nächsten, danebenliegenden Spur auf der Platte befindet.

10. Verfahren nach Anspruch 9, dadurch gekennzeichnet, daß das Plattenlaufwerk mit Mitteln zur Temperaturerfassung für die Überwachung der Betriebstemperatur des Laufwerks ausgestattet ist, wobei dieses Verfahren die Schritte zur periodischen Erfassung der Umgebungstemperatur des Plattenlaufwerks und zur Weiterführung des Meßwandlers auf die Prüfspur als Reaktion auf die Erfassung einer bestimmten Veränderung der Umgebungstemperatur umfaßt.

Revendications

1. Procédé pour la correction de l'erreur de poursuite thermique dans une unité de disques comprenant un disque en rotation (12) ayant une pluralité de pistes circulaires espacées pour stocker des données enregistrées et un moyen de positionnement comportant un chariot pour accéder aux données, un moyen de montage d'un transducteur (10) à une extrémité du chariot et un moyen situé au voisinage de la périphérie du disque en rotation pour entraîner et positionner le chariot le long d'une trajectoire prédéterminée afin de positionner le transducteur par rapport au disque et aux pistes, le procédé comprenant les étapes consistant: à définir une piste de test sélectionnée et une piste de référence sur au moins un côté de ladite piste de test sur ledit disque (12), les deux pistes étant situées à des emplacements non accessibles à l'utilisateur, à positionner ledit transducteur (10) sur ladite piste de test et à déterminer une correction de poursuite en fonction d'un signal de référence reçu de ladite piste de référence; caractérisé en ce que, après positionnement dudit transducteur sur ladite piste de test, ledit transducteur est dé-

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placé de ladite piste de test vers ladite piste de référence par micro-pas incrémentiels prédéterminés qui sont sensiblement plus petits que la distance nominale de piste à piste, en ce que ledit signal de référence est détecté, en ce que le nombre de micro-pas nécessaires pour déplacer ledit transducteur depuis la piste de test jusqu'à l'instant où ledit signal de référence est détecté est utilisé pour déterminer la dérive thermique dudit transducteur par rapport auxdites pistes dudit disque (12), et en ce que la donnée concernant ladite dérive thermique est appliquée à des positionnements ultérieurs sur des pistes de données accessibles à l'utilisateur.

2. Procédé selon la revendication 1, caractérisé en ce qu'un signal de référence est enregistré de chaque côté de la piste de test, et en ce que le transducteur est déplacé vers chacune desdites positions du signal de référence pour détecter le signal enregistré de chaque côté de la piste de test, la dérive thermique dudit transducteur par rapport auxdites pistes du disque étant ensuite calculée.

3. Procédé selon la revendication 1, caractérisé en ce qu'aucun signal n'est enregistré sur la piste de test, ledit transducteur ne lisant que du bruit lorsqu'il est centré sur ladite piste de test.

4. Procédé selon l'une quelconque des revendications 1 à 3, caractérisé en ce que ledit signal de référence est enregistré le long d'une ligne couvrant environ 50% de la distance entre la piste de test thermique et la piste immédiatement adjacente sur le disque.

5. Procédé selon l'une quelconque des revendications 1 à 4, caractérisé en ce que l'unité de disques comporte un moyen de détection de la température pour contrôler la température de fonctionnement de l'unité, ledit procédé comprenant les étapes consistant à détecter périodiquement la température ambiante de l'unité de disques, et à déplacer le transducteur vers la piste de test en réponse à la détection d'une variation donnée de la température ambiante.

6. Procédé selon la revendication 5, caractérisé en ce que ladite variation donnée de la température ambiante est d'au moins 5 °C.

7. Procédé selon la revendication 1, consistant en outre:

pendant les cycles de positionnement du transducteur (10). à déplacer périodiquement le transducteur vers ladite piste de test,

à calculer une constante de compensation pour positionner avec précision ledit transducteur (10) depuis ladite piste de test vers chacune desdites pistes de référence enregistrées pour détecter le signal de référence enregistré sur celles-ci,

à déterminer la distance parcourue vers chacune desdites pistes à partir desdites pistes de test, et

à calculer la constante de compensation à partir de ladite distance.

8. Procédé selon la revendication 7, caractérisé en ce qu'aucun signal n'est enregistré sur ladite piste de test, ledit transducteur ne lisant que du bruit lorsqu'il est centré sur ladite piste de test.

9. Procédé selon la revendication 7 ou la revendication 8, caractérisé en ce que ledit signal de référence est enregistré le long d'une ligne couvrant environ 50% de la distance entre la piste de test thermique et la piste immédiatement adjacente sur le disque.

10. Procédé selon la revendication 9, caractérisé en ce que l'unité de disques comporte un moyen de détection de la température pour contrôler la température de fonctionnement de l'unité, ledit procédé comportant les étapes consistant à détecter périodiquement la température ambiante de l'unité de disques, et à déplacer le transducteur vers la piste de test en réponse à la détection d'une variation donnée de la température ambiante.

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