

Description

This invention relates to tape recording and/or reproducing apparatus and more particularly, but not exclusively, to a cue/review mode of a digital audio tape recorder of the rotary head type.

In a linear tape recorder, the speed in the fast-forward mode (FF mode) is about fifty to sixty times as fast as the speed in the normal playing mode. As compared to this speed, in a rotary head type digital audio tape recorder (sometimes called a DAT), there is the advantage that the speed in the FF mode can be made extremely high (for example, about 200 times as high as in the normal playing mode) because of the helical recording format. However, since the speed in the FF mode is very fast, it is impractical to search for a desired position on a magnetic tape while listening to the reproduced sound or observing the wound diameter of the magnetic tape, as in a linear tape recorder. To overcome this problem, in a DAT, a high speed search operation and a cue/review operation are used to locate a desired target position on the tape.

In the high speed search, rotary heads come into sliding contact with a magnetic tape feed at a high speed (for example, about 200 times as fast as the speed in the normal playing mode) which is near the speed in the FF mode or the rewind mode (REW mode). A start identification (ID) signal recorded on the tape as a sub-code is detected, and the tape feeding operation is automatically stopped when the start ID signal is detected. The start ID signal is recorded at the beginning of each music programme or the like, for about nine seconds as measured at the speed employed in the normal playing mode.

The cue/review operation is then used in a fine search of the tape at positions just before and after the tape position located by the high speed search operation or to search for a tape position, for example in the middle of a given music programme, where no start ID signal is recorded. In the cue/review operation, the magnetic tape is fed at a speed which is about three times the ordinary reproducing speed in the normal playing mode (the latter being for example, 8.15 mm/sec) and thus much slower than the speed in the FF or REW mode or in the high speed search mode. In the cue/review operation, all of the information of the sub-codes and a part of audio pulse code modulated (PCM) signals are reproduced by the rotary heads. Thus the audio PCM signals are reproduced intermittently. The head search operation can be performed while listening to the reproduced sound.

However, a problem arises in the case of making a search without executing the high speed search operation or in the case of searching for a

desired tape position where no start ID signal is recorded, while listening to the sound reproduced in the cue/review operation. Specifically, when the user of the apparatus wants to feed the tape to a position which is located before or after the current tape position by a few minutes, the tape speed, which is only about three times the ordinary reproducing speed, is so slow that it requires an inconvenient length of time to complete the search.

According to the present invention there is provided a tape recorder capable of operation at an ordinary reproducing speed and in a forward or reverse direction and comprising:

a magnetic head for scanning a magnetic tape; operating mode means for running the magnetic tape at a speed higher than said ordinary reproducing speed in a state in which said magnetic head is in contact with the magnetic tape;

operating means controllable by a user of the tape recorder for making said operating mode means inoperative; and

first speed control means for controlling the operating mode means so as to run the magnetic tape at a first speed higher than said ordinary reproducing speed;

characterized by:

second speed control means for controlling the operating mode means so as to run the magnetic tape at a second speed higher than said first speed; and

automatic switching control means responsive to said operating means for making said first speed control means operative for a predetermined period of time after said operating means is operated and for making said second speed control means operative when the operating means is continuously operated beyond the elapse of said predetermined period of time.

Thus in an embodiment of the invention a tape position which is removed from the current tape position by a few minutes as measured at normal playing speed can be promptly accessed without losing the function that a desired tape position can be searched for while listening to the reproduced sound.

For example, a magnetic tape is fed at the first speed, such as a speed that is three times the ordinary reproducing speed, for a predetermined period of time, such as five seconds after the operation switch is turned on, so that a desired tape can be searched for while listening to the reproduced sound. On the other hand, when the operation switch is continuously turned for more than a predetermined period of time, the magnetic tape is fed at the second speed, such as a speed that is sixteen times as fast as the ordinary reproducing speed, so that the tape can be transported quickly (in either direction) to a tape position

that is displaced from the current position by several minutes as measured at ordinary reproducing speed. Consequently, a desired tapé position can be found promptly as compared with apparatus in which a tape position is searched for by merely generating the sound.

The invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of an embodiment of apparatus according to the present invention; Figure 2 is a schematic diagram showing an example of operation keys in the embodiment of Figure 1; and

Figures 3A and 3B are schematic diagrams for explaining the operation of the embodiment of Figure 1.

The embodiment to be described with reference first to Figure 1 is applicable to a DAT and comprises an input terminal 1 via which an analogue audio signal is supplied to an analogue-to-digital (A/D) converter 3 through a low-pass filter (LPF) 2. The A/D converter 3 may employ, for example, 16-bit linear digitization at a sampling frequency of 48.1 kHz (or 32 kHz). The resulting digital audio signal is supplied to an error correction block 4.

The error correction block 4 is connected to a random access memory (RAM) control block 5 and a RAM 6 through a data bus 7. In Figure 1, the portion surrounded by a broken line is constructed as a one-chip integrated circuit IC. The digital audio signal is written into the RAM 6 through the data bus 7, and encoded by the error correction block 4 using a Reed-Solomon code. In this error correction encoding process, an address signal is supplied from the RAM control block 5 to the RAM 6. A sub-code input/output (I/O) interface and data modulator/demodulator are provided in the RAM control block 5.

Recording data that are converted into a recording format of the DAT and are eight to ten modulated are generated by the RAM control block 5. The recording data are supplied through a radio frequency (RF) amplifier 8 to rotary heads 9 attached to a drum having a diameter of 30 mm which is rotated to about 2000 rpm. A magnetic tape is wound around a rotational peripheral surface of the rotary drum at a wrap angle of about 90°. The recording data is recorded as oblique tracks 41 on the magnetic tape T (Figures 3A and 3B) by the rotary heads 9.

The data reproduced from the magnetic tape T by the rotary heads 9 are supplied to the RAM control block 5 through the RF amplifier 8 and subjected to a digital demodulating process. The reproduced audio data are written into the RAM 6, and decoded by the error correction block 4 using

a Reed-Solomon code. The error corrected reproduced data is supplied to a digital-to-analogue (D/A) converter 10 and converted into the analogue audio signal. The analogue audio signal is taken out to an output terminal 13 through a low-pass filter 11 and a muting circuit 12.

Motors 14 include a drum motor and a capstan motor. A drum servocircuit 15 is provided for controlling the drum motor, and a capstan servocircuit 17 is provided for controlling the capstan motor. An automatic track finding (ATF) pilot signal separated from the reproduced signal is supplied from the RF amplifier 8 to an ATF control circuit 16, by which an ATF control signal is formed. This ATF control signal is supplied to the capstan servocircuit 17.

Reel motors 18 are provided on the tape supply side and the tape take-up side, respectively. The reel motors 18 are controlled by a reel servocircuit 19 so that the torques of the supply side reel motor and the take up side reel motor are set to optimum values in accordance with the operating mode. A system controller 20 comprises, for example, a 4-bit microcomputer. The system controller 20 generates timing signals and control signals for the error correction block 4, the RAM control block 5, and the drum servocircuit 15, and also generates control data for the capstan servocircuit 17 and the reel servocircuit 19. These control data are converted into control voltages by D/A converters 21 and 22, respectively. These control voltages have voltage levels in accordance with the operating mode of the DAT.

The system controller 20 also generates a control signal to mute the generation of the reproduced sound in the cue/review operation at a speed which is about sixteen times the ordinary reproducing speed. This control signal is supplied to the RAM control block 5 to mute the digital data and is also supplied to the muting circuit 12 to mute the analogue audio signal.

In conjunction with the system controller 20, a display unit 23 to display a count value of a tape counter or a reproduction time code and operation keys 24 to designate an operating mode are provided.

Figure 2 shows an example of the operation keys 24 comprising a rewind/review (REW/REV) switch 31; a STOP switch 32; a PLAY switch 33; a fast-forward/cue (FF/CUE) switch 34; a recording (REC) switch 35; and a PAUSE switch 36.

The operation of the embodiment will now be described.

When the REW/REV switch 31 or the FF/CUE switch 34 is depressed while the tape recorder is in the stop state, the tape recorder executes the rewind or fast-forward operation. On the other hand, when the REW/REV switch 31 or the FF/CUE switch 34 is depressed while the tape recorder is in

the playing mode, the tape recorder performs the review or cue operation. In the review or cue operation, the magnetic tape is fed at a speed which

about three times the ordinary reproducing speed only for a predetermined period of time, for example about the first five seconds. Then, if the REW/REV switch 31 or the FF/CUE switch 34 remains continuously depressed, the magnetic tape is fed at a speed which is about sixteen times the ordinary reproducing speed after the elapse of the foregoing five seconds.

The switching of the tape speed is automatically performed by control signals which are sent from the system controller 20 to the capstan servocircuit 17 and the reel servocircuit 19. For this purpose, a timer circuit is provided in the system controller 20. In the fast-forward and rewind modes, the capstan and its associated pinch roller do not come into contact with the magnetic tape T, and the magnetic tape T is driven only by the respective reel motors. In the cue and review modes, however, the capstan and pinch roller come into contact with opposite sides of the magnetic tape T, thereby gripping and driving the magnetic tape.

Figure 3A shows the relation between a pattern of recording tracks 41 on the magnetic tape T in the cue mode and the scan locus of the rotary heads 9. At a speed which is about three times the ordinary reproducing speed, as shown at 42A in Figures 3A, a scan locus having an angle of inclination A1 larger than that in the normal playing mode is alternately traced by a pair of rotary heads 9. At a speed which is about sixteen times the ordinary reproducing speed, as shown at 43A, a scan locus having an inclination angle A2 larger than that formed at the foregoing three times speed is alternately traced by the pair of rotary heads 9. In the review mode and at a speed which is about three times the ordinary reproducing speed, as shown at 42B in Figure 3B, a scan locus having an inclination angle A3 smaller than that in the normal playing mode is alternately drawn by the pair of rotary heads 9. At a speed which is about sixteen times the ordinary reproducing speed, as shown at 43B, a scan locus having an inclination angle A4 smaller than that formed at the foregoing three times speed is alternately drawn by the pair of rotary heads 9.

In the case of the 3-times speed operation in which the scan loci 42A and 42B are drawn, the audio PCM signal is intermittently reproduced from the recording tracks 41. A desired tape position can be searched for by listening to the intermittent reproduced sounds obtained from the audio PCM signal. However, in the case of the 16-times speed at which the scan loci 43A and 43B are drawn, the intermittent reproduced sounds of the audio PCM signal can hardly be heard since the speed is too

great. Therefore, in the playing mode at the 16-times speed, the output of the reproduced sound is muted by the system controller 20.

However, in the cases of both the 3-times and 16-times speed operation, all of the information of the sub-codes is reproduced by the pair of rotary heads 9; and, in the case of the 16-times speed, a reproduced time code or a numerical value similar to the time code which is generated by a linear counter and is proportional to the tape run is displayed by the display unit 23. Thus, in contrast to normal operation in the fast-forward or rewind mode, where the tape speed is exceedingly high and accurate data relating to tape position cannot be reliably obtained, the position of the tape T when it moves at sixteen times the ordinary reproducing speed can be estimated by looking at the data displayed.

Although the embodiment described above is applied to a DAT, the invention can be applied also to a linear tape recorder in which digital or analogue audio signals are recorded in the longitudinal direction of the tape, and the invention can also be applied to the case of recording/reproducing an information signal other than an audio signal.

Claims

1. A tape recorder capable of operation at an ordinary reproducing speed and in a forward or reverse direction and comprising:
 - a magnetic head (9) for scanning a magnetic tape (T);
 - operating mode means (20,17, 19) for running the magnetic tape (T) at a speed higher than said ordinary reproducing speed in a state in which said magnetic head (9) is in contact with the magnetic tape (T);
 - operating means (24) controllable by a user of the tape recorder for making said operating mode means (20,17,19) inoperative; and
 - first speed control means (20) for controlling the operating mode means (20, 17, 19) so as to run the magnetic tape (T) at a first speed higher than said ordinary reproducing speed; characterized by:
 - second speed control means (20) for controlling the operating mode means (20, 17, 19) so as to run the magnetic tape (T) at a second speed higher than said first speed; and
 - automatic switching control means (20) responsive to said operating means (24, 31, 34) for making said first speed control means (20) operative for a predetermined period of time after said operating means (24, 31, 34) is operated and for making said second speed control means (20) operative when the operating means (24) is continuously operated beyond



the playing mode, the tape recorder performs the review or cue operation. In the review or cue operation, the magnetic tape is fed at a speed which about three times the ordinary reproducing speed only for a predetermined period of time, for example about the first five seconds. Then, if the REW/REV switch 31 or the FF/CUE switch 34 remains continuously depressed, the magnetic tape is fed at a speed which is about sixteen times the ordinary reproducing speed after the elapse of the foregoing five seconds.

The switching of the tape speed is automatically performed by control signals which are sent from the system controller 20 to the capstan servocircuit 17 and the reel servocircuit 19. For this purpose, a timer circuit is provided in the system controller 20. In the fast-forward and rewind modes, the capstan and its associated pinch roller do not come into contact with the magnetic tape T, and the magnetic tape T is driven only by the respective reel motors. In the cue and review modes, however, the capstan and pinch roller come into contact with opposite sides of the magnetic tape T, thereby gripping and driving the magnetic tape.

Figure 3A shows the relation between a pattern of recording tracks 41 on the magnetic tape T in the cue mode and the scan locus of the rotary heads 9. At a speed which is about three times the ordinary reproducing speed, as shown at 42A in Figures 3A, a scan locus having an angle of inclination A1 larger than that in the normal playing mode is alternately traced by a pair of rotary heads 9. At a speed which is about sixteen times the ordinary reproducing speed, as shown at 43A, a scan locus having an inclination angle A2 larger than that formed at the foregoing three times speed is alternately traced by the pair of rotary heads 9. In the review mode and at a speed which is about three times the ordinary reproducing speed, as shown at 42B in Figure 3B, a scan locus having an inclination angle A3 smaller than that in the normal playing mode is alternately drawn by the pair of rotary heads 9. At a speed which is about sixteen times the ordinary reproducing speed, as shown at 43B, a scan locus having an inclination angle A4 smaller than that formed at the foregoing three times speed is alternately drawn by the pair of rotary heads 9.

In the case of the 3-times speed operation in which the scan loci 42A and 42B are drawn, the audio PCM signal is intermittently reproduced from the recording tracks 41. A desired tape position can be searched for by listening to the intermittent reproduced sounds obtained from the audio PCM signal. However, in the case of the 16-times speed at which the scan loci 43A and 43B are drawn, the intermittent reproduced sounds of the audio PCM signal can hardly be heard since the speed is too

great. Therefore, in the playing mode at the 16-times speed, the output of the reproduced sound is muted by the system controller 20.

However, in the cases of both the 3-times and 16-times speed operation, all of the information of the sub-codes is reproduced by the pair of rotary heads 9; and, in the case of the 16-times speed, a reproduced time code or a numerical value similar to the time code which is generated by a linear counter and is proportional to the tape run is displayed by the display unit 23. Thus, in contrast to normal operation in the fast-forward or rewind mode, where the tape speed is exceedingly high and accurate data relating to tape position cannot be reliably obtained, the position of the tape T when it moves at sixteen times the ordinary reproducing speed can be estimated by looking at the data displayed.

Although the embodiment described above is applied to a DAT, the invention can be applied also to a linear tape recorder in which digital or analogue audio signals are recorded in the longitudinal direction of the tape, and the invention can also be applied to the case of recording/reproducing an information signal other than an audio signal.

Claims

1. A tape recorder capable of operation at an ordinary reproducing speed and in a forward or reverse direction and comprising:
 - a magnetic head (9) for scanning a magnetic tape (T);
 - operating mode means (20, 17, 19) for running the magnetic tape (T) at a speed higher than said ordinary reproducing speed in a state in which said magnetic head (9) is in contact with the magnetic tape (T);
 - operating means (24) controllable by a user of the tape recorder for making said operating mode means (20, 17, 19) inoperative; and
 - first speed control means (20) for controlling the operating mode means (20, 17, 19) so as to run the magnetic tape (T) at a first speed higher than said ordinary reproducing speed; characterized by:
 - second speed control means (20) for controlling the operating mode means (20, 17, 19) so as to run the magnetic tape (T) at a second speed higher than said first speed; and
 - automatic switching control means (20) responsive to said operating means (24, 31, 34) for making said first speed control means (20) operative for a predetermined period of time after said operating means (24, 31, 34) is operated and for making said second speed control means (20) operative when the operating means (24) is continuously operated beyond



- the elapse of said predetermined period of time.
2. A tape recorder according to claim 1 wherein said automatic switching control means (20) comprises:
a timer;
first control means for making said first speed control means (20) operative and for starting said timer in response to the operation of said operating means (24, 31, 34); and
second control means for setting said second speed control means (20) in response to said elapse of said predetermined period of time and to the operation of said operating means (24, 31, 34).
3. A tape recorder according to claim 1 or claim 2 wherein said operating means (24, 31, 34) can be made inoperative while said operating mode means (20, 17, 19) is operating at said first or second speed, and, when said operating means (24, 31, 34) is made inoperative while said operating mode means (20, 17, 19) is operating at said first or second speed, the operating mode means (20, 17, 19) is set so as to run the magnetic tape (T) at the ordinary reproducing speed in the state in which the magnetic head (9) is in contact with the magnetic tape (T).
4. A tape recorder according to claim 1 wherein said operating mode means (20, 17, 19) is a cue/review mode means comprising:
reproducing mode means (20, 17) for running the magnetic tape (T) at the ordinary reproducing speed in the state in which the magnetic head (9) is in contact with the magnetic tape (T); and
fast-forward or rewind mode means (20, 19) for running the magnetic tape (T) at a speed higher than said ordinary reproducing speed in a state in which said reproducing mode means (20, 17) is made operative.
5. A tape recorder according to any one of the preceding claims wherein said first speed is about three times said ordinary reproducing speed.
6. A tape recorder according to any one of the preceding claims wherein said second speed is about sixteen times said ordinary reproducing speed.
7. A tape recorder according to any one of the preceding claims wherein said ordinary reproducing speed is about 8.15 mm/sec.
8. A tape recorder according to any one of the preceding claims wherein said predetermined period of time is about five seconds.
9. A tape recorder according to any one of the preceding claims further comprising a rotary drum, and wherein said magnetic head (9) comprises a plurality of rotary magnetic heads (9) mounted in said rotary drum.
10. A tape recorder according to any one of the preceding claims further comprising:
a reel motor (18);
a capstan motor (14);
a reversible capstan;
a pinch roller;
a supply reel;
a take-up reel;
a reel servocircuit (19) responsive to said first speed control means for controlling said reel motor (18) to drive both of or selectively drive either one of said supply reel to supply the magnetic tape (T) and said take-up reel to wind up the magnetic tape (T); and
a capstan servocircuit (17) responsive to said second speed control means for controlling said capstan motor to drive said reversible capstan for running the magnetic tape (T) in the forward or reverse direction in cooperation with said pinch roller.
11. A tape recorder according to any one of the preceding claims further comprising muting means (12) for reproducing an audio signal recorded on the magnetic tape (T) through said magnetic head (9) and generating a reproduced sound while said operating mode means (20, 17, 19) is operating at said first speed and for stopping the output of said reproduced sound while said operating mode means (20, 17, 19) is operating at said second speed.

Patentansprüche

1. Bandgerät, das mit einer normalen Wiedergabegeschwindigkeit und in einer Vorwärts- oder Rückwärtsrichtung betriebsfähig ist und enthält:
einen Magnetkopf (9) zum Abtasten eines Magnetbandes (T);
Betriebsmodusmittel (20, 17, 19) zum Abfahren des Magnetbandes (T) mit einer höheren Geschwindigkeit als der normalen Wiedergabegeschwindigkeit in einem Zustand, in dem der Magnetkopf (9) in Kontakt mit dem Magnetband (T) ist;
ein Betriebsmittel (24), das von einem Benutzer des Bandgeräts steuerbar ist, um besagte



Betriebsmodusmittel (20, 17, 19) unwirksam zu machen; und

erste Geschwindigkeitssteuermittel (20) zur Steuerung der Betriebsmodusmittel (20, 17, 19), um das Magnetband (T) mit einer ersten Geschwindigkeit zu fahren, die höher ist als besagte normale Wiedergabegeschwindigkeit, gekennzeichnet durch

zweite Geschwindigkeitssteuermittel (20) zur Steuerung der Betriebsmodusmittel (20, 17, 19), um das Magnetband (T) mit einer zweiten Geschwindigkeit zu fahren, die höher ist als die erste Geschwindigkeit; und

automatische Schaltsteuermittel (20), die abhängig von besagtem Betriebsmittel (24, 31, 34) die ersten Geschwindigkeitssteuermittel (20) für eine vorherbestimmte Zeitdauer, nachdem besagtes Betriebsmittel (24, 31, 34) betätigt wird, betriebsbereit machen und die zweiten Geschwindigkeitssteuermittel (20) betriebsbereit machen, wenn das Betriebsmittel (24) nach dem Ablauf der vorherbestimmten Zeitdauer kontinuierlich betrieben wird.

2. Bandgerät nach Anspruch 1, dadurch gekennzeichnet, daß besagte automatische Steuermittel (20) enthalten:

einen Zeitgeber;

erste Steuermittel, die besagte erste Geschwindigkeitssteuermittel (20) betriebsbereit machen und den Zeitgeber in Abhängigkeit von dem Betrieb des besagten Betriebsmittels (24, 31, 34) starten; und

zweite Steuermittel, die besagte zweite Geschwindigkeitssteuermittel einstellen in Abhängigkeit vom Ablauf der vorherbestimmten Zeitdauer und vom Betrieb des besagten Betriebsmittels (24, 31, 34).

3. Bandgerät nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß besagtes Betriebsmittel (24, 31, 34) unwirksam gemacht werden kann, während besagte Betriebsmodusmittel (20, 17, 19) mit der ersten oder zweiten Geschwindigkeit arbeiten, und daß, wenn besagtes Betriebsmittel (24, 31, 34) unwirksam gemacht wird, während besagte Betriebsmodusmittel (20, 17, 19) mit der ersten oder zweiten Geschwindigkeit arbeiten, die Betriebsmodusmittel (20, 17, 19) eingestellt werden, um das Magnetband (T) mit der normalen Wiedergabegeschwindigkeit in dem Zustand zu fahren, in dem der Magnetkopf (9) in Kontakt mit dem Magnetband (T) ist.

4. Bandgerät nach Anspruch 1, dadurch gekennzeichnet, daß die Betriebsmodusmittel (20, 17, 19) ein Markierungs/Nachprüfmodusmittel sind,

das enthält:

Wiedergabemodusmittel (20, 17) zum Fahren des Magnetbands (T) mit der normalen Wiedergabegeschwindigkeit in dem Zustand, in dem der Magnetkopf (9) in Kontakt mit dem Magnetband (T) ist; und

Schnellvorlauf- und Rücklaufmodusmittel (20, 19) zum Fahren des Magnetbands (T) mit einer höheren Geschwindigkeit als der normalen Wiedergabegeschwindigkeit in einem Zustand, in dem besagte Wiedergabemodusmittel (20, 17) betriebsbereit gemacht werden.

5. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß besagte erste Geschwindigkeit etwa das dreifache der besagten normalen Geschwindigkeit ist.
6. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß besagte zweite Geschwindigkeit etwa das sechzehnfache der besagten normalen Wiedergabegeschwindigkeit ist.
7. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß besagte normale Wiedergabegeschwindigkeit etwa 8,15 mm/sec ist.
8. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß besagte vorherbestimmte Zeitdauer etwa fünf Sekunden ist.
9. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß es weiterhin eine Drehtrommel enthält, und daß besagter Magnetkopf (9) eine Mehrzahl Drehmagnetköpfe (9) enthält, die in der Drehtrommel angebracht sind.
10. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß es weiterhin enthält:
- einen Spulenmotor (18);
 - einen Antriebswellenmotor (14);
 - eine umschaltbare Antriebswelle;
 - eine Andruckrolle;
 - eine Abwickelspule;
 - eine Aufwickelspule;
 - einen Spulenservokreis (19), der von den ersten Geschwindigkeitssteuermitteln abhängt zur Steuerung des besagten Spulenmotors (18), um beide oder wahlweise besagte Abwickelspule zum Abwickeln des Magnetbands (T) und besagte Aufwickelspule zum Aufwickeln des Magnetbands (T) anzutreiben; und



einen Antriebswellenservokreis (17), der von den zweiten Geschwindigkeitssteuermitteln abhängt zur Steuerung des besagten Antriebswellenmotors, um besagte umschaltbare Antiebswelle zum Fahren des Magnetbands (T) in beiden Richtungen in Zusammenarbeit mit besagter Andruckrolle anzutreiben.

11. Bandgerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß es weiterhin Spermmittel (12) für die Wiedergabe eines auf dem Magnetband (T) aufgezeichneten Audiosignals durch besagten Magnetkopf enthält und einen Wiedergabeklang erzeugt, während besagte Betriebsmodusmittel (20, 17, 19) mit besagter erster Geschwindigkeit arbeiten, und die Ausgabe des besagten Wiedergabeklangs stoppt, während besagte Betriebsmodusmittel (20, 17, 19) mit der zweiten Geschwindigkeit arbeiten.

Revendications

1. Enregistreur à bande pouvant fonctionner à une vitesse de reproduction ordinaire et suivant un sens avant ou arrière comprenant :
 - une tête magnétique (9) pour balayer une bande magnétique (T) ;
 - un moyen de mode de fonctionnement (20, 17, 19) pour dérouler la bande magnétique (T) à une vitesse supérieure à ladite vitesse de reproduction ordinaire dans un état dans lequel ladite tête magnétique (9) est en contact avec la bande magnétique (T) ;
 - un moyen de fonctionnement (24) qui peut être commandé par un utilisateur de l'enregistreur à bande pour rendre ledit moyen de mode de fonctionnement (20, 17, 19) inopérant ; et
 - un premier moyen de commande de vitesse (20) pour commander le moyen de mode de fonctionnement (20, 17, 19) de manière à faire défiler la bande magnétique (T) à une première vitesse supérieure à ladite vitesse de reproduction ordinaire ;
 - caractérisé par :
 - un second moyen de commande de vitesse (20) pour commander le moyen de mode de fonctionnement (20, 17, 19) de manière à faire défiler la bande magnétique (T) à une seconde vitesse supérieure à ladite première vitesse ; et
 - un moyen de commande de commutation automatique (20) sensible audit moyen de fonctionnement (24, 31, 34) pour rendre ledit premier moyen de commande de vitesse (20) opérationnel pendant une période temporelle prédéterminée après que ledit moyen de fonc-

tionnement (24, 31, 34) est actionné et pour rendre ledit second moyen de commande de vitesse (20) opérationnel lorsque le moyen de fonctionnement (24) est actionné en continu au-delà de l'écoulement de ladite période temporelle prédéterminée.

2. Enregistreur à bande selon la revendication 1, dans lequel ledit moyen de commande de commutation automatique (20) comprend :
 - une minuterie ;
 - un premier moyen de commande pour rendre ledit premier moyen de commande de vitesse (20) opérationnel et pour démarrer ladite minuterie en réponse au fonctionnement dudit moyen opérationnel (24, 31, 34) ; et
 - un second moyen de commande pour établir ledit second moyen de commande de vitesse (20) en réponse audit écoulement de ladite période temporelle prédéterminée et au fonctionnement dudit moyen de fonctionnement (24, 31, 34).
3. Enregistreur à bande selon la revendication 1 ou 2, dans lequel ledit moyen de fonctionnement (24, 31, 34) peut être rendu inopérant tandis que ledit moyen de mode de fonctionnement (20, 17, 19) fonctionne à ladite première ou seconde vitesse et lorsque ledit moyen de fonctionnement (24, 31, 34) est rendu inopérant tandis que ledit moyen de mode de fonctionnement (20, 17, 19) fonctionne à ladite première ou seconde vitesse, le moyen de mode de fonctionnement (20, 17, 19) est établi de manière à faire défiler la bande magnétique (T) à la vitesse de reproduction ordinaire dans l'état dans lequel la tête magnétique (9) est en contact avec la bande magnétique (T).
4. Enregistreur à bande selon la revendication 1, dans lequel ledit moyen de mode de fonctionnement (20, 17, 19) est un moyen de mode repérage/revue comprenant :
 - un moyen de mode de reproduction (20, 17) pour faire défiler la bande magnétique (T) à la vitesse de reproduction ordinaire dans l'état dans lequel la tête magnétique (9) est en contact avec la bande magnétique (T) ; et
 - un moyen de mode avance ou rebobinage rapide (20, 19) pour faire défiler la bande magnétique (T) à une vitesse supérieure à ladite vitesse de reproduction ordinaire dans un état dans lequel ledit moyen de mode de reproduction (20, 17) est rendu opérationnel.
5. Enregistreur à bande selon l'une quelconque des revendications précédentes, dans lequel ladite première vitesse vaut environ trois fois



ladite vitesse de reproduction ordinaire.

6. Enregistreur à bande selon l'une quelconque des revendications précédentes, dans lequel ladite seconde vitesse vaut environ 16 fois ladite vitesse de reproduction ordinaire. 5
7. Enregistreur à bande selon l'une quelconque des revendications précédentes, dans lequel ladite vitesse de reproduction ordinaire vaut environ 8,15 mm/s. 10
8. Enregistreur à bande selon l'une quelconque des revendications précédentes, dans lequel ladite période temporelle prédéterminée vaut environ 5 secondes. 15
9. Enregistreur à bande selon l'une quelconque des revendications précédentes, comprenant en outre un tambour tournant et dans lequel ladite tête magnétique (9) comprend une pluralité de têtes magnétiques tournantes (9) montées dans ledit tambour tournant. 20
10. Enregistreur à bande selon l'une quelconque des revendications précédentes, comprenant en outre :
 - un moteur de bobine (18) ;
 - un moteur de galet d'entraînement (14) ;
 - un galet d'entraînement réversible ; 30
 - un galet de pincement ;
 - une bobine débitrice ;
 - une bobine réceptrice ;
 - un circuit d'asservissement de bobine (19) sensible audit premier moyen de commande de vitesse pour commander ledit moteur de bobine (18) afin d'entraîner à la fois ladite bobine débitrice afin d'alimenter la bande magnétique (T) et ladite bobine réceptrice afin d'enrouler la bande magnétique (T) ou de façon sélective l'une ou l'autre de ces dites bobines ; et 40
 - un circuit d'asservissement de galet d'entraînement (17) sensible audit second moyen de commande de vitesse pour commander ledit moteur de galet d'entraînement afin d'entraîner ledit galet d'entraînement réversible pour faire défiler la bande magnétique (T) suivant le sens avant ou arrière en coopération avec ledit galet de pincement. 45
11. Enregistreur à bande selon l'une quelconque des revendications précédentes, comprenant en outre un moyen de silencieux (12) pour reproduire un signal audio enregistré sur la bande magnétique (T) au travers de ladite tête magnétique (9) et pour générer un son reproduit tandis que ledit moyen de mode de fonc- 55

tionnement (20, 17, 19) fonctionne à ladite première vitesse et pour arrêter la sortie dudit son reproduit tandis que ledit moyen de mode de fonctionnement (20, 17, 19) fonctionne à ladite seconde vitesse.