

Magnetic Tape Recording and/or Reproducing Apparatus

The present invention relates to a magnetic tape recording and/or reproducing apparatus such as, for example, a video tape recorder, operable with a tape cassette having supply and take-up reels and a length of magnetic recording tape secured at its opposite ends to the supply and take-up reels, respectively.

More specifically, the present invention relates to the magnetic tape recording and/or reproducing apparatus, hereinafter referred to as a magnetic tape player, of a type capable of indicating an operator of the magnetic tape player whether or not a cassette tape loaded into the magnetic tape player has a sufficient length of magnetic recording tape required to completely record thereon the entire length of that particular information such as, for example, a televised program, the operator wishes to record.

The magnetic tape player having a capability of indicating the length of magnetic recording tape remaining on the supply reel or the remaining tape length is well known in the art and currently available in the market. Generally, the length of magnetic recording tape remaining on the supply reel and available for information recording or reproduction (playback) is indicated by means of a tape

counter in terms of the length of time left until an approach to the end-of-tape is detected. Even though the magnetic tape player has the capability of indicating the remaining tape length, it has often been observed that the user or operator of the magnetic tape player is annoyed if the cassette tape loaded into the magnetic tape player has an insufficient length of magnetic recording tape required to completely record thereon the entire length of a particular televised program the operator wishes to record.

In any event, reference will be made to Figs. 3 and 4 of the accompanying drawings for the detailed discussion of the prior art magnetic tape player believed to be closest to the present invention.

Fig. 3 illustrates both the magnetic tape player in schematic perspective representation and a circuit block diagram showing a tape transport speed selector mechanism used in the magnetic tape player. A length of magnetic recording tape is generally indicated by 1 and having one end secured to a supply reel 2 to form a supply tape pack and the opposite end secured to a take-up reel 3 to form a recorded tape pack. A portion of the magnetic recording tape 1 generally intermediate between the supply and recorded tape packs on the supply and take-up reels 2 and 3 is, with respect to the direction of tape transport from the supply reel 2 towards the take-up reel 3, passed in front of an eraser head 24, then turned a predetermined angle around a rotary drum assembly 6 so as to be scanned by one or more

magnetic transducing heads, passed in front of an audio eraser head 25 and an audio control head 26 and finally passed through a gap between a capstan 4 and a pinch roller 5.

The capstan 4 is drivingly coupled with a drive motor 23 which is in turn electrically connected with a tape transport means 18. Although not shown, the tape transport means 18 comprises a drive circuit and a servo control mechanism and is operable to drive the capstan drive motor 23 through the servo control mechanism so as to transport the magnetic recording tape 1 at a predetermined speed from the supply reel 2 towards the take-up reel 3. This tape transport means 18 is electrically connected with a recording timer 17 adapted to be preset with a recording time during which information recording on the magnetic recording tape 1 is desired to be made and operable to cause a recording time display unit 16 to display the balance of the preset recording time less the length of time actually spent in the information recording and also to generate a stop signal to the tape transport means 18 to terminate the tape transport when the balance of the preset recording time less the length of time actually spent in the information recording becomes zero, that is, when the length of time corresponding to the preset recording time has been passed.

The tape transport means 18 is also connected with a tape transport speed selecting means 19 including a tape transport speed selecting switch 20 capable of assuming one

of at least two positions, for example, SP (Standard Play mode during which the magnetic recording tape is transported at a first or standard speed) and EP (Extended Play mode during which the length of magnetic recording tape 1 is transported at a second or extended speed which is $1/n$ of the standard speed, n being an arbitrarily chosen integer, for example, 2 or 3) mode positions. The tape transport speed selecting means 19 is so designed as to generate an SP mode signal to the tape transport means 18 to cause the magnetic recording tape 1 to be transported at the standard speed from the supply reel 2 onto the take-up reel 3 when the tape speed selecting switch 20 is set in the SP mode position, but generate an EP mode signal to the tape transport means 18 to cause the magnetic recording tape 1 to be transported at the extended speed from the supply reel 2 onto the take-up reel 3 when the tape transport speed selecting switch 20 is set in the EP mode position.

Fig. 4 illustrates a system for calculating the length of magnetic recording tape 1 remaining on the supply reel 2 (which length is hereinafter referred to as the remaining tape length) and the length of time corresponding to the length of magnetic recording tape remaining on the supply reel 2, which system is employed in the prior art magnetic tape player employing the tape transport speed selector mechanism shown in and described with reference to Fig. 3. This system is found in, for example, the Japanese Patent Publication Examined No. 55-34514, published Septem-

ber 6, 1980, and United State Patent No. 3,834,648, issued September 10, 1974.

In Fig. 4, reference numeral 7 represents a tape motion measuring mechanism for calculating the amount of movement of the magnetic recording tape 1 in a direction longitudinally thereof; reference numeral 8 represents a calculating circuitry operable in response to an signal from the tape motion measuring mechanism 7, which signal is indicative of the amount of movement of the magnetic recording tape 1, to calculate, and generate an output signal indicative of, the remaining tape length or the length of time corresponding to the remaining tape length (which length of time is hereinafter referred to as the remaining tape hour); and reference numeral 15 represents a tape hour display unit for displaying the remaining tape hour.

With reference to Fig. 4, the method of calculating and displaying the remaining tape hour, that is, the length of time corresponding to the remaining tape length on the supply reel 2, will be discussed in detail as it pertains to the present invention.

The tape motion measuring mechanism 7 comprises a reel revolution detecting means or reel tachometer 11 for providing a signal R per revolution of the supply reel 2; a tape length detecting means 9 drivingly coupled with a drive system for the capstan 4 for providing a signal P each time a predetermined length of the magnetic recording tape 1 is

moved in a direction longitudinally thereof; and a tape motion detecting means 10 operable to count the number of signals P, outputted from the tape length detecting means 9, in reference to the signal R outputted from the reel tachometer 11 and for subsequently outputting a tape length signal α representative of the length of the magnetic recording tape having been moved per revolution of the supply reel 2. The reel revolution detecting means or reel tachometer 11 may comprises a photodetector system including a light emitting element or photodiode and a light reflecting or intercepting plate secured to a drive system for the supply reel 2 and designed to generate the signal R each time the supply reel 2 undergoes a complete revolution.

The calculating circuitry 8 is connected with the tape motion measuring mechanism 7 so as to receive the tape length signal α and is operable to determine the remaining tape length L_s , then to calculate the remaining tape hour T_s on the basis of the remaining tape length L_s and to output a remaining tape hour signal, representative of the calculated remaining tape hour, which is subsequently applied to a remaining tape hour display unit 15 for the display of the remaining tape hour T_s . This calculating circuitry 8 is comprised of a squaring circuit 12, a subtracting circuit 13 and dividing circuit 14.

The calculating circuitry 8 performs the following calculations.

The remaining tape length L_s , that is, the entire

length of the magnetic recording tape 1 remaining on the supply reel 2, can be expressed by the following equation.

$$L_s = \pi(rs^2 - rh^2)/d \quad \dots\dots\dots (1)$$

wherein r_s represents the radius of the tape pack on the supply reel 2 including the radius r_h of the reel hub of the supply reel 2 as shown in Fig. 3 and d represents the thickness of the magnetic recording tape 1.

Assuming that the length of the magnetic recording tape 1 moved in the longitudinal direction thereof per revolution of the supply reel 2 is expressed by ℓ , the parameter r_s , that is, the sum of the radii of the tape pack and the reel hub, can be expressed as follows.

$$r_s = \ell/2\pi \quad \dots\dots\dots (2)$$

Rewriting the equation (1) with the use of the equation (2) results in:

$$\begin{aligned} L_s &= [\pi(\ell^2/4\pi^2 - rh^2)]/d \\ &= (\ell^2 - 4\pi^2 \cdot rh^2)/4\pi d \quad \dots\dots\dots (3) \end{aligned}$$

Since the thickness d of the magnetic recording tape 1 and the radius r_h of the reel hub of the supply reel 2 are known parameters, the remaining tape length L_s can be determined if the length ℓ of magnetic recording tape 1 moved per revolution of the supply reel 2 is determined.

Also, if the standard tape transport speed is expressed by V , the remaining tape hour T_s , that is, the length of time corresponding to the remaining tape length L_s (or the length of time over which information recording or playback can be available on the remaining tape length L_s)

can be determined from the following equation.

$$T_s = L_s/V \quad \dots\dots\dots (4)$$

In view of the foregoing, the squaring circuit 12 of the calculating circuitry 8 is operable to determine the square of the length l of the magnetic recording tape 1 moved per revolution of the supply reel 2. The subtracting circuit 13 is operable to subtract $(4\pi^2 \cdot rh^2)$ from the squared value l^2 , and the dividing circuit 14 is operable to divide $(l^2 - 4\pi^2 \cdot rh^2)$ by $4\pi dV$ to give the remaining tape hour T_s .

In the conventional magnetic tape player of the above described construction including the tape transport speed selector means 19 and the tape motion measuring mechanism 7, if the operator or user of the magnetic tape player wishes to change the tape transport speed during an information recording, he or she has to read the remaining tape hour T_s , indicated by the remaining tape hour display unit 15, and the balance of the preset recording time less the length of time actually spent in the information recording, indicated by the recording time display unit 16, and then manipulates the tape transport speed selecting switch. More specifically, assuming that the information recording is taking place with the tape transport speed set at the standard speed, that is, assuming that the information recording is taking place with the magnetic tape player set in the SP mode, and in the event that the reading of both of the remaining tape hour display unit 15 and the

recording time display unit 16 shows that the remaining tape hour T_s is smaller than the balance of the preset recording time less the length of time actually spent in the information recording, the operator has to manipulate the tape transport speed selecting switch 20 to set the magnetic tape player in the EP mode, that is, to cause the magnetic recording tape 1 to be transported at the extended speed. On the other hand, in the event that, during the EP mode in which the magnetic recording tape 1 is transported at the extended speed, the value equal to a multiple of the remaining tape hour T_s coincides with the balance of the preset recording time less the length of the time actually spent in the information recording as indicated by the display unit 16, the manipulation of the tape transport speed selecting switch 20 may result in that the information recording to the end of the magnetic recording tape 1 can terminate simultaneously with the zeroing of the preset recording time, thereby preventing a number of turns of the magnetic recording tape from being left on the supply reel which may be short of a length required to record the future program and, hence, may be unusable turns of the magnetic recording tape on the supply reel.

With the conventional magnetic tape player, when an attempt is made to maximize the utilization of the unrecorded portion of the magnetic recording tape in such a way as to avoid the unusable turns of the magnetic recording tape on the supply reel about the end of the magnetic recording

tape or to avoid the possibility that the end of the magnetic recording tape is approached during the course of information recording taking place thereby leaving a portion of the information unrecorded, the operator of the magnetic tape player has to read the respective displays on the separate display units and performs a mental work to compare the remaining tape hour with the balance between the preset recording time and the length of time actually spent in information recording to determine the necessity of the manipulation of the tape transport speed selecting switch. Accordingly, inconvenience has been often experienced with the conventional magnetic tape player that the operator cannot take a leave from the place where the magnetic tape player is installed.

The present invention has been accordingly developed with a view to substantially eliminating the above discussed inconveniences experienced with the conventional magnetic tape players and is intended to provide an improved magnetic tape player wherein the change in tape transport speed can be automatically performed to enable the recording of a predetermined amount of information to terminate simultaneously with the detection of an approach to the end of the magnetic recording tape on the supply reel.

To this end, the present invention provides a magnetic tape recording and/or reproducing apparatus which comprises a tape transport means for transporting a magnetic

recording tape in a direction longitudinally thereof, a tape transport speed selecting means for controlling the tape transport means and capable of assuming one of first and second modes during which the magnetic recording tape is transported at first and second transport speeds, respectively, said second transport speed being $1/n$ of the first transport speed, wherein n is an integer other than 1, a remaining tape length measuring means for measuring a length of time available for recording information to an end of the magnetic recording tape when the magnetic recording tape is transported at the first transport speed and for outputting an available recording time signal indicative of said length of time available for recording, a recording timer means for outputting a remaining time signal indicative of the balance between a preset recording time and the length of time actually spent in recording and for outputting a terminating signal to the tape transport means to terminate the transport of the magnetic recording tape when said balance becomes zero, and a comparing means for comparing the available recording time signal and the remaining time signal with a conversion value during information recording with the magnetic recording tape transported at the second transport speed.

According to the present invention, where the result of the comparison performed by the comparing means indicates that the available recording time signal outputted from the remaining tape length measuring means is higher than the

remaining time signal outputted from the recording timer means, the tape transport speed selecting means is set in the first mode to cause the magnetic recording tape to be transported at the first transport speed, but where the result of the comparison by the comparing means indicates that the available recording time signal is lower than the remaining time signal, the tape transport means is set in the second mode to cause the magnetic recording tape to be transported at the second transport speed.

Furthermore, according to the present invention, the available recording time represented by the output signal from the remaining tape length measuring means is converted into the remaining tape length which would be indicated during the information recording with the magnetic recording tape transported at the second transport speed that is $1/n$ of the first transport speed. The remaining tape length so converted from the available recording time is subsequently compared with the remaining time represented by the output signal from the recording timer means so that, if the available recording time signal outputted from the remaining tape length measuring means is found higher than the remaining time signal outputted from the recording timer means, the tape transport speed selecting means can be set in the first mode to cause the magnetic recording tape to be transported at the first transport speed, but if the available recording time signal is lower than the remaining time signal, the tape transport means can be set in the

second mode to cause the magnetic recording tape to be transported at the second transport speed.

In the practice of the present invention, the remaining tape length is measured during the information recording taking place, and the measured remaining tape length is converted into the remaining tape length which would be indicated when the magnetic recording tape is transported at the second transport speed during the EP mode of operation of the magnetic tape player. The converted remaining tape length is then compared with the balance between the preset recording time and the length of time actually spent in recording, which balance is represented by the output signal from the recording timer means. Based on the result of the comparison performed by the comparing means, the tape transport speed can be automatically changed so that the information recording can terminate substantially simultaneously with the approach to the end of the magnetic recording tape on the supply reel.

With the magnetic tape player so constructed as hereinabove described according to the present invention, the use of the magnetic recording tape having been recorded in part can be advantageously maximized in such a way as to avoid the possibility that the end of the magnetic recording tape is approached in the course of the information recording taking place to thereby fail to completely record the whole of the information or to avoid the possibility that a relatively greater number of turns of the magnetic recording

tape are left on the supply reel, thereby constituting a cause of waste of the magnetic recording tape. It is eventually pointed out that, with the system of the present invention, the tape transport speed can be automatically changed to permit the entire length of information to be recorded on the magnetic recording tape if it is determined that the recording with the magnetic recording tape being transported at the standard tape transport speed cannot accommodate the whole of the information, and therefore, without the operator of the magnetic tape player needed to be attendant to the magnetic tape player such as occasioned when the recording is desired to be made while the operator is out of the house, the magnetic tape player embodying the present invention can automatically change the tape transport speed to the extended tape transport speed to permit the entire length of information to be successfully recorded on the magnetic recording tape.

In any event, the present invention will become more clearly understood from the following description of a preferred embodiment thereof, when taken in conjunction with the accompanying drawings. However, the embodiment and the drawings are given only for the purpose of illustration and explanation, and are not to be taken as limiting the scope of the present invention in any way whatsoever.

In the accompanying drawings, like reference numerals are used to

denote like parts throughout the several views, and:

Fig. 1 is a schematic diagram illustrating both a magnetic tape player in schematic perspective representation and a circuit block diagram used in the magnetic tape player;

Fig. 2 is a flowchart used to explain the operation of the system according to the present invention;

Fig. 3 is a schematic diagram illustrating both the prior art magnetic tape player in schematic perspective representation and the tape transport speed selecting mechanism used in the prior art magnetic tape player; and

Fig. 4 is a circuit block diagram showing the prior art system used in the magnetic tape player of Fig. 3 for calculating the length of magnetic recording tape remaining on the supply reel and the remaining tape hour.

As can readily understood from the comparison of Fig. 1 with Figs. 3 and 4, the system shown in Fig. 1 in accordance with the present invention is generally similar to that shown in Figs. 3 and 4 except that, in the system of Fig. 1, the dividing circuit 14 is electrically connected with the tape transport speed selecting means 19 through a multiplying circuit 22 and a comparing circuit 21.

The multiplying circuit 22 is operable to multiply the output value from the calculating circuitry 8, that is, the remaining tape hour T_s by a reciprocal of the ratio of the extended tape transport speed relative to the standard

tape transport speed. More specifically, where the extended tape transport speed is chosen to be $1/3$ of the standard tape transport speed, the multiplying circuit 22 is operable to multiply the remaining tape hour T_s by 3. The comparing means 21 receiving as a first input an output signal from the multiplying circuit 22 and as a second input an output signal from the recording timer means 17 is operable to compare the product of the remaining tape hour T_s times 3, which product is hereinafter referred to as the extended remaining tape hour $3 \cdot T_s$, with the output from the recording timer means 17, that is, the remaining time T_n (the balance between the preset recording time, set in the recording timer means 17, and the length of time actually spent in recording).

Should the comparing circuit 21 indicate that the extended remaining tape hour $3 \cdot T_s$ is longer than the remaining time T_n , the comparing circuit 21 applies to the tape transport speed selecting means 19 a first command necessary to cause the tape transport speed selecting means 19 to drive the tape transport means 18 so as to transport the magnetic recording tape 1 at the standard tape transport speed. But should the comparing circuit 21 indicate that the extended remaining tape hour $3 \cdot T_s$ is shorter than the remaining time T_n , the comparing circuit 21 applies to the tape transport speed selecting means 19 a second command necessary to cause the tape transport speed selecting means 19 to drive the tape transport means 18 so as to transport

the magnetic recording tape 1 at the extended tape transport speed.

The operation of the system shown in Fig. 1 will now be described with particular reference to the flowchart shown in Fig. 2. In describing the operation, it is assumed that the extended tape transport speed at which the magnetic recording tape 1 is transported in the direction longitudinally thereof from the supply reel 2 onto the take-up reel 3 during the EP mode of operation of the magnetic tape player is $1/3$ of the standard tape transport speed at which the magnetic recording tape 1 is transported during the SP mode of operation of the magnetic tape player.

Referring now to Fig. 2, subsequent to the magnetic tape player starting a recording operation, the tape transport means 18 is set to the standard tape transport speed at step S51, followed by the setting in the recording timer means 17 at step S52 a recording time over which the operator of the magnetic tape player wishes to make a recording on the magnetic recording tape 1. This recording time set in the recording timer means 17 is herein referred to as the preset recording time. As the recording operation progresses, the remaining tape hour T_s is measured at step S53, which hour T_s is subsequently multiplied by 3 at step S54 to give the extended remaining tape hour $3 \cdot T_s$.

Simultaneously with the progress of the recording operation, the preset recording time set in the recording timer means 17 is progressively decreased at step S55. At

subsequent step S56, a decision is made to determine if the remaining time T_n which represents the balance between the preset recording time and the length of time actually passed subsequent to the start of the recording operation becomes zero. If the result of the decision at step S56 indicates "Yes", that is, that the remaining time T_n is zero, a terminating command is issued to the tape transport means 18 to terminate the recording operation at step S57.

On the other hand, if the result of the decision at step S56 indicates "No", that is, that the remaining time T_n has not yet become zero, and, hence, during a period up until the remaining time T_n becomes zero, the extended remaining tape hour $3 \cdot T_s$ calculated at step S54 is compared with the remaining time T_n at step S58 to determine if the extended remaining tape hour $3 \cdot T_s$ is longer than the remaining time T_n .

If the extended remaining tape hour $3 \cdot T_s$ is longer than the remaining time T_n as determined at step S58, the recording operation continues with the magnetic recording tape 1 being transported at the standard tape transport speed at step S59. However, if the extended remaining tape hour $3 \cdot T_s$ is shorter than the remaining time T_n , the command necessary to change the tape transport speed to the extended tape transport speed is applied to the tape transport speed selecting means 19 to cause the tape transport means 13 to transport the magnetic recording tape 1 at the extended tape transport speed at step S60 with the magnetic tape player

consequently set under the EP mode.

As hereinabove described, while the recording operation is taking place, the tape transport speed can be automatically changed from the standard tape transport speed to the extended tape transport speed so that the available recording time can coincide with the remaining time indicated by the recording timer means 17 to permit the recording time T_n to become zero substantially simultaneously with the approach to the end of the magnetic recording tape 1 on the supply reel 2.

Thus, according to the present invention, the use of the magnetic recording tape having been recorded in part can be advantageously maximized in such a way as to accommodate in the remaining non-recorded portion thereof a certain amount of information which would not be completely recorded on the magnetic recording tape if the latter is during the recording operation transported at the standard tape transport speed. Therefore, without the operator of the magnetic tape player attendant to the magnetic tape player such as occasioned when the recording is desired to be made while the operator is out of the house, the magnetic tape player embodying the present invention can automatically change the tape transport speed, if it is determined that the recording with the magnetic recording tape being transported at the standard tape transport speed cannot accommodate the whole of the information, to the extended tape transport speed to permit the whole of the information to be successfully

recorded on the magnetic recording tape.

It is to be noted that the software flowchart shown in and described with reference to Fig. 2 can be implemented in an hardware environment such as by the use of a microcomputer so programmed as to execute the flowchart.

Although the present invention has been fully described in connection with the preferred embodiments thereof with reference to the accompanying drawings which are used only for the purpose of illustration, those skilled in the art will readily conceive numerous changes and modifications within the framework of obviousness upon the reading of the specification herein presented of the present invention. By way of example, the recording timer means 17 may comprise a clock means capable of indicating the current clock time of the day, a time memory means for storing the clock time at which the recording operation is desired to be terminated, and a subtracting means for subtracting the current clock time, indicated by the clock means, from the clock time stored in the time memory means so that, when the difference given by the subtracting means becomes zero, the terminating command can be issued to the tape transport means 18 to terminate the transport of the magnetic recording tape at step S57.

Also, in the foregoing embodiment of the present invention, the remaining tape hour T_s has been described as multiplied by n which is an integer not smaller than 2 before it is compared with the remaining time T_n . However,

the system can operate effectively even if the remaining time T_n is multiplied by $1/n$, that is, divided by n , and the value T_n/n is subsequently compared with the remaining tape hour T_s .

In addition, in the foregoing embodiment of the present invention, as the tape motion measuring mechanism 7, arrangement has been made to detect the length λ of the magnetic recording tape 1 moved per revolution of the supply reel 2 and then to calculate both of the remaining tape length L_s and the remaining tape hour T_s on the basis of the detected length λ of the magnetic recording tape 1 moved per revolution of the supply reel 2. However, any known technique may instead be employed to detect the speed at which the magnetic recording tape 1 is moved and then to calculate both of the remaining tape length L_s and the remaining tape hour T_s on the basis of the detected tape speed.

Accordingly, such changes and modifications are, unless they depart from the spirit and scope of the present invention as delivered from the claims annexed hereto, to be construed as included therein.

CLAIMS

1. A magnetic tape recording and/or reproducing apparatus which comprises:

a tape transport means for transporting a magnetic recording tape in a direction longitudinally thereof;

a tape transport speed selecting means for controlling the tape transport means and capable of assuming one of first and second modes during which the magnetic recording tape is transported at first and second transport speeds, respectively, said second transport speed being $1/n$ of the first transport speed, wherein n is an integer other than 1;

a remaining tape length measuring means for measuring a length of time available for recording information to an end of the magnetic recording tape when the magnetic recording tape is transported at the first transport speed and for outputting an available recording time signal indicative of said length of time available for recording;

a recording timer means for outputting a remaining time signal indicative of the balance between a preset recording time and the length of time actually passed in information recording and for outputting a terminating signal to the tape transport means to terminate the transport of the magnetic recording tape when said balance becomes zero; and

a comparing means for comparing the available recording time signal and the remaining time signal with a



conversion value during information recording with the magnetic recording tape transported at the second transport speed whereby, if the available recording time signal outputted from the remaining tape length measuring means is higher than the remaining time signal outputted from the recording timer means, the tape transport speed selecting means is set in the first mode to cause the magnetic recording tape to be transported at the first transport speed, but if the available recording time signal is lower than the remaining time signal, the tape speed selecting means is set in the second mode to cause the magnetic recording tape to be transported at the second transport speed.

2. The magnetic tape recording and/or reproducing apparatus as claimed in Claim 1, further comprising a multiplying means for multiplying an output from the remaining tape length measuring means by n prior to said output being supplied to the comparing means.

3. The magnetic tape recording and/or reproducing apparatus as claimed in Claim 1, further comprising a multiplying means for multiplying an output from the recording timer means by $1/n$ prior to said output being supplied to the comparing means.

4. The magnetic tape recording and/or reproducing apparatus as claimed in Claim 1, wherein said recording timer means is operable to subtract the length of time actually passed during the information recording from the



preset recording time set in the recording timer means and then to provide the remaining time signal.

5. The magnetic tape recording and/or reproducing apparatus as claimed in Claim 1, wherein said recording timer means is operable to subtract a current clock time from an expected clock time at which the information recording is desired to be terminated, and then to provide the remaining time signal.

6. The magnetic tape recording and/or reproducing apparatus as claimed in Claim 1, wherein said remaining tape length measuring means comprises a tape motion measuring mechanism operable to calculate the length of the magnetic recording tape which has been moved per revolution of a supply reel according to a predetermined equation using a detected value representative of the number of revolutions of the supply reel and a detected value representative of the length of the magnetic recording tape actually moved, and a calculating circuitry operable to determine an available recording time during which the magnetic recording tape transported at the first transport speed can be recorded to the end of the magnetic recording tape on the supply reel, according to a predetermined equation using an output value from the tape motion measuring mechanism.

7. A magnetic tape recording and/or reproducing apparatus substantially as herein described with reference to and as illustrated in Fig. 1 and 2 of the accompanying drawings.

