Claims

What is claimed is:

1. A recording medium, comprising:

a data layer configured to record data therein; and

a dedicated servo layer configured to provide servo information, wherein the dedicated servo layer comprises a plurality of tracks, wherein a first track comprises a first servo signal, the first servo signal including first servo bursts of a predetermined frequency,

wherein a second track adjacent to the first track comprises a second servo signal, the second servo signal including second servo bursts of the predetermined frequency, and

wherein the first servo bursts are orthogonal to the second servo bursts, and wherein the data in the data layer and the servo information in the dedicated servo layer are provided in a same direction.

2. The recording medium of claim 1, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a sine signal phase shifted compared to the first servo bursts.

3. The recording medium of claim 1, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a cosine signal.

4. The recording medium of claim 1,

wherein the first servo bursts are negated to the second servo bursts.

5. The recording medium of claim 4, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a sine signal phase shifted compared to the first servo bursts.

6. The recording medium of claim 5, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a negated sine signal.

7. The recording medium of claim 1, wherein:

the first servo signal comprises a plurality of alternately arranged preambles and servo bursts; and

the second servo signal comprises a plurality of alternately arranged preambles and servo bursts.

8. The recording medium of claim 1,

wherein the first servo signal and the second servo signal comprises information for providing positioning information.

9. A data storage device, comprising the recording medium of claim 1.

10. The data storage device of claim 9,

wherein the recording medium further comprises a data layer configured to record data therein.

11. The data storage device of claim 9, further comprising:

a reader head configured to read a signal from the recording medium.

12. The data storage device of claim 11, further comprising:

a position error signal determination circuit configured to determine a position error signal based on the signal read from the recording medium.

13. The data storage device of claim 12, wherein the position error signal determination circuit is configured to determine the position error signal based on an average of the signal read from the recording medium over a plurality of servo cycles.

14. The data storage device of claim 12, wherein the position error signal determination circuit is configured to determine the position error signal based on multiplying the signal read from the recording medium with a waveform of the predetermined frequency.

15. A method for determining a position error signal in a recording medium, the recording medium comprising: a data layer configured to record data therein, a dedicated servo layer configured to provide servo information, wherein the dedicated servo layer comprises a plurality of tracks, wherein a first track comprises a first servo signal, the first servo signal including first servo bursts of a predetermined frequency, and wherein a second track adjacent to the first track comprises a second servo signal, the second servo signal including second servo bursts of the predetermined frequency, the method comprising:

reading a signal from the first servo bursts and/or the second servo bursts of the recording medium, and

determining a position error signal based on the read signal,

wherein the first servo bursts are orthogonal to the second servo bursts, and wherein the data in the data layer and the servo information in the dedicated servo layer are provided in a same direction.

16. The method of claim 15,

wherein the position error signal is determined based on an average of the read signal over a plurality of servo cycles.

17. The method of claim 16, wherein the position error signal is determined based on multiplying the read signal with a waveform of the predetermined frequency.

18. The method of claim 15,

wherein the first servo bursts are negated to the second servo bursts.

CLAIMS

1. A recording medium, comprising:

a data layer configured to record data therein; and

a dedicated servo layer configured to provide servo information, wherein the dedicated servo layer comprises a plurality of tracks, wherein a first track comprises a first servo signal, the first servo signal including first servo bursts of a predetermined frequency,

wherein a second track adjacent to the first track comprises a second servo signal, the second servo signal including second servo bursts of the predetermined frequency, and

wherein the first servo bursts are orthogonal to the second servo bursts, and wherein the data in the data layer and the servo information in the dedicated servo layer are provided in a same direction.

2. The recording medium of claim 1, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a sine signal phase shifted compared to the first servo bursts.

3. The recording medium of claim 1, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a cosine signal.

4. The recording medium of claim 1, wherein the first servo bursts are negated to the second servo bursts.

5. The recording medium of claim 4, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a sine signal phase shifted compared to the first servo bursts.

6. The recording medium of claim 4, wherein:

the first servo bursts comprise a sine signal; and

the second servo bursts comprise a negated sine signal.

7. The recording medium of claim 1, wherein:

the first servo signal comprises a plurality of alternately arranged preambles and servo bursts; and

the second servo signal comprises a plurality of alternately arranged preambles and servo bursts.

8. The recording medium of claim 1, wherein the first servo signal and the second servo signal comprises information for providing positioning information.

9. A data storage device, comprising:

a recording medium comprising

a data layer configured to record data therein, and

a dedicated servo layer configured to provide servo information, wherein the dedicated servo layer comprises a plurality of tracks, wherein a first track comprises a first servo signal, the first servo signal including first servo bursts of a predetermined frequency, wherein a second track adjacent to the first track comprises a second servo signal, the second servo signal including second servo bursts of the predetermined frequency, and wherein the first servo bursts are orthogonal to the second servo bursts, and wherein the data in the data layer and the servo information in the dedicated servo layer are provided in a same direction; and

a reader head configured to read a signal from the recording medium.

10. The data storage device of claim 9, further comprising:

a position error signal determination circuit configured to determine a position error signal based on the signal read from the recording medium.

11. The data storage device of claim 10, wherein the position error signal determination circuit is configured to determine the position error signal based on an average of the signal read from the recording medium over a plurality of servo cycles.

12. The data storage device of claim 10, wherein the position error signal determination circuit is configured to determine the position error signal based on multiplying the signal read from the recording medium with a waveform of the predetermined frequency.

13. A method for determining a position error signal in a recording medium, the recording medium comprising: a data layer configured to record data therein, a dedicated servo layer configured to provide servo information, wherein the dedicated servo layer comprises a plurality of tracks, wherein a first track comprises a first servo signal, the first servo signal including first servo bursts of a predetermined frequency, and wherein a second track adjacent to the first track comprises a second servo signal, the second servo signal including second servo bursts of the predetermined frequency, the method comprising:

reading a signal from the first servo bursts and/or the second servo bursts of the recording medium; and

determining a position error signal based on the read signal,

wherein the first servo bursts are orthogonal to the second servo bursts, and wherein the data in the data layer and the servo information in the dedicated servo layer are provided in a same direction.

14. The method of claim 13, wherein the position error signal is determined based on an average of the read signal over a plurality of servo cycles.

15. The method of claim 14, wherein the position error signal is determined based on multiplying the read signal with a waveform of the predetermined frequency.

16. The method of claim 13, wherein the first servo bursts are negated to the second servo bursts.