

## G11B

**INFORMATION STORAGE BASED ON RELATIVE MOVEMENT BETWEEN RECORD CARRIER AND TRANSDUCER** ({producing carriers of sound records for needle playback [B29C 39/00](#) } ; recording measured values in a way that does not require playback through a transducer [G01D](#); photosensitive materials or processes for photographic purposes [G03C](#); electrography, electrophotography, magnetography [G03G](#); recording or playback apparatus using mechanically marked tape, e.g. punched paper tape, or using unit records, e.g. punched or magnetically marked cards, [G06K](#); transferring data from one type of record carrier to another [G06K 1/18](#); printing of data from record carriers [G06K 3/00](#); arrangements for producing a permanent visual presentation of the output data [G06K 15/00](#); arrangements or circuits for control of indicating devices using static means to present variable information [G09G](#); coding, decoding or code conversion, in general [H03M](#); circuits for coupling output of reproducer to radio receiver [H04B 1/20](#); circuits {or arrangements} specially adapted for {pictorial or} television signal recording {[H04N 1/21](#) } , [H04N 5/76](#), [H04N 9/79](#); loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers or circuits therefor [H04R](#))

### Definition statement

*This place covers:*

Recording or playback of information by relative movement between a record track and a transducer, the transducer directly producing, or being directly actuated by, modulation in the track being recorded or played-back, and the extent of modulation corresponding to the signal being recorded or played-back;

Apparatus and machines for recording or playback, and parts thereof, such as heads;

Record carriers for use with such apparatus and machines;

Associated working of other apparatus with such apparatus and machines.

### Relationships with other classification places

The specific application specified in [G11B](#) is mentioned in the document, the document is classified in [G11B](#). However experience shows that many documents also contain features relevant to [H01F](#). In this case the documents are classified in both places.

When the document is more about magneto-optical elements as such, it goes in [G02F 1/09](#) or lower groups. However if the field of application ([G11B](#)) is mentioned in the document or if the expert recognizes that the magneto-optical elements looks like those typically used in the [G11B](#) then the document should also be classified in the [G11B](#)

### References

#### Limiting references

*This place does not cover:*

Recording measured values in a way that does not require playback through a transducer	<a href="#">G01D 9/00</a>
Details of scanning-probe apparatus	<a href="#">G01Q 10/00</a> - <a href="#">G01Q 90/00</a>

Recording or playback apparatus using mechanically marked tape, e.g. punched paper tape, or using unit records, e.g. punched or magnetically marked cards	<a href="#">G06K</a>
Transferring data from one type of record carrier to another type of record carrier	<a href="#">G06K 1/18</a>
Guiding cards or sheets	<a href="#">G06K 13/00</a>
Record carriers for use with machines and with at least a part designed to carry digital markings	<a href="#">G06K 19/00</a>
Static information storage in which no relative movement takes place between an information storage element and a transducer	<a href="#">G11C</a>
Circuits for coupling output of reproducer to radio receiver	<a href="#">H04B 1/20</a>
Loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers or circuits therefor	<a href="#">H04R</a>

### **Application-oriented references**

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Associated working of cameras or projectors with sound-recording or -reproducing means	<a href="#">G03B 31/00</a>
Substation equipment for recording telephonic conversations or messages for absent subscribers	<a href="#">H04M 1/65</a>
Television signal recording	<a href="#">H04N 5/76</a> , <a href="#">H04N 9/79</a>

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Working of plastics; working of substances in a plastic state in general	<a href="#">B29</a>
Layered products in general	<a href="#">B32B</a>
Thermography	<a href="#">B41M 5/26</a>
Containers, packaging elements or packages, specially adapted for particular articles or materials	<a href="#">B65D 85/00</a>
Storing webs, tapes or filamentary material in general	<a href="#">B65H 75/00</a>
Coating metallic material; coating material with metallic material; coating by vacuum evaporation, by sputtering, by ion implantation or by chemical vapour deposition, in general	<a href="#">C23C</a>
Measuring electric or magnetic properties	<a href="#">G01R</a>
Devices or arrangements for the control of the intensity, colour, phase, polarization or direction of light	<a href="#">G02F</a>
Magneto-optical materials in general	<a href="#">G02F 1/0036</a>
Photosensitive materials or processes for photographic purposes	<a href="#">G03C</a>
Electrography; electrophotography; magnetography	<a href="#">G03G</a>
Holographic processes or apparatus	<a href="#">G03H</a>
Electric digital data processing	<a href="#">G06F</a>
Printing of data from record carriers	<a href="#">G06K 3/00</a>

Arrangements for producing a permanent visual presentation of the output data	<a href="#">G06K 15/00</a>
Arrangements or circuits for control of indicating devices using static means to present variable information	<a href="#">G09G</a>
Static stores	<a href="#">G11C</a>
Selection of magnetic materials; thin magnetic films	<a href="#">H01F</a>
Thin magnetic films	<a href="#">H01F 10/00</a>
Semiconductor lasers	<a href="#">H01S 5/00</a>
Coding, decoding or code conversion, in general	<a href="#">H03M</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Record carrier	means a body, such as a cylinder, disc, card, tape, or wire, capable of permanently holding information, which can be read-off by a sensing element movable relatively to the record carrier
Head	includes any means for converting sinusoidal or non-sinusoidal electric wave-forms into variations of the physical condition of at least the adjacent surface of the record carrier, or vice versa
Near-field interaction	means a very short distance interaction using scanning-probe techniques, e.g. quasi- contact or evanescent contact between head and record carrier

## Synonyms and Keywords

*In patent documents the terms "transducer", "head" and "pickup" are often used as synonyms.*

- 1.) Medium, media are synonyms of "record carrier".
- 2) "thin film" and "binderless" both apply to coated films of a (generally) uniformly deposited material, differing from "binder media" which comprises magnetic particles in a (usually organic) binder resin
- 3) vertical or perpendicular are used interchangeably in the art to refer to magnetization directions normal to the plane of the film
- 4) horizontal, longitudinal, in-plane are used interchangeably in the art to refer to magnetization directions lying in the plane of the film.
- 5) substrate, support, base are used interchangeably in the art to refer to the underlying rigid or flexible (in terms of tapes or floppy disks, for example) layer upon which other layers are deposited thereon.
- 6) seed layer, under layer, intermediate layer, orientation control layer, adhesion layer, crystal growth layer are all generally used terminology to describe (usually non-magnetic) layers deposited under the main magnetic layer(s) to assist in crystal growth and tuning of the magnetic properties of the main magnetic layer(s).
- 7) soft under layer (SUL) and keeper layer are used interchangeably to describe a soft magnetic layer used under a hard magnetic recording layer to provide a flux path.

## G11B 3/00

**Recording by mechanical cutting, deforming or pressing, e.g. of grooves or pits; Reproducing by mechanical sensing; Record carriers therefor ([G11B 11/00](#), {[G11B 13/00](#)} take precedence; {recording by cutting or deforming using laser beam [G11B 7/00](#), using electron beam [G11B 9/10](#)})**

### Definition statement

*This place covers:*

Mainly vinyl disks and apparatuses for playing them

### References

#### Limiting references

*This place does not cover:*

Recording by cutting or deforming using laser beam	<a href="#">G11B 7/00</a>
Recording by cutting or deforming using electron beam	<a href="#">G11B 9/10</a>
Recording on or reproducing from the same record carrier wherein for these two operations the methods are covered by different main groups of groups <a href="#">G11B 3/00</a> - <a href="#">G11B 7/00</a> or by different subgroups of group <a href="#">G11B 9/00</a>	<a href="#">G11B 11/00</a>
Recording simultaneously or selectively by methods covered by different main groups	<a href="#">G11B 13/00</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Mounting or connecting stylus to transducer with or without damping means	<a href="#">H04R 1/16</a>
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## G11B 5/00

**Recording by magnetisation or demagnetisation of a record carrier; Reproducing by magnetic means; Record carriers therefor ([G11B 11/00](#) {and [G11B 13/00](#)} take precedence)**

### Definition statement

*This place covers:*

- Methods for magnetic recording of information on any type of record carrier (disks, tapes, drums, cards), for reproducing magnetic information and for erasing said information, wherein there is a relative movement between the record carrier and the transducer
- Structure and manufacture of sliders
- Structure and manufacture of transducers, i.e. recording (e.g. inductive) heads and reproducing heads (e.g. magnetoresistive)
- Means for protecting, cleaning, testing and demagnetizing a head
- Means for supporting the head relative to the record carrier (arm assembly) -- Means for moving the head(s) relative to the record carrier or into or out of the recording or reproducing position or for maintaining position relative to the record carrier.
- Magnetic record carriers characterised by the selection of materials from which they are made.

- Magnetic record carriers characterised by their form (e.g. disk, drum, etc.).
- Magnetic record carriers characterised by the selection of the material.
- Processes and apparatuses specially adapted for the manufacturing of magnetic record carriers.
- Rerecording or transcribing data from one magnetic carrier to another.

### Relationships with other classification places

Marking record carriers in digital fashion: [G06K](#)

Selection of magnetic materials; thin magnetic films: [H01F](#)

Measuring electric or magnetic properties: [G01R](#)

### References

#### Limiting references

*This place does not cover:*

Record carriers	<a href="#">G11B 11/00</a> , <a href="#">G11B 13/00</a>
Magneto-optical recording method and record carriers therefore, wherein the magnetic information is reproduced by optical means	<a href="#">G11B 11/105</a>
Driving, starting or stopping carriers of filamentary (wire) or web (tape) form	<a href="#">G11B 15/00</a>
Guiding record carriers not specifically of filamentary or web form (e.g. disks, cards)	<a href="#">G11B 17/00</a>
Driving, starting or stopping carriers not specifically of filamentary or web form (e.g. disks, cards)	<a href="#">G11B 19/20</a>
Magnetic flux sensitive sensors per se, i.e not specific for recording or reproducing	<a href="#">G01R 33/00</a>
Digital input from or digital output to record carriers, Buffering and Formatting arrangements	<a href="#">G06F 3/06</a>
Magnetic ID or credit cards	<a href="#">G06K 19/00</a>
Static magnetic recording methods and memories, i.e. methods wherein there is no relative movement between the record carrier and the transducer	<a href="#">G11C 11/02</a>
Devices using galvano-magnetic or similar magnetic effects not specific for recording or reproducing; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof	<a href="#">H01L 43/00</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Head arrangements not specific for the method of recording or reproducing	<a href="#">G11B 21/00</a>
Protection against unauthorized use of memory	<a href="#">G06F 12/14</a>
Security arrangements for protecting computers or computer systems against unauthorised activity	<a href="#">G06F 21/00</a>
Methods or arrangements for marking record carriers in a digital fashion	<a href="#">G06K 1/12</a>
Methods or arrangements for the sensing of record carriers	<a href="#">G06K 7/08</a>
Handling of record carriers	<a href="#">G06K 13/02</a>

Record carriers characterised by the type of digital marking	<a href="#">G06K 19/06</a>
Methods and devices for demagnetising of magnetic bodies (e.g. workpieces, sheet material)	<a href="#">H01F 13/00</a>

### Special rules of classification

- [G11B 5/00](#) has a number of main areas, which can be seen from the above definition. Although these areas are fairly self-contained, there are some overlapping definitions which may lead to unnecessary dual classification. Obviously, however, it may often be necessary to classify documents across several areas (method, apparatus, carrier) if a document contains matter which is interesting from several points of view.
- The rules of classification below point out specific examples of places where dual classification should be avoided.
- General note: for reasons obvious to those who work in the field, the majority of documents in [G11B 5/00](#) now relate to magnetic disk drives, specifically hard disks, although a significant minority relate to tape systems, which are still widely used in e.g. large-scale data backup. Magnetic drums represent an older technology which has largely disappeared. Magnetic cards (e.g. ATM cards, 'swipe' cards) are also represented, but there is much overlap with areas of [G06K](#) (see 'Informative references' above). This is reflected in the structure of much of [G11B 5/00](#), which refers explicitly to aspects of disk drives.

Because of this situation, the following general rules apply:

Documents relating to the 'minority' carriers, e.g. tapes, webs, wires, cards, drums, are always classified in one of the subgroups concerning methods and apparatuses for a specific carrier form ([G11B 5/004](#), [G11B 5/008](#)).

However, the 'record carrier' subgroups ([G11B 5/76](#) and the subgroups which depend upon it) are only used if there is something interesting about the carrier itself (other than the materials of which it is made, for which see [G11B 5/62](#) et seq.) e.g. a disk has a series of timing slots or holes in it, or a drum is made removable by separating into two halves longitudinally, etc.

If an aspect (e.g. head, method of recording, servo tracking, etc.) is of more general application, or if there is a place more specific to it elsewhere in the scheme (e.g. [G11B 5/584](#) is specifically for track following on tapes), it is also classified there.

[G11B 5/00](#) partially overlaps with [H01F](#), [G01R](#), [H01L](#). The following general rules apply:

In [H01F 10/00](#) are classified "Magnetic thin films" in general, i.e. thin films whose application is not specific or not limited for magnetic recording or reproducing. Examples are Magnetic Spin Tunnel Junctions (STJ) or Spin Valve structures (SV) which are classified in [H01F 10/3254](#) and [H01F 10/3268](#) respectively and not in [G11B 5/39](#) if the invention does only relate to the magnetic films and their magnetic coupling, without a specific adaptation of the junction or Spin valve to MR reproducing heads, i.e. if the use of the STJ or SV as reproducing head is not mentioned or mentioned among other possibilities and the invention has no specific information related e.g. to the shaping, shielding and biasing necessary for a STJ to be adapted as reproducing head. If, on the contrary, the invention only refers specifically to an adaptation of the STJ or SV thin film structure as reading head, then only the code [G11B 5/39](#) (or subcodes) is given. When the invention has both aspects, i.e. the thin film structure in general and the specific application as reproducing head, then both codes are given.

The same rule applies to [G01R](#), in particular [G01R 33/09](#), where are classified magnetoresistive devices in general (i.e. MR devices whose application is not specific or not limited or specially adapted for magnetic recording or reproducing) and to [H01L](#), in particular [H01L 43/00](#), where are classified devices using galvano-magnetic or similar magnetic effects in general, i.e. not specially adapted for magnetic recording or reproducing.

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Perpendicular Magnetic Recording	In perpendicular magnetic recording the magnetization directions representing the data bits are perpendicular to or out-of-the-plane of the recording layer
Longitudinal Magnetic Recording	In longitudinal magnetic recording the magnetization directions representing the data bits are parallel to or in the plane of the recording layer
MAMR	Microwave Assisted Magnetic Recording
TAMR or TMR	Thermally Assisted Magnetic Recording
NF or NFL	Near Field Light
ATE	Adjacent Track Erasure

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

PMR	Perpendicular Magnetic Recording
MAMR	Microwave Assisted Magnetic Recording
TAMR or TMR	Thermally Assisted Magnetic Recording

The terms "thin film" and "binderless" both apply to coated films of a (generally) uniformly deposited material, differing from "binder media" which comprises magnetic particles in a (usually organic) binder resin.

Vertical or perpendicular are used interchangeably in the art to refer to magnetization directions normal to the plane of the film.

Horizontal, longitudinal, in-plane are used interchangeably in the art to refer to magnetization directions lying in the plane of the film.

Substrate, support, base are used interchangeably in the art to refer to the underlying rigid or flexible (in terms of tapes or floppy disks, for example) layer upon which other layers are deposited thereon.

Seed layer, under layer, intermediate layer, orientation control layer, adhesion layer, crystal growth layer are all generally used terminology to describe (usually non-magnetic) layers deposited under the main magnetic layer(s) to assist in crystal growth and tuning of the magnetic properties of the main magnetic layer(s).

Soft under layer (SUL) and keeper layer are used interchangeably to describe a soft magnetic layer used under a hard magnetic recording layer to provide a flux path.

## G11B 5/004

Recording on, or reproducing or erasing from, magnetic drums ([G11B 19/00](#) takes precedence)

### References

#### Limiting references

*This place does not cover:*

Driving, starting, stopping record carriers not specifically of filamentary or web form, or of supports therefor; Control thereof; Control of operating function	<a href="#">G11B 19/00</a>
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### Special rules of classification

This group refers to an obsolete technology.

## G11B 5/008

Recording on, or reproducing or erasing from, magnetic tapes, {sheets, e.g. cards,} or wires ([G11B 15/00](#) {[G11B 19/00](#)} take precedence; {bulk transferring of information magnetisation for re-recording [G11B 5/865](#); marking record carriers in digital fashion [G06K](#)})

### Definition statement

*This place covers:*

- Methods for recording, reproducing or erasing from magnetic cards in [G11B 5/00808](#)
- Methods for recording, reproducing or erasing from magnetic tapes in longitudinal and/or transverse tracks in [G11B 5/00813](#), heads therefore, including stationary ([G11B 5/00821](#) and [G11B 5/00852](#)) or cyclically driven heads ([G11B 5/00839](#) and [G11B 5/0086](#))

### References

#### Limiting references

*This place does not cover:*

Disposition or mounting of heads relative to moving tape	<a href="#">G11B 5/4893</a>
Fixed mounting of heads	<a href="#">G11B 5/49</a>
Mounting with simultaneous movement of head and tape	<a href="#">G11B 5/52</a>
Track change selection or acquisition by movement of the head across tape tracks	<a href="#">G11B 5/5504</a>
Provisions for track following on tapes	<a href="#">G11B 5/588</a>
Driving, starting, stopping, guiding recording tapes	<a href="#">G11B 15/00</a>
Guiding cards or sheets	<a href="#">G06K 13/00</a>
Record carriers for use with machines and with at least a part designed to carry digital markings	<a href="#">G06K 19/00</a>

### Special rules of classification

- Bulk transferring of information magnetisation for re-recording [G11B 5/865](#);



- Methods or arrangements for marking record carriers in digital fashion [G06K 1/12](#);
- Structures and methods of manufacture of recording or reproducing heads for magnetic tapes or wires are also classified in [G11B 5/127](#) and subgroups

## G11B 5/012

**Recording on, or reproducing or erasing from, magnetic disks ([G11B 17/00](#), [G11B 19/00](#) take precedence)**

### Definition statement

*This place covers:*

Recording, reproducing and erasing methods and corresponding apparatuses specific for magnetic recording disks (e.g. definition of tracks, control of skew angle between head and tracks, subdivision in sectors etc.)

### References

#### Limiting references

*This place does not cover:*

Guiding magnetic or nonmagnetic discs	<a href="#">G11B 17/00</a>
Guiding record carriers not specifically of filamentary or web form, or of supports therefor	<a href="#">G11B 17/00</a>
Driving, starting, stopping record carriers not specifically of filamentary or web form, or of supports therefor; Control thereof; Control of operating function	<a href="#">G11B 19/00</a>
Control of disk drives operating functions	<a href="#">G11B 19/02</a>
Turntables, hubs and motors for disk drives and control thereof	<a href="#">G11B 19/20</a>

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

HDD	Hard Disk Drive
HGA	Head Gimbal Assembly

## G11B 5/02

**Recording, reproducing, or erasing methods; Read, write or erase circuits therefor (timing or synchronising arrangements [G11B 27/10](#))**

### Definition statement

*This place covers:*

- Recording methods (e.g. thermally assisted magnetic recording)
- Reproducing methods
- Erasing methods
- Circuitry for driving the load of a write head of a hard disk drive, e.g. H-bridge configurations to inverse the current direction in the head in order to write data on the recording medium and circuits for boosting said inversion.

## References

### Limiting references

*This place does not cover:*

Improvement or modification of read or write signals (magnetic read/write channels, equalizers, Viterbi detectors etc.)	<a href="#">G11B 20/10009</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Timing or synchronising arrangements	<a href="#">G11B 27/10</a>
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### Special rules of classification

Timing or synchronising arrangements are classified in [G11B 27/10](#)

Signal processing for digital recording or reproducing is generally classified in [G11B 20/10](#) unless specific for the recording method, in which case the class [G11B 5/09](#) is given.

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Shingled writing	Tracks are written in a sequential manner from an inner diameter (ID) to an outer diameter (OD), from OD to ID, or from OD and ID towards a middle diameter (MD) in a radial region of a disk in a hard disk drive (HDD). In other words, a first track is partially overwritten on one side when a second track adjacent to the first track is written, and subsequently a third track is written that partially overwrites the second track, and so forth
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## G11B 5/10

### Structure or manufacture of housings or shields for heads

#### Definition statement

*This place covers:*

Structure or manufacture of head housing, e.g. sliders

Structure or manufacture of shields for shielding the head against electric or magnetic fields

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Grounding of static charges, shielding from Electro-Magnetic Interference (EMI)	<a href="#">G11B 33/1493</a>
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### Special rules of classification

- Fluid dynamic spacing of the slider from the record carrier and specific structures of the slider Air Bearing Surface therefore are classified in [G11B 5/60](#)
- Shields specific for thin film magnetic inductive heads are classified in [G11B 5/3146](#)

- Shields specific for Magnetoresistive reproducing heads are classified in [G11B 5/3912](#)

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

ABS	Air Bearing Surface
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## G11B 5/127

### Structure or manufacture of heads, e.g. inductive

#### References

##### Limiting references

*This place does not cover:*

Magnetic thin films in general (i.e. thin film whose application is not specific or not limited for magnetic recording or reproducing, e.g. MR)	<a href="#">H01F 10/00</a>
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##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Optical recording using near field effect	<a href="#">G11B 7/1387</a>
Lapping machines	<a href="#">B24B 37/00</a>
Thin film devices manufacturing methods per se, metallic coating e.g. by evaporation, sputtering	<a href="#">C23C 14/00</a>
MR elements	<a href="#">G11C 11/16</a> , <a href="#">H01F 10/3254</a> , <a href="#">H01F 10/3272</a> , <a href="#">H01L 43/08</a> , <a href="#">G01R 33/093</a>

#### Special rules of classification

- Thin film heads comprising extra layers for thermally assisted recording, e.g. optical wave guides, optical near field generators are classified in [G11B 5/314](#).
- Manufacturing of thin film heads (inductive or not, i.e. also magnetoresistive) is classified in [G11B 5/3163](#) if it is related to manufacturing aspects which are specific for thin film (e.g. thin film deposition). It is noted that almost all modern heads are thin film heads.
- [G11B 5/3967](#) (composite structural arrangements of transducers, e.g. inductive write head and magnetoresistive read head): since almost all recent heads have this composite structure, documents are classified in this subclass only if the invention relates to this composite structure, e.g. to the positioning or shielding of one head with respect to the other.

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

ABS	Air Bearing Surface
AFM	Anti-FerroMagnetic
TMR	Tunnelling Magneto-Resistance
GMR	Giant Magneto-Resistance

EMR	Extraordinary Magneto-Resistance, i.e. Magneto-resistance in thin film head using narrow-gap semiconductors with metallic impurity in place of ferromagnetic layers.
AMR	Anisotropic Magneto-Resistance
CPP-GMR	Current Perpendicular-to-the-Plane- GMR
CIP-GMR	Current In-Plane-GMR
STO	Spin Torque Oscillator (spin-torque oscillator used in perpendicular write heads to apply a high-frequency auxiliary field to the recording layer to assist writing)

## G11B 5/40

**Protective measures on heads, e.g. against excessive temperature ([G11B 5/31](#) takes precedence; protection against wear [G11B 5/255](#) {protective structure of the head: see under structures, e.g. [G11B 5/3106](#)})**

### Definition statement

*This place covers:*

Measures and methods (e.g. control of the operating functions) to protect the head against damages, e.g. against excessive temperature, head-record carrier collisions (means for their prediction, detection and avoidance), wear.

### References

#### Limiting references

*This place does not cover:*

Fluid-dynamic spacing of heads from record carriers per se	<a href="#">G11B 5/60</a>
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### Special rules of classification

Structural means (e.g. extra layer included in the recording or reproducing head or special layer compositions thereof) to reduce physical detrimental influence (e.g. contamination, humidity) are classified in [G11B 5/3103](#). Structural means to reduce the influence of wear are classified in [G11B 5/3103](#) if they refer to thin film heads and in [G11B 5/255](#) in all other cases.

Structural means (e.g. extra layer included in the recording or reproducing head or special layer compositions thereof) for reducing the influence of temperature changes (e.g. heat dissipation layers or structures avoiding deformation of the head or the pole tip protrusion due to temperature expansion of the pole) are classified in [G11B 5/3133](#).

## G11B 5/41

**Cleaning of heads {(of record carriers [G11B 23/50](#))}**

### References

#### Limiting references

*This place does not cover:*

Cleaning of record carriers	<a href="#">G11B 23/50</a>
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## G11B 5/455

Arrangements for functional testing of heads {(testing of the manufacturing process [G11B 5/127](#))}; Measuring arrangements for heads (measuring electric or magnetic properties [G01R](#); {measuring properties for shaping or assembling elements [G11B 5/127](#)})

### Definition statement

*This place covers:*

Functional testing of the heads when the manufacturing is completed and arrangements therefore, e.g. spin stands or test beds.

### Relationships with other classification places

Measuring electric or magnetic properties: [G01R](#)

### References

#### Limiting references

*This place does not cover:*

Testing of disk drives	<a href="#">G11B 19/048</a>
Monitoring, i.e. supervising the progress of recording or reproducing (monitoring defects of the apparatus and of the recording medium)	<a href="#">G11B 27/36</a>

### Special rules of classification

- Testing of the manufacturing process is classified in [G11B 5/127](#)
- Testing of the manufacturing process of thin film heads or indicating thereto, e.g. before the manufacturing is completed, is classified in [G11B 5/3163](#)

## G11B 5/465

Arrangements for demagnetisation of heads (demagnetisation in general [H01F 13/00](#))

### References

#### Limiting references

*This place does not cover:*

Demagnetisation of record carriers, e.g. bulk erasing	<a href="#">G11B 5/0245</a>
Demagnetisation in general	<a href="#">H01F 13/00</a>

## G11B 5/74

**Record carriers characterised by the form, e.g. sheet shaped to wrap around a drum**

### Definition statement

*This place covers:*

Record carriers (tapes, cards, disks) specially shaped, e.g., bit patterned media, or discrete-track media

### References

#### Limiting references

*This place does not cover:*

Manufacturing of record carriers	<a href="#">G11B 5/84</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Manufacturing of patterned magnetic recording media	<a href="#">G11B 5/855</a>
Photomechanical, e.g. photolithographic, production of textured or patterned surfaces	<a href="#">G03F 7/00</a>

### Special rules of classification

Acquisition of servo patterns and processing thereof [G11B 5/596](#)

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Patterned Media and Bit Patterned Media	In Patterned Media (PM) and Bit-patterned-media (BPM), the magnetic recording layer on the media is patterned into small magnetic isolated data islands. In Bit-patterned media each island corresponds to a bit and is arranged e.g. in concentric data tracks in the case of disks media, while in patterned media the islands may correspond to discrete tracks or to servo patterns. Patterned-media may be longitudinal magnetic recording disks, wherein the magnetization directions are parallel to or in the plane of the recording layer, or perpendicular magnetic recording disks, wherein the magnetization directions are perpendicular to or out-of-the-plane of the recording layer. To produce magnetic isolation of the patterned data islands, the magnetization of the spaces between the islands is destroyed or substantially reduced to render these spaces essentially nonmagnetic. Alternatively, the media may be fabricated so that that there is no magnetic material in the spaces between the islands
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### Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

BPM	Bit-Patterned-Media
-----	---------------------

PM	Patterned Media
DTM	Discrete Track Media

## G11B 5/86

**Re-recording, i.e. transcribing information from one magnetisable record carrier on to one or more similar or dissimilar record carriers {(by varying the order of the information [G11B 27/029](#), [G11B 27/036](#))}**

### Definition statement

*This place covers:*

Master disks - i.e. original disks drawn preliminarily with magnetic information corresponding to a preformatted signal to be magnetically transferred (e.g. servo patterns or reference servo patterns for self-servo-writing) - used to duplicate information on slave disks

### References

#### Limiting references

*This place does not cover:*

Re-recording by varying the order of the information	<a href="#">G11B 27/029</a> , <a href="#">G11B 27/036</a>
Transferring data from one type of record carrier to another type of record carrier	<a href="#">G06K 1/18</a>

### Special rules of classification

When the medium to which information has to be transferred is in direct contact with the master disk the method or apparatus is classified in [G11B 5/865](#).

## G11B 7/00

**Recording or reproducing by optical means, e.g. recording using a thermal beam of optical radiation {by modifying optical properties or the physical structure}, reproducing using an optical beam at lower power {by sensing optical properties}; Record carriers therefor; ([G11B 11/00](#), [G11B 13/00](#) take precedence)**

### Definition statement

*This place covers:*

- purely optical aspects of magneto-optical recording (for example a focus error method)
- optical recording of label information on optical recording media such as CDs, where the recording is done using the optical head that records the coded main data

In general terms, this group is subdivided into:

systems ([G11B 7/002](#)- [G11B 7/003](#)) e.g. tape, card, disc

methods of recording or reproduction (also erasing, overwriting), including holographic recording of coded data ([G11B 7/004](#) - [G11B 7/0065](#)); re-recording of data (transcription) ([G11B 7/28](#))

arrangement of information e.g. control area, land and groove structure, including details of discrete physical structures such as "pits" ([G11B 7/007](#)- [G11B 7/013](#))

access e.g. moving the optical pickup ([G11B 7/085](#))

servo e.g. moving the objective lens ([G11B 7/09](#))

heads e.g. types of heads ([G11B 7/12](#), [G11B 7/14](#))

- details of head components e.g. lasers, detectors, optical elements in the light path between laser and record carrier or between record carrier and detector ([G11B 7/125](#) - [G11B 7/135](#))
- manufacture of heads ([G11B 7/22](#))

record carriers e.g. CD, DVD, BD ([G11B 7/24](#))

- structural aspects e.g. multiple data layers
- material aspects e.g. materials used in recording layers, protective layers, substrates ([G11B 7/241](#)-[G11B 7/258](#))
- manufacture e.g. depositing a layer of recording material, pressing pits into substrate material, arrangements of multiple types of machinery in a production line ([G11B 7/26](#))

In principle, only aspects of the above subjects that are particularly adapted as a result of using light for recording/reproduction (e.g. track pitch, pit depth adapted to the wavelength of light used) should be classified in [G11B 7/00](#).

### Relationships with other classification places

- optical recording/writing of uncoded images e.g.
- holographic storage of images (see [G03H 1/10](#))
- thermography ([B41M 5/26](#))
- laser (electrophotographic)/thermographic printers ([B41J 2/435](#))
- facsimile ([H04N 1/00](#))
- xerography i.e. photocopiers ([G03G](#))
- optical displays based on liquid crystals ([G02F 1/135](#))
- optical storage of small amounts of coded data e.g. on credit card size carriers or bar codes (see [G06K 7/10](#) for methods or arrangements, or [G06K 19/06009](#) for the media e.g. [G06K 19/06028](#) for bar codes)
- static optical memories [G11C](#)
- applications of optical carriers such as CD, DVD, BD e.g.
- games ([A63F 13/00](#));
- audio visual presentations of educational apparatus ([G09B 5/06](#));
- addressable supports for biological samples ([G01N 35/00069](#))
- advertising ([G09F 23/00](#))
- greeting cards ([G09F 1/00](#))

### References

#### Limiting references

*This place does not cover:*

Optical arrangements for thermally assisted magnetic recording	<a href="#">G11B 5/314</a>
Optical servo for magnetic recording	<a href="#">G11B 5/59677</a>
Aspects for data formats for standards such as CD, DVD, BD unless the technical problem underlying the invention arises because of the optical nature of the recording	<a href="#">G11B 7/00</a> , <a href="#">G11B 20/12</a>
Aspects of editing, addressing, timing etc for standards such as CD, DVD, BD unless the technical problem underlying the invention arises because of the optical nature of the recording	<a href="#">G11B 7/00</a> , <a href="#">G11B 27/00</a>



Near field interactions that do not involve optical radiation	<a href="#">G11B 9/12</a>
Using microscopic probe means	<a href="#">G11B 9/14</a>
If recording and reproducing are covered by different main groups,	<a href="#">G11B 11/14</a>
Microscopic probe means	<a href="#">G11B 11/26</a>
Control of operating function, e.g. general control aspects of preventing overwriting of data	<a href="#">G11B 19/02</a> , <a href="#">G11B 19/04</a>
Starting, stopping record carriers, e.g. spindle control discrimination of media type	<a href="#">G11B 19/20</a> , <a href="#">G11B 19/12</a>
Defect management for optical media such as CD, DVD, BD	<a href="#">G11B 20/1889</a>
Aspects of record carriers not specific to method of recording or reproducing e.g. hub details are generally not specific to whether or not the recording is optical or magneto-optical	<a href="#">G11B 23/0028</a>
Computer systems involving digital I/O from or to direct access storage devices involving optical discs	<a href="#">G06F 3/0601</a>

### Special rules of classification

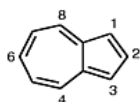
The following "horizontal" Indexing Codes are assigned where appropriate:

- [G11B 2007/0006](#) recording, reproducing or erasing systems adapted for scanning different types of carriers e.g. CD & DVD
- [G11B 2007/0009](#) recording, reproducing or erasing systems for carriers having data stored in three dimensions e.g. volume storage
- [G11B 2007/0013](#) recording, reproducing or erasing systems for carriers having data stored in three dimensions and having multiple discrete layers
- [G11B 2007/0016](#) recording, reproducing or erasing systems for carriers adapted to have label information written on the non-data side by the optical head used for recording (e.g. lightscribe, labelflash)

Further information of subgroups:

[G11B 7/241](#): should be used as little as possible e.g. where different materials for various layers are disclosed and the invention does not reside in one particular layer (e.g. EP2224444, US2005129899)

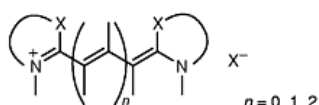
[G11B 7/242](#): this group and subgroups are used when the recording material does not fall (exclusively) into one of the higher dot subgroups; e.g. comprising inorganic and organic material (US2003175616, JP58062094)



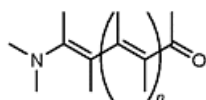
[G11B 2007/2445](#) :

[G11B 7/2467](#) : R1-N=N-R2

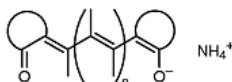
[G11B 7/247](#): styryl dye



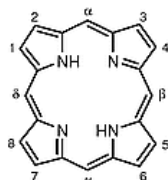
[G11B 7/2472](#) :



[G11B 7/2475](#) :



[G11B 7/2478](#) :



[G11B 7/248](#):

[G11B 7/25](#): in the recording layer

Examples:

- e.g. light-shielding layer, reactive compounds, recording blocking particles, subbing layer (US5100766), smoothing layer,
- mask (=shutter) layer (for Super-RENS application; if in direct contact with recording layer, [G11B 7/257](#) takes precedence) e.g. US5470628, WO2006135180;
- labelling layer; ink receiving layer
- limit-play layer
- third dielectric layer (US5681632), heat sink layer or heat radiating layer (not in direct contact with the recording layer);
- auxiliary layer (US5442619), electrodes, filters;
- parting layer (e.g. WO2005035237A1);
- peelable sheet (e.g. WO2008126524)
- decomposition reaction layer (see EP1645429A1);
- compensating layer (WO2004008446);
- thermochromic layer (WO2004010424)
- flat-plate lens (EP1365394);
- stabilization layer (EP1069556);
- delamination-proof layer (EP0896328);
- shutter layer (DE4214978);
- record-blocking portions (WO2006022360);
- solvent barrier layer (US4423427);
- reflectivity adjustment layer (US5846625);
- super-resolution film (US6385162);
- pyrotechnic layer (WO0000453);
- Servo layers (WO0178068);
- subbing layer (US4753861);
- ultraviolet absorption film (EP0259151);

Note in group [G11B 7/252](#), multi-aspect classification is applied, so that if subject matter is characterised by aspects covered by more than one of its subgroups, the subject matter should be classified in each of those subgroups

[G11B 7/254](#): topcoat layers = outermost layer

[G11B 7/2542](#) ;

Examples:

- in case of printing layer on the top of the protective layer,
- class [G11B 7/254](#) is given to the printing layer,
- [G11B 7/252](#) to the protective layer (cf. e.g. EP0628956, US5510164);
- if cover layer on the protective coat, then [G11B 7/254](#) to cover layer,
- and [G11B 7/252](#) to protective coat; anti-staining layer e.g. see doc. No US2005158558);
- when there is an inorganic material film ([G11B 7/252](#)) provided on the surface, which
- in turn has a protective layer provided thereon ([G11B 7/2542](#)), see doc. No EP0123223);
- vibration prevention layer (US2003224136);
- lubricant layer as outermost layer (e.g. US2002054974)

[G11B 7/2545](#) : e.g. carbon containing coating , DLC coating - (EP0410704)

[G11B 7/256](#): (EP1343159)

[G11B 7/257](#): Only layers provided in direct contact with the recording layer are classified here. Other protecting layers, which are not toplayers ([G11B 7/254](#)) are classified under [G11B 7/252](#).

Examples:

- antireflection layer (US5398232);
- A heat-deformable dye binder layer (US4336545);
- Oxidisable (oxidation) layer (JP57163597);
- Hollow spaces above recording layers (e.g. spacers) (US4791044);
- Charge transfer layer (EP0183168);
- Mask (= shutter layer for near-field applications) (EP1071086)

**G11B7/257B;**

Examples:

- shutter layer (EP0580346)

[G11B 7/2575](#) ;

Examples:

- high modulus layer (WO03021588);
- heat insulation layer (FR2435779);

[G11B 7/2578](#) ;

Examples:

- flattening layer (US5095478);
- light-to-heat converting film (EP0596339);
- reinforcement layer (US4408213)

**G11B 7/0025**

**with cylinders or cylinder-like carriers {or cylindrical sections or flat carriers loaded onto a cylindrical surface}, e.g. truncated cones**

**Definition statement**

*This place covers:*

Uncommon or outdated technology (in 2011)

**G11B 7/003**

**with webs {, filaments or wires}, e.g. belts, spooled tapes or films of quasi-infinite extent**

**Definition statement**

*This place covers:*

Uncommon or outdated technology (in 2011)

**G11B 7/0031**

**{using a rotating head, e.g. helicoidal recording}**

**Definition statement**

*This place covers:*

Optical tape data storage systems that feed an optical tape helically around a drum while writing and/or reading digital data on the optical tape see e.g. US5524105

Uncommon or outdated technology (in 2011)

**G11B 7/0032**

**{for moving-picture soundtracks, i.e. cinema (cameras or projectors with sound recording or reproducing means [G03B 31/02](#))}**

**Definition statement**

*This place covers:*

Uncommon or outdated technology (in 2011)

**G11B 7/0033**

**with cards {or other card-like flat carriers, e.g. flat sheets of optical film}**

**Definition statement**

*This place covers:*

Optical storage of small amounts of data on cards (analogous to magnetic strip on bank cards) is normally classified in [G06K 19/06009](#) (media) or [G06K 7/10](#) (methods and apparatus)

**G11B 7/0037**

**with discs**

**Definition statement**

*This place covers:*

This sub-group is a residual sub-group and should only be assigned if there is something about an optical disc system related to the optical nature of recording and reproduction that is not classifiable elsewhere in [G11B 7/00](#)

this sub-group includes systems in which the label information is written optically on the non-data side of disc e.g. technologies such as Hewlett Packard LightScribe and Yamaha/FujiFilm LabelFlash

for labelling of optical data carriers that does not write the label data with the optical head used to write the main data, see [G11B 23/40](#)

## **G11B 7/00375**

**{arrangements for detection of physical defects, e.g. of recording layer}**

### **Definition statement**

*This place covers:*

This sub-group is a residual sub-group and should only be assigned if (part of) the subject-matter can not be classified elsewhere, in particular in one of the following:

[G11B 7/0948](#): servo control specially adapted for detection and avoidance or compensation of imperfections on the carrier e.g. dust, scratches, dropouts

[G11B 20/1889](#): defect management

[G11B 20/1816](#) testing e.g. of dropouts

[G11B 7/268](#): checking for defects during/after manufacture

[G01N 21/9506](#): Systems specially adapted for investigating the presence of flaws or contamination in optical discs

## **G11B 7/0045**

**Recording ([G11B 7/006](#), [G11B 7/0065](#) take precedence)**

### **Definition statement**

*This place covers:*

Indexing Code [G11B 2007/00457](#) is assigned for two photon recording (including two photon recording in holographic data storage media

## **G11B 7/00451**

**{involving ablation of the recording layer}**

### **Definition statement**

*This place covers:*

For example, recording data as "pits" in a dye recording layer (e.g. CD-R, DVD-R, BD-R) not to be confused with spectral hole burning (see [G11B 7/00453](#)) for materials used in recording layers see [G11B 7/242](#) and subgroups

## **G11B 7/00452**

**{involving bubble or bump forming}**

### **Definition statement**

*This place covers:*

Uncommon or outdated technology (in 2011)

Generally involves thermal expansion of a recording layer to form bumps which alter the amount of reflected light because of the phase difference (interference effect) between light reflected by the protuberance and light reflected by the surface which is not raised.

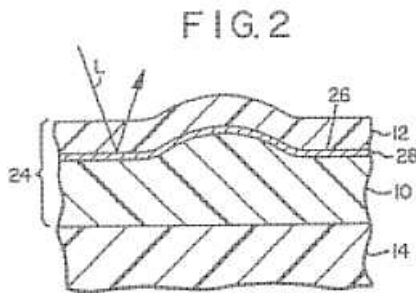


Figure from EP 338776

For materials used in recording layers see [G11B 7/242](#) and subgroups.

## G11B 7/00453

{involving spectral or photochemical hole burning}

### Definition statement

*This place covers:*

Uncommon or outdated technology (in 2011)

Multiple bits can be stored in the same space using different frequencies atoms or molecules which are in different environments. The absorption line of a material is inhomogeneously broadened (comprised of many homogeneously broadened lines, due to the slightly different energies and therefore frequencies/wavelengths corresponding to the different environments).

Not to be confused with ablative recording (which is a thermal effect, not a spectral one).

For materials used in recording layers see [G11B 7/242](#) and subgroups.

## G11B 7/00454

{involving phase-change effects}

### Definition statement

*This place covers:*

For example, recording using chalcogenide materials e.g. GeSbTe.

This classification should only be assigned if:

- the invention is about the phase change recording mechanism (note that this is now rare, since phase change recording is a "mature" technology), or
- if the invention is specifically adapted for recording based on a phase change of the material AND there is no better classification (see below)

Recording pulse sequences are classified in [G11B 7/0062](#) (for overwritable media) or in [G11B 7/00456](#) (for write-once media)

Phase change materials are classified in [G11B 7/243](#) and subgroups.

## G11B 7/00455

{involving reflectivity, absorption or colour changes}

### Definition statement

*This place covers:*

For example, photochromic recording in which the colour is changed; documents concerning recording in which the texture of the surface is changed to change the reflectivity are classifiable here.

### References

#### Limiting references

*This place does not cover:*

Involving ablation of the recording layer	<a href="#">G11B 7/00451</a>
Involving bubble or bump forming	<a href="#">G11B 7/00452</a>
Involving spectral or photochemical hole burning	<a href="#">G11B 7/00453</a>
Involving phase-change effects	<a href="#">G11B 7/00454</a>

## G11B 7/00456

{Recording strategies, e.g. pulse sequences ([G11B 7/0062](#) takes precedence)}

### References

#### Limiting references

*This place does not cover:*

Overwriting strategies, e.g. recording pulse sequences with erasing level used for phase-change media	<a href="#">G11B 7/0062</a>
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### Special rules of classification

Both [G11B 7/00456](#) and [G11B 7/0062](#) are assigned if the strategy or strategies disclosed is/are applicable to both write-once and rewritable media. Example:

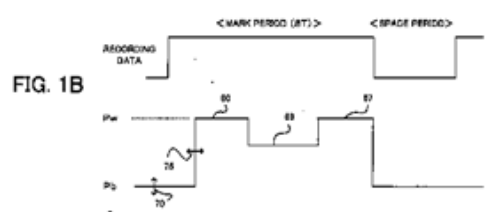
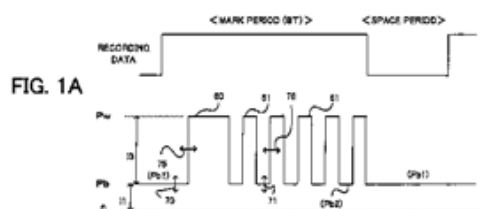


Figure taken from EP1548710

## **G11B 7/00458**

**{Verification, i.e. checking data during or after recording}**

### **Definition statement**

*This place covers:*

This class should only be assigned for invention information (mostly older technology) in which the actual data is read during recording and compared with the data that should have been recorded, or verification using a separate read/verify beam.

Running optical power control (ROPC): [G11B 7/1263](#)

Walking optical power control : [G11B 7/1263](#)

## **G11B 7/0051**

**{involving phase depth effects}**

### **Definition statement**

*This place covers:*

Documents are only assigned this class (or code) if the particular problem or solution of the invention disclosed relates to the aspect of phase depth AND if there is no better classification (see below). (Phase depth effects are the most common basis for reproduction of information in [G11B 7/00](#): the reproduction of the usual data pits in a CD, DVD, BD (i.e. pits in the plastic substrate, covered with a reflective layer) relies on this effect.)

Also reproduction of phase change media normally involves a phase depth effect, because the refractive indices of the various layers are adjusted to give a particular optical path length difference. (n.b. "phase" here has two different meaning - the physical state of the material ("phase change material") and the optical or physical difference in path length between two areas resulting in constructive or destructive optical interference "phase depth")

[G11B 7/24085](#) (Arrangement of the information on the record carrier) Details of discrete information structures, e.g. shape or dimensions of pits, pre-pits

(n.b. From 2012 revision of the IPC introduces new group [G11B 7/2407](#) for media characterised by the pits, and ECLA will be revised correspondingly)

## **G11B 7/0052**

**{involving reflectivity, absorption or colour changes}**

### **Definition statement**

*This place covers:*

For example, reproduction of data recorded in a photochromic material.



## G11B 7/0055

**Erasing ([G11B 7/006](#), [G11B 7/0065](#) take precedence)**

### Definition statement

*This place covers:*

Mostly uncommon or outdated technology (in 2011) - nearly all modern commercial disc technology is of the write-once type (e.g. recording in dye layer) or of the overwritable type (e.g. recording in a layer of phase change material).

### References

#### Limiting references

*This place does not cover:*

Overwriting	<a href="#">G11B 7/006</a>
Recording, reproducing or erasing by using optical interference patterns, e.g. holograms.	<a href="#">G11B 7/0065</a>

## G11B 7/00557

**{involving phase-change media}**

### Definition statement

*This place covers:*

Mostly uncommon or outdated technology (in 2011) - most modern phase change materials are overwritable.

## G11B 7/006

**Overwriting ([G11B 7/0065](#) takes precedence)**

### Definition statement

*This place covers:*

Rewritable is often synonymous with overwritable (but rewritable may mean merely erasable in old documents).

## G11B 7/0062

**{Overwriting strategies, e.g. recording pulse sequences with erasing level used for phase-change media}**

### Definition statement

*This place covers:*

Both [G11B 7/00456](#) and [G11B 7/0062](#) are assigned if the strategy or strategies disclosed is/are applicable to both write-once and rewritable media.

See Figure of a pulse strategy under [G11B 7/00456](#).

## G11B 7/0065

### Recording, reproducing or erasing by using optical interference patterns, e.g. holograms

#### Definition statement

*This place covers:*

Relationship between groups:

There are subgroups for certain aspects of holographic recording and where one (or more) or those subgroups is relevant they are assigned, and [G11B 7/0065](#) or Indexing Code [G11B 7/0065](#) are not assigned unless

there is "invention" information relevant to the system as a whole, or

if there is no better classification for the invention information.

Warning: These "holographic" subgroups were created in the second half of 2009, and the reclassification from [G11B 7/0065](#) has not been systematically done. For documents published before 2010, [G11B 7/0065](#) and Indexing Code [G11B 7/0065](#) should be searched.

If there is no subgroup specific to holography for the invention subject-matter (e.g. there are no specific subgroups under [G11B 7/242](#) for specific materials for holography), then the relevant general class is assigned and the Indexing Code [G11B 7/0065](#). For example:

[G11B 7/08564](#) for galvanomirrors e.g. used in angular multiplexing [G11B 7/128](#) for SLM, acousto-optical, electro-optical, magneto optical modulators [G11B 7/128](#) and [G11B 7/1369](#) if modulator is liquid crystal device

[G11B 7/1392](#) for a diffuser (e.g. in speckle holography)

[G11B 7/1365](#) for polarization rotators [G11B 7/1372](#), or subgroup, for lenses [G11B 7/1356](#) for double prism beam splitter [G11B 7/1395](#) for other beam splitters

#### References

##### Limiting references

*This place does not cover:*

Where the recording mechanism of the holographic storage is of interest e.g. <a href="#">G11B 2007/00457</a> is assigned for two-photon recording of holograms	<a href="#">G11B 7/0045</a>
Collinear holography: Where the object and reference beams are substantially parallel or coaxial before being focused (synonym: "coaxial", "common path", co-propagating)	<a href="#">G11B 2007/00653</a>
Counter propagating holography: Where the object and reference beams are directed to opposite sides of the medium (synonym: "standing wave" or "stationary wave")	<a href="#">G11B 2007/00656</a>
Holographic storage of images	<a href="#">G03H</a>

##### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Arrangement of holographic information, including multiplexing of information	<a href="#">G11B 7/00772</a>
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Arrangement of auxiliary information for holographic storage	<a href="#">G11B 7/00781</a>
Concerning access of holographic information	<a href="#">G11B 7/083</a>
Concerning structural aspect of media for holographic storages	<a href="#">G11B 2007/240025</a>

## G11B 7/007

**Arrangement of the information on the record carrier, e.g. form of tracks{, actual track shape, e.g. wobbled, or cross-section, e.g. v-shaped; Sequential information structures, e.g. sectoring or header formats within a track}**

### Definition statement

*This place covers:*

Aspects for data formats for standards such as CD, DVD, BD are not classified in [G11B 7/007](#) unless the technical problem underlying the invention arises because of the optical nature of the recording. In such cases the documents may be classifiable both in [G11B 7/007](#) and in [G11B 20/00](#).

Standards for various aspects of the formats of optical discs are available from the Internet site of ECMA ([www.ecma.org](http://www.ecma.org)).

(e.g. CD-ROM, DVD-ROM, DVD-RAM, DVD-R, DVD-RW, CD-RW Ultra-speed)

White Papers for the Blu-ray Disc Format are available from the Internet site of the Blu-ray Disc Association ([www.blu-raydisc.com](http://www.blu-raydisc.com))

e.g. the Physical Format Specifications for BD-RE and for BD-ROM

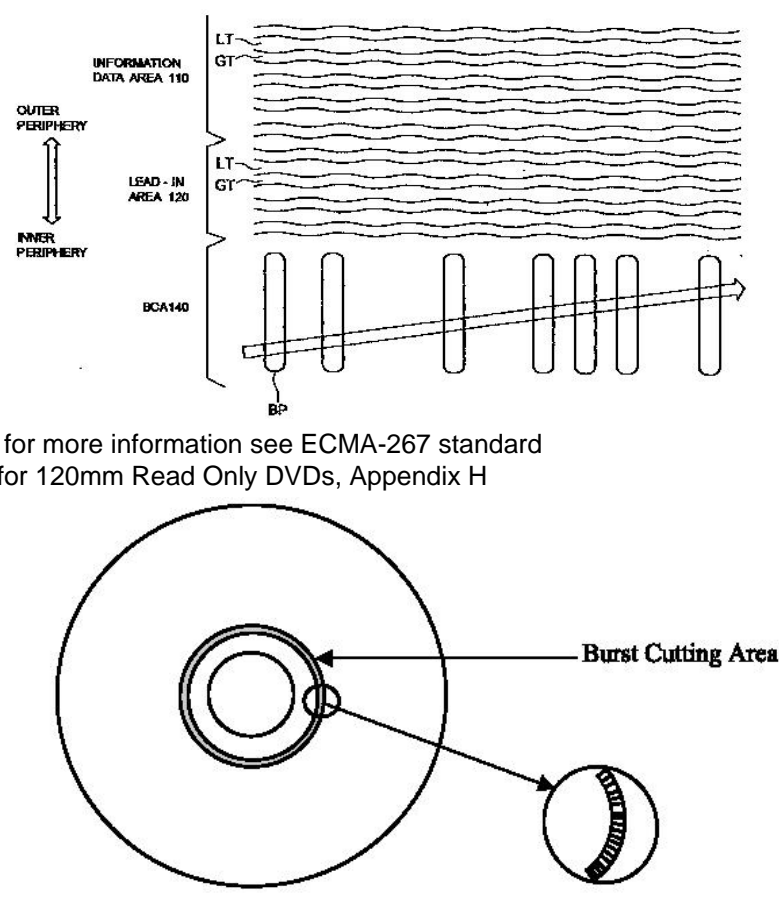
There are also ECMA standards for holographic discs (HVD-ROM, HVD)

## G11B 7/00736

{Auxiliary data, e.g. lead-in, lead-out, Power Calibration Area [PCA], Burst Cutting Area [BCA], control information (sector headers or addresses in prepits [G11B 7/00745](#); address data in track wobble [G11B 7/24082](#))}

### Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

<p>Burst cutting area</p>	<p>Auxiliary data recorded towards the inner periphery of the disc, as a type of bar code (stripes) . Because it is recorded as stripes, it can be read before the tracking servo is on. The data is phase-encoded (i.e. "0" is represented by 2 channel bits set to "1 0", and "1" by "0 1"), and the sequence of data bits is return-to-zero modulated.</p>  <p>for more information see ECMA-267 standard for 120mm Read Only DVDs, Appendix H</p> <p>IT-3200-A</p> <p>Figure H.1 - Burst Cutting Area</p>
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### Synonyms and Keywords

In patent documents, the following abbreviations are often used:

BCA	burst cutting area
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*In patent documents, the following words/expressions are often used with the meaning indicated:*

"read in (area)"	"lead in (area)", based on Japanese applications.
"read out (area)"	"lead out (area)".

## G11B 7/00772

**{on record carriers storing information in the form of optical interference patterns, e.g. holograms}**

### Definition statement

*This place covers:*

When the invention information concerns multiplexing, the document should be classified in [G11B 7/00772](#) (since it has to do with the arrangement of the information) and assigned the relevant EC for the means (elements) by which the multiplexing is done. For example:

angular (azimuth) multiplexing:

[G11B 7/08564](#) for deformable or movable mirrors and [G11B 7/1362](#) when the movable mirror cooperates with stationary mirror(s):

- for angular (azimuth) multiplexing or peristrophic multiplexing, when the medium is moved relative to the (reference) light beam [G11B 7/083](#)
- for wavelength multiplexing, [G11B 7/127](#) if tuneable lasers are involved, [G11B 7/1275](#) if multiple lasers with different wavelengths are used
- phase multiplexing:
  - [G11B 7/1365](#) for stationary REFRACTIVE plates that change the phase;
  - [G11B 7/1369](#) for MOVABLE refractive plates; [G11B 7/128](#) for other phase modulators
- for shift modulation (overlapping holograms) and spatial modulation [G11B 7/083](#)
- speckle modulation [G11B 7/1392](#)

### Special rules of classification

This subgroup was created in the second half of 2009, and the reclassification from [G11B 7/0065](#) has not been systematically done. For documents published before 2010, [G11B 7/0065](#) and [G11B 7/0065](#) should be searched.

## G11B 7/00781

**{Auxiliary information, e.g. index marks, address marks, pre-pits, gray codes}**

### Definition statement

*This place covers:*

For example, separate layers containing servo information for holographic discs, or marks around the edge for aligning page type holographic media.

Servo information for volume storage media that are not holographic: classify [G11B 7/0938](#) (or Indexing Code [G11B 7/0938](#) if the document discloses these details, but it is not particularly relevant to the invention information) in addition to the Indexing Code [G11B 7/00:00S4](#) to indicate the volumetric aspect of the storage medium itself.

Warning: This subgroup was created in the second half of 2009, and the reclassification from [G11B 7/0065](#) has not been systematically done. For documents published before 2010, [G11B 7/0065](#) and Indexing Code [G11B 7/0065](#) should be searched.

## G11B 7/013

**for discrete information, i.e. where each information unit is stored in a distinct discrete location {, e.g. digital information formats within a data block or sector}**

### Definition statement

*This place covers:*

Only aspects of format that are adapted to solve a problem related to the optical recording. (In general, the data formats for optical recording media are not very closely related to the optical aspect and are classified in [G11B 20/12](#))

## G11B 7/081

**{for time base error correction by moving the light beam}**

### Definition statement

*This place covers:*

Uncommon or outdated technology (in 2011)

## G11B 7/083

**{relative to record carriers storing information in the form of optical interference patterns, e.g. holograms}**

### Definition statement

*This place covers:*

Apparatus/methods aspects of access e.g. multiplexing are classified here, and if appropriate in the relevant optical element group.

If the optical elements used are not especially adapted for the type of access, but e.g. just used or controlled in a special way then the document should be classified in [G11B 7/083](#) and coded in the appropriate optical element group (e.g. galvanomirror [G11B 7/08564](#) or [G11B 7/00:0085B3](#)).

If it is the arrangement of the information aspect of the multiplexing that is "invention information" it is classified in [G11B 7/00772](#)

Warning: This subgroup was created in the second half of 2009, and the reclassification from [G11B 7/0065](#) has not been systematically done. For documents published before 2010, [G11B 7/0065](#) and [G11B 7/0065](#) should be searched.

## G11B 7/08505

**{Methods for track change, selection or preliminary positioning by moving the head}**

### References

#### Limiting references

*This place does not cover:*

Arrangements for moving the whole head	<a href="#">G11B 7/0857</a>
--	-----------------------------

**G11B 7/08511****{with focus pull-in only}****Definition statement***This place covers:*

Changing layers in media with multiple data layers e.g. dual layer DVD.

**References****Limiting references***This place does not cover:*

Focus search for distinguishing between types of discs	<a href="#">G11B 19/127</a>
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**G11B 7/08564****{using galvanomirrors}****Definition statement***This place covers:*

For example, multiplexing in holographic storage of data.

**G11B 7/0904****{Dithered tracking systems}****Definition statement***This place covers:*

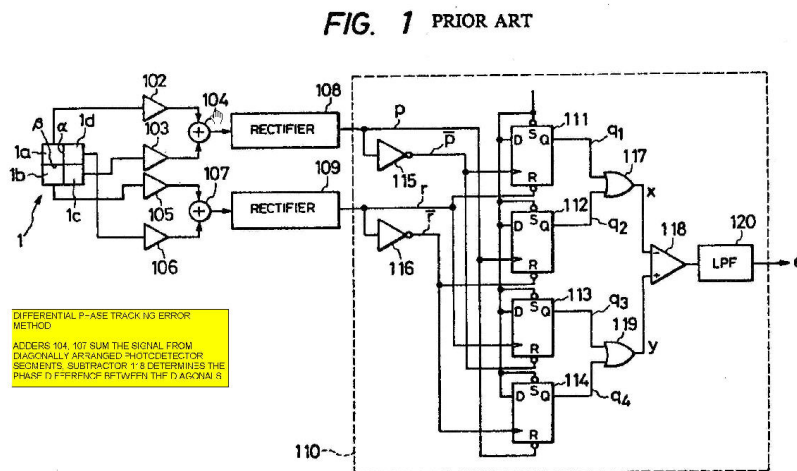
Uncommon or outdated technology in 2011.

Methods in which the beam is driven back and forth to generated the tracking error signal.

**G11B 7/0906****{Differential phase difference systems}****Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:



U.S. Patent

Nov. 2, 1993

Sheet 1 of 15

5,258,968

**Synonyms and Keywords**

*In patent documents the following expressions:*

"phase difference tracking error method"

"differential phase detection" (DPD)

"phase variation method"

"time difference detection method"

"heterodyne"

"phase contrast method"

"phase comparison method "

*are often used instead of "differential phase difference method".*



**G11B 7/0908**

{for focusing only ([G11B 7/0925](#), [G11B 7/094](#), [G11B 7/0941](#), [G11B 7/0943](#), [G11B 7/0945](#), [G11B 7/0946](#), [G11B 7/0948](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

Electromechanical actuators for lens positioning ( <a href="#">G11B 7/0857</a> takes precedence)	<a href="#">G11B 7/0925</a>
Methods and circuits for servo offset compensation	<a href="#">G11B 7/094</a>
Methods and circuits for servo gain or phase compensation during operation (for initialising servos <a href="#">G11B 7/0945</a> )	<a href="#">G11B 7/0941</a>
Methods and circuits for performing mathematical operations on individual detector segment outputs	<a href="#">G11B 7/0943</a>
Methods for initialising servos, start-up sequences	<a href="#">G11B 7/0945</a>
Specially adapted for operation during external perturbations not related to the carrier or servo beam, e.g. vibration	<a href="#">G11B 7/0946</a>
Specially adapted for detection and avoidance or compensation of imperfections on the carrier, e.g. dust, scratches, dropouts ( <a href="#">G11B 7/095</a> takes precedence)	<a href="#">G11B 7/0948</a>

**G11B 7/0909**

{by astigmatic methods}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

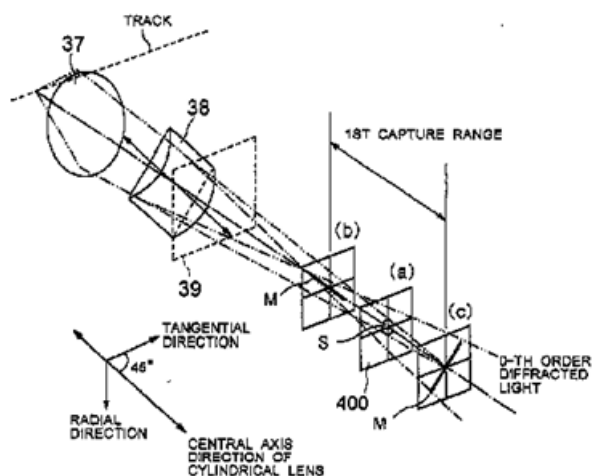


Figure from EP1220210

**G11B 7/0912****{by push-pull method}****References****Limiting references***This place does not cover:*

Push-pull tracking	<a href="#">G11B 7/0901</a>
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**Synonyms and Keywords***In patent documents, the following words/expressions are often used with the meaning indicated:*

"spot size focus error method"	"push-pull method".
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**G11B 7/0916****{Foucault or knife-edge methods}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

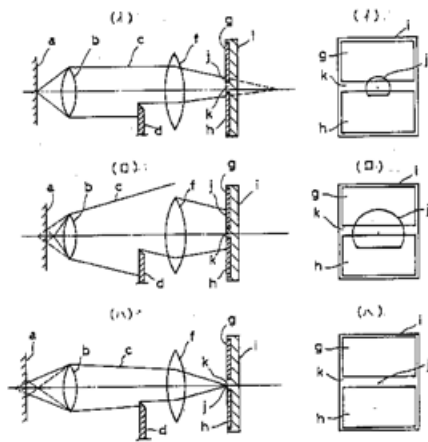


Figure taken from JP60010424

**G11B 7/0917****{Focus-error methods other than those covered by [G11B 7/0909](#) - [G11B 7/0916](#)}****Definition statement***This place covers:*

Uncommon or outdated technology (in 2011).

Further classification information:

The following Indexing Codes are assigned:

[G11B 2007/0919](#) critical angle methods

[G11B 2007/0919](#) dither methods

**S11B/09B8F** far-field methods

[G11B 2007/0924](#) skewed beams method

## G11B 7/0932

### {Details of sprung supports}

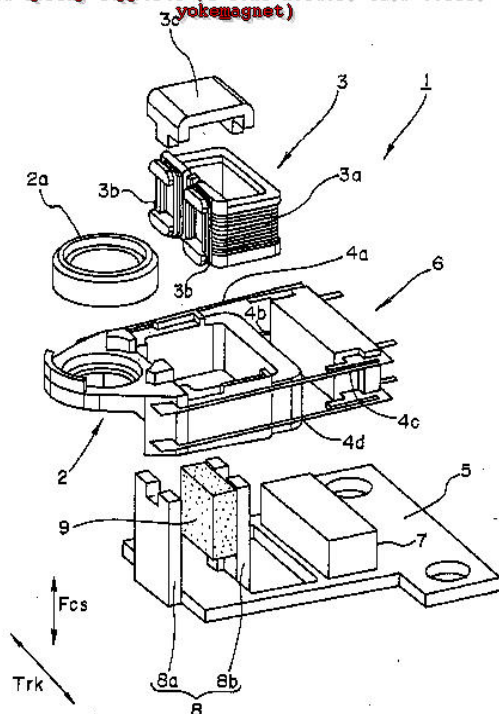
#### Definition statement

*This place covers:*

Sprung supports - e.g. lens holder support by wires or flat springs

also contains other support systems such as liquid, magnetic, combinations.

**4a-4d spring supports (2=lens holder; 3a,b-coils; 8=yoke magnet)**



## G11B 7/0933

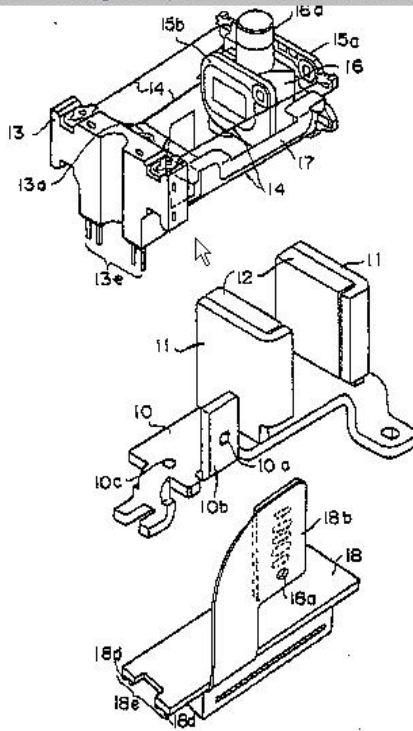
### {Details of stationary parts}

#### Definition statement

*This place covers:*

Stationary parts: e.g. the magnets on the sled, e.g. the yokes and magnets of a "normal" four-wire-sprung actuator.

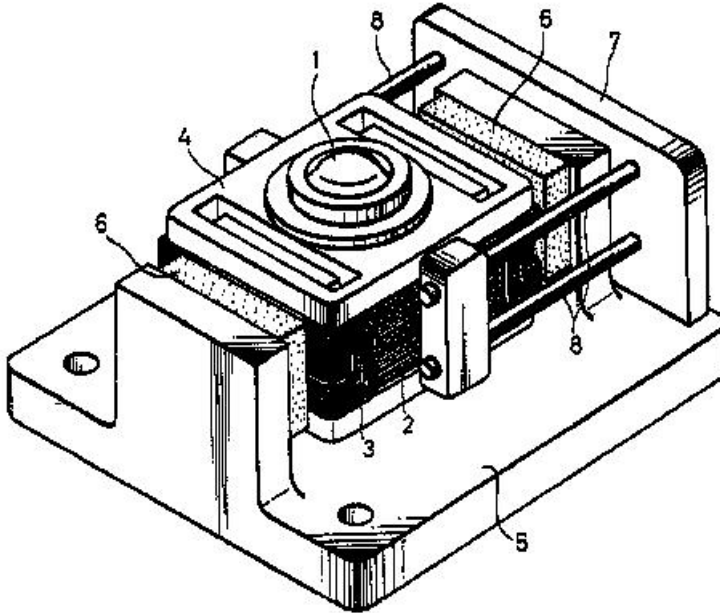
**11=yoke; 12=magnet (16=lens holder, 14=springs)**



**G11B 7/0935****{Details of the moving parts}****Definition statement***This place covers:*

Moving parts: lens holder and coils (or, occasionally, magnets) attached to it. Example:

2=focusing coil;3=tracking coil  
 (1=lens;4=holder;6=magnet;8=springs)

**G11B 7/0945****{Methods for initialising servos, start-up sequences}****References****Limiting references***This place does not cover:*

Distinguishing between types of discs by using an initial focus search or scan	<a href="#">G11B 19/12</a>
--	----------------------------

**G11B 7/0953****{to compensate for eccentricity of the disc or disc tracks}****Definition statement***This place covers:*

Acting on the tracking actuator.

### Synonyms and Keywords

In patent documents, the following words/expressions are often used with the meaning indicated:

"radial runout"	"eccentricity".
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### G11B 7/0956

{to compensate for tilt, skew, warp or inclination of the disc, i.e. maintain the optical axis at right angles to the disc}

#### Definition statement

*This place covers:*

Acting on focusing or tilt actuator

### Synonyms and Keywords

In patent documents, the following words/expressions are often used with the meaning indicated:

"axial runout"	"tilt", "skew" or "inclination of the disc"
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### G11B 7/12

Heads, e.g. forming of the optical beam spot or modulation of the optical beam (disposition or mounting of head elements within housing or with provision for moving of light source, optical beam or detector, irrelevant to the transducing method [G11B 7/08](#); modulating lasers [H01S 3/10](#); controlling the intensity, colour, phase, polarisation or direction of light beams arriving from an independent light source, e.g. switching gating or modulating [G02F 1/00](#))

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Controlling the intensity, colour, phase, polarization or direction of light beams arriving from an independent light source, e.g. switching gating or modulating	<a href="#">G02F 1/00</a>
Modulating lasers	<a href="#">H01S 3/10</a>

### G11B 7/121

Protecting the head, e.g. against dust or impact with the record carrier

#### Definition statement

*This place covers:*

Brushes incorporated into CD form factor discs for cleaning e.g. EP1411505

## G11B 7/1245

the waveguides including means for electro-optical or acousto-optical deflection {(electro- or acousto-optical deflection in general [G02F 1/29](#), [G02F 1/33](#))}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Electro or acousto optical deflection in general	<a href="#">G02F 1/29</a> , <a href="#">G02F 1/33</a>
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## G11B 7/125

Optical beam sources therefor, e.g. laser control circuitry specially adapted for optical storage devices; Modulators, e.g. means for controlling the size or intensity of optical spots or optical traces {(electro-, magneto-, or acousto-optical modulators [G02F 1/00](#); optical diaphragms [G03B 9/02](#))}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Electro-, magneto-, or acousto-optical modulators	<a href="#">G02F 1/00</a>
Optical diaphragm	<a href="#">G03B 9/02</a>
Light emitting diodes	<a href="#">H01L 33/00</a>
Semiconductor lasers	<a href="#">H01S 5/00</a>

## G11B 7/1263

Power control during transducing, e.g. by monitoring

### Definition statement

*This place covers:*

"Running optimum power control"

"walking optimum power control".

OPC carried out as a preparation when the medium is loaded or just before the transducing mode is started: [G11B 7/1267](#) Power calibration

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Running OPC	Continuous adjustment of the writing power to the optimum power during recording. This compensates for changes in the optimum power during recording due changing conditions e.g. temperature change. (see for example the standard ECMA-394 "Recordable Compact Disc Systems CD-R - Multi-speed", Chapter 13 "Attachments", Annex 13 "Running OPC")
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Walking OPC	According to wo 2006 018810 "Walking OPC calibration as disclosed in WO 03/065357 adapts the writing power at different instances during the writing process"
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### Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

OPC, ROPC	running optimum power control
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*In patent documents, the following words/expressions are often used as synonyms:*

- "running optimum power control", "running OPC", "DRDW" and " dynamical power control"

## G11B 7/127

**Lasers; Multiple laser arrays {(lasers per se [H01S](#))}**

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Light emitting diodes	<a href="#">H01L 33/00</a>
Lasers per se	<a href="#">H01S</a>
Semiconductor lasers	<a href="#">H01S 5/00</a>

## G11B 7/128

**Modulators ([G11B 7/1245](#) takes precedence)**

### Definition statement

*This place covers:*

Speckle modulation in holographic storage, the following should be assigned as appropriate:

- for the diffuser [G11B 7/1392](#)
- for multimode optical fibers [G11B 7/1384](#)

### References

#### Limiting references

*This place does not cover:*

The waveguides including means for electro-optical or acousto-optical deflection	<a href="#">G11B 7/1245</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Electro, magneto or acousto optical modulators	<a href="#">G02F 1/00</a>
Optical diaphragm	<a href="#">G03B 9/02</a>



**G11B 7/13**

Optical detectors therefor {(optical detectors per se [G01J](#); demodulating light, transferring the modulation of modulated light, frequency changing of light [G02F 2/00](#))}

**References****Informative references**

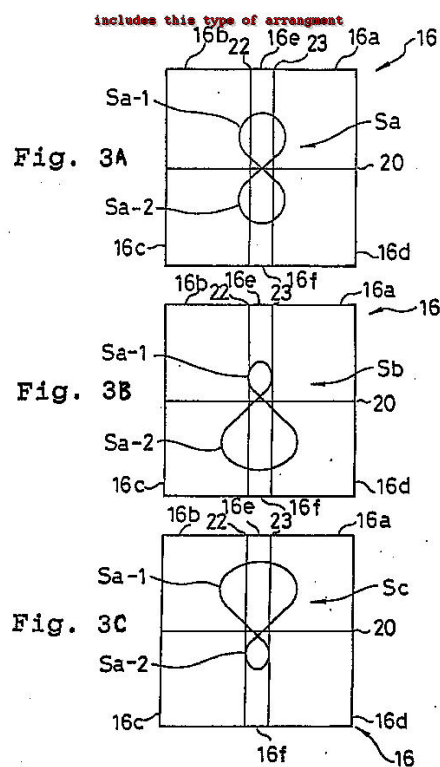
Attention is drawn to the following places, which may be of interest for search:

Optical detectors per se	<a href="#">G01J</a>
Demodulating light, transferring the modulation of modulated light, frequency changing of light	<a href="#">G02F 2/00</a>

**G11B 7/133****Shape of individual detector elements****Definition statement**

This place covers:

Illustrative example of subject matter classified in this group:



## G11B 7/135

**Means for guiding the beam from the source to the record carrier or from the record carrier to the detector**

### Definition statement

*This place covers:*

Documents in which the invention information concerns a common optical path

Documents in which the invention information concern the relative arrangement of different optical elements

Anti-reflection films on optical elements where the particular type of element is not important

Further classification information:

There is no specific classification in [G11B 7/00](#) for the manufacture of optical elements per se, therefore the manufacture of the optical elements is classified in the most relevant optical element group itself if this is closely related to the application of the element to optical recording/reproduction. (For mounting, aligning of elements in the head see [G11B 7/22](#)).

Where subgroups of [G11B 7/135](#) are available for the means and for the function, both classification(s) for the elements and for the function are assigned.

### References

#### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

If the application concerns a system adapted for scanning different types of carrier such as CD & DVD	<a href="#">G11B 2007/0006</a>
If the application concerns recording/reproduction of multiple data layers,	<a href="#">G11B 2007/0013</a>

## G11B 7/1353

**Diffraction elements, e.g. holograms or gratings {(diffraction gratings per se [G02B 5/18](#); holograms per se [G02B 5/32](#); grating systems [G02B 27/44](#))}**

### Relationships with other classification places

The borderline between [G11B 7/1367](#) and [G11B 7/1353](#) is not a distinct one, but generally diffraction gratings are regular, repetitive phase steps on a relatively small scale. In borderline cases both are assigned.

Gratings integrated into other elements e.g. lenses are assigned both relevant classes, unless noted otherwise below (e.g. in [G11B 7/1367](#))

Classify also the function if a group exists e.g. diffraction elements used in Foucault (knife edge) method of generating focus error servo signals are also classified in [G11B 7/1381](#)

## References

### Limiting references

*This place does not cover:*

Irregular, non-repetitive phase steps on a relatively large scale	<a href="#">G11B 7/1367</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Diffraction gratings per se	<a href="#">G02B 5/18</a>
Holograms per se	<a href="#">G02B 5/32</a>
Grating systems	<a href="#">G02B 27/44</a>

## G11B 7/1359

### Single prisms

### Relationships with other classification places

Classify also the function if a specific group exists e.g. beam shaping [G11B 7/1398](#)

## G11B 7/1365

### Separate or integrated refractive elements, e.g. wave plates

### Definition statement

*This place covers:*

- Integrated combinations of a refractive element, such as a coating element or phase plate, with another element, such as a lens, are classified in this group and in other appropriate groups for the other element.
- Polarisation plates.

### Relationships with other classification places

Classify also the function if a specific group exists e.g. beam shaping: [G11B 7/1398](#)

Plates used as beam splitters are classified in both [G11B 7/1365](#) and [G11B 7/1395](#)

### Special rules of classification

[G11B 7/1365](#) is not assigned if the plate is merely a support for a diffraction grating with no particularly adapted feature

## G11B 7/1367

### Stepped phase plates

### Definition statement

*This place covers:*

For example, plates used in apparatus compatible with multiple disc standards to control the aberration at one or more wavelengths

Any plate with a lateral spatially varying effect on the phase of the beam (i.e. in the plane of the plate) e.g. Figure 4 WO 2006/135053

This class is also assigned when the spatial variation is integrated into another element such as an objective lens (since this is essentially equivalent to a plate with the phase structure cooperating with the lens).

### Relationships with other classification places

The borderline between [G11B 7/1367](#) and [G11B 7/1353](#) is not a distinct one, but generally the phase steps referred to are not regular, repetitive steps as in most diffraction gratings and/or are on a larger scale than a diffraction grating. In borderline cases both are assigned.

Classify also the function if a specific group exists e.g. aberration correction [G11B 7/13922](#).

## G11B 7/1369

### Active plates, e.g. liquid crystal panels or electrostrictive elements

#### Definition statement

*This place covers:*

- Acousto optical deflectors (because they work by changing the refractive index)
- Plates that are mechanically moved e.g. for aberration correction for one or more media types in apparatus compatible with different formats

### Relationships with other classification places

Classify also the function if a specific group exists e.g. aberration correction [G11B 7/13925](#) or [G11B 7/13927](#)

## G11B 7/1372

### Lenses

#### Definition statement

*This place covers:*

Relative positioning of more than one type of lens (e.g. collimator and objective lens) e.g. for controlling magnification

## G11B 7/1374

### Objective lenses {(optical objectives per se [G02B 9/00](#))}

#### Definition statement

*This place covers:*

The SIL of compound objective lenses i.e. where SIL is between the objective lens and the optical data carrier

Further classification information.

### Relationships with other classification places

Also assign Indexing Code for the specific type of lens ([G11B 2007/13722](#) for Fresnel lenses, [G11B 2007/13725](#) for catadioptric lenses, [G11B 2007/13727](#) for compound lenses)

## References

### Limiting references

*This place does not cover:*

Objective lenses used in near-field apparatus, unless particularly adapted for the invention.	<a href="#">G11B 7/1374</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Optical objectives per se	<a href="#">G02B 9/00</a>
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## G11B 7/1376

**Collimator lenses {(collimators per se [G02B 27/30](#))}**

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Collimators per se	<a href="#">G02B 27/30</a>
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## G11B 7/1378

**Separate aberration correction lenses; Cylindrical lenses to generate astigmatism; Beam expanders**

### Relationships with other classification places

Lenses not coming within the scope of [G11B 7/1374](#), [G11B 7/1376](#) or [G11B 7/1378](#) should be classified in [G11B 7/1372](#).

Note that after a recent reorganization (Q4/2011) the scope of this group has changed from "other lenses".

## G11B 7/1381

**Non-lens elements for altering the properties of the beam, e.g. knife edges, slits, filters or stops ([G11B 7/1353](#) - [G11B 7/1369](#) take precedence)**

### Definition statement

*This place covers:*

Elements that:

- reduce stray light at the detector (e.g. US 2006 0062101)
- are used to generate servo signals (e.g. diffractive areas for focus error detection using the Foucault method)
- comprise one or more annular areas that diffract part of the beam out of the main beam, or that block part of the beam or that deliberately introduce a larger aberration into part of the beam, for the purpose of reducing noise e.g. in apparatus compatible with different standards, since this is a type of filtering
- optically modify the power of the beam (e.g. US 2010 165823, US 2003 0169667).

Elements for apodisation (e.g. for "super-resolution" i.e. to reduce the beam width of a main lobe of the beam below the diffraction limit for that wavelength) but [G11B 7/1387](#) has precedence (i.e. if a lens for near-field apparatus includes a shielding element it is classified in [G11B 7/1387](#), and not also [G11B 7/1381](#)).

Note that after a recent reorganization (Q4/2011) the scope of this group has been broadened (it is no longer has the qualifier "as it falls on the detector")

## References

### Limiting references

*This place does not cover:*

Diffractive elements, e.g. holograms or gratings	<a href="#">G11B 7/1353</a>
Double or multiple prisms, i.e. having two or more prisms in cooperation	<a href="#">G11B 7/1356</a>
Single prisms	<a href="#">G11B 7/1359</a>
Mirrors	<a href="#">G11B 7/1362</a>
Separate or integrated refractive elements, e.g. wave plates	<a href="#">G11B 7/1365</a>
Stepped phase plates	<a href="#">G11B 7/1367</a>
Active plates, e.g. liquid crystal panels or electrostrictive elements	<a href="#">G11B 7/1369</a>

## G11B 7/1384

### Fibre optics

#### Definition statement

*This place covers:*

Waveguide elements (mostly older technology), because they work using a similar principle.

#### References

##### Limiting references

*This place does not cover:*

Waveguide heads	<a href="#">G11B 7/1245</a>
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## G11B 7/1387

### using the near-field effect

#### Definition statement

*This place covers:*

In a hemispherical lens, the rays that come in at large angles (relative to optical axis) from the previous lens are totally internally reflected at the interface due to the refractive index difference BUT there is an evanescent wave which doesn't die to zero immediately. This can be used to read/write on a medium, as long as the medium is very close (e.g. if the hemispherical lens is on a flying head); Recording may also use the evanescent wave from a very fine tip held near a medium.

Warning: This subgroup was created in 2008 and the reclassification of documents published before 2009 has not been systematically done. For earlier documents [G11B 7/12](#), [G11B 7/122](#), [G11B 7/123](#) should be searched.

A sharply elongated optical fibre may act as a local emitter, similar to scanning near field optical microscopy (SNOM)

### Relationships with other classification places

Solid Immersion Lenses (SIL) are also be assigned Indexing Code [G11B 2007/13727](#)

Catadioptric lenses are also assigned Indexing Code [G11B 2007/13725](#)

[G11B 7/1372](#) is not assigned if there is no particular adaptation of the (compound) objective lens.

Where a shielding element is involved, this group has precedence over [G11B 7/1381](#)

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Scanning near field optical microscopes	<a href="#">G01Q 60/18</a>
(non waveguide) optics using evanescent waves	<a href="#">G02B 27/56</a>
Optical recording carriers adapted to be used in near-field such as super-RENS (super resolution near field structure) media	<a href="#">G11B 7/24065</a>

### Synonyms and Keywords

In patent documents, the following words/expressions are often used with the meaning indicated:

"evanescent field"	"the exponentially dying electromagnetic field near the surface, which does not cross a gap according to classical optics, because of total internal reflection"
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## G11B 7/139

### Numerical aperture control means

#### Definition statement

*This place covers:*

Means to control the angle of the outermost parts of the beam to the optical axis, therefore controlling the size of the spot at the focus.

For apparatus compatible with different standards this often involves some way to block the outer part of the beam for a particular wavelength (see e.g. US6396791 Figure 10(a)(b), paragraph 63, and the prior art shown in Figure 11, paragraph 14) using dichroic effects, diffraction grating or phase difference that affect one wavelength more than another, or polarisation (e.g. by using beams polarised in different directions for different wavelengths), but it may involve elements located elsewhere (e.g. US6160646 Figure 6-9, the asymmetrical grating in the central part of the lens is used for CD medium)

[G11B 7/139](#) is assigned for elements that allow a single lens to be used for different standards. Although switching between objective lenses in apparatus compatible with different standards e.g. CD, DVD, BD, changes the numerical aperture (as well as changing the aberration correction), such documents are not assigned [G11B 7/139](#).

## References

### Limiting references

*This place does not cover:*

Objective lenses with NA > 1 (i.e. for near field apparatus)	<a href="#">G11B 7/1387</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Means for shaping the cross-section of the beam, e.g. into circular or elliptical cross-section	<a href="#">G11B 7/1398</a>
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## Special rules of classification

[G11B 7/139](#) has precedence over [G11B 7/1392](#) and subgroups.

## G11B 7/1392

**Means for controlling the beam wavefront, e.g. for correction of aberration**  
{(optical systems for aberration correction per se [G02B 27/00](#))}

### Definition statement

*This place covers:*

Spherical aberration, coma (also referred to as comatic aberration) and chromatic (i.e. varying with wavelength)

## References

### Limiting references

*This place does not cover:*

Numerical aperture control means	<a href="#">G11B 7/139</a>
Means for shaping the cross-section of the beam, e.g. into circular or elliptical cross-section	<a href="#">G11B 7/1398</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Optical systems for aberration correction per se	<a href="#">G02B 27/0025</a>
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## G11B 7/13922

{passive}

### Definition statement

*This place covers:*

- The use of elements with one or more annular areas that diffract part of the beam out of the main beam, or that block part of the beam or that deliberately introduce a larger aberration into part of the beam, for the purpose of reducing noise.



- Passive elements that change the beam from a Gaussian intensity profile to a flat(ter) intensity profile.

### Relationships with other classification places

In apparatus compatible with different standards:

- where the annular area is a phase step, the class [G11B 7/1367](#) is also assigned,
- where the annular area blocks the beam, the class [G11B 7/1381](#) is also assigned, because it is a type of filtering.

The element specifically adapted for this purpose should also be classified, e.g. lenses designed to minimize aberrations are classified here (as well as in [G11B 7/1372](#) and subgroups).

### References

#### Limiting references

*This place does not cover:*

Numerical aperture control means	<a href="#">G11B 7/139</a>
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### Special rules of classification

[G11B 7/13922](#) is not assigned to lenses or plates adapted to control numerical aperture, since the purpose of this adaptation is to control the aberration (i.e. assigning this class would amount to assigning two classes for the same aspect).

## G11B 7/13925

**{active, e.g. controlled by electrical or mechanical means}**

### Definition statement

*This place covers:*

- The use of switchable objective lenses in apparatus compatible with different standards e.g. CD, DVD, BD, because the purpose of the switch includes changing the aberration correction (as well as changing the numerical aperture).
- Active elements that change the beam from a Gaussian intensity profile to a flat(ter) intensity profile.

The element specifically adapted for this purpose should also be classified.

### References

#### Limiting references

*This place does not cover:*

Numerical aperture control means	<a href="#">G11B 7/139</a>
----------------------------------	----------------------------

### Special rules of classification

[G11B 7/13922](#) is not assigned to lenses or plates adapted to control numerical aperture, since the purpose of this adaptation is to control the aberration (i.e. assigning this class would amount to assigning two classes for the same aspect).

**G11B 7/13927**

{during transducing, e.g. to correct for variation of the spherical aberration due to disc tilt or irregularities in the cover layer thickness}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Tilt servo aspect	<a href="#">G11B 7/0956</a>
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**G11B 7/1395**

Beam splitters or combiners ([G11B 7/1353](#), [G11B 7/1356](#) take precedence {; beam splitting or combining per se [G02B 27/10](#)})

**Relationships with other classification places**

[G11B 7/1365](#) is also assigned for plate beams splitters.

**References****Limiting references**

This place does not cover:

Diffraction elements, e.g. holograms or gratings	<a href="#">G11B 7/1353</a>
Double or multiple prisms, i.e. having two or more prisms in cooperation	<a href="#">G11B 7/1356</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Beam splitting or combining per se	<a href="#">G02B 27/10</a>
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**G11B 7/1398**

Means for shaping the cross-section of the beam, e.g. into circular or elliptical cross-section

**Definition statement**

This place covers:

The shape of a contour of equal intensity

**G11B 2007/240025**

{for storing optical interference patterns, e.g. holograms}

**Relationships with other classification places**

- If the holographic carrier is multilayered carrier also classify in [G11B7/24S4](#), or coded in Indexing Code [S11B7/24S4](#) if not "invention" information
- If one of the holographic layers has additional information (i.e. auxiliary information, control information, also classify or code, as appropriate in in [G11B 7/00781](#) or [G11B 7/00781](#)

Warning: This subgroup was created in the second half of 2009, and the reclassification from [G11B 7/0065](#) has not been systematically done. For documents published before 2010, [G11B 7/0065](#) and [G11B 7/0065](#) should be searched.

## References

### Limiting references

*This place does not cover:*

Volumetric holographic storage	<a href="#">G11B 2007/0009</a>
Holographic carriers in the form of a card or other rectangular shape, if not invention information	<a href="#">G11B7/24F2</a> , <a href="#">G11B 2007/240008</a>
Holographic tape carriers, if not invention information	<a href="#">G11B7/24F4</a> , <a href="#">G11B 2007/240017</a>

## G11B 7/24065

**Layers assisting in recording or reproduction below the optical diffraction limit, e.g. non-linear optical layers or structures (cover layers for near-field media [G11B 7/24059](#))**

### Definition statement

*This place covers:*

Optical recording carriers adapted to be used in near-field or adapted to provide resolution below the diffraction limit e.g. provided with layers that act as masks. For example, "Super-RENS" (super resolution near field structure) media in which a low melting temperature layer such as Sb that acts as a controllable aperture.

## References

### Limiting references

*This place does not cover:*

N: Conditioning of record carrier e.g. mechanised protection or means for reducing influence of physical parameters	<a href="#">G11B7/24C</a>
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## G11B 7/241

**characterised by the selection of the material**

### Definition statement

*This place covers:*

Optical recording media such as CDs, DVDs, Blu-Ray discs and Holographic Versatile Discs (HVDs), Optical Cards etc. characterised by the materials.

### Relationships with other classification places

- Polymers as such are covered by [C08F](#) and [C08G](#)
- Dyes as such are covered by [C09B](#)
- Photosensitive materials as such are covered by [G03C](#)

## References

### Limiting references

*This place does not cover:*

Recording, reproducing or erasing methods	<a href="#">G11B 7/004</a>
Record carriers Indicating prior or unauthorized use by changing the physical properties of the record carrier - Limited play	<a href="#">G11B 23/282</a>
Sheet materials for thermography incl. laser writable labels (e.g. LightScribe® )	<a href="#">B41M 5/26</a>
Sputtering targets for producing e.g. the reflective layer	<a href="#">C23C 14/3407</a>
Photosensitive materials for photography	<a href="#">G03C 1/00</a>
Materials for phase modulating patterns i.e. holographic images	<a href="#">G03F 7/001</a>

### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Recording or reproducing by optical means, e.g. recording using a thermal beam of optical radiation - Record carriers for holograms	<a href="#">G11B 2007/240025</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Nanotechnology for information processing, storage or transmission, e.g. quantum computing or single electron logic	<a href="#">B82Y 10/00</a>
Recording methods involving bubble or bump forming	<a href="#">G11B 7/00452</a>
Recording methods involving phase change effects	<a href="#">G11B 7/00454</a>
Recording methods involving reflectivity, absorption or colour changes e.g. photochromic recording	<a href="#">G11B 7/00455</a>
Recording methods for holographic recording	<a href="#">G11B 7/0065</a>
3D recording by using multiple recording layers (not holographic)	<a href="#">G11B 2007/0009</a>

### Special rules of classification

- In general only the subject matter of
- claims
- specific embodiments e.g. examples, figures...is classified.
- Materials disclosed in long non-binding listings are not classified.
- No classes are given for materials which are considered standard and consequently trivial e.g. :
- Dielectric layers made of ZnS-SiO<sub>2</sub>, ([G11B 7/2578](#) )
- Base layers made of polycarbonate if the polycarbonate is not further specified ([G11B 7/2534](#) )
- Reflective layers made from silver if no specific alloy is mentioned ([G11B 7/259](#) )
- Recording layers:
- made of or containing "dye" - if no specific dyes is mentioned ([G11B 7/246](#))
- made of "GeSbTe" - if the alloy is not further specified (**G11B7/243B**)
- Please also refer to Annex 1:

Annotated CPC [G11B 7/241-G11B 7/2595](#)

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

3D	three dimensional
Super-RENS	Super REsolution Near field Structure
Blue wavelength	390 - 500 nm
"nanosize" or "nanoscale"	related to a controlled geometrical size below 100 nanometres in one or more dimensions

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

BD	Blu-Ray Disc
CD	Compact Disc
DVD	Digital Versatile Disc
HVD	Holographic Versatile Disc
COC	Cyclic Olefin Copolymer

*In patent documents, the following words/expressions are often used as synonyms:*

- "mask layer", "shutter layer" and "aperture control layer"
- "data layer" and "recording layer"
- "topcoat(ing)" and "outer layer"

*In patent documents, the word/expression in the first column is often used instead of the word/expression in the second column, which is used in the classification scheme of this place:*

"substrate", "support layer" and "board"	"base layer"
"colo(u)rant" and "pigment"	"dye"
"bonding"	"adhesion"
"compostable"	"(bio)-degradable" for substrate/base materials

## G11B 7/26

**Apparatus or processes specially adapted for the manufacture of record carriers (processes involving a single technical art and for which provision exists elsewhere, see the relevant class, e.g. [B29](#), [G03](#) {manufacture of intermediate mediums, e.g. matrixes for processing [G11B 23/0057](#)})**

### Definition statement

*This place covers:*

Joining of disc substrates e.g. for DVDs.

[G11B 7/26](#) or a subclass is assigned when the process involves a single technical art for which provision exists elsewhere but where the adaptation is specific to the optical record carrier.

In this subgroup, special care should be taken to circulate the document to classifiers for the relevant "single technical art" - see the informative references.

## References

### Limiting references

*This place does not cover:*

Recovery of plastics or other constituents of waste material containing plastics	<a href="#">B29B 17/00</a>
Joining of preformed parts; using adhesives	<a href="#">B29C 65/48</a>
Methods or apparatus for laminating (e.g. by curing) by pressing	<a href="#">B32B 37/10</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Reconditioning e.g. cleaning of disk carriers (including destroying CDs)	<a href="#">G11B 23/505</a>
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## G11B 7/261

{Preparing a master, e.g. exposing photoresist, electroforming}

## References

### Limiting references

*This place does not cover:*

Electronic editing of signals on discs	<a href="#">G11B 27/034</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Photosensitive materials for photomechanical, e.g. photolithographic production of textured or patterned surfaces	<a href="#">G03F 7/004</a>
Exposure apparatus for photomechanical, e.g. photolithographic production of textured or patterned surfaces	<a href="#">G03F 7/20</a>
Making masks on semiconductor bodies for further photolithographic processing	<a href="#">H01L 21/027</a>

## G11B 7/263

{Preparing and using a stamper, e.g. pressing or injection molding substrates (production of optical record carriers, e.g. optical discs [B29D 17/005](#))}

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulds or cores for shaping or joining of plastics	<a href="#">B29C 33/00</a>
Injection moulding	<a href="#">B29C 45/00</a>

Producing (from plastics) optically read record carriers, e.g. optical discs	<a href="#">B29D 17/005</a>
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## G11B 7/265

{Apparatus for the mass production of optical record carriers, e.g. complete production stations, transport systems}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Vacuum work holders	<a href="#">B25B 11/005</a>
Conveyors	<a href="#">B65G 25/00</a>

## G11B 7/266

{Sputtering or spin-coating layers (sputtering in general [C23C 14/24](#); spin-coating in general [B05D 1/005](#))}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Spin coating	<a href="#">B05D 1/005</a>
Sputtering	<a href="#">C23C 14/24</a>

## G11B 7/268

{Post-production operations, e.g. initialising phase-change recording layers, checking for defects (investigating the presence of flaws or contamination in optical discs [G01N 21/9506](#))}

### Definition statement

*This place covers:*

This class is assigned for writing the BCA, which occurs during manufacture (not done by end user apparatus).

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Photographic or thermographic registration for marking record carriers	<a href="#">G06K 1/126</a>
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### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Burst code area	see Glossary of terms Figure in <a href="#">G11B 7/00736</a>
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## Synonyms and Keywords

In patent documents, the following abbreviations are often used:

BCA	Burst code area
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## G11B 9/00

Recording or reproducing using a method not covered by one of the main groups [G11B 3/00](#) - [G11B 7/00](#); Record carriers therefor ([G11B 11/00](#) takes precedence {driving or moving of heads [G11B 21/02](#)})

### Definition statement

This place covers:

- Recording or reproducing using near-field interactions, e.g. recording by means directly associated with the tip of a microscopic electrical probe as used in Scanning Tunneling Microscopy (STM) or Atomic Force Microscopy (AFM) for inducing physical or electrical perturbations in a recording medium, the permanent effect of which being the writing of at least one information unit of a sequence disposed along a track; Reproducing such memorised information by such association of tip and means; Record carriers or media specially adapted for such transducing of information; Structure and manufacture of said microscopic probe and means for moving the microscopic probe or the record carrier relatively to each other for track access and/or for controlling the relative spacing;
- Recording or reproducing using ferroelectric record carriers and record carriers therefor;
- Recording or reproducing using record carriers with variable electric resistance and record carriers therefor;
- Recording or reproducing using electrostatic charge injection and record carriers therefor;
- Recording or reproducing using electron beams and record carriers therefor.

### Relationships with other classification places

Scanning probe Microscopy: [G01Q](#)

Microstructural devices: [B81B](#)

## References

### Limiting references

This place does not cover:

Recording on or reproducing from the same record carrier wherein for these two operations the methods are covered by different main groups of groups <a href="#">G11B 3/00</a> - <a href="#">G11B 7/00</a> or by different subgroups of group <a href="#">G11B 9/00</a> ; Record carriers therefor driving or moving of heads <a href="#">G11B 3/02</a> , <a href="#">G11B 5/48</a> , <a href="#">G11B 7/08</a> , <a href="#">G11B 21/02</a>	<a href="#">G11B 11/00</a>
Marking using electrical current	<a href="#">B41M 5/20</a>
Measuring roughness or irregularity of surfaces	<a href="#">G01B 7/34</a>

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Driving or moving of heads	<a href="#">G11B 21/02</a>
Microstructural systems	<a href="#">B81B 7/00</a>



Manufacture or treatment of nanostructures by manipulation of individual atoms or molecules, or limited collections of atoms or molecules as discrete units	<a href="#">B82B 3/00</a>
Investigating or analysing materials by the use of electric, electro-chemical, or magnetic means	<a href="#">G01N 27/00</a>
Scanning or positioning arrangements, i.e. arrangements for actively controlling the movement or position of the probe	<a href="#">G01Q 10/00</a>
Monitoring the movement or position of the probe	<a href="#">G01Q 20/00</a>
Particular type of SPM [Scanning Probe Microscopy]	<a href="#">G01Q 60/00</a>
Applications, other than SPM, of scanning-probe techniques	<a href="#">G01Q 80/00</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Near-field interaction	A very short distance interaction using scanning-probe techniques, e.g. quasi- contact or evanescent contact between head and record carrier
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## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

SP	Scanning Probe
SPM	Scanning Probe Microscopy
STM	Scanning Tunnel Microscopy
AFM	Atomic Force Microscopy
MFM	Magnetic Force Microscopy
SNOM	Scanning Near-field Optical Microscopy
SCM	Scanning Capacitance Microscopy

## G11B 11/00

**Recording on or reproducing from the same record carrier wherein for these two operations the methods are covered by different main groups of groups [G11B 3/00](#) - [G11B 7/00](#) or by different subgroups of group [G11B 9/00](#); Record carriers therefor {(driving or moving of heads [G11B 3/02](#), [G11B 5/48](#), [G11B 7/08](#), [G11B 21/02](#))}**

### Definition statement

*This place covers:*

Only the cases wherein the method of recording differs from the method of reproducing. The following recording methods (when associated to a different reproducing method) are covered:

- recording by perturbation of the physical or electrical structure;
- recording by deforming with non-mechanical means, e.g. laser, beam of particles;
- recording by electric charge or by variation of electric resistance or capacitance;
- recording by magnetic means or other means for magnetisation or demagnetisation of a record carrier, e.g. light induced spin magnetisation, demagnetisation by thermal or stress means in the

presence or not of an orienting magnetic field; and in particular magneto-optical recording, i.e. using a beam of light or a magnetic field for recording by change of magnetisation and a beam of light for reproducing, e.g. light-induced thermo-magnetic recording, spin magnetisation recording, Kerr or Faraday effect reproducing;

- recording by optical means;
- recording by mechanical cutting, deforming or pressing;
- recording by near-field interactions.

### Relationships with other classification places

Microstructural devices	<a href="#">B81B</a>
Scanning probe Microscopy	<a href="#">G01Q</a>
Recording or playback apparatus using mechanically marked tape, e.g. punched paper tape, or using unit records, e.g. punched or magnetically marked cards	<a href="#">G06K</a>

### References

#### Limiting references

*This place does not cover:*

Reading only or recording only using mechanical, magnetic, optical or other methods is covered respectively by groups	<a href="#">G11B 3/00</a> , <a href="#">G11B 5/00</a> , <a href="#">G11B 7/00</a> , <a href="#">G11B 9/00</a>
Driving or moving of heads	<a href="#">G11B 3/02</a> , <a href="#">G11B 5/48</a> , <a href="#">G11B 7/08</a> , <a href="#">G11B 21/02</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Recording by mechanical cutting, deforming or pressing, e.g. of grooves or pits; Reproducing by mechanical sensing; Record carriers therefor	<a href="#">G11B 3/00</a>
Recording by magnetisation or demagnetisation of a record carrier; Reproducing by magnetic means; Record carriers therefor	<a href="#">G11B 5/00</a>
Recording or reproducing by optical means, e.g. recording using a thermal beam of optical radiation, by modifying optical properties or the physical structure, reproducing using an optical beam at lower power by sensing optical properties; Record carriers therefor	<a href="#">G11B 7/00</a>
Recording or reproducing using a method not covered by one of the main groups <a href="#">G11B 3/00</a> - <a href="#">G11B 7/00</a> ; Record carriers therefor	<a href="#">G11B 9/00</a>

### Special rules of classification

Recording by magnetic means or other means for magnetisation or demagnetisation of a record carrier [G11B 11/10](#) takes precedence over [G11B 11/08](#) recording by electric charge or by variation of electric resistance or capacitance.

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Near-field interaction	Means a very short distance interaction using scanning-probe techniques, e.g. quasi- contact or evanescent contact between head and record carrier
------------------------	--

## Synonyms and Keywords

In patent documents, the following abbreviations are often used:

MO	Magneto-Optical
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## G11B 13/00

Recording simultaneously or selectively by methods covered by different main groups {among [G11B 3/00](#), [G11B 5/00](#), [G11B 7/00](#) and [G11B 9/00](#)}; Record carriers therefor {not otherwise provided for}; Reproducing therefrom {not otherwise provided for ([G11B 9/14](#), [G11B 11/002](#) take precedence; driving or moving of heads [G11B 3/02](#), [G11B 5/48](#), [G11B 7/08](#), [G11B 21/02](#))}

### Definition statement

*This place covers:*

This group is limited to the combination of recording and reproducing on the same record carrier by more than one of the different method covered by groups [G11B 3/00](#), [G11B 5/00](#), [G11B 7/00](#) and [G11B 9/00](#)

Recording simultaneously or selectively:

- magnetically and by styli
- magnetically and optically
- optically and by styli.

Using near-field interactions or transducing means and at least one other method or means for recording or reproducing

### Relationships with other classification places

Microstructural devices: [B81B](#)

## References

### Limiting references

*This place does not cover:*

Reading only or recording only using mechanical, magnetic, optical or other methods is covered respectively by groups	<a href="#">G11B 3/00</a> , <a href="#">G11B 5/00</a> , <a href="#">G11B 7/00</a> , <a href="#">G11B 9/00</a>
Takes precedence	<a href="#">G11B 9/14</a>
Using recording by perturbation of the physical or electrical structure	<a href="#">G11B 11/002</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Recording by mechanical cutting, deforming or pressing, e.g. of grooves or pits; Reproducing by mechanical sensing;	<a href="#">G11B 3/00</a>
Recording by magnetisation or demagnetisation of a record carrier; Reproducing by magnetic means;	<a href="#">G11B 5/00</a>
Recording or reproducing by optical means, e.g. recording using a thermal beam of optical radiation, by modifying optical properties or the physical structure, reproducing using an optical beam at lower power by sensing optical properties;	<a href="#">G11B 7/00</a>

Recording or reproducing using a method not covered by one of the main groups <a href="#">G11B 3/00</a> - <a href="#">G11B 7/00</a> ;	<a href="#">G11B 9/00</a>
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### Special rules of classification

- Assisted magnetic recording, e.g. thermally or microwave assisted magnetic recording are classified in [G11B 5/00](#);
- Driving or moving of heads [G11B 3/02](#), [G11B 5/48](#), [G11B 7/08](#), [G11B 21/02](#)

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Near-field interaction	Means a very short distance interaction using scanning-probe techniques, e.g. quasi- contact or evanescent contact between head and record carrier
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## G11B 15/00

**Driving, starting or stopping record carriers of filamentary or web form; Driving both such record carriers and heads; Guiding such record carriers or containers therefor; Control thereof; Control of operating function (driving or guiding heads [G11B 3/00](#) - [G11B 7/00](#), [G11B 21/00](#))**

### Definition statement

*This place covers:*

- Mechanism for loading/unloading/guiding single tape cartridges in/from tape drives.
- Libraries of tape cartridges in which the cartridges are transported from a random access magazine to a tape drive or viceversa.
- Means for guiding the tape within the tape drive.
- Means for extracting the tape from the cartridge.
- Means for controlling the tension of the tape within the tape drive.
- Means for sensing features present on the record carrier or on the cartridge.

### Relationships with other classification places

The user interface aspects of tape drives are classified also in [G11B 25/06](#).

Analogue recording or reproducing [G11B 20/02](#).

Digital recording or reproducing [G11B 20/10](#).

Transmission of digital information [H04L](#).

### References

#### Limiting references

*This place does not cover:*

Recording/reproducing operations	<a href="#">G11B 5/00</a> , <a href="#">G11B 7/00</a> , <a href="#">G11B 9/00</a> , <a href="#">G11B 11/00</a>
Magnetic heads	<a href="#">G11B 5/127</a>
Signal processing	<a href="#">G11B 20/00</a>
Record carriers, tape cartridges	<a href="#">G11B 23/00</a>

User interface aspects of drives	<a href="#">G11B 25/00</a>
Recording/reproducing apparatuses in combination with television sets	<a href="#">G11B 31/00</a>
Recording/reproducing apparatuses in combination with video cameras	<a href="#">G11B 31/006</a> , <a href="#">H04N 5/225</a>
Vibration damping means	<a href="#">G11B 33/08</a>

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

Apparatuses using web form record carriers, e.g. tapes	<a href="#">G11B 25/06</a>
Apparatuses using web form record carriers in combination with non web form record carriers; combi apparatuses	<a href="#">G11B 25/10</a>
Telephones answering machines	<b>H01M1/64</b>
Telephones with dictation recording systems	<a href="#">H04M 11/10</a>
Apparatuses for television signal recording	<a href="#">H04N 5/76</a>

## **G11B 17/00**

**Guiding record carriers not specifically of filamentary or web form, or of supports therefor (guiding cards or sheets [G06K 13/00](#))**

### **Definition statement**

*This place covers:*

- Mechanisms for loading/unloading/guiding single disk cartridges or naked disks in/from disk drives.
- Mechanisms in which the disks are transported from a consecutive access magazine to a disk drive.
- Libraries of disks or disk cartridges, in which the disks or cartridges are transported from a random access magazine to a disk drive and viceversa.

### **Relationships with other classification places**

- Hard disk drives are classified in [G11B 25/043](#).
- Analogue recording or reproducing [G11B 20/02](#).
- Digital recording or reproducing [G11B 20/10](#).
- Transmission of digital information [H04L](#).
- Libraries of tape cartridges [G11B 15/68](#).

### **References**

#### **Limiting references**

*This place does not cover:*

Tape drives	<a href="#">G11B 15/00</a>
Tape libraries	<a href="#">G11B 15/68</a>
Driving means for disks turntables	<a href="#">G11B 19/20</a>
Tape cartridges	<a href="#">G11B 23/04</a> , <a href="#">G11B 23/087</a>
Hard disk drives	<a href="#">G11B 25/043</a>

Chassis of disk drives	<a href="#">G11B 33/02</a>
Vibration damping means	<a href="#">G11B 33/08</a>
Electrical connections	<a href="#">G11B 33/12</a>
Preventing/reducing contamination of the disk drive	<a href="#">G11B 33/14</a>
Transport devices	<a href="#">B65G</a>

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Constructional details of computers	<a href="#">G06F 1/16</a> , <a href="#">G06F 1/18</a> , <a href="#">G06F 1/20</a>
Transport of card shaped record carriers	<a href="#">G06K 13/00</a> , <a href="#">G06K 17/00</a>
Adhesive labels	<a href="#">G09F 3/00</a>

### Synonyms and Keywords

In patent documents, the following abbreviations are often used:

Disk tray	Disk drawer, caddy, pallet, receiver
Disks magazine	Storage means, stowage means, stocker
Disk accessor	Picker, gripper, take out, hand, transport unit, carriage, shuttle

## G11B 19/00

**Driving, starting, stopping record carriers not specifically of filamentary or web form, or of supports therefor; Control thereof; Control of operating function (guiding such record carriers [G11B 17/00](#)); {Driving both disc and head}**

### Definition statement

*This place covers:*

Any aspect of control regarding recording and reproducing devices which use carriers moving with respect to the transducer but which are not of filamentary (wire) or web (tape) form. This includes disks and drums, but is predominantly to do with disks.

Any form of control whether externally generated (e.g. user control, external shock) or internally (e.g. a response generated by the sensing of a feature of the record carrier).

Driving, starting and stopping such carriers, including details of control systems used for starting, stopping or altering the speed of motion of the carrier and details of the electromechanical arrangements used in driving, starting, speed-changing and stopping.

### Relationships with other classification places

[G11B 19/2009](#) and [G11B 19/2036](#) are used to classify spindle motors for disk drives. Electric motors in general are also classified in [H02K](#) (Dynamo-electric machines), but only those specifically mentioned as having applications in disk drives are classified in [G11B 19/2009](#) or [G11B 19/2036](#).

[G11B 19/2036](#) is used specifically for the classification of spindle motors characterised by having fluid-dynamic bearings. Such bearings per se are also classified in [F16C 17/00](#), but only those specifically mentioned as having applications in disk drives are classified in [G11B 19/2036](#).

[G11B 19/20](#) is used to classify any other spindle motor arrangements (e.g. for drums).

## References

### Limiting references

*This place does not cover:*

Signal processing	<a href="#">G11B 20/00</a>
Editing, Indexing, Addressing	<a href="#">G11B 27/00</a>

## Special rules of classification

Control of operating function ([G11B 19/02](#) and subgroups) should not be confused with speed control ([G11B 19/20](#) and subgroups).

The development of battery-powered portable media devices using moving media has led to a number of applications regarding power-saving arrangements and methods. These are considered to have a control aspect, but not of operating function as such. They are generally classified in [G11B 19/00](#).

An exception to this is methods and arrangements for powering down or reducing the speed of the spindle motor in order to save power during idle time, which aspects are classified in [G11B 19/2072](#).

Any other control aspects which do not fall under [G11B 19/02](#) or [G11B 19/20](#) should be classified in [G11B 19/00](#).

Most sub-groups of [G11B 19/00](#) have definitions which are self-explanatory, but exceptions are shown below.

The definition of the [G11B 19/04](#) sub-group according to the IPC is so general that it could cover almost any problem or error experienced while using a recording and reproducing device. It explicitly does NOT cover the following, however:

Data error detection and correction: this is to be found in [G11B 20/18](#) and sub-groups.

Defect management i.e. the detection and management of bad sectors and reallocation of data to good sectors: this is to be found in [G11B 27/00](#).

The sub-groups of [G11B 19/04](#) are self-explanatory and cover the majority of problems often encountered. Other problems not explicitly mentioned are classified in [G11B 19/04](#) itself.

## G11B 20/00

### Signal processing not specific to the method of recording or reproducing; Circuits therefor

#### Definition statement

*This place covers:*

any kind of signal processing which is performed when reading data from or recording data to record carriers. This signal processing specifically includes analog and digital filtering, equalisation, carrier and symbol synchronization (adjustment of read/write clocks), and the corresponding ways of assessing and improving the quality of the recorded/reproduced signal. Modulation and demodulation techniques (i.e. the actual codes and the stochastic methods for recovering the bit sequences that are reproduced from a record carrier), in the context of recording and reproducing Techniques of applying error correcting codes in recording / reproducing devices, and likewise how interleaving techniques can be used to mitigate the effects of local burst errors. Techniques for actually detecting media errors (e.g. bad sectors), or data structures and algorithms for coping with these errors, e.g. by relocating data from defective sectors to non-defective spare sectors. The sub-group [G11B 20/12](#) also

covers the actual format of the record carriers (in the sense of how different kinds of data are arranged on the medium, e.g. documents which describe dedicated areas for storing specific kinds of user or control data, or documents which relate to the data structure of individual sectors). [G11B 20/00086](#) is a prominent sub-group, which comprises documents about all sorts of copy protection and digital rights management for record carriers. Since recent copy protection initiatives address the copyright protection issue with techniques which apply likewise to all kinds of different storage media, this sub-group nowadays also includes copyright protection for record carriers which do not necessarily involve any physical movement between a head and the medium.

### Relationships with other classification places

- The scope of this group is in principle restricted to record carriers that involve some relative movement between the record carrier and a transducer, i.e. record carriers that are fed forward or spinned (grammophone/vinyl records: [G11B 3/00](#); magnetic tapes/discs: [G11B 5/00](#); optical cards/tapes/discs: [G11B 7/00](#)). Recording processes that do not involve any physical movement (i.e. semiconductor memories, [G11C](#)) were not considered under [G11B](#) in the past. This has changed to some extent, since various techniques (in particular: copy protection / DRM schemes, see [G11B 20/00086](#)) equally apply to both kinds of record carriers. Historically, there was also a strict separation from anything related to computer I/O ([G06F 3/00](#)). To some extent, this separation is about to diminish as well.
- The subject-matter classified in [G11B 20/00](#) is conceptually tied to, on the one hand, the technology classified in [G11B 5/00](#) and [G11B 7/00](#), and on the other hand, the one classified in [G11B 27/00](#), [G11B 5/00](#) and [G11B 7/00](#) define physical properties of magnetic and optical recording media, respectively, and the physical structure and the physical operation of different components in the corresponding drives. They also do involve some basic signal processing to the extent that certain signals need to be measured and evaluated in order to adjust the physical properties of the magnetic or optical heads (e.g., for optimising the power of the laser, or for choosing the appropriate write strategy). However, if some more elaborate signal processing is involved to improve the signal quality, or if formatting aspects are discussed which go beyond the mere physical structure of the medium, it would fall within the scope of [G11B 20/00](#).
- The group [G11B 27/00](#) covers more high-level aspects, in the sense that it relates to data processing (e.g., editing) or data structures (e.g., tables of contents) which are independent of the specific signal processing that takes place right before writing data to or reading data from a medium (modulation, error correction, etc).
- The sub-group [H04N 5/76](#) deals with video recording, which covers as opposed to [G11B 20/00](#), data processing techniques, which are specifically adapted to video signals and which are independent of the low-level processing required for actually writing the data on the record carrier, Sub-group [H04N 5/76](#) also covers aspects not specific to how the data actually appear on the medium. In particular, copy protection strategies for protecting broadcast video signals when recording them may be classified in [H04N 5/913](#), but also in [G11B 20/00086](#) if they are specific to the medium used, or if they have applications beyond the limited context of a PVR or a STB.
- The sub-group [G06F 21/10](#) is used for general DRM concepts that are fully independent of the actual recording medium used. If the copy protection involves features of a storage medium, then it would be classified in [G11B 20/00086](#).
- The sub-group [G06F 21/80](#) covers computer-related access protection for magnetic and optical storage media. If this access protection is part of a copy-protection scheme, e.g., for A/V data, then it should be classified in [G11B 20/00086](#) instead.



## References

### Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Computer storage devices which use signal processing when accessing a record carrier, but the main focus is on the processing needed for the I/O interface rather than on some specific processing tailored to the recording medium	<a href="#">G06F 3/06</a>
Computer storage devices in which each record medium is protected by common error correction codes, as found in <a href="#">G11B 20/18</a> , but the main focus is on aspects that are specific to the application in computer systems (e.g., redundant hardware, such as RAID systems)	<a href="#">G06F 11/10</a>
PVRs, STBs, which record broadcast data streams on a record carrier, wherein the recorder makes use of signal processing technology generally covered in <a href="#">G11B 20/00</a> , but the main focus is either on a very specific signal processing that is especially adapted to TV signals and or on the broadcasting / transmission aspects	<a href="#">H04N 5/76</a>

### Special rules of classification

The main group [G11B 20/00](#) is not used for classification. Documents are classified in its subgroups instead.

### Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Linear replacement	defect management by relocating the data of defective sectors to a separate spare area
Slipping algorithm	defect management by shifting the beginning of the user area, at the expense of the primary spare area, so as to compensate for defective sectors listed in the PDL. Each defective sector will be replaced by the first good sector following the defective sector.
Skip replacement	defective sectors are skipped; data recording continues at a subsequent good sector
Pre-pit	pre-recorded address pattern on a recordable optical disc
Wobble	radially oscillating pattern of the recording track of an optical disc

### Synonyms and Keywords

In patent documents, the following abbreviations are often used:

(d,k) constraint	constraint on the minimum and maximum runlength between two transitions of a NRZI modulated signal
17PP	Parity Preserving RLL(1,7) code, the modulation code used for Blu-Ray discs
AAC	Advanced Audio Coding, lossy compression scheme for audio data, standardised in MPEG-2 and MPEG-4
AACS	Advanced Access Content System, copy protection scheme used on Blu-Ray discs, HD-DVDs, etc.
ADC	Analog to Digital Converter

ADIP	Address In Pregroove, address data modulated onto the wobble frequency of an optical disc, used e.g. on a DVD+R
AES	Advanced Encryption Standard, also called Rijndael, designed to supersede DES, published as FIPS 197
AGC	Adaptive Gain Control, Automatic Gain Control
AIT	Advanced Intelligent Tape, standard for magnetic tape recording
AKE	Authentication and Key Exchange
ATIP	Absolute Time In Pregroove, CD-R/RW term for control information which is retrievable from a wobbled pre-groove, see also ADIP
ATRAC	Adaptive Transform Acoustic Coding, lossy compression scheme for audio data
AV	Audio/Video
AWGN	Additive White Gaussian Noise
BCA	Burst Cutting Area, barcode pattern appearing as radial stripes at the inner rim of an optical disc
BCH code	Bose Chaudhuri Hocquenghem code, a specific class of error-correcting block codes
BD	Blu-ray Disc
BD-J	Blu-Ray Disc Java, a specific variant of the Java programming language which is implemented in BD players
BPSK	Binary Phase Shift Keying
BSC	Binary Symmetric Channel
C2	Cryptomeria Cipher, Feistel network-based block cipher
CBC	Cipher Block Chaining, encryption mode in which each block of a message is XORed with the encrypted previous block before being encrypted
CBHD	China Blue High Definition disc, competes with the BD format
CCI	Copy Control Information, two bits indicating Copy Free, Copy No More, Copy Once, or Copy Never
CD	Compact Disc
CE	Consumer Electronics, typically standalone devices designed specifically for processing audio/video data, unlike a general-purpose computer
CGMS	Copy Generation Management System, similar to CCI
CIRC	Cross-interleaved Reed Salomon code, the ECC used on CDs
CPPM	4C Content Protection for Prerecorded Media
CPRM	4C Content Protection for Recordable Media
CPSA	5C Content Protection System Architecture
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check, a specific EDC
CSS	Content Scrambling System, copy protection scheme used on prerecorded DVDs
D	usually, the unit delay operator
DA	Data Area

DAC	Digital to Analog Converter
DAT	Digital Audio Tape
DC	Direct Current, Bias, Offset
DCT	Discrete Cosine Transform
DDS	Disc Definition Structure, control structure recorded, e.g., in the DMA of a DVD-RAM; also : Digital Data Storage
DES	Data Encryption Standard, published as FIPS 46
DFE	Decision Feedback Equaliser
DFT	Discrete Fourier Transform
DLT	Digital Linear Tape, standard for magnetic tape recording
DM	Delta Modulation
DMA	Defect Management Area, sometimes also: Defect Managed Area; also: Direct Memory Access
DMCA	Digital Millenium Copyright Act
DPCM	Differential PCM
DPSK	Differential Phase Shift Keying
DRM	Digital Rights Management
DSA	Digital Signature Algorithm, published as FIPS-186
DSP	Digital Signal Processor
DSV	Digital Sum Variation, the difference between the minimum and maximum RDS; DSV may also denote the Digital Sum Value, which is a synonym of the RDS
DTCP	5C Digital Transmission Content Protection
DVD	Digital Versatile Disc, Digital Video Disc
DVR	Digital Video Recorder, usually used as a synonym of PVR
E2PR	see EEPR
ECB	Electronic Codebook, encryption mode in which each block of a message is encrypted separately
ECC	Error Correcting Code, code used for repairing a bit sequence that was altered by the transmission channel
EDC	Error Detecting Code, provides enough redundancy for detecting errors, but not necessarily for correcting them
EEPR	PR channel with transfer function $(1-D)(1+D)^3$
EFM	Eight-to-Fourteen Modulation, the modulation code used for CDs, transforms 8 input bits into 14-bit codewords
EFM+	Eight-to-Sixteen Modulation, the modulation code used for DVDs, transforms 8 input bits into 16-bit codewords
EKB	Enabling Key Block, data structure on a recording medium which authorises devices to process encrypted content
EPR4	PR channel with transfer function $(1-D)(1+D)^2$
FE	Frequency Encoding, frequency modulation
FEC	Forward Error Correction, error correction without a return channel, no retransmission of data

FFT	Fast Fourier Transform
FIR	Finite Impulse Response
FM	Frequency Modulation, frequency encoding
FSK	Frequency Shift Keying
HD	High Density; also: High Definition
HDCP	High Bandwidth Digital Content Protection
HDD	Hard-Disk Drive
ID	Identifier, unique number, such as a serial number
IF	Intermediate Frequency
IID	Independently and Identically Distributed
ISCR	International Standard Recording Code, globally unique identifier for sound recordings and music videos
ISI	Inter-Symbol Interference
KEK	Key Encrypting Key, a cryptographic key used for encrypting another key
LBN	Logical Block Number
LDPC code	Low Density Parity Check code, also known as Gallager codes
LFSR	Linear Feedback Shift Register
LIA	Lead-In Area, area near the inner rim of an optical disc
LMS	Least Mean Squares
LOA	Lead-Out Area, area near the outer rim of an optical disc
LPP	Land Pre-Pit, prerecorded address information on, e.g., a DVD-R
LSN	Logical Sector Number
LTO	Linear Tape Open, also marketed as Ultrium, standard for magnetic tape recording
MAC	Message Authentication Code; also : Medium Access Control
MAP	Maximum A-Posteriori
MD	Mini Disk
MD5	Message Digest Algorithm 5, cryptographic hash algorithm
MFM	Modified Frequency Modulation, Delay Modulation, Miller Code
MKB	Media Key Block
ML	Maximum Likelihood
MMC	Multi-Media Command, command specifically designed for accessing multimedia data on a recording medium
MMSE	Minimum Mean Squared Error, a general paradigm for setting up the objective function in the context of parameter optimisation
MO	Magneto-Optical
MP3	MPEG-1 Layer 3, lossy data compression for audio data
MPEG	Moving Picture Experts Group
MRW	Mount Rainier, specific format for rewritable optical discs
MSE	Mean Square Error

NA	Numerical Aperture; also: Not Applicable (N/A)
NRZ	Non Return to Zero
NRZI	Non Return to Zero Inverted
OPC	Optimum Power Calibration, adjusting the laser power of an optical write head
OTP	Opposite Track Path, recording on a multi-layer disc alternates between radially outwards on one layer and radially inwards on the following layer
PAM	Pulse Amplitude Modulation
PBN	Physical Block Number
PC	Personal Computer
PCA	Power Calibration Area, specific area used for OPC
PCM	Pulse Coded Modulation
PDL	Primary Defect List, lists defective sectors found at formatting a disc
PE	Phase Encoding, phase modulation
PI	Parity Inner, parity bits of the inner code of a product code
PIC zone	Permanent Information and Control Data zone, prerecorded area of a Blu-Ray disc
PLL	Phase Locked Loop
PM	Phase Modulation, phase encoding
PO	Parity Outer, parity bits of the outer code of a product code
PR	Partial Response; a PR(a,b,c) channel maps binary samples x,y,z to $a*x*D+b*y*D^2+c*z*D^3$
PR4	Class 4 Partial Response channel, PR channel with transfer function $(1-D^2)$
PRML	Partial Response Maximum Likelihood
PSK	Phase Shift Keying
PSN	Physical Sector Number
PTP	Parallel Track Path, on all layers of a multi-layer disc, recording proceeds from the inner to the outer diameter
PVR	Personal Video Recorder, usually used as a synonym of DVR
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RAM	Random Access Memory, rewritable storage
RC4	a specific cryptographic stream cipher ("Rivest Cipher 4")
RDS	Running Digital Sum; see also DSV
RF	Radio Frequency
RLL	Run Length Limited
RLS	Recursive Least Squares
RS code	Reed-Solomon code

RSA	public-key encryption algorithm developed by Rivest, Shamir and Adleman
SA	Spare Area, replacement area, area on a recording medium used for replacing defective sectors
SAC	Secure Authenticated Channel
SACD	Super Audio CD
SAIT	Super AIT, variant of AIT having a higher capacity,
SDL	Secondary Defect List, lists defective sectors found when trying to record data on a disc
SDM	Sigma-Delta Modulation
SDMI	Secure Digital Music Initiative
SHA	Secure Hash Algorithm, cryptographic one-way function published as FIPS 180
SNR	Signal to Noise Ratio
STB	Set-Top Box
TCM	Trellis Coded Modulation
TDL	Tapped Delay Line
TOC	Table Of Contents
VCO	Voltage Controlled Oscillator
VCPS	Video Content Protection System, DRM standard for DVD+R and DVD+RW
VCR	Video Cassette Recorder
VFO	Variable Frequency Oscillator
WO	Write Once, not rewritable
WORM	Write Once Read Many, not rewritable
XOR	exclusive OR
ZF	Zero Forcing, zero forcing equalisers multiply the read signal with the reciprocal of the transfer function of the recording channel

## G11B 20/00007

{Time or data compression or expansion (audio compression based on psychoacoustics [G10L 19/00](#); data processing for reproducing audio data at different playback speeds [G10L 21/04](#); video compression [H04N 19/00](#); data compression per se [H03M 7/30](#))}

### Definition statement

*This place covers:*

Data compression in the context of recording, both for A/V signals (ATRAC, MP3 etc) and for digital signals in general, e.g. subband coding, transform coding. Also analogue compression, e.g. "time compression/expansion" by altering the density at which the data are recorded, e.g. on an analog tape).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Image compression	<a href="#">G06T 9/00</a>
Lossy or lossless audio compression, e.g. MP3 encoding, speech encoding etc., streaming, transcoding	<a href="#">G10L 19/00</a>
Time compression for audio data, e.g. by increasing the pitch	<a href="#">G10L 21/04</a>
Theory of data compression	<a href="#">H03M 7/30</a>
Data compression in computer networks	<a href="#">H04L 29/0604</a>
Video compression for transmission purposes	<a href="#">H04N 19/00</a>

## G11B 20/00086

**{Circuits for prevention of unauthorised reproduction or copying, e.g. piracy (indicating unauthorised use of record carriers in general [G11B 23/28](#); scrambling for television signal recording [H04N 5/913](#); network architectures or network protocols for network security [H04L 63/00](#); cryptographic mechanisms or cryptographic arrangements for secret or secure communication [H04L 9/00](#))}**

### Definition statement

*This place covers:*

Copy protection for record carriers; preventing unauthorised access to recorded data; providing means for recognising unauthorised use of data or for distinguishing between authorised and illicit copies; tracing back users, recording devices, or media manufacturers; encryption, decryption, and scrambling algorithms; distributing, updating or revoking encryption keys; secure content acquisition and transmission for recording contents on record carriers; limiting access to a content to certain conditions (certain duration, geographical region, restricted set of users or devices, restricted number of copies, reduced quality). For both digital and analog recording.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Labels, i.e. visible patterns, formed on an optical disc, e.g. by modifying the pit width or the groove width	<a href="#">G11B 2007/00727</a>
Optical discs having specific layers or comprising specific materials which limit the time the disc can be played back	<a href="#">G11B 7/24</a>
Testing for media defects	<a href="#">G11B 20/1816</a>
Record carrier with additional integrated circuitry, such as transponder tags	<a href="#">G11B 23/0042</a>
Physical arrangements for indicating or preventing unauthorised use of record carriers, e.g. cassettes which can be locked mechanically etc.	<a href="#">G11B 23/28</a>
Time limited playback by modifying physical properties of the record carrier	<a href="#">G11B 23/282</a>
Digital codes on the record carrier	<a href="#">G11B 23/284</a>
Cryptography for protecting computer memory devices	<a href="#">G06F 12/1408</a>

Digital rights management and copyright protection in a more general context, commonly with computers accessing the data, not necessarily bound to the features of specific record carriers	<a href="#">G06F 21/10</a>
Software watermarking	<a href="#">G06F 21/16</a>
Mutual authentication	<a href="#">G06F 21/445</a>
Testing the integrity of files, message authentication	<a href="#">G06F 21/50</a>
Secure communication between devices or processes, see also <a href="#">H04L 9/00</a>	<a href="#">G06F 21/60</a>
Security arrangements for protecting various kinds of record carriers	<a href="#">G06F 21/78</a>
Mutual authentication	<a href="#">G06F 2211/003</a>
Public key encryption	<a href="#">G06F 2211/008</a>
Record carriers with integrated chips in general	<a href="#">G06K 19/07</a>
Record carriers comprising integrated circuitry, e.g. CDs with transponder tags	<a href="#">G06K 19/07</a>
Transponder cards	<a href="#">G06K 19/0723</a>
Record carriers with active circuitry for preventing them to be read out	<a href="#">G06K 19/07336</a>
Record carriers with built-in fingerprint detectors or other biometrical devices	<a href="#">G06K 19/07354</a>
Record carriers with RFID tag	<a href="#">G06K 19/14</a>
Data processing for e-commerce	<a href="#">G06Q 30/06</a>
Image watermarking	<a href="#">G06T 1/0021</a>
A/V downloading, e.g. buying MP3 files on the web	<a href="#">G07F 17/16</a>
Audio watermarking	<a href="#">G10L 19/018</a>
Secret or secure communication in general	<a href="#">H04L 9/00</a>
Distributing encryption keys	<a href="#">H04L 9/08</a>
User or message authentication, digital signatures	<a href="#">H04L 9/32</a>
Protocols for digital signatures, certificates	<a href="#">H04L 9/3247</a>
Public key certificates	<a href="#">H04L 9/3263</a>
Secure data transmission over networks	<a href="#">H04L 29/0602</a>
Network protocols for multimedia communication, e.g., home networks, authorised domains, also: downloading music etc.	<a href="#">H04L 29/06027</a>
Content encryption in computer networks	<a href="#">H04L 29/06659</a>
Protocols for symmetric cryptography	<a href="#">H04L 29/06666</a>
Protocols for asymmetric cryptography	<a href="#">H04L 29/06673</a>
Protocols for key distribution	<a href="#">H04L 29/06707</a>
Hierarchical key distribution	<a href="#">H04L 29/06727</a>
Copy protection for picture information; security feature of banknotes	<a href="#">H04N 1/00838</a>
Image watermarking	<a href="#">H04N 1/32144</a>
Copy protection, e.g. scrambling, for TV signal recording	<a href="#">H04N 5/913</a>
Inserting a copy protection signal in the vertical blanking interval	<a href="#">H04N 2005/91314</a>
Inserting a record or copy inhibit flag for TV signal recording	<a href="#">H04N 2005/91321</a>



Inserting a CGMS flag for TV signal recording	<a href="#">H04N 2005/91328</a>
Inserting a watermark for TV signal recording	<a href="#">H04N 2005/91335</a>
Inserting an authentication signal for TV signal recording	<a href="#">H04N 2005/91342</a>
Scrambling for TV signal recording	<a href="#">H04N 2005/91364</a>
Scrambling TV signals for transmission/broadcast	<a href="#">H04N 7/167</a>
Downloading video from a server, video on demand, etc., the client actively requesting a content from the server	<a href="#">H04N 7/173</a>
Video watermarking	<a href="#">H04N 19/467</a>
DRM and copyright management for video signals	<a href="#">H04N 21/23406</a>

### Special rules of classification

Although the definition of the sub-class [G11B](#) suggests otherwise, the copy protection techniques which are classified in [G11B 20/00086](#) are not necessarily limited to storage media which involve a relative movement between the medium and the transducer, but they relate to all sorts of physical record carriers in general.

## G11B 20/00992

### {Circuits for stereophonic or quadraphonic recording or reproducing}

#### Definition statement

*This place covers:*

Recording multichannel signals, e.g., stereo or quadraphonic signals, but also if more than 2 or 4 channels are involved.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Stereo or multi-channel audio processing	<a href="#">G10L 19/008</a>
Earpieces for telephones	<b>H03R1/10</b>
Stereo broadcasting, AM/FM radio transmission	<b>H04H5/00</b>
Audio signal processing for stereo playback	<a href="#">H04S 1/002</a>
Audio processing with more than two channels, e.g., surround sound systems	<a href="#">H04S 3/00</a>
Pseudo-stereo systems	<a href="#">H04S 5/00</a>
Electronically adapting the sound field	<a href="#">H04S 7/30</a>

## G11B 20/02

### Analogue recording or reproducing

#### Definition statement

*This place covers:*

Analogue recording or reproducing, e.g. audio cassettes, grammophone records, laser discs etc. A further refinement of this subgroup addresses error detection and correction ([G11B 20/025](#)),

direct recording or reproducing ([G11B 20/04](#)), recording and reproducing angle-modulated signals ([G11B 20/06](#), mostly FM modulated audio signals), recording and reproducing pulse-modulated signals (e.g. FM audio in video tapes).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Recording PCM signals digitally	<a href="#">G11B 20/10527</a>
Angle modulation in general	<a href="#">H03C 3/00</a>
Demodulating angle modulated signals	<a href="#">H03D 3/00</a>
Pulse modulation	<a href="#">H03K 7/00</a>
Pulse demodulation	<a href="#">H03K 9/00</a>

## G11B 20/10

**Digital recording or reproducing (digital computers in which at least part of the computation is effected electrically, arrangements for handling digital data [G06F](#); transmission of digital information [H04L](#))**

### Definition statement

*This place covers:*

Digital recording or reproducing. Processing pipeline of a typical recording apparatus: an A/V signal is compressed ([G11B 20/00007](#)), error correction codes are added ([G11B 20/1833](#), [G11B 20/1866](#)), the signal is modulated ([G11B 20/14](#)), equalisers and filters improve the signal quality ([G11B 20/10009](#)), then the signal is recorded to the record carrier according to a given format ([G11B 20/12](#)).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Magnetic recording	<a href="#">G11B 5/00</a>
Optical recording; for holographic recording see also <a href="#">G11C 13/042</a>	<a href="#">G11B 7/00</a>
Operating tape devices, e.g. starting, stopping, altering the speed	<a href="#">G11B 15/00</a>
Operating recording and playback devices for record carriers other than tapes, including user interfaces	<a href="#">G11B 19/00</a>
Dictating devices, dictaphones	<a href="#">G11B 25/00</a>
Editing A/V data, data formats, addressing and indexing	<a href="#">G11B 27/00</a>
Radio recorders	<a href="#">G11B 31/003</a>
Physical connectors for disc or phase drives, e.g., cables, USB or IDE sockets, etc.	<a href="#">G11B 33/122</a>
Mountings for plural disk drives	<a href="#">G11B 33/128</a>
Digital I/O for computers, e.g. hard disk controllers	<a href="#">G06F 3/0601</a>
Information transfer via an I/O bus, bus controllers, interface protocols, direct memory access (DMA) architectures	<a href="#">G06F 13/28</a>
Semiconductor memories	<a href="#">G11C</a>

Transmission of digital information	<a href="#">H04L</a>
Video recorders	<a href="#">H04N 5/76</a>
Hard disk recorders	<a href="#">H04N 5/781</a>
Optical video recorders	<a href="#">H04N 5/85</a>
Video transmission	<a href="#">H04N 7/24</a>

### Special rules of classification

It is the default group for anything which cannot be classified elsewhere.

## G11B 20/10009

### {Improvement or modification of read or write signals}

#### Definition statement

*This place covers:*

Modifying and improving the read or write signals (i.e. removing jitter, increasing the SNR), e.g. by using equalisers and filters; anything about how to adjust the frequency and phase of the read/write clock or the bit clock of the demodulation circuit, e.g. clock adjustment with a PLL; anything related to PRML techniques (Partial Response Maximum Likelihood); A/D conversion, recovering the bit string from the analogue HF signal; maximum likelihood estimation and related techniques for recognising the correct bit sequences, e.g. using the Viterbi algorithm. Wobble detection can also be classified here if the document is linked to clocking.

#### References

##### Limiting references

*This place does not cover:*

Code-related aspects of clock adjustment, e.g. documents which describe specific synchronisation patterns	<a href="#">G11B 20/1403</a>
Specific modulation schemes to be applied to a wobbled pre-groove	<a href="#">G11B 20/1419</a>

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Magnetic recording, hardware aspects	<a href="#">G11B 5/00</a>
Optical recording, hardware aspects	<a href="#">G11B 7/00</a>
Applying suitable write strategies, i.e. giving an optical mark the desired shape by burning it as a certain sequence of write pulses	<a href="#">G11B 7/00456</a>
Measuring jitter specifically on optical discs	<a href="#">G11B 7/005</a>
Algorithms/circuits for keeping an optical head on the track	<a href="#">G11B 7/09</a>
Optimum power calibration	<a href="#">G11B 7/1267</a>
Measuring noise, SNR, jitter, phase jitter in general	<a href="#">G01R 29/26</a>
A/D converters for computer interfaces	<a href="#">G06F 3/05</a>
Interpolation, smoothing, least mean squares	<a href="#">G06F 17/17</a>
Gain control for digital amplifiers	<a href="#">H03G 3/3089</a>
Phase-locked loops	<a href="#">H03L 7/06</a>

AD/DA converters in general	<a href="#">H03M 1/00</a>
Calibrating AD converters in general	<a href="#">H03M 1/1014</a>
DC removal for AD converters in general	<a href="#">H03M 1/1023</a>
Equalisers for line transmission	<a href="#">H04B 3/04</a>
Digital PLL in a transmitter-receiver setup	<a href="#">H04L 7/0331</a>
DC equalisers in transmitters and receivers	<a href="#">H04L 25/03</a>
Removing inter-symbol interference in such a DC equaliser	<a href="#">H04L 25/03006</a>
Adaptive equalizers for transmission lines	<a href="#">H04L 25/03885</a>
Modulators for data transmission	<a href="#">H04L 27/36</a>

## G11B 20/10194

{using predistortion during writing ([G11B 20/10055](#) takes precedence)}

### Definition statement

*This place covers:*

Applying pre-distortion (e.g. by modifying the timing) during writing, e.g. by modifying the signal according to the known characteristics of the read/write channel

## G11B 20/10203

{baseline correction (DC correction by choosing codewords of the modulation code [G11B 20/1426](#))}

### Definition statement

*This place covers:*

Correcting the DC baseline of the read signal, slicing (adapting the threshold at which the signal will be recognised as a binary zero or one)

## G11B 20/10212

{compensation for data shift (e.g. pulse crowding effects)}

### Definition statement

*This place covers:*

Compensating for data shift, e.g. addressing the fact that the timing of a peak value might be affected (advanced, delayed) by inter-symbol interference (ISI)

## G11B 20/10527

{Audio or video recording; Data buffering arrangements ([G11B 20/12](#) - [G11B 20/18](#) take precedence)}

### Definition statement

*This place covers:*

Initially, [G11B 20/10527](#) was supposed contain all documents about how to record PCM audio data. Nowadays it also comprises many documents about how to use intermediate memories (buffers), e.g., playback buffers for ensuring a seamless playback of a recorded video stream while reading

the data intermittently in high-speed bursts, or recording buffers for making sure that even in case discontinuous data reception the recording process will not be interrupted; [G11B 20/10527](#) will particularly be assigned if the aspect "memory" is important (e.g., addressing within the buffer, adjusting the read/write clock of the buffer, etc.). In the past (when people started recording digitised audio signals on record carriers), [G11B 20/10527](#) was also used for documents about A/D conversion, filtering, quantisation errors, dithering, oversampling, or sampling frequency conversion; these aspects are now classified in [G11B 20/10009](#).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Buffers for preventing read/write errors in recording/playback apparatuses, e.g., for portable devices	<a href="#">G11B 19/044</a>
Data compression in the context of recording, also for audio data	<a href="#">G11B 20/00007</a>
I/O interfaces for radio receivers	<a href="#">G11B 31/003</a>
Buffering for I/O devices of computers, caching	<a href="#">G06F 3/0656</a>
Sound input/output	<a href="#">G06F 3/16</a>
Audio streaming	<a href="#">G10L 19/167</a>
Audio transcoding	<a href="#">G10L 19/173</a>
Audio filtering in combination with compression	<a href="#">G10L 19/26</a>
Audio filtering, speech enhancement	<a href="#">G10L 21/00</a>
Audio processing for audio quality enhancement	<a href="#">G10L 21/0205</a>
Noise filtering for audio signals	<a href="#">G10L 21/0208</a>
Audio compression	<a href="#">G10L 21/04</a>
I/O buffers for semiconductor memories	<a href="#">G11C 7/10</a>
Audio amplifiers	<a href="#">H03G 3/3005</a>
Audio processing circuitry for TV receivers	<a href="#">H04N 5/60</a>
Interfaces between A/V recorders and other devices	<a href="#">H04N 5/765</a>
Interfaces to a digital video camera	<a href="#">H04N 5/77</a>
Buffer level management for the transmission of digital TV signals	<a href="#">H04N 21/44004</a>
Recording devices in a set-top box	<a href="#">H04N 21/4627</a>
Audio signal processing for stereo playback	<a href="#">H04S 1/002</a>
Digital audio processing for stereo signals	<a href="#">H04S 1/007</a>
Audio processing with more than two channels, e.g., surround sound systems	<a href="#">H04S 3/00</a>
Pseudo-stereo systems	<a href="#">H04S 5/00</a>

## G11B 20/12

**Formatting, e.g. arrangement of data block or words on the record carriers  
{(within interface between computers and data recorders [G06F 3/06](#))}**

### Definition statement

*This place covers:*

Formatting, e.g. arrangement of data block or words on the record carriers. General low-level structure of a record carrier (what to store where), e.g. the format of sector headers, the size of the lead-in area, etc.

### Relationships with other classification places

Broadly speaking, the sub-group [G11B 20/12](#) covers formatting aspects which are at an intermediate level between, on the one hand, those covered by [G11B 27/00](#) and, on the other hand, those covered by [G11B 5/00](#) or [G11B 7/00](#). The group [G11B 27/00](#) relates to formatting aspects at the higher system level (e.g., formatting aspects which one would usually associate with the operating system, including specific file formats and the format of control structures such as the TOC, but also the format of playlists and data formats for organising separate A/V data streams, etc.). The groups [G11B 5/00](#) (magnetic recording media) and [G11B 7/00](#) (optical recording media) cover aspects that pertain to the physical structure of the recording medium, such as the physical arrangement of separate layers, and physical characteristics such as the chemical components of which the recording medium is made, the shape of the media, etc.

### References

#### Limiting references

*This place does not cover:*

Documents related to defect management	<a href="#">G11B 20/18</a>
File format conversion	<a href="#">G06F 17/30005</a>
File format or the syntax of recorded video streams	<a href="#">H04N 7/24</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Wobble format of optical discs	<a href="#">G11B 7/0053</a>
Optical aspects of the Burst Cutting Area, BCA, lead-in, lead-out, Power Calibration Area	<a href="#">G11B 7/00736</a>
Physical structure of optical media with multiple layers	<a href="#">G11B 7/2403</a>
Detecting the data format of a data carrier	<a href="#">G11B 19/125</a>
Formatting aspects related to defect management, e.g., documents defining the structure of DMAs, TDDS, SDLs, PDLs, etc.	<a href="#">G11B 20/18</a>
High-level formatting, e.g. file formats, formatting aspects particular to the operating system, file indices such as a TOC	<a href="#">G11B 27/00</a>
Formatting aspects of computers exchanging data with disk drives	<a href="#">G06F 3/0661</a>
Record carriers having barcodes	<a href="#">G06K 19/06028</a>

### Special rules of classification

Usually, if a document defines formatting aspects related to defect management, e.g. structure of DMAs, TDDS, SDLs, PDLs, etc., then this document should be classified in [G11B 20/18](#); if a document defines the location of such a structure on the medium (e.g. DMA1 and DMA2 being radially opposed), it should be classified in both [G11B 20/12](#) and [G11B 20/18](#).

## G11B 20/1201

{on tapes}

### Definition statement

*This place covers:*

Formatting aspects of tape storage devices; a distinction is made between tapes with longitudinal tracks, [G11B 20/1202](#), transverse tracks, [G11B 20/1207](#), and combinations of both, [G11B 20/1211](#); if applicable, a further distinction can be made between tapes which are specifically designed for storing A/V data ([G11B 20/1204](#)) and those designed for storing computer data ([G11B 20/1205](#)).

## G11B 20/1215

{on cards (optical aspect of optical cards [G11B 7/0033](#))}

### Definition statement

*This place covers:*

Formatting aspects record media if the form factor is a card.

### References

#### Limiting references

*This place does not cover:*

Optical aspects of optical cards	<a href="#">G11B 7/0033</a>
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## G11B 20/1217

{on discs}

### Definition statement

*This place covers:*

Formatting aspects of magnetic or optical disks; this is where most documents in [G11B 20/12](#) are currently being classified; a distinction can be made between recording A/V data, [G11B 20/1251](#), recording computer or control/management data, [G11B 20/1252](#), and recording mixtures of both, [G11B 20/1254](#); of some relevance is [G11B 20/1258](#), disks having a structure defined by multiple radial zones, e.g. zone constant angular velocity discs, ZCAV.

### Special rules of classification

This sub-group comes with various complementing Indexing Codes, which are not mirrored by respective ECLA symbols, see in particular [G11B 2220/2545](#) + for various CD formats, [G11B 2020/1257](#) for the count key data format, [G06F 3/04815](#) for the floppy disk formats, and [G11B 2020/1259](#) for hybrid discs having a ROM and a RAM area.

## G11B 20/1261

{on films, e.g. for optical moving-picture soundtracks (optical aspect [G11B 7/0032](#))}

### Definition statement

*This place covers:*

Formatting aspect of films, i.e. transparent record carriers which are primarily meant for recording photographic frames and accompanying audio or control data.

### References

#### Limiting references

*This place does not cover:*

Formatting aspects of how to record movies on digital tapes or different kinds of disks	<a href="#">G11B 20/1201</a> , <a href="#">G11B 20/1217</a>
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## G11B 20/1262

{with more than one format/standard, e.g. conversion from CD-audio format to R-DAT format}

### Definition statement

*This place covers:*

Record carriers involving more than one format/standard, e.g. conversion from CD-audio format to R-DAT format, disks having a CD and a DVD layer, discs storing normal PCM signal and additional MP3 tracks, etc.

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Optical aspects of how to record the same data in two different forms of an optical record carrier	<b>G11B7/20</b>
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## G11B 20/14

using self-clocking codes

### Definition statement

*This place covers:*

In the strict sense, self-clocking codes for digital recording. Today virtually all codes are self-clocking, however, current record carriers do not have a separate track for bit clock synchronisation. [G11B 20/14](#) hence encompasses all kinds of modulation codes (e.g., the EFM code used on audio CDs).

### Relationships with other classification places

This group covers different coding schemes in the context of recording and reproducing apparatuses. Documents which discuss theoretical aspects of these coding schemes in general, without any



reference to an application in recording / reproduction context, will commonly be classified in subgroups of [H03M 5/00](#) instead.

## References

### Limiting references

*This place does not cover:*

Error correcting codes, error detecting codes in the context of recording and reproducing systems	<a href="#">G11B 20/1833</a>
Theory of error correcting codes, error correcting codes per se	<a href="#">H03M 13/00</a>

## G11B 20/1403

**{characterised by the use of two levels}**

### Definition statement

*This place covers:*

Although originally being meant to comprise binary modulation codes in general, this sub-group is now mainly used for documents about synchronisation patterns for bit clock recovery.

## References

### Limiting references

*This place does not cover:*

Synchronisation of separate data streams, e.g. audio and video channels	<a href="#">G11B 27/10</a>
Synchronisation patterns for stream synchronisation	<a href="#">G11B 27/3027</a>
Theory of binary codes in general, not in the specific context of record carriers	<a href="#">H03M 5/04</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Sync patterns specifically for the servo patterns of hard disks	<a href="#">G11B 5/59688</a>
Certain old documents about sync patterns in general	<a href="#">G11B 27/3027</a>

## G11B 20/1407

**{code representation depending on a single bit, i.e. where a one is always represented by a first code symbol while a zero is always represented by a second code symbol}**

### Definition statement

*This place covers:*

Bit-by-bit coding, binary codes having one symbol representing a zero and another symbol representing a one, no interdependence between subsequent information bits.

## References

### Limiting references

*This place does not cover:*

Theory of bit-by-bit coding in general, not in the specific context of record carriers	<a href="#">H03M 5/06</a>
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## G11B 20/1411

{conversion to or from pulse width coding}

### Definition statement

*This place covers:*

Pulse width modulation. A signal to be recorded is encoded by varying the pulse width of a square wave at a constant frequency. Examples: delta modulation, sigma-delta modulation.

## References

### Limiting references

*This place does not cover:*

Sigma-delta encoded audio signals	<a href="#">G11B 20/10527</a>
Theory of pulse width modulation in general, not in the specific context of record carriers	<a href="#">H03M 5/08</a>

## G11B 20/1415

{conversion to or from pulse frequency coding}

### Definition statement

*This place covers:*

Pulse frequency modulation, information encoded by altering the repetition rate of the pulses, every pulse having the same fixed length. As pulse width modulation, this modulation scheme alters the duty cycle of the square wave.

## References

### Limiting references

*This place does not cover:*

Theory of pulse frequency modulation in general, not in the specific context of record carriers	<a href="#">H03M 5/10</a>
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## G11B 20/1419

{to or from biphasic level coding, i.e. to or from codes where a one is coded as a transition from a high to a low level during the middle of a bit cell and a zero is encoded as a transition from a low to a high level during the middle of a bit cell or vice versa, e.g. split phase code, Manchester code conversion to or from biphasic space or mark coding, i.e. to or from codes where there is a transition at the beginning of every bit cell and a one has no second transition and a zero has a second transition one half of a bit period later or vice versa, e.g. double frequency code, FM code}

### Definition statement

*This place covers:*

E.g. binary phase modulation (Manchester codes); also phase or frequency modulation of wobbles. [G11B 20/1419](#) generally relates to codes where a one is coded as a transition from a high to a low level during the middle of a bit cell and a zero is encoded as a transition from a low to a high level during the middle of a bit cell or vice versa, e.g. split phase code, Manchester code conversion to or from biphasic space or mark coding, i.e. to or from codes where there is a transition at the beginning of every bit cell and a one has no second transition and a zero has a second transition one half of a bit period later or vice versa, e.g. double frequency code, FM code. Biphasic level codes in general: [H03M 5/12](#).

### References

#### Limiting references

*This place does not cover:*

Theory of biphasic level codes in general, not in the specific context of record carriers	<a href="#">H03M 5/12</a>
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## G11B 20/1423

{Code representation depending on subsequent bits, e.g. delay modulation, double density code, Miller code}

### Definition statement

*This place covers:*

Basic coding schemes wherein the input bits are not coded independently of each other, but their code representation depends on subsequent bits, e.g. delay modulation, double density code, Miller code.

## G11B 20/1426

{conversion to or from block codes or representations thereof}

### Definition statement

*This place covers:*

Binary block codes. This very prominent subgroup also includes run-length limited (RLL) codes and various kinds of DSV optimised codes, e.g. the Modified Frequency Modulation (MFM) used on floppy discs, the EFM and EFM+ codes used on CDs and DVDs, or the 17PP code used on Blu-Ray discs.

## References

### Limiting references

*This place does not cover:*

Theory of block codes in general, not in the specific context of record carriers	<a href="#">H03M 5/145</a>
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## G11B 20/1488

{characterised by the use of three levels}

### Definition statement

*This place covers:*

Ternary codes, i.e. modulation codes wherein the code may contain three different symbols which are commonly represented by three discrete signal levels.

## References

### Limiting references

*This place does not cover:*

Partial response signals exhibiting three possible signal levels	<a href="#">G11B 20/10009</a>
Theory of ternary codes in general, not in the specific context of record carriers	<a href="#">H03M 5/16</a>

## G11B 20/1492

{two levels are symmetric, in respect of the sign to the third level which is "zero"}

### Definition statement

*This place covers:*

Ternary codes wherein the possible signal levels are -a, 0, and a.

## G11B 20/1496

{characterised by the use of more than three levels}

### Definition statement

*This place covers:*

n-ary digital modulation codes with  $n \geq 4$  and above, e.g. quaternary modulation codes (4 possible signal levels, i.e. each symbol can per se convey two bits).

## References

### Limiting references

*This place does not cover:*

Partial response signals with $n > 3$ signal values	<a href="#">G11B 20/10009</a>
Theory of n-ary codes, $n > 3$ , in general, not in the specific context of record carriers	<a href="#">H03M 5/20</a>

## G11B 20/16

using non self-clocking codes, i.e. the clock signals are either recorded in a separate clocking track or in a combination of several information tracks

### Definition statement

*This place covers:*

Non self-clocking codes, i.e. the clock signals are not derivable from the modulated data sequence itself (which is the case for any modern RLL code) but instead they are either recorded in a separate clocking track or in a combination of several information tracks.

## G11B 20/18

Error detection or correction; Testing{, e.g. of drop-outs}

### Definition statement

*This place covers:*

Detecting and correcting errors, e.g. erroneous bits or sectors; testing the medium for defects. This sub-group covers, e.g., the detection of bad sectors, strategies for replacing these sectors by other sectors, the application of various kinds of error correction codes and error detection codes so as to reliably recover the recorded bit sequence, the usage of interleaving schemes for spreading the effect of local defects, the actual detection of such defects by verification and certification processes, the idea of mitigating the effects of a local defect by data interpolation, and the documentation of defects by maintaining different kinds of defect lists.

### References

#### Limiting references

*This place does not cover:*

Defect management by using redundant hardware (e.g. RAID systems per se)	<a href="#">G06F 11/00</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Testing the correct function of read/write heads for magnetic disk drives	<a href="#">G11B 5/455</a>
Detecting defects on optical discs	<a href="#">G11B 7/00375</a>
Read-after-write verification for optical discs	<a href="#">G11B 7/00458</a>
Protection against errors caused by vibration or physical shock	<a href="#">G11B 19/042</a>
Protection against errors caused by free fall	<a href="#">G11B 19/043</a>
Protection against power failures in recording/playback apparatuses	<a href="#">G11B 19/047</a>
Testing disk drives	<a href="#">G11B 19/048</a>
Controlling recording/reproduction using identification or authentication marks	<a href="#">G11B 19/12</a>
Finding physical defects on optical discs by optical inspection	<a href="#">G01N 21/9506</a>
Testing digital circuits	<a href="#">G01R 31/317</a>
Detecting and correcting errors in computer systems, e.g., repairing inconsistencies / bad sectors on file system level, without the use of error correcting codes	<a href="#">G06F 11/07</a>

Error correcting codes for computers	<a href="#">G06F 11/08</a>
Computers performing error processing by retrying	<a href="#">G06F 11/1402</a>
Backup and data recovery, possibly by mirroring	<a href="#">G06F 11/1402</a>
Error correction at file system level	<a href="#">G06F 11/1435</a>
Computers recovering from power failure	<a href="#">G06F 11/1441</a>
RAID systems	<a href="#">G06F 11/2087</a>
Testing and diagnosis of idle hardware	<a href="#">G06F 11/22</a>
Verifying the correctness of markings on a record carrier	<a href="#">G06K 5/00</a>
Testing while recording	<a href="#">G06K 5/02</a>
Verifying the correct alignment of markings	<a href="#">G06K 5/04</a>
Testing digital memory circuits for defects / correct operation	<a href="#">G11C 29/00</a>
Theory of error correcting codes	<a href="#">H03M 13/00</a>
Monitoring audio equipment, e.g. loudspeakers or microphones	<a href="#">H04R 29/00</a>

## G11B 20/1803

{by redundancy in data representation}

### Definition statement

*This place covers:*

Obtaining additional robustness by simple redundancy, i.e. by recording the same data multiple times at different locations.

### References

#### Limiting references

*This place does not cover:*

Redundancy generating ECC schemes that are more advanced than such a simple repetition code	<a href="#">G11B 20/1833</a>
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## G11B 20/1806

{Pulse code modulation systems for audio signals ([G11B 20/1803](#) takes precedence)}

### Definition statement

*This place covers:*

Approaches particularly designed for audio signals ([G11B 20/1809](#): purely by interleaving, i.e. for mitigating the perceptual effect of a burst error; [G11B 20/1813](#): by error correcting codes involving parity symbols).

## G11B 20/1816

{Testing}

### Definition statement

*This place covers:*

Testing the medium, recognising bad sectors, determining whether the medium is actually usable. If such tests take place during the recording/playback operation, see also [G11B 27/36](#) (monitoring). If the test involves recording a particular test pattern, the document will be classified in [G11B 20/182](#).

## G11B 20/1833

{by adding special lists or symbols to the coded information ([G11B 20/1806](#), [G11B 20/1866](#) take precedence)}

### Definition statement

*This place covers:*

Any error-correcting code (ECC) or Error-Detecting Code (EDC) used on record carriers.

### References

#### Limiting references

*This place does not cover:*

ECC in the specific context of dedicated computer hardware	<a href="#">G06F 11/00</a>
Theory of ECC, not in the specific context of record carriers	<b>H03M3/13</b>

## G11B 20/1866

{by interleaving ([G11B 20/1809](#) takes precedence)}

### Definition statement

*This place covers:*

Any interleaving used for mitigating the effects of read/write errors, also if being combined with additional parity symbols.

### Special rules of classification

ECC schemes, which also use an interleaver (e.g., LDPC and turbo codes) must also be classified in [G11B 20/1833](#) or [H03M 13/00](#)

## G11B 20/1876

{Interpolating methods}

### Definition statement

*This place covers:*

Interpolation, missing or defective information is recovered by estimating the correct data values based on adjacent data items.

## G11B 20/1879

### {Direct read-after-write methods}

#### Definition statement

*This place covers:*

Read-after-write methods. During a normal recording operation, a data item is read from the medium for immediate verification that it has been recorded correctly.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Optical / physical aspects of read-after-write methods when applied to optical discs	<a href="#">G11B 7/00458</a>
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## G11B 20/1883

### {Methods for assignment of alternate areas for defective areas}

#### Definition statement

*This place covers:*

In case of defective areas (e.g., bad sectors), relocating the data that was supposed to be recorded to the defective area to another area. This other area can be part of a dedicated spare area (linear replacement), or it can be a sector following the defective sector (skip replacement). Subgroups for applying this principle to tapes ([G11B 20/1886](#)) and discs ([G11B 20/1889](#)).

## G11B 20/20

### for correction of skew for multitrack recording

#### Definition statement

*This place covers:*

Correcting skew for multitrack recording, mainly in the context of magnetic tapes.

## G11B 20/22

### for reducing distortions

#### Definition statement

*This place covers:*

Strategies for reducing distortions, i.e. occasionally occurring degradations of the signal quality.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Reducing noise or correcting distortions on record carriers	<a href="#">G11B 23/0007</a>
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### Special rules of classification

This subgroup is obsolete. New documents about signal quality enhancement must also be classified in [G11B 20/10009](#).

## G11B 20/24

for reducing noise {(control of amplification in general, e.g. dependent upon noise level [H03G](#))}

### Definition statement

*This place covers:*

Strategies for reducing noise, i.e. systematically occurring degradations of the signal quality.

Obsolete technology

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Reducing noise or correcting distortions on record carriers	<a href="#">G11B 23/0007</a>
Noise filtering for audio signals	<a href="#">G10L 21/0208</a>

### Special rules of classification

This subgroup is obsolete. New documents about noise removal must also be classified in [G11B 20/10009](#).

## G11B 21/00

Head arrangements not specific to the method of recording or reproducing

### Definition statement

*This place covers:*

Any details of head arrangements for any type of moving record carrier which are not already covered by subgroups specific to a particular method of recording.

[G11B 21/00](#) has two main areas: Driving and Moving ([G11B 21/02](#)) and Supporting ([G11B 21/16](#)).

### Relationships with other classification places

[G11B 21/02](#) and subgroups have parallel structures in [G11B 5/54](#) - [G11B 5/58](#) and their subgroups and these should be used for details regarding magnetic recording.

[G11B 21/02](#) and subgroups have parallel structures in [G11B 7/085](#) and [G11B 7/09](#) and subgroups and these should be used for details regarding optical recording.

Most other areas ([G11B 3/00](#), [G11B 9/00](#), [G11B 11/00](#), [G11B 13/00](#)) also have their own structures which deal with the aspects covered in general by [G11B 21/00](#), which are often very specific to the technology in use (e.g. Scanning Tunnelling Microscopy). These aspects should not be classified in [G11B 21/00](#).

## Special rules of classification

In practice, most of the details of heads are specific to the recording method and should be classified in those subgroups, unless there is no suitable place for them.

NB: the above practice has not always been followed in the past, which has led to much double classification between specific areas and the general area, predominantly in [G11B 5/00](#) (magnetic recording).

As noted above, where possible, documents should be classified in recording-method-specific areas only.

[G11B 21/12](#) is used to classify documents regarding loading and unloading of heads to and from magnetic disks, particularly emergency head unloading in the case of e.g. power failure or mechanical shock.

[G11B 21/22](#) is used to classify arrangements for supporting or holding magnetic heads and arms while they are outside the recording area e.g. ramps, buffers and latches.

## G11B 23/00

**Record carriers not specific to the method of recording or reproducing; Accessories, e.g. containers, specially adapted for co-operation with the recording or reproducing apparatus {Intermediate mediums; Apparatus or processes specially adapted for their manufacture (processes involving a single technical art and for which provision exists elsewhere, see the relevant class, e.g. [B29](#), [B41M](#), [B05D](#), [C08L](#), [F16N](#))}**

### Definition statement

*This place covers:*

- Disk shaped record carriers, disk cartridges, tape cartridges, reels of tapes.
- Apparatuses or processes for the manufacture of cartridges.
- Record carriers with means for indicating/preventing prior or unauthorised use
- Disks with visible labels
- Reconditioning or destruction of record carriers.

### Relationships with other classification places

Punched cards, magnetic or optical cards, conveying cards, [G06K](#).

### References

#### Limiting references

*This place does not cover:*

Materials for record carriers	<a href="#">G11B 5/62</a> , <a href="#">G11B 7/241</a>
Manufacture of record carriers	<a href="#">G11B 5/84</a> , <a href="#">G11B 7/26</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Record carriers characterised by the form	<a href="#">G11B 5/74</a> , <a href="#">G11B 7/24</a>
Circuits for preventing unauthorised use or copy	<a href="#">G11B 20/00086</a>
Magnetic or optical cards, conveying cards	<a href="#">G06K</a>

Antennas	<a href="#">H01H 1/00</a>
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## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Form factor	the size of a cartridge
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## Synonyms and Keywords

In patent documents the following expressions/words "cartridge"

Cartridge	cassette, container, magazine
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## G11B 25/00

**Apparatus characterised by the shape of record carrier employed but not specific to the method of recording or reproducing (individual parts of apparatus [G11B 3/00](#) - [G11B 23/00](#), [G11B 33/00](#)), {e.g. dictating apparatus; Combinations of such apparatus}**

### Definition statement

*This place covers:*

Mechanical structure of such apparatuses.

Documents which do not find a more appropriate classification in the depending subgroups.

### References

#### Limiting references

*This place does not cover:*

Recording/reproducing methods	<a href="#">G11B 5/00</a> , <a href="#">G11B 7/00</a> , <a href="#">G11B 9/00</a> , <a href="#">G11B 11/00</a> , <a href="#">G11B 20/00</a> , <a href="#">G11B 27/00</a>
The aspect of controlling the operating functions	<a href="#">G11B 15/02</a> , <a href="#">G11B 19/00</a>
The aspect of driving, starting, stopping the tape	<a href="#">G11B 15/18</a>
The aspect of guiding the tape within the apparatus	<a href="#">G11B 15/60</a>
The aspect of guiding the tape cartridges within the apparatus	<a href="#">G11B 15/675</a>
Library of tape cartridges	<a href="#">G11B 15/68</a>
Recording and reproducing apparatuses in combination with television sets	<a href="#">G11B 31/00</a>
Recording and reproducing apparatuses in combination with video cameras	<a href="#">G11B 31/006</a> , <a href="#">H04N 5/225</a>
Registering or indicating the working of vehicles	<a href="#">G07C 5/00</a>
Static data storage memories	<a href="#">G11C</a> , <a href="#">H01L 27/108</a> - <a href="#">H01L 27/115</a>
Telephones with dictation recording systems	<a href="#">H04M 1/10</a>
Telephone answering machines	<a href="#">H04M 1/64</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Registering or indicating the working of vehicles	<a href="#">G07C 5/00</a>
Registering performance data other than driving of vehicles	<a href="#">G07C 5/0891</a>
Telephone answering machines	<a href="#">H04M 1/64</a>
Telephones with dictation recording systems	<a href="#">H04M 11/10</a>
Apparatuses for television signal recording	<a href="#">H04N 5/76</a>

**G11B 25/04**

using flat record carriers, e.g. disc, card

**Definition statement**

This place covers:

- Apparatus for card shaped record carrier.
- Feeding or guiding non disc shaped (i.e. mainly card shaped) record carriers [G11B 17/0408](#).

**References****Limiting references**

This place does not cover:

Card shaped record carrier having a circular recording area	<a href="#">G11B 23/0014</a>
Hard disk drives	<a href="#">G11B 25/043</a>
Card shaped record carriers and apparatus for such carriers	<a href="#">G06K</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Methods or arrangements for sensing record carrier	<a href="#">G06K 7/08</a>
Record carriers characterised by the type of digital marking	<a href="#">G06K 19/067</a>

**G11B 25/043**

{using rotating discs}

**Definition statement**

This place covers:

The mechanical aspects of disk drives in which the disk or disks are permanently installed (e.g. hard disk drives HDD)

**References****Limiting references**

This place does not cover:

Heads of HDD	<a href="#">G11B 5/127</a>
Motors for HDD	<a href="#">G11B 19/2009</a>

**G11B 25/046**

{using stationary discs, or cards provided with a circular recording area (driving heads relatively to stationary record carriers for mechanical transducing [G11B 3/40](#); automatic feed mechanism producing a transducing traverse of the head across stationary disk tracks [G11B 21/043](#))}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

The card shaped record carrier having a circular recording area	<a href="#">G06K</a> , <a href="#">G11B 23/0014</a> .
Methods and arrangements for sensing card shaped record carriers	<a href="#">G06K 7/00</a>
Record carriers characterised by the type of digital marking	<a href="#">G06K 19/067</a> , <a href="#">G06K 7/0021</a>

**G11B 25/06**

using web-form record carriers, e.g. tape

**References****Limiting references**

This place does not cover:

Mechanisms which find adequate	<a href="#">G11B 15/00</a>
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**G11B 25/063**

{using tape inside container}

**Glossary of terms**

In this place, the following terms or expressions are used with the meaning indicated:

Tape container	tape cassette, tape cartridge
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**G11B 25/066**

{adapted for use with containers of different sizes or configurations; adaptor devices therefor}

**Glossary of terms**

In this place, the following terms or expressions are used with the meaning indicated:

Form factor	It refers to the specific (possibly standard) shape and dimension of a cartridge
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## G11B 25/08

using filamentary record carriers, e.g. wire

### Definition statement

*This place covers:*

Apparatuses using wire shaped record carriers .

## G11B 25/10

Apparatus capable of using record carriers defined in more than one of the sub-groups [G11B 25/02](#) - [G11B 25/08](#); {Adaptor devices therefor}

### Definition statement

*This place covers:*

combi apparatus,

apparatus which combine a tape player(s) with a disc player(s),

apparatus which combine a tape or disc player with a hard disc drive (HDD).

### References

#### Limiting references

*This place does not cover:*

The aspect of backing up data	<a href="#">G11B 7/28</a> , <a href="#">G06F 11/14</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Re-recording, i.e. transcribing information from one optical record carrier on to one or more similar or dissimilar record carriers	<a href="#">G11B 7/28</a>
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## G11B 27/00

**Editing; Indexing; Addressing; Timing or synchronising; Monitoring; Measuring tape travel**

### Definition statement

*This place covers:*

Editing;

editing operations performed on audio or video content recorded on the type of recording medium historically falling under the subclass [G11B](#) and extended to any type of recording medium storing physically audio and video content in a permanent manner, resulting in a modified or new recorded content. This covers as well the physical implementations of operations such as cut, paste, merge, adding sound track as well as the definition of the editing operations to be performed within an editor (non-destructive editing, playlist arrangements, editing operations in a video editor).

Indexing and addressing;

details concerning the type of information attached to a recording content which allows to access said content as well as information indicating reproduction of a sequence of addressed parts of recorded contents (play list typically). This can be with respect to the physical details of the recording medium (subcodes, lead-in, lead-out in case of a CD, AIT track for tape, prepits for DVD) carrying the information as long as the type of the recording medium falls under the subclass [G11B](#). In addition, it covers the case of indexing or addressing information in a audio or video content which are not specific to the physical characteristics of the recording medium such as table of content, metadata and other information which allow navigation within a file containing audio video content (typically a specific file format with indexing and addressing information embedded) or other special modes of reproduction. Special modes of reproduction (trickplay, repeat) are also classified in [G11B 27/00](#).

Timing or synchronizing;

Details relating to the synchronized reproduction of different components making up an audio video recording. By extension, synchronization of content between a main unit and an auxiliary video or audio player.

Monitoring;

Monitoring concerns the supervision of the progress of recording or reproducing, mainly monitoring power failure during recording or reproduction and logging the use of medium or apparatus for fault prevention It covers also the testing of the medium as a direct step in a recording and reproducing method and the use of information about the execution of the reproduction and/or recording (flags, power failure).

Measuring tape travel;

obsolete. Technical details concerning the measuring of tape travel are classified in [G11B 15/00](#).

### Relationships with other classification places

The group [G11B 27/00](#) is in close relationship with the area of television recording [H04N 5/76](#), computers [G06F](#) and the other domains of the subclass [G11B](#), notably, [G11B 20/00](#) for the formatting aspects related to channel encoding modulation, error correction, spatial arrangement of different kinds of information on the medium and [G11B 5/00](#), [G11B 7/00](#) for the physical aspect (shape, layer, structure, etc...) of the recording medium.

In particular, the group [G11B 27/00](#) deals with content management (space management, erasure of programs) concerning pre-recorded material or recorded material such as television programs, once these programs have been recorded on the recording medium. The other aspects of television recording such as the reservation of programs to be recorded are not dealt with in [G11B 27/00](#) but in [H04N 5/76](#), unless it involves using information pertaining to the recording medium usage (dedicated recording area, free space, other meta information such as date for erasure).

The group [G11B 27/00](#) does not deal with the details of the video coding technique found in subgroup [H04N 19/00](#) but is concerned with the application thereof in a corresponding editing and addressing operation or if it refers to coding parameters that are recorded for indexing purposes.

The group is also linked to [G06F 17/30](#) (database structures), and deals with the specific application to audio, video and leaves out the general and not specific database management techniques.

Synchronization aspects related to the extraction of a bitstream from the recording (e.g. bit clock extraction during channel decoding) are covered in the group [G11B 20/00](#) and not [G11B 27/00](#).

Likewise, the basic error corrections, or defect area management, are dealt with in [G11B 20/18](#) and not [G11B 27/00](#).

In General [G11B 20/00](#) deals with lower level (Channel, buffering) whereas in [G11B 27/00](#), the main focus is at the system level.

## References

### Limiting references

*This place does not cover:*

Testing the correct function of read/write heads for magnetic disk drives	<a href="#">G11B 5/455</a>
Testing recording/reproducing heads	<a href="#">G11B 7/00</a> , <a href="#">G11B 5/00</a>
Detecting defects on optical discs	<a href="#">G11B 7/00375</a>
Testing disk drives	<a href="#">G11B 19/048</a>
Synchronization linked to channel decoding	<a href="#">G11B 20/10009</a> , <a href="#">G11B 20/1403</a>
Management of defective sectors, error correction	<a href="#">G11B 20/18</a>
Finding physical defects on optical discs by optical inspection	<a href="#">G01N 21/9506</a>
Peripheral management in general	<a href="#">G06F 3/00</a>
User interface in general	<a href="#">G06F 3/048</a>
RAID systems in general	<a href="#">G06F 2003/0692</a>
Testing computer peripherals	<a href="#">G06F 11/2268</a>
Image processing	<a href="#">G06T</a>
Audio broadcast recording	<b>H04H1/02</b>
Television studio equipment	<a href="#">H04N 5/222</a>
Television broadcast recording	<a href="#">H04N 5/76</a>
Video Broadcasting	<a href="#">H04N 7/24</a>
A/V synchronization in transmission	<a href="#">H04N 7/52</a>
Video display of recorded content	<a href="#">H04N 9/00</a>
Video/audio coding aspects	<a href="#">H04N 19/00</a> , <a href="#">G11B 20/00</a>
Network broadcasting	<a href="#">H04N 21/20</a> , <a href="#">H04N 7/24</a>

### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Music or video database	<a href="#">G06F 17/30</a>
(tape) libraries	<a href="#">G06F 3/06</a> , <a href="#">G11B 15/68</a>
Pvr	<a href="#">H04N 5/76</a>
Camera with a recording entity	<a href="#">H04N 5/772</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Car navigation	<a href="#">G01C 21/26</a>
File backup; hierarchical storage management	<a href="#">G06F 11/14</a>
Interfaces, busses, program control of peripheral devices	<a href="#">G06F 13/10</a>
Dictation systems (e.g. testimony)	<a href="#">G06F 17/241</a>
Databases, retrieval	<a href="#">G06F 17/30</a>



"Multimedia"; File format	<a href="#">G06F 17/30017</a>
Intelligent playlist building; Library content management	<a href="#">G06F 17/30053</a> ; <a href="#">G06F 17/30781</a> ; <a href="#">G06F 17/3074</a> ; <a href="#">G06F 17/30784</a>
(graphical/manual/vr) user interfaces in general, also eye tracking, brain signals	<a href="#">G06F 3/033</a> , <a href="#">G06F 3/048</a>
General User interface	<a href="#">G06F 3/048</a>
Storage media in computer environment (I/O, device drivers)	<a href="#">G06F 3/06</a>
Application software, xlets	<a href="#">G06F 9/44</a>
Video object recognition	<a href="#">G06K 9/00</a>
Business methods (selling, renting, ordering DVDs, accounting, billing)	<a href="#">G06Q 30/00</a>
Animation (editing)	<a href="#">G06T 13/00</a> , <b>G06T15/70</b>
Image analysis e.g. motion based segmentation	<a href="#">G06T 7/20</a>
Payment aspects in relation with video playback	<a href="#">G07F 17/16</a>
Surveillance systems	<a href="#">G08B 13/24</a> , <a href="#">G08B 13/196</a> , <a href="#">H04N 7/18</a>
Learning systems	<a href="#">G09B 5/00</a>
DJ equipment, scratching, midi, music analysis (rhythm, genre,...)	<a href="#">G10H 1/00</a> , <a href="#">G10H 1/36</a>
Karaoke	<a href="#">G10H 1/00</a> , <a href="#">G10K 15/04</a>
Musical instruments	<a href="#">G10H 7/00</a>
Speech analysis	<a href="#">G10L 19/00</a>
Audio coding	<a href="#">G10L 19/167</a>
Audio processing in general	<a href="#">G10L 21/00</a>
Picture (photo) editing	<b>G10T11/60</b> , <a href="#">H04N 1/387</a>
Magneto-optical, minidisc (physical level details)	<a href="#">G11B 11/00</a>
Tape in general (physical/mechanical level, servo)	<a href="#">G11B 15/00</a>
Disc changers, jukeboxes (mechanical details)	<a href="#">G11B 17/00</a>
Control of operating function at player/recorder level	<a href="#">G11B 19/02</a>
Malfunction prevention	<a href="#">G11B 19/04</a>
Recognizing media	<a href="#">G11B 19/12</a>
DRM, copy protection, encryption	<a href="#">G11B 20/00086</a>
Recording/reproducing signal processing, buffering; Digital recording	<a href="#">G11B 20/10</a>
Recording format (sector level); Format (disc)	<a href="#">G11B 20/12</a>
Error detection/correction, defect lists	<a href="#">G11B 20/18</a>
Medium container/cartridge details	<a href="#">G11B 23/023</a> , <a href="#">G11B 33/02</a>
Recording or reproducing apparatus associated with related apparatus (cameras, projectors,...)	<a href="#">G11B 31/00</a>
Apparatus constructional details	<a href="#">G11B 33/00</a>
Specific for magnetic recording (hdd)	<a href="#">G11B 5/00</a>
Hdd testing	<a href="#">G11B 5/127</a>

Optical disc formats (physical level details)	<a href="#">G11B 7/007</a>
Solid state memories	<a href="#">G11C 7/16</a>
Broadcast equipment	<a href="#">H04H 60/00</a>
User behavior with respect to received broadcast signal	<a href="#">H04H60/26</a> , <a href="#">H04H 60/56</a>
User preferences in broadcasting	<a href="#">H04H 60/38</a>
Broadcast metadata	<a href="#">H04H60/69</a>
A/V home networks (HAVI,UPnP)	<a href="#">H04L 12/2805</a>
Protocols for multimedia communication	<a href="#">H04L 29/06027</a>
Still image editing	<a href="#">H04N 1/387</a> , <a href="#">G06T 11/60</a>
Multimedia settop box	<a href="#">H04N 21/40</a>
Multimedia server	<a href="#">H04N 21/20</a>
Scene detection	<a href="#">H04N 5/147</a> , <a href="#">G06F 17/30053</a> ; <a href="#">G06F 17/30781</a> ; <a href="#">G06F 17/3074</a> ; <a href="#">G06F 17/30784</a>
Studio equipment	<a href="#">H04N 5/222</a>
Tv studio equipment	<a href="#">H04N 5/225</a> , <a href="#">H04N 5/262</a>
OSD, subtitle and menu display	<a href="#">H04N 5/445</a> , <a href="#">G09G 5/00</a>
Television recording; (Broadcast) video recording in general	<a href="#">H04N 5/76</a>
Still cameras (capturing aspects)	<a href="#">H04N 5/772</a>
Trick mode reproduction (no matter what recording medium)	<a href="#">H04N 5/783</a>
Video conferencing	<a href="#">H04N 7/15</a>
Video transmission	<a href="#">H04N 7/16</a> , <a href="#">H04N 7/24</a> , <a href="#">H04N7/73</a> , <a href="#">H04N 21/00</a>
Video source coding	<a href="#">H04N 19/00</a>

### Special rules of classification

A document relevant to [G11B 27/00](#) (e.g. containing invention information or additional information relating to [G11B 27/00](#) EC) will be given an [G11B 27/00](#) EC group

Indexing Codes are not used.

Circulation rules :

- When a camera is involved : [H04N 5/772](#)
- scene detection : [H04N 5/147](#)
- When auxiliary content is retrieved from a network to supplement primary information on a recording medium : [H04N 7/24](#), [H04N 21/00](#)
- When a pvr is involved : [H04N 5/76](#)
- When a set-top box : [H04N 7/24](#)
- Building a collection of information concerning video or audio items : [G06F 17/30](#)
- When the data are arranged on the recording medium (of the type covered by the subclass [G11B](#)) in a specific way : [G11B 20/12](#)

Check also to the neighbouring fields listed in the informative references for circulation

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TOC	(Table of content) : collection of information allowing the definition and retrieval of individual pieces of audio and video content .
EDL	(Edit Decision List); collection of information (part of content used, editing commands to be executed and their chronological and spatial order, leading when executed to the creation of a piece of audio /video content
Playlist	collection of information in sequential order defining the reproduction order of recorded content, e.g. (user defined) program chain in dvd, mp3 playlist; merely a list of objects that are to be reproduced in sequence with no common timeline defined

## Synonyms and Keywords

In patent documents the following expressions/words are often used as synonyms (or close concepts):

"Comment", "annotation" and "label"

"Defect", "damage", "scratch" and "corrupted"

"Edit point", "edit mark", "In point", "Out Point", "Mark in", "Mark out", "cue point" and "cue mark"

"Random" and "shuffle"

"Segment", "portion", "part", "fragment", "section" and "sequence"

"Summary", "abstract", "highlight" and "digest"

## G11B 31/00

Arrangements for the associated working of recording or reproducing apparatus with related apparatus (with cameras or projectors [G03B 31/00](#)}; recording/reproducing of music for electrophonic musical instruments [G10H 1/0033](#); automatic arrangements for answering calls or for recording messages for absent subscribers [H04M 1/64](#); telephonic communication systems adapted for combination with dictation recording and playback systems [H04M 11/10](#); connection of TV recorder with other related apparatus, e.g. TV camera or receiver, in which the TV signal is significantly involved [H04N](#), e.g. [H04N 5/225](#), [H04N 5/765](#); combination of radio or TV with other apparatus, e.g. with vehicles [H05K 11/00](#)})

### Definition statement

*This place covers:*

Apparatus where the recording and reproducing device is interfaced with the user.

Take-up mechanisms for earphones cable.

### Relationships with other classification places

Television signal recording [H04N 5/78](#), [H04N 5/84](#).

Registering or indicating the working of vehicles (black boxes) [G07C 5/00](#).

Electrically operated educational appliances in combination with videotapes or videodisks [G09B 5/00](#).

## References

### Limiting references

*This place does not cover:*

Constructional details or arrangements of data processing systems	<a href="#">G06F 1/16</a>
Output arrangements for transferring data from processing unit to output unit	<a href="#">G06F 3/00</a>
Accessing, addressing, or allocating within memories	<a href="#">G06F 12/00</a>
Protection against unauthorised use of memories	<a href="#">G06F 12/14</a>
Transfer of information between memories, I/O devices or central processing units	<a href="#">G06F 13/00</a>
Recording/reproducing of accompaniment for use with an external source, e.g. karaoke systems	<a href="#">G10H 1/361</a>
Transmission systems	<a href="#">H04B</a>
Transmission of digital information	<a href="#">H04L</a>
Data switching networks	<a href="#">H04L 12/00</a>
Loudspeakers, microphones	<a href="#">H04R</a>
Wireless communication network	<a href="#">H04W</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Portable videocameras	<a href="#">H04N 5/225</a>
The recording apparatus and the television camera being placed in the same enclosure	<a href="#">H04N 5/772</a>

## G11B 33/00

**Constructional parts, details or accessories not provided for in the preceding groups (containers, packaging elements or packages specially adapted for record carriers [B65D 85/00](#))**

### Definition statement

*This place covers:*

- Chassis for recording/reproducing apparatuses.
- Portable recording/reproducing apparatuses.
- Covers, lids, front bezels of recording/reproducing apparatuses.
- Jewel boxes and similar containers, packaging containers for single disks or for multiple disks, racks for disks.
- Means for dampening vibrations or sounds.
- Means for indicating the working conditions of recording/reproducing apparatuses (e.g. displays).
- Layout of components within the housing.
- Electrical connections of/within recording/reproducing apparatuses.
- Docking stations for recording/reproducing apparatuses.
- Means for reducing/controlling the influence of the temperature in recording/reproducing apparatuses.

- Means for reducing contaminations.
- Means for shielding against electromagnetic interference, means for grounding.

### Relationships with other classification places

- Constructional details of computers, personal computers, laptops [G06F 1/16](#), [G06F 1/18](#), [G06F 1/20](#).
- Electrical connectors [H01R](#).
- Cabinets for electrical apparatuses [H05K 5/00](#).
- Furniture aspects of cabinets [A47B 81/06](#).
- Anti-theft devices for disks or cartridges [E05B 73/0023](#).

### References

#### Limiting references

*This place does not cover:*

Magazines for naked disks or for cartridges, which are part of the recording/reproducing apparatuses.	<a href="#">G11B 15/68</a> , <a href="#">G11B 17/22</a> , <a href="#">G11B 17/30</a> , <a href="#">G11B 23/023</a> , <a href="#">G11B 23/03</a>
Hard disk drives	<a href="#">G11B 25/043</a>
Photocopy machines	<a href="#">G03G</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Liquid crystal displays LCD	<a href="#">G02F 1/13</a>
Constructional details of computers, personal computers, laptops	<a href="#">G06F 1/16</a> , <a href="#">G06F 1/18</a> , <a href="#">G06F 1/20</a>
Electrical connectors	<a href="#">H01R</a>
Cabinets for electrical apparatuses	<a href="#">H05K 5/00</a>
Heat transfer	<a href="#">H05K 7/20</a> , <a href="#">F28D 15/00</a> , <a href="#">H04B 1/036</a> , <a href="#">G06F 1/20</a> , <a href="#">H01L 23/34</a>